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Expert ideas in institutional context – How bureaucratic structures helped shape energy policy response in the United Kingdom and France

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I dedicate this work to my father

For always stimulating inquiry and discussion

Ole Buhl-Madsen (1951-2013)

Abstract

This thesis examines the intersect of institutions and ideas during crisis. It suggests to synthesise institutional and ideational theories of change and stability in pragmatic empirical research inspired by classics of comparative politics. It emphasises a specific set of institutional parameters: Open or closed bureaucratic structures understood along three analytical dimensions: capacity of state, negotiation style and basis of expertise. These affect the way in which policy ideas can be utilized by experts. The ideational dimension is considered along three distinct aspects of policy ideas: overarching ideas, instrumental ideas and settings of ideas. The empirical contribution of the thesis is an examination of energy policy ideas of public experts in energy policy in the United Kingdom and France around the first oil crisis. The two cases represent diverse cases of variation on the causal factor of bureaucratic structures where the United Kingdom represents an open bureaucratic structure and France represents a closed bureaucratic structure. The findings of the investigation emphasise that ideas matter, but that different institutional contexts affect the ability of expert actors to form coalitions around different policy ideas. In the French case, this allowed the EDF to form ideational coalitions with shifting expert groups whereas the United Kingdom required political intervention to break the gridlock and status quo dynamics among multiple expert groups. Therefore, there is considerable insight in examining how ideas matter in a well-specified institutional context. In synthesising these two dimensions of policy change, the thesis highlights the institutional conditions for actor coalitions to form around ideas and the conditioning role the institutional environment can have for status quo policy dynamics. Furthermore, the analysis sheds light on how the role of ideas for policy during crisis may be understood as incremental and piecemeal logic rather than the erstwhile dominance of paradigmatic or punctuated shifts.

Acknowledgements

While all doctoral theses have one principal author it is always made possible by an entire network of academics, colleagues and friends. This is no less the case for this thesis. It would be impossible for me to mention all the discussions and insights that eventually made this thesis possible, but I would like to highlight a few key institutions and people for their contribution.

First, I would to thank Scuola Normale Superiore for creating a disciplinary environment at least as stimulating as the location in Palazzo Strozzi in the heart of Florence. In particular, the emphasis on fostering an interdisciplinary and international faculty comprised of many different nationalities, disciplinary and geographical backgrounds meant discussions were never boring nor lacking in insight they could offer. I deeply appreciate having been given the opportunity of being part of such a stimulating academic environment – this extends to the courteous and helpful staff at the Residenza Aldo Capitini were many of the students of the Scuola reside.

This thesis would not have existed had it not been for the multiple external visits at other universities. In the initial stages of my research project I benefitted from the close relationship between Scuola Normale Superiore and École Normale Supérieure in Paris. During a visit to the latter, my understanding of the intersects between Social Sciences and the discipline of History, as well as the broader literature on energy policy and modernization of France, benefitted tremendously from engaging talks with Blaise Wilfert-Portal. From Sciences Po., I owe particular thanks to Colin Hay for feedback on earlier renditions of the theoretical framework and stimulating discussion of the empirical trail I began to uncover in the national archives in France as well as Britain. Cheryl Schonhardt-Bailey at London School of Economics was gracious enough to lend me her thoughts on the broader project, contribution and connection with methodological innovations in qualitative computerization. These visits doubled as a possibility to collect the necessary data to substantiate the analyses of this thesis.

Internally at Scuola Normale Superiore, a broader group of colleagues and staff are responsible for improving the finished thesis at multiple stages throughout the project. In particular, I want to highlight the feedback at the always collegial and insightful comments at the recurring workshop for Ph.D. students of International and Comparative Economy and Policy at Scuola Normale Superiore. Feedback from the participants at these workshops in many ways helped shape both the

framing, methodological approach and theoretical framework that eventually made up the combined argument of the thesis. Outside this circle, but no less my friends and colleagues, Bastiaan Bruinsma and Aleksei Gridnev are owed thanks for reading through various parts of the thesis at different stages and discussing its content with me (sometimes over a glass of Chianti). The final form of the thesis is no less indebted my friend and intellectual comrade-in-arms, Carl Stefan Roth-Kirkegaard. His pragmatic approach and tireless energy for debating various problems has helped this thesis immeasurably. I am forever grateful for his friendship and support. Through discussion and suggestions, his insights have only improved the thesis that resulted.

My supervisor deserves special mention. Manuela Moschella served as an able guide and inspirator of the project and remained so throughout the stages of its progression. Through specifying research questions, methods of data collection, arranging external visits and giving helpful comments on what should be done to keep the development on track. In particular, I owe her thanks for her steadfast focus on how the contribution of the thesis could be framed and drawn out more clearly. It is in these debates that the project took several turns through its progression, which ultimately have allowed the thesis to speak to a set of more interesting questions than initially thought. I owe her thanks for this - and for her willingness to respond and comment on questions and drafts at short notice (and sometimes at odd hours). Her valuable input has helped steer this thesis to a more interesting, and ultimately, personally rewarding place. I would also like to give thanks to the two external reviewers who took the time to read and comment on the final thesis on very short notice in a period during all the additional chaos that a pandemic brings into the mix. Their comments were reflective of careful reading and engagement with the argument of the thesis and, in reflecting on and incorporating their suggestions and revisions, the thesis can only have improved.

These were but some of the people or institutions that have been instrumental in finishing this thesis. However, I would be remiss if I did not mention the broader influence of my family. My parents created an environment where inquisitiveness and reflection from an early age was encouraged on societal issues as well as wider scientific enquiry. My father, who is sadly no longer with us, stimulated these aspects in me and fostered a belief in knowledge through engaging with others. It is in recognition of the importance of these qualities to the path that led to this thesis and, more broadly, to me as a person that I dedicate this work to him.

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Chapter 1 Introduction and Puzzle

1.1 Introduction

Looking at today's international political landscape the relevance of examining crises is readily apparent. This introduction is written in the autumn of 2020 in a period where several countries are still under lockdown due to the pandemic of covid-19. At the time of writing almost 40 million people are estimated to have contracted the virus and more than 1.1 million have died (COVID-19 Map n.d.). With this backdrop, the relevance of studying international crises as a phenomenon becomes all the more apparent when situated within one. Of course, crises are not something new. It seems only a short time ago that economists were warning of the risk of a renewed recession essentially borne out of recurring problems resulting from the financial crisis of 2008. That is not to mention the refugee crisis, which highlighted human suffering brought about by disparities in wealth and safety across the globe as well as the problems associated with finding common political solutions to sudden shifts in migratory flows especially to the EU. Finally, the question of the crisis of mother earth in relation to problems associated with the man-made effects of global warming and the follow-effects that reaching the threshold of 1.5°C global average before 2050 has meant an ongoing sense of crisis for several years in much of political discourse (Masson-Delmotte et al. 2018). This is of course not an exhaustive list, and indeed, we may hear the word "crisis" invoked often in our everyday life for different reasons by different people and with, arguably, different degrees of severity.

Antonio Gramsci famously defined a crisis as the interregnum where the old is dying and the new cannot yet be born (Gramsci 1999, 276)[1]. Crisis, in this way, becomes a concept, in part, of the casting into doubt or dethroning of existing dominant ideas or institutions without a clear alternative. Importantly, though, it is this opening of the interregnum where new realities may be constructed. This highlights the inherent political nature of a crisis. Its invocation serves to bring into flux the known and introduce an element of uncertainty into an otherwise (tacitly assumed) calculable and stable – in the sense of predictable - future. In that sense, the collective agreement

[1] For Gramsci it was this was manifest as the disconnect between leading capacity of ruling classes with their ideological support – in which case they simply become dominant through the use of coercive force (Gramsci 1999, 276, 1999, 55). For a longer exposé on the nature of crisis, see (Koselleck and Richter 2006).

that an event is a crisis also acts retroactively in delineating the predicted from the unpredicted, or the normal from the unique.

That such momentous events can have restructuring effects on actors, resources and policies may seem a borderline trivial observation. Even when confining our focus to policy change during economic crisis, such a focus is not really state of the art. Already in 1986 examinations of economic crisis, as "'major downturn(s)' in the business cycle which rearrange the 'placement of social actors in the economy and shape subsequent policy choices" made this connection between crisis events and policy change (Gourevitch 1986, 20–21). As Gramsci's definition implies, as Gourevitch would probably agree and as the responses to the above-mentioned crises tell us, a common crisis does not imply a commonality in the solutions applied. In an attempt to disassemble the, otherwise assumed, automaticity of the link between crisis and response, the social sciences have long tried to understand why countries react differently to similar stimuli. Some parts of the literature have emphasised the role of structural conditions to explain why countries or people react the way they do to a crisis. Recent scholarship on ideas has emphasised the importance of what people think to understand how they react to a crisis (Blyth 2013a, 2013b; Carstensen 2015; Clift 2012; Hay 1996, 1999; Matthijs and McNamara 2015; Moschella and Tsingou 2013; Schmidt 2016). Crisis provides an opportune moment for the historical study of the shaping of political ideas. By focusing on crisis, it becomes more likely to observe changes in political ideas and trace how these changes formed.

Such mechanisms of interaction between actors and environment can only be studied with a certain temporal separation (Gaddis 2002, 61–62; Hay 2002, 124). The dynamics of ideas have to a large extent been studied in the setting of crisis. Much of the focus of this research agenda has been in highlighting the significance of political ideas in their own right in contrast to earlier material explanations of policy outcomes (Blyth 1997, 2002; Campbell 2002; Campbell and Pedersen 2001; Gofas and Hay 2012; Hall 1989, 1993; Hay 1996; Parsons 2003; Schmidt 2002b). As such, the development within constructivist institutionalism and discursive institutionalism of "ideas matter" is to say that ideas matter in themselves and beyond their material reflection or foundation often emphasised in rational choice institutionalism and historical institutionalism (Goldstein and Keohane 1993; Mahoney and Thelen 2010, 2015; North 1990; Pierson 2000, 2004; Shepsle 1989;

Streeck and Thelen 2005; Weingast 1998)[2]. However, this forceful move from materiality to the focus of ideas might itself have neglected the complex relationship existing between ideas and the material structure in which they exist. For instance, Mark Blyth's exploration of the dynamics of ideas in Great Transformations (Blyth 2002) is exactly a study of the embeddedness of ideas in structures of material resources. This study succeeded in suggesting material resources as decisive for idea formation. However, the study of the configuration of state institutions and their effect on ideas is still underexplored. Thus, this thesis aims to resituate the study of ideas in emphasising the interplay between ideas and materiality by exploring the effects of state institutions (as bureaucracies) on the formation of political ideas.

To understand these complexities I suggest contribute to the further illumination of this relationship using a comparative research design that leans heavily on historical archive material from the historical period surrounding the first oil crisis, in an attempt to examine the mechanisms that link configurations of material institutions as bureaucratic structures to certain policy ideas among governmental elites and decision-makers. This period is chosen as the object of study because it provided a crisis or similar external shock, thus similar crisis conditions, to many affected countries. The cases explored in this investigation are United Kingdom and France. They are prime candidates for such an examination for several reasons. Firstly, because they have similar simple-polity structures where political authority is centred on the national government as opposed to dispersed among several authorities (Schmidt 2007, 13). Secondly, they share the characteristic of choosing national policy solutions rather than international coordination, say, through the European Community, in the wake of the later dubbed 'Oil Crisis'. Despite these similarities the two countries opted for markedly different policies in response to the similar conditions provided by the crisis; both in terms of content of policies but also reflecting different trajectories. These two characteristics mean that crisis interpretations are likely to be present among governmental elites and their actions are – at least formally – set outside a broader set of international interaction of explanations.

Thus, this thesis has an overarching theoretical puzzle of how material structures, such as bureaucratic structures, influence the ability of policy ideas of some experts to become dominant in

[2] One may reasonably argue this critique of historical institutionalism is perhaps more applicable to newer renditions of the framework rather than the original statement of (Steinmo and Thelen 1992). For a version of this argument, see (Hay 2008) or (Schmidt 2010a). We will return to the potential intersects between historical institutionalism and the study of ideas, later.

energy policy. The choice of exploring this in relation to the handling of the oil crisis of 1973 in the United Kingdom and France embeds the study in the broader question of why countries react differently to a common international crisis. The chosen path through which the analysis does so is by exploring ideational developments within explicitly formulated dimensions of material structures. Before establishing these aspects of the theoretical puzzle, I will briefly sketch the chapter outline of the thesis.

1.2 Chapter Outline

The remainder of chapter 1 situates the puzzle of the thesis in the historical context of the first oil crisis and the sensitivity of the United Kingdom and France to the disruptions it brought about. Then, it highlights some of the broader insights that may be gained from examining the oil crisis before it briefly sets out the argument of the thesis and the research questions it attempts to answer. Chapter 2 situates the thesis in the broader literature on comparative politics and specifically in the discussions of neo-institutionalist theories of the dynamics of change and continuity. It argues for a renewed appreciation for the potential insights from combining historical institutionalist and ideational approaches in studying policy change and draws on a classic of comparative politics to remind us this synergy is possible. Having situated the thesis in the literature, chapter 3 sets out the theoretical framework used in the analyses. It specifies the causal factor of bureaucratic structure as a subset of institutional variation relevant to the role of expertise and the outcome factor of policy ideas among experts. Chapter 4 sets out the methods and data sources of the thesis. It delves into the case selection logic and argues for the combination of process tracing methods with a comparative analytical approach. It then describes the empirical archive material that was collected and used for the analyses.

The two following chapters are the analyses of the two cases. Each analysis follows to broad steps. Chapter 5 analyses the bureaucratic structure and policy ideas among experts in the United Kingdom. The first step of the analysis establishes the open nature of the bureaucratic structure. The second step then examines the policy ideas among experts within context of this specific bureaucratic structure. For pedagogical reasons this step of the analysis is separated into two parts representing the policy ideas in the bureaucratic structure of the United Kingdom before and after the crisis. Chapter 6 proceeds to analyse the French case according to a similar structure. The first step establishes the closed bureaucratic structure of France. The second step analyses the policy

ideas among experts in energy policy within this institutional context. Chapter 7 concludes on the thesis by setting the broader goals and research questions in relation to the individual findings the analysis of each case and compares the contributions they bring to the literature by indicating which general insights we might draw from these specific findings. Finally, the chapter attempts to hint at how future research might benefit from the findings of this thesis and how a closer analytical attention to the connection between institutions and ideas can be used to enrich our understanding of other phenomena in modern society. Chapter 8 and Chapter 9 are the references to used archive material and literature, respectively.

1.3 The Puzzle

1.3.1 International economic crisis and domestic effects

The period treated sits against the backdrop of international economic crisis and the waning of the golden age of embedded liberalism. In the early 1970s, the historical compromise forged between countries on the back of the disasters of the Great Depression and the Nazi and fascist experiences of the Second World War was in the process of being undermined. The conflicts in the Middle East, the oil shocks of the early 1970s, the de-facto dissolving of the Bretton woods system of pegged exchange rates (when dollar stopped being an anchor) marked a shift. The previously stable compromise of the managed economy was in trouble. At the same time, increasing international cooperation in the General Agreement on Trade and Tariffs and the expansion of the European Community meant that the world was significantly different from when the blueprint of the managed international economy was stuck onto paper. Concurrent with the downturn in the economic business cycle came re-configuration of traditional party-political lines and a host of new parties emerged across Europe as the *Trente Glorioueses* of the post-World War 2 came to a halt. That the oil crisis of the early 1970s had many facets is therefore no surprise. What is interesting is how and why countries reacted differently in the context of these shifts.

In the broader literature on comparative political economy, this period has been extensively studied in no small part by neo-institutionalist scholars (Hall and Taylor 1996). In more recent literatures, the positioning has been characterised by a division between existing studies that emphasise material factors in the explanation of outcomes and those that instead emphasise constructivist perspectives of ideational dynamics and the power of ideas to explain outcomes (Abdelal, Blyth,

and Parsons 2010; Béland and Cox 2011). These literatures, as we shall see in more detail in the following chapter, have furthered our understanding of politics in ways that allows research to close in on the drivers of agency and why actors do what they do. But how do they interact? In emphasising the necessary demarcation and boundary setting of this literature with reference to more material perspectives, the ideational literature has neglected to actively integrate how material and ideational factors interact. Indeed, we know that ideas do not exist in a vacuum (Risse-Kappen 1994). From classics of the literature we also know that coalitions that support policy change or inertia depend on a multitude of factors (ideational and material) (Gourevitch 1986). How do material and ideational factors specifically interact in conditioning policy outcomes? In the case of the role of expertise in politics, the role of existing institutional structures for the role of ideas in politics is often implicitly, but rarely explicitly incorporated as part of the puzzle. How do we integrate material and ideational factors in explaining the dominant policy ideas of experts? Social reality is complex, and thus one quickly risks over-specifying an explanation.

If the broader puzzle is about how countries react differently to external stimuli, the broadest analytical category has to refer to a domain of politics no larger than a country since these are, ultimately, what are compared. However, which material institutions should one focus on? The two cases of United Kingdom and France display a puzzling empirical development. They represent a particular subset of cases with different outcomes in policy response to the oil crisis of 1973. For instance, this is despite showing similar reluctance of cooperation after attempts to coordinate at the supra-national level of the European Community - which the United Kingdom had just joined. This does not mean that international dimension is irrelevant, of course. While scholars may debate the properties of economic crisis, there should be little disagreement that in an interdependent world these properties are operational at an international level (Gourevitch 1978, 1986). This means that the characteristics of international crisis are expected to have effects on domestic levels of policy-making by linking domestic struggles over policy responses to crisis with wider international economic trends. One of the advantages of the two cases of France and the United Kingdom in the early 1970s and the supply-shock and price-hike on crude oil due to actions by the OPEC alliance, is that the countries in question chose not to cooperate following attempts at regional level-solutions forwarded at the level of the European community. The cases therefore allow a level of control over direct formal decision-making in response to the economic crisis from supra-national level

institutional structures. These differences are therefore likely to be located at a domestic level of the two countries.

The many facets of intersecting historical developments in this period means that the oil crisis needed to be understood by those required to act upon it. In modern governments, experts exist within different policy areas who aid in defining and ascribing meaning to a given problem. Through their ideas of what the country should do to counteract the crisis a policy solution is found. However, which experts prevail? Is it inherently a question of the idea itself, or does it rely on other factors?

Answering this question requires more than analysing the ideas of different experts, but also how they achieve broader support. Moreover, it raises the question of what determines the support of an idea. This is as much a question of the context within which an idea can be translated into power through support. From a theoretical point of view, the study of the oil crisis allows the analysis to study the way in which domestic institutions interact with idea-driven agency in a context of uncertainty. The fact that the analysis is diachronic across several years means that the analysis can also potentially illustrate shifts (or not) in ideational change dynamics across "normal" and "crisis" times, and the extent to which crises responses rely on existing ideas and to what extent institutional contexts interact with these dynamics. The thesis thus attempts to grapple with the broader theoretical puzzle of the interaction between material structures and the drivers of agency. The two cases are useful for such an analytical endeavour because they vary according to the institutional context within which policy ideas are forwarded by experts. The puzzle of how institutional context and ideas interact to condition different policy ideas of experts can be illustrated by examining the bureaucratic structures and the policy ideas among experts in the two countries. Thus, this thesis has an overarching theoretical puzzle of how material structures, such as bureaucratic structures, influence the ability of policy ideas of some experts to become dominant in energy policy.

1.3.2 The effects of the oil crisis.

It would be an understatement to say oil has been important as a source of energy and a material basis for western economic growth – indeed they sometimes seem to be in a vicious relationship (Thompson 2017, chap. 4). It is the largest source of energy supply for the world and despite developments in electrification of transportation, a large majority of energy for transportation still

relies on oil (BP Energy Outlook 2019, 45). With that in mind, it might be useful to examine a few details of the dependence on foreign oil in the two cases.

Before the first oil crisis the supply of oil was generally ensured on the back of a rather mercantilist system of trading schemes between major Western oil companies, who bought concessions to extract and refine crude oil from oil-exporting countries. In addition, several state-agreements existed between importer-countries and exporter-countries. All of this meant, that most of the oil-trading on a global scale was done through long-term bilateral contracts (Goldthau et al. 2010, 3).

A number of interrelated factors triggered the oil crisis of the early 1970s. The crisis followed from the fourth Arab-Israeli war of October 1973 with a few caveats. For instance, one should not underestimate the pre-existing debates on pricing structure and the tight market for oil-demand that acted as conditions to increase the leverage of oil producers beyond the members of OAPEC with a direct stake in the military conflict (Venn 2002, 8–9). Concerns over conditionality of the origin of the crisis aside, we may somewhat simplified consider the crisis as triggered when the Arab section of oil producers (loosely organized under OAPEC) embargoed oil shipments to United States and the Netherlands. Other countries were allowed to import oil on the basis of support for the Arab position in the Arab-Israeli conflict. Most members of OAPEC reduced total oil exports so that countries under the embargo were not able to import oil from other members of OAPEC, a cutback which were to increase by 5% per month until demands were met.

These events combined to allow OPEC (Arab oil producers as well as countries like Nigeria, Iran and Venezuela) to raise oil prices around 400% in a very short amount of time (Lindberg 1977, 47). The combination of an explicit act of first embargo and then cutback in oil exports for achieving political goals in the Israeli-Arab world constitutes what became termed “the oil weapon” (Licklider 1988, 206). Several factors intersected to make this a crucial time. One obvious factor was the difficulty consumer-countries had with replacing oil supplies that were lost during the embargo and general costs associated with the price-increases that followed in the cutbacks. Moreover, the general stability of the Persian Gulf was in question in this period with the Arab-Israeli conflict having resulted in several military conflicts in the period beyond the Yom-Kippur War that prompted the embargo. To make matters worse, the decreasing domestic oil production in the United States a few years earlier led U.S. President Nixon to remove import quotas on oil, which had previously buffered some of the US demand for global oil (Goldthau et al. 2010, 3). All of these

factors combined make up the difficult situation that hit importer-countries, in particular Western Europe.

1.3.2.1 Import dependence and Oil

A common denominator of energy consumption after the second world war is that of a shift toward oil and natural gas instead of relying on coal - an observation which holds for both United States and Western Europe (and to some extent, Japan)(Kohl 1982). During the early 1950s, the then nascent European Community was broadly self-sufficient with energy. The original-six EC members supplied 90% of their energy demand with domestic coal resources and other sources, of which the former made up around 70%. Only around 10% of total energy consumption was made up of imported oil. The year before the oil embargo of 1973, this number was 60% on average (Kohl 1982, 81–82). While the absolute level of import dependence varied between Western European countries, they shared the common dependence on energy imports, especially compared to the United States[3]. This import dependence underscored a common interest in reducing demand pressures on the international oil market for their potential disruptive effects to national economies (Ikenberry 1986, 106). Therefore, there was ample room for governments, especially in Western Europe, to declare similar energy security goals against the use of the "oil weapon" by OPEC (Goldthau et al. 2010; Goldthau and Witte 2011).

To understand the impact of sudden supply-shocks to the two countries in question, we need to look at the specifics of their energy demand, that is, the distribution and dependency of energy consumption.

[3] The one exception being the Netherlands, who at the time had large quantities of natural gas available and thus their oil dependence does not as easily translate from import-export balances of energy.

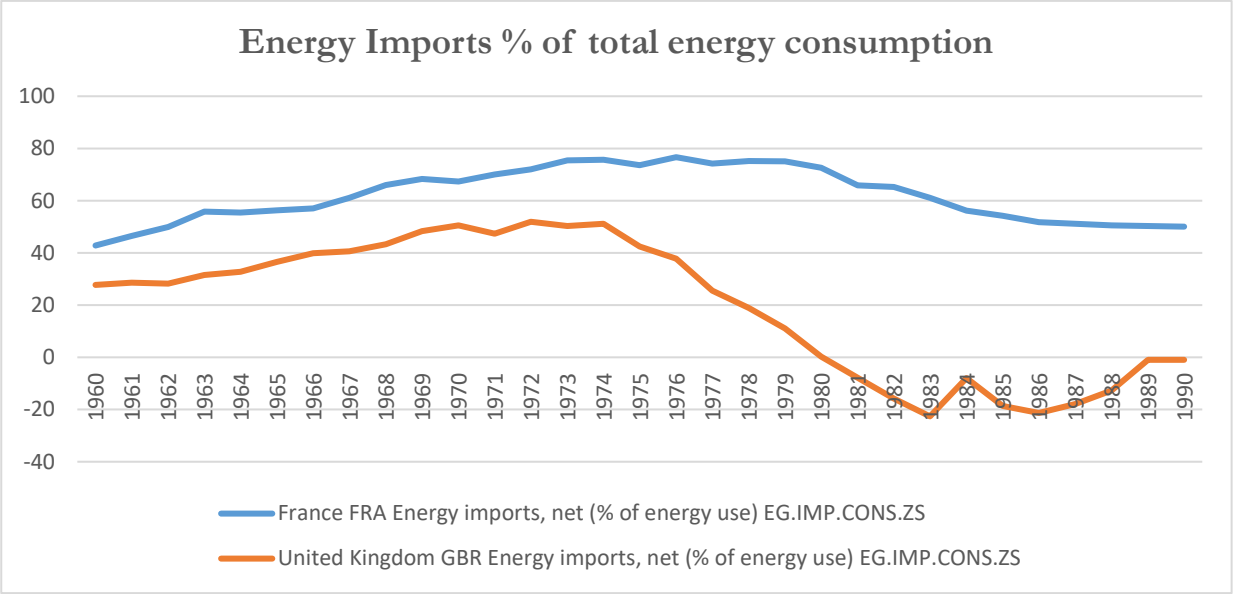

Figure 1 Net energy imports as percentage of total energy use (World Bank n.d.)

Net imports of energy as percentage of total energy consumption[4] gives us an idea of the dependency of the United Kingdom and France of imports of foreign energy – and hence – their world market prices of said energy. This gives us a proxy for the vulnerability of the two countries to instabilities in world supply of energy, at a general level. Of the two countries examined, France has continually been at a higher level of import-dependence compared to the United Kingdom in the period from 1960 to 1990. The extremes vary from around 42.8% in the early 1960s to a highpoint of 76.6% in 1976. In the entire period, France has been dependent on imports from other countries and we can observe a sharp reduction in imported energy around 1980. By comparison, the United Kingdom has been generally less dependent on energy imports over the period. Net imports of energy peak at 51.9% in 1972 from a low-point of 27.8% in 1960. Similar to France, the highest import share is recorded after the first oil crisis, and similar to France again, the drop from the high-point occurs a few years after this point with a shift from an otherwise stabilized level, only at a lower level in the low 50% by comparison to the mid-75s in France. In the United Kingdom we begin to see the drop in energy imports around 1974 onwards.

[4] "Net energy imports are estimated as energy use less production, both measured in oil equivalents. A negative value indicates that the country is a net exporter. Energy use refers to use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport." (indicator EG.IMP.CONS.ZS, source note).

Three relevant differences can therefore be discerned. The general level of dependency is high for both countries, but France has a continually higher net-import of energy than the UK in the period from 1960 to 1990. Both countries experience rather sudden downshifts in import of energy imports after imports stabilize over a couple of years, but they do so at different points in time, where the import drops earlier and faster than France. Moreover, we can observe an actual negative import, that is, export of energy from the United Kingdom to other countries from 1980 onwards, although nearing an equilibrium toward the end of the period. The general picture we gain from this is that over the period examined both countries managed to reduce their dependency on imported energy during the 1970s and early 1980s. In the case of the United Kingdom, the import balances were turned away from dependency on imported energy more quickly than that of France. From 1980 onwards the United Kingdom was a net exporter of energy.

To understand the dependency the two countries experienced on the primary energy commodity in question during the first oil crisis, we can look at oil as a percentage of total energy consumption. This allows us to establish the size of dependency of the two countries on oil.

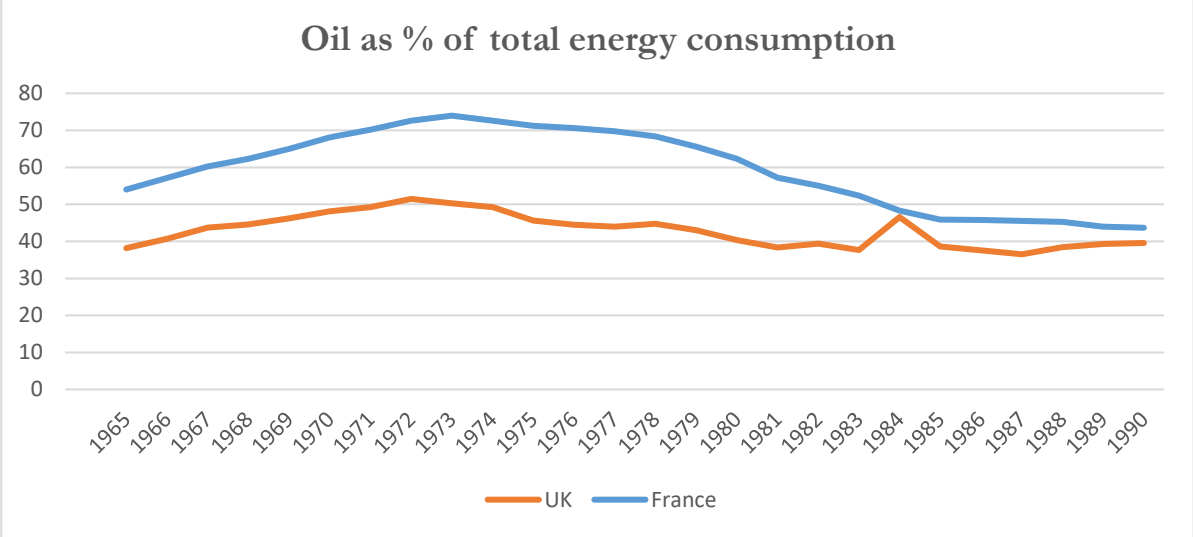

Figure 2 Oil as percentage of total energy consumption (BP Statistical Review of World Energy 2014 n.d.)

From figure 2 it becomes evident that oil as share of total energy consumption was of a considerable size, increasing through the examined period from 1965 onwards until the period around the oil crisis, where consumption naturally drops as oil prices increase. Similar to the

previous chart on import dependence, we again see that France tops the chart with around 10%-point higher share of total energy consumption deriving from oil in 1965 compared to the United Kingdom. This difference increases to 20%-points in 1973. While France is more reliant on oil for domestic energy consumption, it is also a fact that both economies rely heavily on oil for their energy needs. This is consistent with the broader picture in Europe where the year before the oil crisis, in 1972, the percentage of gross oil imported was 99% for Western Europe, as a whole, and 80,4% of which came from North Africa or the Middle East (Kohl 1982, 83). Dependency on oil imports increased up to and through the oil embargo of 1973 from relatively minor levels in the early 1950s to more than half of total energy consumption. Moreover, a great majority of this oil dependency was on oil imported from the Middle East, and Western Europe was therefore in a particularly sensitive position vis-à-vis sudden price shocks.

From this brief overview of the dependence structure of France and the United Kingdom, we learn that both countries were extremely dependent on foreign imports of energy to satiate national demand, and fluctuations to this demand or prices would therefore have a serious effect on both countries in economic and social terms. Moreover, the share of oil in this import structure is between 40%-55% at their lowest point before the oil crisis in the autumn of 1973. The scale of the problem is thus illustrated. However, why would we then examine the role of domestic institutions and expertise in this regard? To answer this, we need to turn to some of the reasons why the theoretical puzzle of this thesis can be illuminating several aspects of existing scholarship.

1.3.3 Insights and contributions of examining the oil crisis

The theoretical puzzle is embedded in this broader question of the differing policy responses to similar stimulus. More specifically, it emphasises how bureaucratic structures can influence ideational development and how bureaucratic structures influence national political action through conditioning ideas of experts. Existing studies have emphasised the domestic structures in understanding how crisis responses map on to particular policy fields - especially in economic policy (Gourevitch 1986; Katzenstein 1978; Simmons 1997). Where more recent approaches have emphasised the ideational drivers of agency to understand why specific choices are made among alternatives (Blyth 2002), more work can still be done on the systematic interrelationship between institutions as both constraining and empowering to agency driven by ideas (A. Baker 2015; Moschella 2015; Moschella and Tsingou 2013). This can lead the literature towards other modes of

dynamics of ideational change (Carstensen 2011a; Carstensen and Matthijs 2018), but also open the question of how crisis responses can vary with the institutional structures that surround the given policy field.

In dealing with a policy sector that has direct implications for both households and GDP-growth more generally, this also speaks to the nature of state-market relations with France following a more state-centred approach to energy policy as opposed to the more market-oriented approach of the United Kingdom (Keay 2016, 248). More broadly, given the current and increasing importance of transformation of energy sectors to more carbon-neutral production, the findings of studies that examine the intersect between institutional contexts and agency in the role of policy ideas should be a worthwhile endeavour. While one should be careful in extrapolating findings from one historical period to another, insight can be indicated when thinking about current societies' attempts to transition to more sustainable energy mix, which is less reliant on fossil fuels. Examining the expertise and ideas behind energy policy during the first oil crisis thus promises insight into the different concerns that influence energy transitions more broadly. In emphasising the role of specific institutional contexts for policy ideas, the analyses can highlight the structural conditions that may hinder or aid different types of policy change. Studying both the institutional and agency dimension of change is therefore useful in relation to debates of today as well.

The disciplinary relevance of studying the time period of the 1970s is further enhanced by often being used in the literature as an anchor to descriptions of shifting macro-economic policies following from Keynesian to more Chicago-school dominated policies (Hall 1989). At a broader level, the familiarity with the period in the literature will make it more easily observable how arguing for greater theoretical interaction between historical institutionalist and ideational scholarship can contribute to our understanding of ideational dynamics. The emphasis of the analysis on role of ideas among experts speaks more directly to this literature and more recent scholarship (Ban 2016; Chwieroth 2007b, 2010), but the subject of energy policy in the response to the oil crisis also speaks to role of ideas in policy contexts characterised by high levels of technical complexity. From the policy angle, the analysis has particular relevance as well, because it has long been a mainstay of policy-studies that the development and trajectory of policy was a long-term phenomenon (Bösch and Graf 2014). This is particularly the case for large infrastructure and resource-intensive sectors like that dealing with energy. From an empirical perspective, the fact that the 1970s is outside the usual limitations of access to public records directly affects the ability to

access historical archives from the period. Other than the theoretical backdrop of being a known entity, the accessibility of archive material makes it possible to reconstruct the debates of experts in energy policy with a great degree of precision.

The cases of France and the United Kingdom are particularly interesting in examining the dynamics between international crises and national responses. At prima facie, existing explanations that emphasise party politics in charting policy, developments do not seem sufficient to understand the interest that lead to specific policy choices in the two countries. In the early 1970s, these two countries had similar right-leaning conservative governments, yet their reactions were very different. What is more, despite the first French socialist president being elected in the following period (François Mitterrand, 1981), the overall policy of energy policy following nuclear energy through extensive state-intervention continued.

While not the main focus of this work, the emphasis on the dynamics of policy choice and change in the energy sector may have useful corollaries to some of the more recent developments in newer times. In particular, the United Kingdom's renewed interest in nuclear power as a source of clean-energy and the switching focus of reform policies from more market-led approaches to more intervening attempts at facilitating goals for energy policy in the face of climate change. Moreover, this particular development speaks to relevance of understanding the genesis of these crisis responses of earlier times, as these newer policies in the U.K. involve the Électricité de France as a key partner in developing nuclear solutions (Keay 2016, 249). Knowledge of both these countries and the histories of their energy policies at crucial times in earlier periods is thus paramount. Moreover, a more detailed reconstruction of the reasoning and motivation of decision-makers during the 1970s may help cast new light on reorganizations of the relationship between the government, regulators and the market seen in more recent periods (Rutledge and Wright 2011, chap. 10). Finally, because energy policy in recent years has become a component of, if not subservient to, the agenda of climate change and environmental policies (which dominate many debates and questions related to global governance today) the dynamics of crisis and response in the energy sector during this particular period may be of broader interest than otherwise dictated by the specifics of the period.

1.4 Argument in brief

Crises are periods of uncertainty where preferences and goals can be in flux. International crises are common to a wider set of nations and thus opens the possibility of comparing national responses to international crises. Understanding the role of domestic factors in mediating policy choice has been on ongoing question in the social sciences.

The scholarship on the role of ideas in policy choice has made significant impact in this regard. A key contribution is the argument that crises are events that are not reducible to informational asymmetries or constraints (Blyth 2002; Hay 1996, 1999; W. W. Widmaier, Blyth, and Seabrooke 2007). Focusing on a highly technically complex and knowledge-based policy field like energy illustrates the point that information does not necessarily reduce ambiguity – and thus the role of politics. This has led to some parts of the scholarship explicitly tackling how institutions and ideas interact. They highlight, that insufficient attention have been given to the way in which existing institutional characteristics can constrain or permit different dynamics of policy ideas (A. Baker 2015; Moschella and Tsingou 2013).

Synthesizing existing arguments from ideational scholarship and historical institutionalism I argue that policy ideas are potentially influential in shifting the power balance between expert groups within energy policy in France and the United Kingdom, but that the way in which these shifts take place depend on the open or closed nature of the bureaucratic structure in which these experts reside. This line of argument emphasises that "structures do not come with an instruction sheet" (Blyth 2003). However, this is not a cultural-determinist argument in the sense that there is no agency outside these ideational constructs. The argument is thoroughly constructivist, in the sense that structures and agents interact in producing change or stability. So, while structures do not come with an instruction sheet, "ideas do not float freely", either (Risse-Kappen 1994). The material and political dimension of this becomes how different political groups or alliances form around particular policy ideas. This is exactly important, because acting on the basis of ideas can have very material redistributive consequences. The open or closed nature of a bureaucratic system affects the way in which domestic experts in energy policy of a country can build alliances around particular policy ideas that affect the energy policy response of a country to the international oil crisis of 1973.

A follow-up aspect of the analysis is therefore not in controlling alternative explanations per se, but instead in accepting this complex interaction of ideas and institutions. This is crucial for understanding why some policy ideas may win out over others. The selection mechanism for some ideas over others is crucial exactly because of the policy responses and future trajectories that may be instituted on the basis of them.

1.5 Research question and Hypotheses

The research question that frames the investigation of this thesis can be phrased as:

How do domestically specific institutional configurations shape the dynamics of policy ideas among experts in energy policy during the first oil crisis?

To answer this rather broad question, we need to specify some hypothetical claims about specific domestic institutions and policy ideas among experts. Below I have specified a main hypothesis as a more specific variant of the research question and two sub-hypotheses relating to the different aspects of the focus on institutions and their interaction with policy ideas, respectively. What I term the bureaucratic structure is a subset of institutional characteristics, which are hypothesised to affect policy idea dynamics across different operational categories of ideas. These will be elaborated in the theoretical framework (chapter 3), but it is worth briefly mentioning them at the outset.

The main hypothesis is derived from the above research question but formulated as a more specific claim about the nature of institutions and policy ideas and can be formulated as: *Differing bureaucratic structures helped shape ideational exchange and negotiation about policy responses to the First Oil crisis in France and the United Kingdom.* In this main hypothesis, I emphasise that a subset of institutional contexts can be operationalized as what I term bureaucratic structures, which is the institutional context of the exchange of policy ideas of experts who are embedded or related to the state bureaucracy (which will be elaborated in the theoretical framework, chapter 3). The variation in such institutional context is hypothesised to affect the exchange of ideas and negotiation among expert actors in the two cases around the period of the first oil crisis. This means the analysis should focus on the period before and after the crisis to examine the variation in policy idea dynamics that may follow from variation in bureaucratic structures. This broader main hypothesis presupposes two sub-hypotheses. The first sub-hypothesis is that: *The bureaucratic*

structure varied across the two cases examined. The analysis therefore needs to examine whether difference can be observed along sufficiently nuanced and yet easily distinguishable variational patterns of bureaucratic structures. Thus, the second sub-hypothesis is that: *The bureaucratic structures influenced the dynamics of ideational development in different directions.* The key to this hypothesis is that the policy ideas of experts (in whatever form they may take) varied in accordance with conditions of the specific bureaucratic structure. In conjunction, the two sub-hypotheses form each side, the institutional and the ideational, of the main hypothesis and thus allows the analysis to answer the research question.

In this brief introduction, I aimed to show how the mediation of international crises to a domestic context can be a worthwhile research endeavour that may shed light on a crucial period of post-world war development in the field of energy policy. In particular, on the role of expertise in complex policy fields may be usefully illustrated in terms of existing debates on the respective roles of institutional environments and policy ideas. The research question and hypotheses provide the vantage point of the investigation by aiming to pinpoint the conjunctive role both of these aspects in understanding broader questions of change and continuity during crisis and their dynamics.

Before we can get into the clarification and operationalisation of the specific analytical concepts relating to the research hypotheses (in chapter 3), we need to situate the research question of institutions and policy ideas during crisis in the broader literature, to which we now turn.

Chapter 2 Literature Review

2.1 The relationship between crises and domestic institutions

Studying the relationship between crisis and state structures is situated in the literature on comparative political economy. The literature on comparative political economy has long been interested in the balance between characteristics dynamics such as crisis of the economic system and its interaction with state forms. For an early example, we may recall Shonfield's examination of the balance between private and public power and the characteristic features of capitalism after the Second World War (Shonfield 1965). These different features, which we might today term a form of Keynesian demand management, were characterised by elements like; industry regulation, counter-cyclical economic policy with the explicit goal of full employment and welfare state expansion(Clift 2014; Hall 1989). The particularities of the specific institutions that supported these elements in each country as well as particularities of economic development trajectories is what resulted in distinctive variations of policy despite overarching similar economic policy projects in *Modern Capitalism* (Shonfield 1965). Against this backdrop of the high-growth, demand-management decades following the second world war, examining the first oil crisis might be termed the 'beginning of the end' of the era of the so-called "trente glorieuses". This period is broadly understood as ranging from the end of the second world war to the early to mid-1970s (Coates 2005, chap. 11) and marked by high levels of average GDP growth (Piketty and Goldhammer 2014)[5] averaging 5.2 percent real growth in the world economy (Bending and Eden 1984, 13).

A large part of the studies on the relationship between economic development and state structures in political economy has taken the vantage point of institutionalist theory. What institutionalist approaches surfacing in the 1980ies have in common is a shared preoccupation with deriving outcomes from material incentive structures (preferences) under assumptions of rationally calculating actors (Cohen 2008, 148). These actors often, explicitly or implicitly, work under a set of assumptions deriving from micro-economics, chief of which are: 1) political economy should study relationships between given ends and scarce means under conditions of scarcity, 2) the primary, if not only, problem to be addressed is the maximization of utility, 3) utility is subjectively determined by actors, 4) parsimoniosity and ceteris paribus assumptions about the influence of

[5] I leave outside the scope of this examination whether the period from 1945-75 constituted an anomaly of high-growth and is therefore unique (Piketty, 2014; Panitch & Gindin, 2002) or the consequence of the permanent downward shift in the rate of profit (Brenner in Coates, 2005: 216-8).

historical and political factors, 5) individuals are rational utility maximizers with perfect information about ends and means, 6) markets are perfectly competitive and "clear" to an equilibrium state between supply and demand (Clift 2014, 87). Much of what has been termed the Open-Economy Politics approach to international political economy works in a similar manner (Lake, 2006). Perhaps because of this focus on generalizable and law-like patterns, neither Rogowski nor Frieden, proponents of the open-economy politics approach(Frieden 1991; Rogowski 1989), like the other institutionalist literature of the 1980ies speak to the potential effects of crisis as an independent factor in its own right on affecting actors choices and institutional formation.

2.2 Neo-institutionalist reflections to change

The institutionalism of the 1980ies with its focus on the rational choice of actors from given preferences is called the rational choice institutionalism (RCI). In very brief terms, rational institutionalist scholars work from an axiomatic assumption of actor rationality, which, among other things, as described above, entails assumptions of fixed and transcendent preferences, which allows the ordering of different alternative actions according to a list – or order – of expected outcomes. Consequently, institutional change is perceived as a collective action problem (Shepsle 1989). The outcome of the cognitive computation of preferences and means to achieve them, in a setting of similarly minded individuals, results in series of strategic games and alliance-building which are essentially considered equilibria between different actors' preferred outcomes(Shepsle 1972, 1979).

The approach often applies the logic of game theory to great effect, because of its ability to predict different types of outcomes - like a Nash-equilibrium(Weingast 1998). Because strategic action between individuals with potentially conflicting interests are the crux of this approach, they emphasise the role of institutions through the rules they set on actor behaviour. As Douglas North famously put it: "(a) set of humanly devised rules of the game" (North 1990) which structure the human behaviour by setting incentive structures for political actors[6]. Consequently, the focus of such analysis becomes the constraints of institutions and how it impacts rational action. The causes of changes to outcomes, such as the reaction to crisis, in such a model, however, becomes a necessarily exogenous element of the explanation, because the approach essentially attempts to

[6] Other versions of rational choice take a "bounded" approach to rationality inspired by Herbert Simon. Here, informational asymmetries and cognitive limitations of individuals push agents to utilize shortcuts in reasoning to make sense of an otherwise incalculable number of alternative actions in complex and information-rich environments (Simon 1979).

model why stability, or collective outcomes, can be secured through the interaction of individuals with varying preferences in a context structured by a particular set of rules where everything wider outside the strategic game is held constant.

More recent scholarship in this vein has emphasised the metaphor of the game to model actor interaction over repeated games of collective action problems by emphasising how these ceteris-paribus assumptions can switch between being fixed and non-fixed – a so-called a quasi-parameter (Greif and Laitin 2004). This injects a possibility increased endogenous change in the model, because quasi-parameters are perceived as such by the actors involved. However, this pushes the question of endogenous change a step further out in the logical chain to the concept of quasi-parameter. How do actors make a choice of whether and what is perceived as a quasi-parameter? In effect, the causal weight is shifted from utility maximizing actors in a stable setting, to the whether or not actors perceive the setting as given. To sum up, the rational choice institutionalist analysis has put emphasis on the role of state institutions and conditions for alliance building and strategic actions in the political response to economic developments and crisis, but has not emphasised how these institutions can change actor's preferences and sources of strategic action as anything other than an exogenous element.

2.3 Historical institutionalism

Another prevalent strand within institutionalism investigating the relationship between state institutions and economic developments has been the historical institutionalism (HI). Within the tradition of historical institutionalism, the emphasis has from the beginning been on long time periods and causal complexity to understand politics - thus incorporating more of the contextual variation held constant by the rational choice approaches. In one of the foundational texts of disciplinary reflection Steinmo, Thelen and Longbottom attempted to synthesize the main characteristics of the approach against the contrasting backdrop of Marxist and behaviouralist literatures (Steinmo and Thelen 1992). Historical institutionalists often emphasise that putting things in their proper time and context is what is essential to understanding the formation of preferences and identities of actors: "neither interest nor value have substantive meaning if abstracted from the institutional context in which humans define them" (Steinmo and Thelen 1992, 9). This lead historical institutionalists to a theoretical focus on longer time periods compared to

rational choice institutionalism (and sociological/organisational institutionalism[7]) to make sure that research designs could capture the different interaction and contextual effects that produced varying patterns of politics (Mahoney and Rueschemeyer 2003).

A classic example is in the transition patterns developing countries which developed differently according to sequence through which they transitioned to a new form of political regime according to the varying ways in which labour forces were incorporated into the transition (R. B. Collier and Collier 1991). These junctures are critical because they fix institutional setups or arrangements on a specific path - a point made both by scholars coming from a political (Pierson 2000) as well as sociological quarters (Mahoney 2000). Moreover, to the path dependent mechanisms, for which they act as a theoretical starting point, they are difficult to alter ex post because they generate self-reinforcing patterns. This differs from the fixed-model of preferences assumed by rational choice inspired approaches exactly because the evolution of constraints and opportunities the multiple institutions that shape human interaction create different types of political games over time.

Therefore, such theorizations are, to a larger extent, able to speak to questions of how institutions shape preferences during a crisis – something that is downplayed by rational choice theories. The calculations of actors over how to achieve their preferences, and even, what their preferences are, will change over time as actors compare the costs and benefits of sets of institutional setups at time t_1 with those at t_0. However, the literature focus on the concept of path dependence and emphasise the causes and consequences of path dependence as a socially grounded process that is dominated by a dynamic of increasing returns. Scholars in this vein emphasised how these paths lead to institutional patterns that may be hard to revert because, as the effects begin to accumulate, they generate virtuous (or otherwise) cycles of self-reinforcing activity (Pierson 2000). Authors have emphasised that path dependence does not preclude change (Mahoney and Rueschemeyer 2003; Thelen 1999). Instead, path dependent logics preconditions which types of change are more likely to happen and significant work therefore moved in the direction of specifying how historical sequences with deterministic properties could be traced back to contingent events, which specifically went some way towards an analytical separation of the phenomenon of institutional change from that of stability (Mahoney 2000).

[7] This is the last of the three "new" institutionalisms. It is not treated explicitly here, because it has not been as prevalent in the study of crisis in international relations and international political economy

When examining long periods of institutional development it becomes clearer that the dynamics that drive different institutional developments generate distinctive patterns of institutional outcomes (Pierson 2004, 15). Further developments moved toward the argument that institutional development could create distinctive patterns of outcomes. Streeck & Thelen moved in this direction by emphasising the different modes of institutional development that may be examined over time. They emphasised that the institutional development was characterised by different forms of slow incremental change called "drift" (changed impact of rules because of changes in environment), "layering" (introduction of new rules alongside, or on top of, existing ones), "conversion" (strategic redeployment of existing rules and changed enactment as result) and "displacement" (the removal and replacement of existing rules with new ones) (Streeck and Thelen 2005).

These categorizations of different forms of incremental change allowed a more fine-grained understanding of the developmental paths of institutions. However, the theorization was light on specifying actually did this "layering". In a sense, they were primarily descriptive categories of types of change and thus while the heuristic was useful to map change patterns, the theoretical understanding of change was developed further by the literature. In a more recent development of this branch of historical institutionalism, Mahoney & Thelen attempt to grapple with exactly what caused these patterns to emerge. To facilitate this reorientation they formulate institutions as battlegrounds of distributive questions:

"Any given set of rules or expectations – formal or informal – that patterns action will have unequal implications for resource allocation, and clearly many formal institutions are specifically intended to distribute resources to particular kinds of actors and not to others." (Mahoney and Thelen 2010, 8).

Reinstating political struggles over distributional issues as the main driver requires a conceptualization of who or what takes part in these struggles. To solve this theoretical issue, they suggest the concept of a "change agent" (Mahoney and Thelen 2010, 22). These most openly exist when benefits of the status quo of institutional setup is not conferred on them. In such a case, they become motivated to push for change, which they can do according to a number of strategies differentiated, chiefly, according to whether they follow the rules of the institutions and whether they seek to preserve a given institution. This allows differentiation between short-run conformity

and long-term strategies (Mahoney and Thelen 2010, 22–23). In this way, the study of developmental dynamics suggested by Pierson, 2004 is still present, but the focus is shifted from the temporal models of causality to developmental paths over time to a focus on the distributional struggles and strategies of the actors that animate these conflicts (Mahoney and Thelen 2010, 14).

In particular, the focus on actors and their concrete political struggles of distributional issues have moved us a significant step beyond the dichotomous relationship assumed by earlier literatures between external shocks and self-reinforcing mechanisms of stability. They even move a significant step towards incorporating the importance the meaning that actors ascribe to winning or losing distributional battles. This happens when they state that change agents act under a more elemental level of ambiguity (Mahoney and Thelen 2010, 11) than normally ascribed by scholars that emphasise the role of compliance in promoting collective action by reducing free-riding problems (e.g. (North 1990; Ostrom 1990). However, while they may have a broader scope for their conception of ambiguity as a permanent feature of institutions, ambiguity still refers mainly to rules that affect agent behaviour, not the underlying distributional resource conflict that animates it (W. Widmaier 2016, 340-41;, 2016, n. 4).

In this way, ambiguity is a feature of the institutional environment, not of actor preferences per se. Moreover, they still emphasise the role of institutional element of the explanation than that of agency. The differences in veto-possibilities and extent of discretion in institutional enforcement end up being the main contextual factors that determine the types of change-agents we observe: "Change agents become the intervening step through which the character of institutional rules and political context do their causal work." (Mahoney and Thelen 2010, 28). Hence, we still have institutional dynamics structuring the micro-level behaviour of individuals, who then do the changing. In this way, the shift to a focus on agency in distributional struggles over resources becomes a severely institutionally circumscribed conception of agency, where factors external to agency structure the types of agency, which is possible. The flip-side of this move might be what one scholar noted, that in an attempt to generate a general theory of endogenous change, a strong theory of institutions has become a derivative theory of agents and coalitions formed under conditions of rule ambiguity and uncertainty (Blyth 2016, 466). Moreover, the "trigger" of why particular patterns of policy response prevail in a particular time is still underspecified.

Essentially, the model of change, and its relations to crisis and state institutions, is the same: punctuations come either from exogenous factors in the context or from perceived changes in the context (quasi-parameters). The latter explanation endogenises change by emphasising individual actor action involved in change through their identification and reliance on quasi-parameters, but leaves underspecified how the identification of switchable parameters is supposed to happened and under which conditions. It is basically a sequence of Markovian chains, where one causal factor is limited to the rules that govern the disequilibrium of actor preferences for a given collective action problem in a given point in time (contextually fixed, time-fixed game of strategic actors). That is to say, that cause A at $time_1$ affect B at $time_2$ in such a way that B now becomes cause C. From there, one can predict patterns of actor behaviour just as a well as one could if the entire history of the institutional setting was known, but this also means that the full institutional history is unnecessary because the path forward becomes ever more contingent on the contextual causes and effects at a given point in time. Thus, we end up with a model of change that is separate chains of cause and effect where the importance of path dependence as an explanatory engine is reduced in favour of mutually contingent chain links of causal relationships. This, in effect, makes history reversible and thus causally unimportant (Blyth 2016, 465).

In conclusion, both the rational choice and historical institutionalism can speak to the relationship between state institutions and economic developments such as crisis through how have conceptualized dynamics of change and institutions. While rational choice as emphasised actor preferences and subsequently incorporated the attempts at explaining the changing of structures and its effects on actors as part of quasi parameters, it still has not explained the link between actor change and the nature of these quasi parameters. The historical institutionalist literature has on the other hand had more sensitivity towards how institutions can affect actors preferences from the start and underscored how institutional structures could change actors views and interplay in determining policy outcome of handling economics developments and crisis it arrived at the same theoretical issue as rational choice institutionalism in theoretically specifying views of actors change. In order to engage with this theoretical problem, a subsection of the historical (and to a lesser degree rational choice) institutionalists turned their attention to the dynamics of ideas and how that actors understanding is established in order to subsequently structure their preferences in a given situation.

2.4 Ideational literature

In the early to mid-1990s an increasing focus on the role of ideas began to take form developed in the spirit of insights from the discipline of international relations (e.g. by (Ikenberry 1992; Kratochwil 2001; Ruggie 1998; Wendt 1992)). These developments questioned the material nature of things like erstwhile accepted analytical assumptions of the lack of sovereign resulting in a state of anarchy between nations in the international system of states. This helped gap the analytical blind-spot that had resulted in inability to predict the end of the cold war (Burchill 2009, 229–31) or the puzzling permanence of NATO in a post-soviet union world (Mearsheimer 1990).

As this analytical focus moved to other disciplines within the social sciences, it became part of the neo-institutionalist debates as a corrective to solely materialist explanations of institutional origin and causes(Hall 1989) and their inability to explain the change embodied in the origin of new institutions. At the heart of many of these debates were underlying assumptions about the connection between structures and agency, and ultimately what explains the agency that is not a strict function of preferences and path dependency conditions by pre-existing institutional structures. This debate had gained traction with sociologists, perhaps most prominently with figures like Anthony Giddens in previous decades (Giddens 1986) and much of what became the constructivist turn in the social sciences relies on these cognitive schema (see also (Hay 2002)).

Early attempts to include ideas in institutional analysis (e.g. (Goldstein and Keohane 1993)) gave a subservient role in the explanation of policy outcomes by effectively reducing them to the residual of the explanatory model. In so doing, the role of ideas becomes to "mop up" the residual variance not explained by existing models of preference formation, path dependency and quasi parameter. This was sufficient for the role that ideas had been assigned in solving the abovementioned theoretical problem. Therefore, it was perhaps to some extent natural that this was the function they served. However, the renewed interest of ideas quickly spawned a subsequent critique that existing rational choice institutionalist or historical institutionalist uses of ideas did not take the independent explanatory role of ideas seriously but reduces ideas logically to a *deus ex machina* which is introduced when the limits of rational choice institutionalism becomes evident(Gofas and Hay 2012, 19–21). This was opposed to a more radical use of ideas in institutionalism where they was not just explanations of quasi-parameters but rather was to be key variables in and of themselves (Blyth 1997). In this view ideas could not simply be instrumentally employed tools by which to

reduce search costs or focal points that aid convergence on policy by different actors (Goldstein and Keohane 1993) because that would make ideas completely determined by the institutional environment in which they are located (Blyth 1997, 241).

Much of the later scholarship of ideas following this critique worked towards showing the specific role that ideas had in explaining policy outcomes in across different policy fields outside of the existing interest-based explanation where the interests of actors involved could be derived from the institutional context in which they were located. This critique meant actively examining how the interests of involved actor were constructed through ideas. Hammering home the distinction between materialist inclined institutionalisms of RCI and HI, Colin Hay called the collective ideational scholarship "constructivist"(Hay 2008):

" constructivist institutionalists place considerable emphasis on the potentially ineffective and inefficient nature of social institutions; on institutions as the subject and focus of political struggle; and on the contingent nature of such struggles whose outcomes can in no sense be derived from the extant institutional context itself" (Hay 2008, 64).

Therefore, the focus of ideas moved to some extent away from informing the theoretical problems of rational choice and historical institutionalism to form a new strand of institutionalism in itself that focused on ideas as explanatory factors in themselves. Much of this new strand of institutionalism can be re-found in classics of the neo-institutional comparative literature that examines the role of ideas in policy change in times of crisis (Blyth 2002; Hay 1996). They focused on the different ways that crisis could be narrated to empower specific policy outcomes (Hay 1996), or how the uncertainty generated in a crisis can make frames developed and deployed by agents to make sense of the world viable as and as blueprints to restructure, or finally embed themselves in institutions to stabilize them (Blyth 2002, chap. 2). It is perhaps also from this heritage we find the propensity to equate the changes in policy following from ideas as a phenomenon mostly associated with crises. Although the focus on crisis narratives in the study of the ways ideas matter to politics has not decreased following the financial crisis in 2008 (see, e.g. (Matthijs 2016; Matthijs and McNamara 2015; Schmidt 2016)).

In this tradition, multiple different strands of work has been done on the different forms that ideas can take and how they come to affect state institutions and its relationship to crisis. They vary in

several ways. Ideas may usefully be described as relating to: meaning, cognition, uncertainty or subjectivity (Abdelal, Blyth, and Parsons 2010), or more discursive approaches (Schmidt 2002a, 2008, 2010a) or speaking of ideas as constructs of bricolage (Carstensen 2011b, 2015) that can both explain the perception of crisis and how state institutions change but can also be the explanandum as ideas dependent on specific forms of crisis or shaped in specific ways by state institutions.

Perhaps naturally from this disciplinary origin, the debates moved further in the direction of examining what constituted ideas and their role as explanations for policy or institutional change and how they could be said to "matter". What much of the early 2000s literature on ideas had in common was a preoccupation with examining the isolated role of ideas in explaining policy outcomes (Mehta 2010). The preoccupation with crisis was also specified as because ideas were held to have the greatest influence in times of crisis because of the inability of existing patterns of thinking in reliability predicting the outcomes of interactions of actors (Culpepper 2008).

Having established that ideas "matter" as independent causal factors for institutions in their own right one significant question arising from the development of this literature became under which conditions they matter for policy outcomes. More recently, this has been explored by parts of the ideational literature emphasising the specific ways in which ideas interact with power (Béland, Carstensen, and Seabrooke 2016; Carstensen and Schmidt 2016). This approach is useful, because it reorients the study of ideas towards the way in which ideas can in different ways express one of the most basic of concepts in the social sciences: power. For instance, how ideas can become embedded in something as seemingly scientific as mathematical models and economic indicators (Mügge 2016; Mügge and Stellinga 2015). However, I also agree with the cautionary note by some ideational scholars, that following the specific framework of power "through", "over" or "in" –ideas run the risk of unnecessarily limiting analysis of how ideas matter to these dimensions(Blyth 2016). Outside such limitations, much useful work has been done on ideas, which does not necessarily follow this conceptualization of ideational influence (e.g. (Matthijs 2016)).

A related question to the current literature in the understanding of when ideas matter. The turn in the ideational literature towards the conditions through which ideas matter shifts the focus toward the ways ideas matter in given contexts (or not). This puts into question some of the assumptions of the classic paradigmatic approach often adopted in the earlier literature on ideas which borrowed

from Peter Hall's (most famously (Hall 1989, 1993) use of the Kuhnian concept of scientific paradigms to explain changes in ideas (Kuhn 1996).

Somewhat simplified we might illustrate this model of change as assuming a particular dynamic of change through which ideas operate, in which paradigms of ideas shift from exogenous shifts that allow their replacement by another paradigm (Carstensen and Matthijs 2018). As noted by one of the foremost scholars of ideas this dynamic of change through paradigmatic shifts resulted from an inherent ambivalence of logic within Halls original argument between a "Bayesian" model of commensurate knowledge and a "constructivist" model of incommensurate knowledge (Blyth 2013b; Hall 2013). In the original argument, paradigm shifts occur as the accumulation of what was termed "anomalies" begin to undermine the existing paradigm (Hall 1993, 280). Hall is not explicit about which particular logic he ascribes the accumulation, but speaking of how experimentation and attempts to ad-hoc support discredits the paradigm, point in the direction of what Blyth termed "bayesian" logic (Blyth 2013b, 198). Here, failures of the paradigm to predict or describe the political reality and thus ascribe policy suggestions is deteriorated by subsequent empirically verifiable and objective "failures". Thus, social learning becomes linked with an empirical record of a reality characterised by commensurable knowledge (Blyth 2013b, 199). However, in several places in the argument Hall makes reference to political discourse as a relevant partial explanation of social learning. For instance through the ability of actors to gain influence by affecting the political discourse (Hall 1993, 290).

This would imply a more constructivist interpretation by which a given political discourse ascribes authoritatively the given meaning of an event in politics(Blyth 2013b, 204) or at the least an acceptance of some level of social construction in the ascription of anomalies to a paradigm (Wilder and Howlett 2014, 190). Moreover, the logic of the classic model of social learning through paradigmatic shifts seems to favour third order change, where change in ideas can only occur once the paradigm (third order) is changed by external substitution, not from within (A. Baker 2015). This assumption is problematic, especially for some policy fields, to which we shall now turn. Becoming aware of this implicit assumption have allowed the scholarship of ideas to move towards other potential dynamics through which ideational change might take place. Rather than being limited to paradigmatic violent shifts that happen as a consequence of crises, ideas may exert influence through an incremental dynamic of change. Subsequently, while the study of ideas has managed to bring to the fore both that ideas "matter" as independent causes of change and has put

focus on the how and when ideas matter, the study has detached itself more from the historical institutionalist focus on material institutions and has thus provided less attention to specifying the interplay between material and ideational institutions.

2.5 Re-integrating historical and ideational literatures?

Despite a general attention to the contextual conditions and "whether, when, and how" similar causal mechanisms yield different outcomes across time and space (Falleti and Lynch 2009) the possible synthesis of historical institutionalist and ideational institutionalist approaches has been fragmented. While one of the original founders of the approach, Sven Steinmo, stated that there was a natural fit between historical institutionalism and the study of ideas (Steinmo 2008) not all are as consistently positive. Streeck & Thelen's 2005 anthology of the discipline delves deep into the different patterns of development that can be mapped with HI, but emphasise explicitly that their definition of institutions is a formal one. As such, it does not contain elements of norms and beliefs – which they instead associate with anthropology, not social sciences. They prefer instead to highlight the different policy dynamics expected under varying forms of institutional setups which they characterise as "drift", "layering", "conversion" and "displacement" (Streeck and Thelen 2005).

The more recent Mahoney & Thelen, 2010 seems more amenable to incorporating ideas when they speak of "change agents" who utilize ambiguity and power to enact change(Mahoney and Thelen 2010). While I agree with the critiques of (Blyth 2016; W. Widmaier 2016) that these approaches are severely limited in terms of explaining change through ideas in and of themselves, they do highlight the importance of institutions to change, and they focus on the different dynamics of policy that different institutional orders can generate. Irrespective of the ability of these particular works in studying ideas, the institutional and path-dependent or incremental logics can also have their uses in examining the specifics of the conditions for some types of ideas over others to succeed or fail. By explicitly making the institutional environment of our study of ideas part of the analysis, the conditions in which ideas matter can be better specified. This would also take us closer to understanding examples of expected paradigmatic shifts that do not occur (Crouch 2011; Hay 2011).

As I have noted already noted, this is not to say that there is a steep divide between those researchers that examine ideas and those who examine institutions. Whether this separation is because of a drift in recent historical institutionalism towards rational choice I do not know. However, I do agree that historical institutionalism and ideational scholarship have many potential overlaps in modes of study (Schmidt 2010a) and that some renditions of historical institutionalism can take into account the role of ideas in a way consistent with the ontological purview of most of ideational scholarship (Hay 2008, 61–63).. A great example of how institutional settings matter to ideas (even when conceptualised as paradigms) is the work on how neo-liberalism travels and becomes embedded in an existing institutional structure. In this sense, paradigms are not different "opposing" policy ideas and goals, but the processes by which different seemingly antagonistic theories can become intertwined over time which aim towards common dominant goals. In this way, the resilience of neo-liberalism as an economic paradigm can be explained through the ability to "go local" through flexible co-option of competing frameworks that it came into contact with when being applied in particular domestic contexts (Ban 2016, 10–11).

Another way in which the focus on ideas and institutions has been sought synthesised is in the examination of institutional power over ideas This is because the concept of institutional power over ideas (Carstensen and Matthijs 2018, 438) speaks to the way in which ideas can be constrained by an institutional environment. This can take several forms, but some of the most common are probably the ability of some actors to act as "policy gate keepers" who have the institutional position to frame evidence to conform to specific political preferences ((Wilder and Howlett 2014, 194)(Hay, in: (Campbell and Pedersen 2001, chap. 8)). Another way in which institutional power over ideas might be relevant to the study of ideas is how institutional positions can allow actors to ignore conflicting interest of other actors through different forms of institutional resistance – like veto-power (Matthijs and McNamara 2015)[8]. Another relevant insight is also how institutional logics travel within a political economy. Here, change is driven by the understanding of institutional interlinkages as perceived by actors and the undermining of a dominant paradigm through "invasion from within". This consists in a three-stage understanding of 1) progressive weakening of one paradigm in an institutional setting and the subsequent strengthening of another in an adjacent

[8] As (Carstensen and Matthijs 2018, 438) rightly note, the ability of policy actors to define the core beliefs around which they understand their interests and behaviour has been an element of earlier scholarship of, for instance, epistemic communities (Adler and Haas 1992; Haas 1989, 1992).

setting 2) build-up of alliance in the other institutional field 3) the use of framing to legitimize actions supported by the new paradigm and delegitimize the old (Carstensen and Röper 2019).

To be fair, we have already seen examples of some of these logics being applied with great effect in the study of ideas, which also suggests that the paradigmatic lens is not always the most useful tool to examine change (be it of ideas or by ideas). It may also be, that some policy fields are more relevant to study through the paradigmatic lens than others. What seems to be the case, though, is that in studies of the IMF, researchers have found that ideational change is better characterised by dynamics of incremental, additiveness and pragmatism which has led to the reintroduction of other concepts of change than the punctuated equilibrium model assumed by the classic paradigm logic (Clift 2018, 52; Moschella 2015). The dynamics of ideational change can be viewed through such a lens not only because it allows the examination of how actors can operate within the constraints of institutional environments for ideas to change, but also because this environment is itself enabling of some changes over others (Moschella 2015, 443). For instance, by utilizing ambiguity of the rules in the IMF statutes that afforded the fund flexibility in its belief in the use of capital controls (Moschella 2014, 2015). In that institutions constrain actors as well as are changed by them they serve a double function (Schmidt 2008). This allows change within the constraints of the institutional setting and makes it more likely that ideational dynamics will be characterised by adaptation than punctuation (Moschella 2015, 448).

This point involves two of the dimensions of ideational scholarship examined above. First, it seems to imply that studying the permissive role of institutions (Soifer 2012) in the role of ideas is a useful theoretical and empirical endeavour for the discipline. Second, it implies that the study of ideas should focus on other dynamics of ideational change than characterised the initial wave of ideational scholarship focused on punctuated logics. I would agree with the latter point and emphasise useful attention might be brought to the different policy fields that may be more likely to exhibit incremental logics (Carstensen and Matthijs 2018). The first argument, I would push a step further. Given that ideas never operate in a vacuum (Risse-Kappen 1994), it would seem prudent of students of ideational dynamics to take into account more systematically how institutions and ideas interact and how some institutional environments may enable some types of ideas and not others. While the dynamics of ideational change may in some respects be left to the empirical investigation of a given research programme, the role of institutions should always be carefully thought out.

Moreover, in taking the step (in some ways back) to examining the interacting role of ideas and institutions we can gain significant insight into the role of ideas.

Seen at the broader level of the discipline of comparative political sciences, the puzzles inherent in these questions do have some relevance to earlier work done in the discipline. This thesis is interested in the examination of a period of crisis and emphasises the role of domestic institutions in shaping the possibilities of policy ideas to dominate among different experts the bureaucratic structure in the specific policy area of energy in two countries. I want to stress, that while my argument so far has been the need to better specify the interactions between institutions and ideas in the study of politics during crises that does not imply that the discipline has not worked implicitly to do something along these lines. As has been illustrated above, the discussions between historical institutionalism and the ideational scholarship in neo-institutionalist debates have been an example of how these different dynamics can be examined. Even earlier work by classics like Peter Katzenstein and Peter Gourevitch have examined the intersect between external stimuli (like a crisis), varying domestic institutional conditions and different policy outcomes

Within comparative political economy and international political economy, the 1978 work of Peter Katzenstein picks up along a similar vein as Shonfield's classic, in emphasising that advanced industrialized states had very different domestic, social and political structures (Clift 2014, 12) which affected how their individual economic foreign policy adjusted to the economic crisis of the 1970s. In so doing, he effectively opened the "black box" of the state in the study of international and comparative political economy (Cohen 2008, 120). This meant that situating the national political economy in an international context while emphasising that international developments outside an understanding of domestic structures of advanced industrialized state leave the explanation of differential foreign economic policies underspecified (Katzenstein 1978, 13–16). In terms of his conceptualization of crisis, the work does however leave something to be desired, in the sense that it does not contain an explicit formulation of how agency is affected by crisis only that different domestic structures react differently to similar external pressure.

In terms of explaining change, the analytical logic has similarities with comparative statics (Hay 2002, 145–48) in describing the "shift" between before and after a given event, without a further examination or theoretical specification of agency in these shifts other than those derived from structures of domestic institutions. While I agree with the innovation of examining the domestic

factors in responding to external stimuli, the specific explanation of shifts in foreign economic policy is thus extrapolated from these institutions rather than linked explicitly to actions or cognitions of actors. Thus, it suffers somewhat from some of the critiques also levied against historical institutionalism above. Moreover, while the argument was relatively nuanced in describing the interaction between domestic and international as influencing each-other (Katzenstein 1978, 11)[9], the fact that domestic structures are the starting point and independent variable of the analysis, invariably, led to some critiques that some of the historical events of the time, e.g. the oil crisis of the 1970s which was also described in Katzenstein's own work, might have affected the domestic structures that determined the economic foreign policy of nation-states.

In other words, the domestic structures could not be assumed to be exogenous, but endogenous to changes in the international system. It was therefore necessary to ascertain "…the extent to which the (domestic structure) itself derives from exigencies of the international system"– a critique also known as the "second image reversed" (Gourevitch 1978). This critique points to a problem of endogeneity where the explanation (domestic structure) of foreign policy in the international system is explained by dynamics in the international system itself. Thus, the causal relationship between explanans and explanandum is in fact reversed (Della Porta and Keating 2008, 68). When examining the intersect between international and national it is thus necessary to specify carefully how an international phenomena (like the energy crisis) interacts with domestic structures. This problem of endogeneity in the explanation of policy change is in fact what is at stake when ideational scholars critique historical institutionalism for weakening the explanatory power of the framework

It is worth spending a bit more space on the work of Peter Gourevitch because one of the classics of the field penned by him is an indication of how the neo-institutionalist insights of historical and ideational form can be usefully co-contributive to understanding policy dynamics. In "Politics in Hard Times", Gourevitch tackles the problem of endogeneity head on. He examines the policy responses to economic crisis in France, Germany, Sweden, the United Kingdom and the United States (Gourevitch 1986). He also deals with endogeneity in another way than the methodological isolation of causal direction. The examination of policy responses in different crises highlights an attention to how actors map policy options to policy alternatives. In emphasising the role of

[9] Something also noted by (Clift 2014, 12)

coalitions in this process, he essentially predates the attempts of historical institutionalism to move towards an endogenous explanation of change rather than a causal relation that relies on phenomena external to the object studied to understand change in behaviour. He maps out the different policy options available to policy-makers during these crises (Gourevitch 1986, 35–53) so that the choices facing policy-makers can be compared with different explanations of policy choice that he derives from domestic aspects of the case countries. The four explanatory models he suggests to map according to the political options available are 1) the political parties and interest groups who manage the linkage of economic actors to the state 2) the organizational laws that characterise the state (like electoral laws and balances between branches of government and courts as well as the bureaucracy 3) The ideologies that provides understanding of the economy (which is in crisis) and motivations of other actors 4) the coalitions between countries derived from the placement of the country in the international system of states (Gourevitch 1986, 21, 54–65). Using these relatively broad analytical categories, the analysis is able to capture a great deal of empirical nuance possible explanations.

For Gourevitch, a crisis is understood as "moments of flux when several things might happen but only one actually does" (ibid. 9). In invoking this understanding, he juxtaposes periods of "crisis" with periods of "normal" politics which helps us to comprehend the potentially multitude of contingent factors that may characterize "…the open moments when system-creating choices are made…the range of choices, present and past, from which new systems emerge". (Gourevitch 1986, 34). While the immediate setup of the argument relies on a distinction between crisis and non-crisis to make the argument, this is much more of a logical figure than an a priori claim about a particular mode or dynamic of policy change assumed to follow paradigmatic shifts per se.

This move allows the analysis to compare the policy responses of different countries to the same "stimulus"(Gourevitch 1986, 10) and to map out patterns of support that have formed around the various programmes of economic policy that countries have adopted in response to severe disruptions in the international economy (ibid, 20). That is, his analysis attempts to pin-point the choice among alternative responses to a crisis as well as the political support and conflicts over these alternatives. The weight of the explanation, so to speak, is on the political alliances that form between coalitions underpin the policy stances in different periods. In this way, the policy responses he is examining become a function of coherence between policy preferences of political groups at the domestic level and their ability to limit policy alternatives for other political groupings.

The argument has become a classic for a reason. It convincingly shows how there is a considerable domestic dimension to the response to crisis. Moreover, it is explanatorily rich in accepting the multi-causal nature of political analysis that deals with broad questions of policy choice, reaction patterns and crisis. The careful and reflected way in which different explanations are linked to different policy options across the cases makes in a very compelling examination of extremely complex phenomena of crisis and change dynamics. The analysis also highlights the inherent political component of politics during crisis (specifically in economic policy). In emphasising the different conditions for coalitions to form around policy choices in periods characterised by ambiguity and uncertainty it actually incorporates many of the concerns highlighted by recent historical institutionalist scholarship that emphasises the role of coalitional balance of power and institutional ambiguity (Mahoney and Thelen 2010)[10]. Moreover, the careful way in which the analysis of different crises is done makes a convincing argument in itself that dynamics of change (paradigmatic or incremental) do not have to be a priori modelled for a historical research to have convincing analytical purchase.

This historically sensitive analysis is able to incorporate agency and institutional parameters in the multitude of explanatory factors he employs in a very convincing manner. Moreover, this move essentially sidesteps the problem of historical institutionalism to become too deterministic and path-dependent because the analysis is very sensitive to the shifting explanatory factors that support some coalitions over others. As Blyth has also pointed to, these elements are worth a second consideration in trying to tackle HI and ideas literature theoretical issue of endogenous change (Blyth 2016).Writing in the mid-1980s, Gourevitch naturally did not anticipate all the theoretical developments in neo-institutionalist theory among other elements the explanatory power of ideas in themselves. As such, his analysis of the relationship between ideas and institutions is limited to the role of "economic ideologies" as nationally specific traditions and values concerning the economy which can support coalitions around policy consistent with them (Gourevitch 1986, 61–62). However, the dynamics of ideas as well as the institutional basis of how ideas of coalitions are formed are not explicated in Gourevitch's framework. That is, further research might usefully put focus on the conditions for the coalitions as a function of relevant contextual agents themselves.

[10] While I would not go as far as Blyth in saying that Gourevitch "ate historical institutionalism for lunch" (Blyth 2016, 466), I would contend that there are important similarities in approaches suggested by newer strands of historical institutionalism and the pioneering work done by Gourevitch.

Such a move would also take the literature a step closer towards the endogenous change that was the goal for historical institutionalism with the concept of "change agent" - but perhaps not quite fulfilled. This entails moving into focus the specific back-and-forth of individuals or groups that push different policy ideas within the given domestic institutional environment. This would also allow more explicit examination of the varying role of different types of actors that hold. For instance, the varying degrees of influence due to not just formal political control, as emphasised by Gourevitch, but also to the pluralism of different policy-elites and experts that make up modern policy-making. This would allow analyses to speak to a broader focus on the role of expertise in politics and the reliance of politicians on knowledge to solve increasingly complex or wicked problems (Peters 2017). Incorporating ideas explicitly in the way agents interact might be a useful way to solve this. This would involve expanding the ideational factor across analytical categories and linking them more explicitly to how it motivates agency which could as one possibility "trigger" the coalition building that both historical institutionalism and Gourevitch consider key to understanding change.

However, accepting that ideas matter and has importance for outcome in turn brings a similar challenge to explanatory in ideational scholarship, namely how ideas relate to other institution. Ideas are embedded in institutional environments where their success in terms of adoption or acceptance by others is dictated not only by their construction as mattering, in the sense that they may "activate" or "trigger" change, as we see in logics from the paradigmatic school of ideational scholarship. The ability of ideas to achieve influence is just as much a matter of how well they operate in the institutional environment they are in - paralleling the relationship between actor preferences and institutional environments in earlier institutionalist scholarship. This opens the door to an understanding of ideas that more actively engages with the specific way in which ideas matter. That is not to say, that much of ideational scholarship has been unaware of the interconnection between institutions and ideas. Indeed, the empirical examination of ideas in different institutional settings has been done in several seminal works (Blyth 2002; Parsons 2003; Schmidt 2002b) and some work has even examined the national institutional setup that generates the conditions for particular ideas (Campbell and Pedersen 2001, 2014). Thus, the point is not that institutions have been forgotten. Instead, it seems to me, that in having spent time defending the, worthwhile and important, goal of an isolated and individual effect of ideas in politics, the role of institutions were

relegated to contextual variation, which was more of a constant that had to be described and stated rather than a part of the explanation of ideas.

My plea to the ideational scholarship, and the backdrop of this thesis, is to reintroduce institutions into the examination of the role of ideas in a manner that takes their combined role seriously. A greater understanding of the potential patterns in institutional setup might help us toward a broader understanding of why some actors or groups attain power "through", "over" or "in" ideas, as it were. Nuanced historical analysis is required for such analysis of the intersect between ideas and institutions to succeed. This goes beyond a historical description of the institutional context in which policy change is brought about by ideas or how the ideas change. Compared to the direction of both historical institutionalist scholarship and the ideational scholarship just examined, I suggest we move towards slight more abstract but more generally applicable concepts of ideas and institutions. Rather than over-emphasising on which type of power and idea wields, we should focus attention on specification of the institutional context in which ideas operate. Classics like "Hard Times", I think, are an indication of the direction this could take. Broader analytical conceptualizations that incorporate ideas as well as institutions. In this context, it is more important that the relevant ideas and institutions examined are specified with relation to the context they operate in. That means some level of inductive thinking is required in laying out the reasoning for how these broader concepts can help illuminate dynamics of the chosen object of study. This means that the institutional context should be operationalized and analysed at a level of abstraction that allows specification of the mechanisms and the patterns of policy dynamics that expected to be more likely to gain traction in the cases examined. This, I think, would also take us closer as a discipline to accepting the fundamental insight that agents and structures interact (Hay 2002, chap. 3) and it is in this nexus that we find the dynamic potential of ideas to explain politics. This also takes us closer to examining the distinct constitutive explanatory power of ideas (Wendt 1999) when their interconnectedness with institutions is taken seriously as part of the research design.

2.6 Conclusion

In summary, three strands of literature have been discussed in their relation to state institutions and crisis. The rational choice institutionalism, historical institutional and constructive institutionalism have especially focused on the change and the role of agents. Open political economy models or institutionalist models of rational choice have in common that their basic logic of change is derived from exogenous shifts to the utility-maximizing calculations of rational actors that are assumed to, at least principally, be able to order the possible actions in a list according to already given preferences. When newer renditions of this logic incorporate new concepts like the quasi-parameter, they are moving the question of endogenous change to the perceived state of a parameter, thus implicitly incorporating an element of individual interpretation, but weakening the formal strength of the rational actor model otherwise implied. Historical institutionalist accounts on the other hand have emphasised the role of institutions in shaping the paths through which agency behaviour could occur through a focus on path-dependence and critical junctures. While the latter has more potential to examine change, these approaches had a tendency to externalise change and instead examine the origin in preferences as a function of institutions. Newer renditions attempted to solve this problem with "change agents", in a similar move rational choice, but this waters down the explanatory power of institutions and still does not adequately specify what drives these agents.

Ideational scholarship, or constructivist institutionalism, has attempted to solve this problem by emphasising the role of ideas as opposed to material institutional structures or material preferences. Instead, they emphasise the different ways through which meaning is constructed to explain change. This has led to debates eschewing towards emphasising the differences between ideational and especially historical institutionalist scholarship even if initial work on ideas was very cognizant and nuanced in their description of the role of ideas in institutional contexts across time. This has led to an emphasis on models of change which are punctuations of equilibria rather than incremental in nature. Recent literature on ideas is now trying to incorporate other modes of change into ideational logics, which have greater similarity to the incremental logics examined by historical institutionalists.

A way to think about how these approaches may learn from each other is through the prism of what has been done before the advent of neo-institutionalist debates. Gourevitch, 1986 is a good starting point for illustrating some of these insights because his work his highly detailed and historically

sensitive work that incorporates a multiplicity of different explanatory factors that follow different logics. His specific explanation of policy responses to crisis, as a function of the coalitions that form around policy alternatives, may superficially look similar to a historical institutionalist argument. However, I believe that expanding the role of ideas in relation to the institutional patterns can integrate the focus on how agency is driven by ideas and the institutional environment they find themselves in. In that sense, this is where my thesis is situated and the debate to which I somewhat modestly contribute. First, both institutions and ideas clearly matter to change. We can usefully examine early ideational scholarship and historical comparative studies outside the straightjacket of current debates to find a way to re-combine the focus on the materiality of specific institutions with the focus on agents' ideational content and through this change of institutions. This entails a move away from the tendency to create ever more nuanced conceptualizations of ideas and towards broader concepts which can be applied in careful historical analysis. In combination with a well-specified institutional context this would allow a more detailed examination of the intersection of institutional and ideas in unison – and significantly contribute to the literature of both ideas and institutions. Second, opening this avenue would make it more obvious that different logics of change may come about due to the role of ideas. Thus, the predominance of punctuated equilibrium models of change in the study of ideas should be joined by careful diachronic examinations of how ideas matter in "crisis times" through "normal times".

Chapter 3 Theoretical framework

This thesis is about the intersect of institutions and ideas. More specifically, it attempts to operationalize a way in which bureaucratic structures as a causal factor affect policy ideas within energy policy in the context of crisis. The agency component that links the causal factor of bureaucratic structures and policy ideas are the public experts within bureaucracies that surround modern policy-making. The policy ideas of these experts have a crucial role in politics in general, with the increasing prevalence of technically advanced policy decisions or wicked-problems. The role of experts will increase in cases of energy crisis where technically complex policy issues combine with the need for political action. Domestic bureaucratic structures in the given country affects the available policy ideas in policy making by structuring which experts are able to push policy ideas on the basis of which the crisis is interpreted and policy solutions preferred.

I operationalize the causal factor of bureaucratic structures as broadly following a distinction between open and closed bureaucratic structures. This attempts to capture the difference in the permeability and accessibility of outside influence (experts or otherwise) on the bureaucratic structure. This basic distinction is then further developed along three dimensions of a bureaucratic structure that may affect the role of experts and the policy ideas they can push.

First is a distinction between the weak or strong capacity of the state to affect behaviour of societal actors. This draws on a classic distinction by Krasner, but is expanded with the addendum that the lacking will to affect societal actor behaviour can have similar effects. This leads to the introduction of distinctions from comparative politics of forms of market-state relationship where the United Kingdom is claimed to favour a less regulatory and liberal form of state-society interaction and the French case an opposite form which favours intervening actively in the society and markets in order to direct it (dirigisme). The relative unwillingness to intervene and control the economy is hypothesised to correlate with more open bureaucratic structure, where the expertise of multiple societal actors may be equally influential on policy ideas. Direct intervention into the society by state actors is expected to correlate with a more closed bureaucratic structure where policy ideas are dictated by the intervening state rather than defined by a multitude of state-society actors. The power of policy ideas by public experts is going to be higher in this case, because they are more of a monopoly on interpreting the correct intervention.

Second, the style of interaction between experts will be different in open and closed bureaucratic structures. Open bureaucratic structures will include experts from multiple different parts of society or state and will therefore be of a more personal nature when interaction happens. By comparison, closed bureaucratic systems will have a style of interaction that is more formalized (e.g. in special committees, or at set intervals). These differences will affect which policy ideas experts are able to push because the variation in interaction style changes the conditions for agreement on policy issues, and personal interaction becomes similar to a series of unconnected strategic games.

Third, the institutional basis of the substance of expertise will vary in open and closed bureaucratic structures. If a bureaucratic structure is open, it more easily allows different types of actors to affect the policy ideas that are created as input to decision-making. This means that there are less like to be formal constraints on which educational background, the number and difficulty of accessibility requirements to the bureaucratic structure, as well as the requirements of pre-existing specific educational training and the ability to shift expertise within the bureaucratic structure. Open bureaucratic structures will have either much less of these requirements or relinquish control in other ways, e.g. by having a general requirement and then allowing mobility in function and expertise as part of the employment in the bureaucratic structure. Closed bureaucratic structures will more tightly control all these aspects of the institutional side of the experts that are allowed access to the bureaucratic structure. The policy ideas that different experts ascribe to are likely to become more specialized because the particular training and access requirements are fostered by the state. Open bureaucratic systems are likely to have less specialization due to more exposure to different policy ideas as well as a lack of steering of the knowledge basis of expertise in the bureaucratic structure.

The outcome factor is operationalized as the policy ideas that experts utilize to interpret the energy crisis. The substance of differences in policy ideas might have been sufficient in comparing the two cases to each other at an aggregate or overarching level. By disaggregating policy ideas in three different aspects, it is made possible to examine the variation in policy ideas also between experts within the cases across time. This adds the additional nuance to the analysis, that while bureaucratic structures affect the form of policy ideas that experts can utilize, it does not mean that only one set of policy ideas can exist with a given bureaucratic structure. The analysis is structured as a form of correlational analysis where the bureaucratic structure is first identified as resembling open or closed. Then the policy ideas of different public expert groups within the field of energy policy are

examined. This is repeated for two cases. Finally, the effect of open or closed bureaucratic structure is evaluated by comparing the correlation between the causal factor of bureaucratic structure and outcome factor of policy ideas.

3.1 Causal factor: Bureaucratic structure

Despite some discussions of the ups- and downs of bureaucracies in modern states (Olsen 2008), the fact remains that bureaucracies persist surrounding most modern democratic systems and supply vital rule-driven and functional needs of those political systems. Perhaps, due to this fact, the de-bureaucratization waves have come and gone, but the functional necessity of bureaucracies have kept them around (Ferlie et al. 2005). Slightly less determinate statements emphasise that societies simply haven't discovered a more effective way to coordinate complex action (Kettl 2008, 373). In the following section, I will define a bureaucratic structure and set out some operational characteristics by which to identify variations in bureaucratic structures across countries. Finally, I will describe how these distinctions may apply to the two cases of France and the United Kingdom.

At first glance, we observe that what I have termed bureaucratic structure consists of two components. The two component concept consists of bureaucracy and structure. Both concepts have individual long histories of use in political science in many different forms, so it is necessary to define them before we move on.

3.1.1 Structure defined

A structure is defined in Merriam Webster's as a number of things, broadly as either the act or outcome of an action of construction or as a type of pattern of organization. It is this second set of meanings that relate to this thesis in that it emphasises the role of different patterns of constituent parts of a bureaucracy when examining its effect on policy ideas. In this sense, a structure is understood as *"something arranged in a definite pattern of organization"* (ref. def. 2b). In this sense, it is similar to the use of the concept in the discipline of classical political economy, which speak of economic structures as *"organization of parts as dominated by the general character of the whole"* (ref. def. 4b.). The particular variation in pattern of organization in the relevant

bureaucracy thus is posited to be a key explanandum when understanding varying policy ideas. In political science, structures of various kinds can therefore be said to have been studied[11].

In relation to the role of structure in conjunction with policy ideas and policy change, the literature has followed two broad conceptualizations. A structure may be understood as a set of formal or unformal conditions that affect or constrain the agency of actors. In that sense, structure is similar to the way that rational choice theorists understand institutions as formal rules of the game (Shepsle 1979, 1989). Structures may however also be of a non-formal kind, similar to cultural norms and conventions (March 1989). The debate on structure resurfaced exactly within the literature on institutions, because it was claimed that such understandings of institutions were too narrow to adequately describe how agency interacts with the institutions that constrain it. Most explanations of policy choice thus became reducible to the institutional environment and left very little, if any, room for actual agents to act. The debates about the relationship between individual action and institutional constraints is often known as the structure-agency debate (Hay 2002, chap. 4). I follow this literature, and draw on Parsons understanding that structure is a contextual element of agency that has an existence outside of agency itself, but which can, like institutions, be affect by agency over time (Parsons 2016). Thus, structures may be understood as agency choices that become embedded over time. A structure a contextually specific constraint on agency behaviour, whose variation affects policy ideas.

The use of the concept of structure with a specific organization (like bureaucratic) relates firstly to the point that I consider structures as being of different forms (there are different bureaucratic structures across the selected cases in this thesis, for instance). Second, the concept of structure, as a pattern of organization, indicates that the pattern has several constituent parts. These different elements of a structure are what allows variation in the man institutional factor of bureaucracy. The concept itself, as we shall see below, is too aggregated to be applicable and as such requires separation into different components that all can be said to be part of the structure of bureaucracy. The concept of structure in relation to bureaucracy means in this context that we are selecting partial components of the institutional constraint that bureaucracy is for agency, but that it can vary depending on which agency our research question is interested in understanding. Before we can

[11] In the broadest sense, bureaucracy itself may be seen as a structure. However, in this case, structure relates to the specific pattern of organization of unit of bureaucracies

move on to examine which dimensions are relevant to bureaucratic structures in relation to policy ideas of public experts, we need to examine bureaucracy.

3.1.2 Bureaucracy defined

Max Weber famously identified modern nation-states with the development of a formal system of organization known as rational-legal bureaucracy[12]. Bureaucracy for Weber referred both to the formal organization of work, but also to the person working at the bureaucracy; the bureaucrat. A long line of research has been born out from these distinctions, and at the risk of generalizing a little, it is not wholly wrong to characterise the later work on bureaucracies as still highly dependent on Weberian categories.

The characteristics of the rational-legal model of bureaucracy that Weber proposed and other scholars have followed in depicting modern administrative structures of nation-states have several characteristics relating to the type of organization of tasks and manpower as well as their training, organized careers, salaries and pensions. These characteristics of the bureaucrats and the structure of their working environment are then assumed to adhere to certain behavioural traits leading to a procedural rationality of bureaucracy, which was contingent across political governments. This resulted in a system driven by laws, rules and regulations that create a level of predictability and consistency in administrative decision-making as well as a rule-bound hierarchy that allows swift decisions and accountability through rule-following – procedural decision-making (Du Gay 2000; Olsen 2008, 4). This classic model has received some level of criticism from several quarters. Empirically, this has been due to an observation of the rise of competitive markets and policy networks rather than bureaucratic forms of organization (Dunleavy and Hood 1994). These new and more advanced forms of administration were by some scholars considered inevitable leading to a convergence among many western countries (Osborne and Gaebler 1992). This has led some scholars to claim that while bureaucracy is still relevant it has been challenged as an organizational form and fundamental changes to its external organizational boundaries with new forms ready to, if not replace it, then reduce its influence ((Goldsmith and Eggers 2004), Bogason, 2005 in (Ferlie et al. 2005)).

[12] In describing the historical variation in administrative organization he distinguished three different ideal-types. Each consisted of different organizational characteristics which resulted in varying operating logics. Weber identified a traditional, a charismatic and a legal-rational ideal-type of bureaucratic organization (Weber 1958)

Despite some of all these interventions against the bureaucratic form of governance and the empirical challenges to rational-legal modes of bureaucracy in newer recent periods, some scholars still maintain that bureaucratic governance is functionally necessary in modern societies (Meier and Hill 2007) or due to its ability to coordinate complex action (Du Gay 2000; Kettl 2008). Without delving too deep into these discussions, it is sufficient for our purposes to maintain that there is still some useful application to the concept of bureaucracy in social science research.

Due to Weber's purpose being to illustrate the difference between bureaucratic organization vs. other types of state administration, there are obviously some limitations as to how narrowly his original categories may be applied to a thesis that deals with two cases which are both bureaucratic in some form. This has a few implications. Theoretically, it has meant an anchoring of much scholarship in the Weberian rational-legal model of bureaucracy, with all other systems being compared to this reference point. The theoretical anchoring has obfuscated some real differences in the origin and sequence of bureaucratic developments across countries (Silberman 1993).

Empirically, this anchoring has meant empirical comparisons of bureaucracies required significant further contextual theorizing to be applicable (Evans and Rauch 1999). While these points may not be surprising per se, it means that some additional and more specific theorizing and choosing of relevant aspects of a bureaucracy must be selected when emphasising their role of particular dependent causes – like policy ideas of experts within them. The original conceptualization of bureaucracy is useful to get a general understanding of bureaucracy as: both 1) an organization of administrative authority around rules, hierarchy, standardization and specialization that results in functional division of labour as well as 2) the professional, full-time administrative staff with lifelong employment and organized career, salaries and pension (Olsen 2008, 4–5). That being said, it is not sufficient to apply directly to specific aspects of expertise.

Instead of utilizing Weberian bureaucracy in its classic rendition as a specific definition for this thesis, I follow Silberman in arguing that defining different ideal-types of bureaucracy should be utilized as categorical descriptions of the phenomena in question (Silberman 1993, chap. 2). Following this line of thinking, it would be necessary to specify which particular aspects of bureaucracy I am utilizing in examining the policy ideas of experts. What this requires, is that any further examination of the differences in bureaucratic aspects of two cases are further specified to pinpoint the variation in the aspect of bureaucracy that is central to the research question at hand. In

this case, that means further theorizing how specific aspects of bureaucracy and structure can be understood to affect expertise and thus policy ideas of those wielding expertise.

Therefore, I apply the concept of a bureaucratic structure, rather than the often used concept of bureaucracy, to indicate that the analytical focus is on a certain structures of particular bureaucratic functions around a political system. The chief purpose of the recasting of definitional focus is to avoid some of the critiques of literature on bureaucracy. The key is, that bureaucracies do in fact vary widely across countries, even if they may involve similarities in along the broad definitions initially set out by Weber and later refined and operationalised by more recent political scientists and public policy scholars.

3.1.3 Open and closed bureaucratic structures

How can one speak of differences in bureaucratic structures. Of course, different dimension of them may vary. At a more general level, it is useful to operate with a basic distinction, which allows distinguishing different forms of expertise as it manifests around bureaucratic structures. The chosen research objects will naturally affect the relevant distinctions to be made. This thesis is about the intersect between institutional constraints, agents – in the form of experts – and policy ideas. For that reason, it is necessary to understand how these three component elements interact in making policy.

Working from a basic principle that is not meant to be exhaustive of all potential variation of bureaucratic structures, we may work from a distinction between *open* and *closed* bureaucratic structures. As with any analytical distinction, others could potentially have been made. The strength of this, is that it is relatively simple, and it attempts to capture *the variation in access to different types of interests and agents to the bureaucratic structure*. In a sense, it can be thought of as the pluralism of actor interests that can be made to bear on policy choice in the nexus between expertise and policy ideas. At the most simple level, this is about how isolated experts in the bureaucratic structure are from influence outside the bureaucratic structure. As such, it would overlap somewhat with proxies for pluralism of interest representation in the machinery of government. This does not mean that specific outside interests cannot be incorporated into the policy ideas of experts within the bureaucratic structure, but that these interests are not explicitly represented by external actors. These may be anything from lobbyists, private enterprise, think tanks or even universities.

The distinction between open and closed bureaucratic structures is meant as an ideal-typical distinction. In being an ideal-type, they are categories that allow distinction on a key parameter of the explanatory factor but only simplifications that allow comparison of general characteristics. For instance, this means that an open bureaucratic structure is more permeable and inclusive of a multitude of societal actors than that of a closed bureaucratic system. However, even open bureaucratic systems may exhibit elements of formal limitations of access of outside actors.

At a general level the relationship between open and closed bureaucratic structures are expected to have effects on the role of public experts, because it generally acts as an indicator of how much outside conflicting expertise is allowed to compete with existing experts in the creation of policy ideas. The more access to the bureaucratic structure by outside actors, the more potential for conflict over policy ideas as the number of policy ideas in play increases with the number of actors.

3.1.4 Open and closed Bureaucratic Structures and specific research questions

Open and closed bureaucratic structure may make intuitive sense as a distinction to capture the isolation of public expert influence on policymaking in government, but it is not sufficient to analytically capture the nuances of different forms of bureaucratic organization. Part of the reason for this, is simply that the distinction is at a too high level of analytical abstraction to adequately capture the variation of interest in the information that pertain to cases. Therefore, it may help us delineate some further dimensions at a lower level of abstraction.

These dimensions need to be closer to the specific research questions that pertain to the analysis in order to capture the variation in bureaucratic structures that may affect the policy ideas of experts within them. These dimensions are drawn from different literatures. The first dimension leaning on comparative economics and state development. The two second dimensions draw more on studies of administration and bureaucratic history. In further description of what these dimensions entail, we can then begin to see the contours of a theoretical framework.

3.2 Three sub-dimensions when examining experts in bureaucratic structures and expectations

The relationship between the state and society is, at least in part, based on the authority and capacity of the state to affect behaviour of citizens within its legitimate area of sovereignty. The ability to make autonomous decisions by the state may thus be conceived along the lines of open and closed bureaucratic structures as well. The permeability of the bureaucratic structure is high for open bureaucratic structures and low for closed bureaucratic structures. The role of the policy ideas of public experts is expected to be less in cases where the ability of the state to affect behaviour of societal actors is lower.

The second dimension draws on administrative literature in distinguishing how open bureaucratic structures that are more permeable to outside influence will be characterised by less rule-bound and formal interaction of experts in the generation and conflict over policy ideas. This is because a more open bureaucratic system does not have the same persistence and regularity in how and which experts are involved. In an open bureaucratic structure, interaction between experts is expected to be characterised by more personal interactions in advocating policy ideas and vice-versa for those of a closed bureaucratic structure.

The third dimension attempts to capture the substance and institutional dimensions of the public experts themselves. The types of rules that regulate their access to the bureaucratic structure is expected to be great in a closed system with greater state control over the different institutions of meritocracy and education. Moreover, the closed bureaucratic structure is expected to facilitate the creation of hyper-specialized experts because they do not need to compete with outside experts about the authority of their expertise to the extent that would be necessary in a more open bureaucratic structure.

These three dimension all attempt to capture the aspects of the bureaucratic structures that is relevant to understanding the role of expertise in policy-making surrounded by formal and semi-permanent administrations. In the subsequent section, I will examine in more detail these three aspects of bureaucratic structures and relate them to the two cases of France and the United Kingdom.

3.2.1 Dimension one: State capacity to change behaviour of societal actors

In the classic distinctions inspired by comparative political economy, we may extract some categories by which to initially understand the case-selection and their differences vis-à-vis bureaucratic structures. These are naturally ideal types in Max Weber's sense of them approximating a silhouette of a phenomenon, but emphasising key aspects that may be considered relevant for the research purpose at hand. In the branch of comparative political economy that examined policy styles and regimes in the 70s, the distinction of open and closed types of policy systems can be of instructive use (Katzenstein 1978). Furthermore, it survived in a reformulated form in the later literature on varieties of capitalism (Hall and Soskice 2001; Hancké, Rhodes, and Thatcher 2007), so we may consider the two cases in respects to governing styles.

United Kingdom and France differ markedly in their approach to organizing the productive forces of the economy. France historically preferring a coordinated structure of connections between public and private along with a particular type of government management referred to as *dirigisme* (Hall 1986, chap. 7; Zysman 1982), and, the U.K. falling closer to the United States in preferring a less restrictive and liberal economic structure. Along somewhat broad distinctions between decentralized/centralized and closed/open policymaking they both fall closer to the centralized and closed policy-making part of the spectrum. In the United Kingdom, the characteristic is the permanent nature of the professional cadre of civil servants in the civil service referring only to the respective minister of a policy-area. At the other end of the spectrum, a state that has the strength to modify the types and patterns of interaction between private actors, values and economic institutions; in short, to remake society.

This model was meant to describe regime stabilization and destabilization, and, as such, the extreme points are of little use in this case. However, the distinction itself may still be useful in more stable liberal economic regimes to conceive of the difference in state autonomy from civil society (Krasner 1978, 55–57). Along these lines, the U.K. may be considered a weak state because while it may have the power to resist societal pressures it has been unable or unwilling to change the behaviour of private actors as significantly as – for instance - other European countries (Marier 2003, 280). By comparison the French state can be considered strong, because it both manages to insulate it's decision-making from societal pressure groups, but likewise has the ability to, and has historically used it, to manipulate both economic structures and interactions between private actors

in a way consistent with much more state controlled economic planning – as is also emphasised in classical comparative political economy (Shonfield 1965).

Because of these characteristics, the United Kingdom more so likens a weak state as described by (Krasner 1978). Based on an assumption of fundamental distinction between state and civil society, Krasner develops an ideal typical continuum between weak and strong states to analyse the strength of a state in relation to its own domestic civil society. The weak state is characterised by permeation of pressure groups and as a result, central government organizations and institutions serve specific interests rather than a presumed common purpose of the citizenry. Because the United Kingdom favours a less regulatory and liberal form of state-society interaction and the French case an opposite form, which favours intervening actively in the society and markets in order to direct it (dirigisme) there will be variation in the conditions for policy ideas of public experts. In the case of an open bureaucratic structure, the relative unwillingness to intervene and control the economy is hypothesised to correlate with a situation where expertise of multiple societal actors may be equally influential on policy ideas. The individual role of policy ideas by public experts will be less due to more expert actors being present. Moreover, more actors can mean more vectors for conflict over policy ideas, and thus less likelihood that agreement is found on which policy ideas are allowed to interpret the situation. The closed bureaucratic structure correlates with direct intervention into the society by state actors and is expected to correlate with policy ideas being more closely dictated by the intervening state rather than defined by a multitude of state-society actors. The power of policy ideas by public experts is going to be higher in this case, because they have more of a monopoly on interpreting the correct intervention. Which particular conflicts will exist among groups of public experts over time is an empirical question that the operationalization of the outcome factor will attempt to deal with below.

3.2.2 Dimension two: Personal vs. Expertise-based management

The effect of open and closed bureaucratic structure is also relevant with regard to the style of interaction that characterises the experts in each. Because a closed bureaucratic structure allows less outside access to the bureaucratic structure the relevant groups of experts is expected to more consistent in makeup over time. This means that interaction between experts can be more rule-bound, systematic and formalized (e.g. in committees, at regular intervals, following specific procedures). The opposite expectation would exist for open bureaucratic systems, because the multitude of experts from different parts of society can interact.

This will lead to an increase in number of actors as well as the policy ideas they believe in. This decreases the probability of agreement on policy ideas and makes interaction more personal and akin to unconnected subsequent strategic games over time, which reduces the possibility of stabilizing a certain policy idea. United Kingdom has been characterised as a society of entrepreneurial leadership[13]. This meant that interaction and management historically has been highly personal rather than abstract and based on rules. One of the manifestations of this characteristic is in the prevalence of the "chat" as a mode of coordinating policy decisions (Heclo and Wildavsky 1974). The corollary for the functioning of UK bureaucratic system entails a highly personalized bargaining and negotiation processes which despite complex bureaucratic tasks and organisation seem to be the norm as opposed to more classic command and control logics which rely on the imposition of authority based on bureaucratic rules (Peters and Peters 2002, 37).

One of the implications of this is that most decision-making becomes the object of contestation and political conflict over whose interests are served by one policy choice over the other. Conflict and contestation is of course the hallmark of any democratic political system to some extent, and as such, this also takes place in societies based on less personal interaction for cohesion and agreement. However, the implication is that the frequency of contestation and the points at which a closed case decision can be re-opened for renewed debate and conflict is higher and more prevalent. Even highly ritualized and regular tasks like those performed by the treasury are performed along these lines (Peters and Peters 2002, 37).This leads to a highly politicized decision-making cycle

[13] See Reinhard Bendix for this distinction ((Bendix 2019) /1956)

where political supervision of the bureaucratic structures that support the political system is quite high, and the possibility of politicians to second-guess or revert decisions is equally so.

3.2.3 Dimension three: Institutional basis of expertise authority

In a study of the role of public experts on policy ideas, it would be remiss to not mention the seeming similarity in educational requirements in the two cases. I should note, that do not focus on how the origin of expertise authority in university training, but it is necessary to note some commonalities. In both cases, candidates for administrative positions are highly educated. Both require high levels of educational background from top universities in order to quality for membership of the bureaucratic structure.

That being said, there are substantive differences between the position of experts in society and their substantive education, which we shall go into presently. One such difference relates to how they are organised vis-à-vis the society. In France, they represent a cadre of experts that permeate large public and private companies whereas the civil servant in the UK resides mostly in public service. The preference for broad state involvement both in the training and facilitation of these elites and spreading them across sectors of society is broadly consistent with ideas of French dirigisme mentioned above. Similarly, the preference for private training and stricter less state-influence can be seen in the comparatively less encompassing societal role served by the British civil service which is primarily relegated to Whitehall. These variations mirrors the different preferences for state-society organization of the economy in the two countries which has been described by the comparative capitalisms literature (Jackson and Deeg 2008). Finally, the substance of how and in what the candidates for administrative functions are trained matters in terms of the substance of their educational background.

Traditionally, the workforce of the U.K. bureaucracy is drawn from broadly the same background at the top universities (Oxford and Cambridge, historically). These universities have over the years generally been known for educating classically trained students who have a broad knowledge of humanities subjects or perhaps law, but relatively sparse specialist knowledge from hard sciences leading to the perhaps pejoratively inclined description of “talented amateurs” (Peters and Peters 2002, 92). Obviously, the different tasks of various parts of the bureaucracy requires specialization of the workforce, so a system of achieving experience through training “in the job” has developed

over time. This means that expertise is gained over time rather than known at the beginning. This trait of bureaucratic structures in UK also means that career paths also emphasise the possible movement between ministries or agencies, because the underlying idea is that one is a civil servant first, then a specialist or expert of a given knowledge field.

In the case of France, the reform that created the the Ecole Normale d'Administration (ENA) in 1945 effectively put the education of non-technical civil servants under the control of the state Further, the requirement of passing an centrally controlled exam known as the *concours* helped insure a level of uniformity of the educational background and skillset of the civil servants. Additionally, to even attempt the concours, the student was required a diploma from a grande école like ENA (Silberman 1993, 91) leaving the educational background firmly in the control of the French state. A further asymmetry exists. While the judicial training in ENA may generally be comparable to the classic schooling of British civil servants, studies at ENA also emphasised economics.

The administrators at ENA are only one group of the two main institutional sources of public experts in the French bureaucratic structure. A large part of the public experts in French bureaucratic structure were of an educationally natural science background. The Polytechnique trained and supplied natural scientists like physicists and chemists and the two engineering schools, École des mines, or École Points et chausses, were the source of engineers (Silberman 1993, 93). The resulting association with a *cadre* of a specific training in a common university helped reinforce the elitist image of the civil service and foster a degree of main characteristics of pre-ww2 structures were still surrounding: grade, cadre and group as opposed to specification of job. That means there was considerable departmental specialization with very little cross-ministerial movement of civil servants as opposed to functional specialization (Silberman 1993, 92). As opposed to the U.K. cross-ministerial movement was rare and the specialization of the civil service was higher than the more "jack-of-all-trades" quality of the broadly educated civil servants in Whitehall. The resulting basis of expertise is much more technical know-how of the practical policy-decisions and thus a capability to work with much more complex policy solutions. The influence of these differences naturally should vary with the policy-field, but in the area of energy policy where different technical solutions to the oil crisis and fears of energy shortage are in play, this difference should be significant.

3.2.4 Bureaucratic structure

Table 1 Comparison of Bureaucratic structures

Type of bureaucratic structure	Open	Closed
Capability of state	Weak, pluralistic	Strong, controlled
Negotiation style	Personal and characterised by diverse actors	Formalized and characterised by limited actors
Basis of expertise	General education, broad knowledge and experience	Specialized education and specific technical knowledge
Resulting policy dynamic	More politicized issues, ad hoc decisions with frequent back-and-forth on policy decisions	More coordinated, closed, highly technical and driven by strategic planning

3.3 Experts and Expertise

Having now defined bureaucratic structure both in a general sense, and sub-dimensions necessary to examine its effect on policy ideas of public experts, we now turn to what constitutes an expert in the sense applied in this thesis. In the final section, I will define the concept of policy ideas as the output of experts in policymaking.

3.3.1 Literature on Experts

Within more classic political science literature the role of experts has been cropping up in different forms. In relation to a non-material dimension of their activities International Relations literature on in the early 1990s is indicative of this shift. In the 1990s international relations and comparative political science saw the introduction of the concept of epistemic communities (Haas 1992). This branch of the literature attempted to deal with the increasing existence of transnational groups of experts who were held together as groups by a set of epistemic beliefs and norms. Irrespective of the staying-power of this specific concept in terms of generating new problems and conceptual developments (Dunlop 2000), it still sees continued use across political science sub-fields. Moreover, their contribution was more substantial in terms of allowing scientists to think in terms of groups that were transnational in character and the insight that they were being driven by what was essentially a common belief system of objectivity of science, rather than interest politics(Adler and Haas 1992).

That is not to say, that the authors were not aware of the potential for classical politics of conflict and interest to intersect and be relevant when examining these groups, but rather that they existed and were based on a seemingly non-material basis of scientific beliefs. Furthermore, as complexity of political problems increasingly become problematic to deal with at a national level – like environmental issues – the stage is set for increasing role of such epistemic communities in international politics, and as such, for their power to define the relevant policy problems and potential solutions. In this sense, the epistemic community literature represents a classically pluralist view of politics where experts in the sense of epistemic communities are groups formed in civil society who attempt to affect state action, now also, but not theoretically necessarily, at a transnational level. This literature thus reminds us of the extra-national and sometimes global nature

of expert groups and their potential to affect politics even if they do not explicitly form a part of formal decision-making processes.

In different branches of comparative political economy, we may draw some insights on how expertise may be activated in different ways to achieve political goals. In Great Transformations Mark Blyth is famous for having noted the role of ideas as weaponized and "blueprints" of institutional change in the period following the recession of 1930s and later in the end of the golden era in the 1970s and 1980s. A key point for Blyth is that these ideas are push irrespective of any real technical merit to their claims (Blyth 2002, chap. 1). These battles of defining the problem at stake were between different groups of state, public and private actors.

During the 1930s recession in the United States, the TNEC hearings, including testimony from Harvard academics like the Keynesian economist Robert Hansen helped the state to defeat finance ideas that were being pushed by business actors and the Treasury department and set the basis for a new underlying principal enemy that economic policies should seek to solve: the lacking private investment to attain higher employment. Business attempted to reduce the impact of these ideas through the committee for economic development, but with limited success. The National Resource planning board reports from the early 1940s attest to the institutionalization of state intervention to solve the lacking private investment and achieve higher employment(Blyth 2002, 258). These ideas became the bedrock of further state intervention in the U.S. economy and what became known as the "new deal" set of infrastructure and economic policies meant to boost aggregate demand in the U.S.

For our purposes, it is key to note the role that different groups, representing various interests, made claims to authoritative knowledge of the economic crisis the country was facing at the different points of crisis described by Blyth during the depression and the stagflation of the 1970s. Blyth's work has been instrumental in showing the role of ideas on policy and likewise how some actors cement ideas as institutional blueprints that limit the future policy-alternatives to those consistent with their ideas(Blyth 2002, chap. 2). Ideas may through institutional embedding become more permanent. One aspect of this otherwise excellent examination, which is still a puzzle, is the function served by different institutional arrangements for the role of ideas. Why were some groups of interests the key actors in pushing certain ideas, how does the institutional setup of a given country affect which actors are allowed to participate in the battle of ideas that is described? I

should note, that these comments are merely a reflection of Blyth's analytic focus on ideas and specific societal interests they represent rather than a general oversight. The question, however, remains an interesting one for the literature to tackle.

Remaining within comparative politics, we can examine a more explicit take on the role of experts, in the literature on think tanks in policy-making. Andrew Rich has worked extensively on the role of think tanks as groups of experts in within the context of American Politics. Think tanks can be considered a particular form of knowledge regimes that produce public policy documents often following a political agenda or with a openly political leaning – especially in the United States (Béland and Cox 2011, 196). Rich, 2004 charts the dissemination of conservative political ideas through the rise of think tanks in American politics since the 1970s (Rich 2010). As independent non-profit research organizations they function as expert groups that can supply the political decision making process in several ways. Expertise delivered by think tanks may become influential in several stages of the policy process. They may act as a warning about incoming policy problems or facilitate guidance as to how to revise policy. Once policy is under deliberation, think tanks may supply ammunition as well as support to policy-makers views. In the implementation phases of policy, they may act as guidance for assessment of the effective institution of a new set of policies. In charting the different ways in which conservative ideas have affected different stages of key policy since the 1970s, the work of Rich, illustrates how expert knowledge is a factor throughout the policy-process, but also the specific characteristics of the plural and open type of politics in the U.S.

A more structural approach to analysing the nationally distinct role of experts comes from a strand of the literature on comparative political economy which has attempted to combine two major directions in the literature. It stands at the intersect between the literature on the effect of policy-making regimes' effect on national economic competitiveness (Katzenstein 1978) and the literature on Varieties of Capitalism which examines the effect of nationally distinct production regimes on domestic economic performance (Hall and Soskice 2001). According to the knowledge regimes literature, these strands underspecify how the policy ideas come about that explain the origin of these policy-making and production regimes-, respectively (Campbell and Pedersen 2014, chap. 1). Expertise and experts have a key role in such and explanation, even if the concept of knowledge regime refers to a broader and more abstract range of phenomena that constitute: "sets of actors, organizations, and institutions that produce and disseminate policy ideas that affect how policy-

making and production regimes are organized and operate in the first place" (Béland and Cox 2011, 167). This leads to analyses that emphasise the different ways that nationally distinct institutional arrangements affect the types of ideas that are created and disseminated. Along this vein of literature is research emphasising the role of experts in translating and adapting broader economic ideational developments, like the spread of neo-liberalism, to different domestic cultural contexts (Ban 2016).

Perhaps because of the connection with the literature on the role of ideas, this strand of literature does not single out expertise in an analytically distinct category as *explanans*. At the operational level, such analyses examine the data, research, theories and policy recommendations that underpin different types of public policy (Béland and Cox 2011, 167; Campbell 1998). The various policy-mixes that this entail will in turn have differential implications for national economic competitiveness. Despite variations in analytical level, many of the descriptions that follow might be consistent with my empirical goals, although less analytically specified at the outset. The key difference is that I am explicitly singling out an aspect of a formal institutional condition in open and closed policy-making. Within this sub-division I further focus on the role of expertise in bureaucracies understood as the permanent and state funded functions of policy-making process (see also the chapter on independent causal factor). That means that my aim is both more narrow and more specific in scope than that of the knowledge regime literature.

First, this is about a difference in analytical level between emphasising structural aspects and more actor-level analysis. The knowledge regime literature emphasises the knowledge production apparatus that is specific to each domestic economy. As such, the focus naturally on mapping the domestic types of knowledge producers that exist in a given regime to trace the origin of particular "sense-making" structures(Campbell and Pedersen 2014, 3). As opposed to a somewhat genealogical analysis of the origin of knowledge particular production for national competitiveness, I am interested in the particular experts, or groups of them, within state apparatus that are proximate to decision-making. Not that knowledge regimes cannot speak to this aspect, but I start from the policy field and focus much more narrowly on the actors who create "sense-making" in the area. Moreover, while overlaps of relevance exist between my analysis and the knowledge regime literature, I do not purport to make an analysis exhaustive and broad enough in scope to constitute a knowledge regime of the entire political economy of my chosen cases. Rather, I focus on a number of key expert groups whose sense-making is relevant within the narrower field of energy policy.

Second, because I am interested in the inter-expert conflict over a policy area, I need a more detailed set of analytical categories to examine how the knowledge produced by these groups varies and contest each other. This narrower focus naturally means I can only speak to a much smaller range of policy-related issues, but that the more specific focus should allow the analysis to come closer to identifying how ideas mattered in a particular policy context. This means that the contribution of my analysis is also an exploration of the mechanism through which particular ideas became powerful in a given institutional context. The analysis does not speak to how policy knowledge came to be, rather, how it contests other knowledge. The more explicit focus of my analysis is thus on the inter-expert contestation of the "sense-making" in a given policy area.

My further contribution to this debate is to examine the more detailed interaction of particular institutional characteristics with the role of expertise within policy-making. Furthermore, the ultimately dependent policies are not related directly to national economic performance, although some actors in the analysis may believe so, rather I am interested in the energy policy that followed from the different organization of public expertise around policy-making on energy. The particular period I chose to examine these dynamics is the periods surrounding the first oil crisis from the early 1970s crisis up until the second crisis in early 1980s. The *explanans* in this case is not ideas by themselves, but the different formal institutional organization of expertise in the political systems examined – France and the United Kingdom.

These works collectively speak in various ways to the organizational infrastructure of ideas (Béland and Cox 2011, 196). Although their different purpose of analysis and choice of units to examine affect their scope. Much is now known about the role of experts and expert ideas in affecting policy change because of these works. However, there is still much untapped potential in examining both other instances of the organizational infrastructure of ideas, but also, more specifically to focus on the interaction between the formal institutional context and the role of ideas. While this has given us a better understanding of institutions and ideas in relation to expert knowledge, we are still lacking a more specific understanding of how specific forms of expertise, like technical knowledge affect policy outcomes in an increasingly technologically dependent society.

Science and Technology Studies (STS) sit at the intersection between technology, science and politics. In this literature, the work of Sheila Jasanoff stands out. In much of her work she deals with problematizing the often assumed neutrality of science and emphasises the constructed nature

of expertise as it interacts with policy-making (Jasanoff 1994, 1999, 2012). In a recent anthology, the empirical implications of such are examined. In examining the different dimensions of what she terms the sociotechnical imaginaries, several of the contributions tackle how expertise and scientific knowledge interact with politics(Jasanoff and Kim 2015, 339).

In the chapter by Clark Miller, it is argued that the creation of institutions like the WHO (World health organization) and WMO (World meteorological association) allowed the creation of a new global imaginary of governance. This shift was made possible by the increasing use of science-driven projections, modelling and visualization of populations that rather previously representing nation-states, represented groups of the world population at risk of HIV/AIDS, rising sea levels or other pandemics. This doesn't just supersede national jurisdiction, it creates a new type of scientifically legitimized and expert-driven definition of how problems and solutions should be understood – and which institutions are best suited to deal with them(Jasanoff and Kim 2015, chap. 13).

Andrew Lakoff's study in the same anthology, illustrates that this superseding of national jurisdiction and competence is not always as automatic or seamless as first assumed. Indeed, much of such a process depends on some degree of submission and supplanting of previously existing institutions of experts. In examining WHO preparedness programmes for global health emergencies, he emphasises the conflicts of interest that occurred in the process of shifting the locus of legitimate action from national health authorities in the nation states to a global set of UN-based institutions. The work thus illustrates that expertise is neither neutral, nor are scientific and technical inclusion into politics going to remove conflicts – neither between levels of governance or between different types and groups of experts (Jasanoff and Kim 2015, chap. 14).

In this literature, the emphasis is on the collective construction of meaning through the application of sociotechnical paradigms (Jasanoff prefers the term "imaginaries")(Jasanoff and Kim 2015, chap. 1). These imaginaries are then shown to affect institutional and policy choices in different areas, but often of using historical and diachronic methods to examine the genesis and shifts of imaginaries over time. This leads to shifts of instruments or definition of problems and solutions within a policy area or the creation of whole-sale new policy fields of broader scope than before – like the introduction of scientific tools to identify and combat global public health threats in the WHO or issues of climate change (Jasanoff and Kim 2015). Experts and those who wield expertise, in this

sense, are a subfield of actors who are giving meaning to a policy field through a given sociotechnical imaginary – or attempt to change it through attempts to legitimize or delegitimize different tools or scientific understandings of a phenomenon[14].

The way Jasanoff applies the concept of sociotechnical imaginaries it is as an outcome of a process of expert disagreement and settlements. Her analytical focus favours how these aspects can reproduce broader cultural and societal preferences for particular types of evidence and delegation of authority (Jasanoff 2012, 12). Compared to this work, of my work has more in common with the more subject specific investigation of expert disputes on the concrete intersect of technical types of knowledge and politics that are found elsewhere in the literature on STS - especially, in the contributions of Miller and Lakoff on how expertise within global governance structures such as WHO and WMO or other similar works (Miller, Edwards, and Haas 2001).

From the point of view of this literature, the creation and dissemination of sociotechnical imaginaries is what holds the key to how complex policy problems become solvable. This is not as straightforward as one might think. From the point of view of economic sociology, what is at stake here is the attribution of probabilities to an unknowable future outcome. Frank Knight is famous for having distinguished probabilistic uncertainty and radical uncertainty. The cognitive action of moving from radical uncertainty imply that values and probabilities assigned to outcomes in the future required explanation with reference to the actors who assign those probabilities(Abdelal, Blyth, and Parsons 2010, 138pp)[15].

A sociotechnical imaginary thus requires individuals who presume to understand and can analyse the probabilities of future outcomes. Experts become relevant as actors who create the techno-political imaginaries that help to understand the possible future outcomes of one policy choice over another. As policy problems become more complex, the reliance on experts and sociotechnical imaginaries through which to understand and ascribe meaning to policy problems will increase. Indeed, the reliance on experts in modern political systems is already significant and their authority inseparable from expertise (Jasanoff 2012, 12). The concept of sociotechnical imaginaries is,

[14] Perhaps owing to the interdisciplinary and openly pluralist roots of this literature there is no one definition of expertise being applied. However, one could make a distinction between those who are experts as those who have already been accepted as wielders of legitimate expertise within a field, and as such, the attribution of expertise is an interaction process that requires the construction of specific expertise as relevant to a policy field before one can speak of groups of experts. Experts are thus, logically and sequentially, those who have already achieved acceptance among relevant policy actors as experts of the problems pertaining to that policy field.

[15] For a concise and clear introduction to some of these debates in the classics of economic thinking, see the chapter by Cornelia Woll in (Abdelal, Blyth, and Parsons 2010). For more detailed renditions of these discussions, see (Skidelsky 2010)

perhaps due to the holistic aspirations of parts of STS, left somewhat broad. For each practical application it would be necessary to further specify some ways through which expertise and understanding are applied by experts in a given policy field. Before we can move to this step, we need to examine more closely the substance of what constitutes expertise and those who wield it - the experts - in relation to the study of this thesis.

3.3.2 Sociotechnical imaginaries and expertise

Perhaps owing to the more broad aspirations of much of the STS scholarship surrounding Sheila Jasanoff, the field does not utilize explicit or consistent definitions of expertise and experts. Rather, most of the works seems to prefer a more empirically grounded approach to empirical studies, where the specific nature of expertise can be teased out within the context of each case. The scholarship seems to prefer broader examinations of which kinds of reasons best correlate with different publics (opinions, broadly understood?) and their relation to political culture and the legitimacy and authority of expertise (Jasanoff 2012, 5).

Some work in the literature gets close to an operational definition, where expertise might be seen as a corollary to what she calls “Civic epistemology”. This consists of a number of dimensions: (1) the dominant styles of public knowledge making; (2) the methods of ensuring accountability; (3) the practices of public demonstration; (4) the preferred registers of objectivity; and (5) the accepted bases of expertise (Jasanoff 2012, 72). The specific focus of this work is on how such paradigms are legitimized to a public (which perhaps becomes clear when examining especially point 1 and 3). However, the methods of ensuring accountability, preferred registers of objectivity and the bases of expertise may all relate to a definition of expertise. The first point relates to how expertise produces knowledge that is actionable upon as policy solutions. The second, registers of objectivity, refers to the ways in which the produced knowledge attempts to solidify itself as true, or un-political in nature. This may be through perceived technical basis in natural sciences, complexity or similar. Finally, the basis of expertise attempts to encapsulate why given experts are accepted as having expertise within a field to begin with. Thus, this dimension speaks to the origin of the social construction of expertise within a field. I can appreciate such sensitivity to the unique ways in which expertise might manifest, however, as a consequence, these guidelines and dimensions are still too broad and holistic to be utilized in an operational manner in a study of more specific policy area.

On the inability to predict the 9/11 2001 terror attacks on World Trade Center, the commission tasked to analyse the event noted that imagination is normally not associated with bureaucracies[16]. One might debate the general ability to predict future events is a problematic endeavour that confuses calculable probability with risk (Knight 2012). Working from an understanding of the modus operandi of bureaucracies as routine administrative analysis, the statement perhaps makes more intuitive sense. More to the point, however, is that even expertise that allowed such "imagination" would require to be accepted as a viable threat that the existing administrative system and eventually policy-makers had to deal with as a policy problem with associated policy solutions.

This translation of expertise into action is in fact possible within existing bureaucratic structures, but which experts and thus what policy ideas are allowed to dictate the combination of policy solutions and problems is variable. The variability of expertise in policy-making depends on the characteristics of the particular bureaucratic structure in question, which will vary based on general country specificities, but also on in policy-sector specific manner. The interaction between these more formal institutional contexts of expertise and the concrete expertise that helps guide policy-making is thus an empirical question. A question that this thesis attempts to grapple with.

The purpose of this thesis is to examine the empirical existence of the conflict or coalitions of experts within two different bureaucratic structures. Instead. analyses similar to those advocated by Jasanoff and parts of the STS scholarship emphasise "deeper imaginaries" representing a common cultural representation of (public) reason which ultimately relies on reference to a public space (Jasanoff 2012, 19). Although, some of the authors within STS who work on specific policy fields get closer to what I intend to do (e.g. Miller and Lakoff, above).

I share the emphasis that "The rationality of experts….is never natural but always achieved, through institutionalized rules of the game that admit or preclude particular modes of asserting expertise" (Jasanoff 2012, 12). Moreover, the concept of imaginaries points to the potential conflict over expertise whose legitimacy is ultimately socially constructed. However, the origin and creation of this embedded authority is not my focus. Instead, my analysis will attempt to illuminate how different groups of experts are positioned given the bureaucratic structure they are embedded in. This entails contextual knowledge on part of the researcher and the analysis to take into account the

[16] The exact quote reads: "(i)magination is not a gift usually associated with bureaucracies" (9/11 commission, 2004: 344, quoted in (Jasanoff 2012, 69)

variations of the aspects of bureaucratic structures like the ability of the state to affect behaviour of other agents in society, the type of inter-governmental negation and the basis of selection of experts. By emphasising these aspects I am attempting to bridge the institutional aspects of a given case with the more active role that agents (such as experts) can play in policy-making.

I am examining the inter-expert conflicts of achieving closure around their particular policy-preference within energy policy. This means examination of expertise in policy-making needs to take into account the non-technical aspects of how policy-solutions and agendas are set. This implies that there is always a political component to expertise in policy-making (perhaps in general) in that democratic systems often require the explicit or implicit consensus either of governing bodies, expert groups and politicians to achieve agreement on policy choices.

3.4 What is expertise?

Before moving on to a discussion of experts and their relationship to political decision-making within energy policy, we need to, first, examine what constitutes expertise.

Upon initial examination, it becomes clear that the two words are highly correlated. Thus, in Merriam-Webster's dictionary expertise and expert are simply defined in terms of the each other. Thus, expertise is simply "the skill of an expert" (Merriam-Webster Online Dictionary n.d.). Moving beyond the semi-tautological implications of statements a-la "expertise is held by experts and experts are holders of expertise" we may come a bit closer by examining the origin and etymology of the term.

The origin of the word expert is in the Latin adjective "expertus" meaning "tried, proved, known by experience," which in 14th century French came to mean the attribute of being "skilful" (Online Etymology Dictionary n.d.). "Skill" in turn is from the Old Norse verb *skil*: "to separate; discern, understand" (Online Etymology Dictionary n.d.). To separate into constituent parts is similar to that of analysis; which we draw from Greek, the literal "a breaking up, a loosening, releasing," (Online Etymology Dictionary n.d.). This has later become what is in most sciences understood with the concept of analysis: "resolution of anything complex into simple elements"(Online Etymology Dictionary n.d.).

We can thus see a line between expertise, to skill and the ability to understand through ability to separate into constituent parts. The ability to discern and separate to allow understanding, like the separation of a research object into smaller components in order to understand them. Now we are beginning to see how the understanding is linked with expertise. The ability to understand a given phenomenon is thus the key to having expertise. Thus, we are left with an intrinsically linked set of concepts. Expertise is the application of skill to understand and analyse a phenomena and those who hold particular skills are experts. Applied to the area of politics and policy-making those who hold expertise are: *Individuals, or groups of them, who have skills to analyse and thus understand the given policy area.*

In principle, expertise may be held by an individual or group of individuals in many parts of society. They will furthermore vary on a case by case basis, and often also on a policy area basis[17]. For the purposes of this thesis, the chosen subgroup of experts are those related to decision-making within energy policy of the United Kingdom and France in the period surrounding the first oil crisis. In a part of the bureaucracy, this may be a ministry agency or some other public bureaucratic division – even publically owned but politically controlled entities. This definition of expertise and experts does not directly deal with the question of whose knowledge and skills are considered relevant for the solving of policy issues. A further implication is that many experts will, and indeed do, exist surrounding the policy processes examined in this thesis. However, following similar logic as indicated above, it is also the purpose of any examination that purports to understand a phenomenon to delineate and separate the relevant aspects of the phenomena in question.

Therefore, the thesis does does not have aspirations to be an exhaustive examination of all the expert influence that may have been surrounding the making of energy policy surrounding the first oil crisis. Rather, it is an attempt to select and examine the most relevant actors with reference to the research question studied. It is my claim, that a key contribution of the empirical part of this thesis is the uncovering and identification of the use of knowledge and skills to influence how energy policy developed as applied by experts within the decision-making processes of the two countries in the period. This does not mean that it takes into account all the potential experts, but instead focus

[17] Although it would be difficult to imagine a policy process where the Treasury does not have some kind of influence, if not at least, in terms of setting the financial conditions for scope and quality of policies.

on those that relevant for the examination of the nexus between bureaucratic structures as policy ideas in the two cases.

3.4.1 Who are the relevant experts?

As alluded to earlier, experts may be anywhere in society. However, for the purposes of this thesis we are limiting the focus to experts within the political decision making process.

Furthermore, the focus on the interplay between the role of ideas and institutional constraints necessitates a focus on experts within the institutional constraints defined by focus of the thesis. The thesis examines the interaction between the difference in types of bureaucratic structure and different ideas of energy policies in two cases. This means that the experts in question are those who exist in the institutional setting surrounding the political decision-making process of energy policy in the two cases. In effect, we are examining a subset of the administrative bureaucracy in the United Kingdom and France. Bureaucratic structures as they will be defined below may of course manifest different in other countries, and as such, these insights are not immediately transferable to other cases, policy areas or to other countries besides those institutions relevant to the cases. At a higher level of abstraction, inferences about the conditions under which open or closed bureaucratic structures allow some ideas over others may however be relevant to examine, and as such, the study may indicate the type, or which ideas among several possible, ideas in a given policy field, would become dominant with different combinations of expertise or political oversight.

These experts may in theory be relevant throughout the classic policy-cycle distinctions of agenda-setting, policy formulation, implementation and evaluation stages, but the classic theoretical expectation, which I carry over from this literature, is that the role of bureaucratic agents is strongest in the definitiorial and formulation stages. The stages metaphor is not meant to be a strict analytic category but pertain to the areas where the analysis will broadly refer (DeLeon 1997; Lasswell 1956; Sabatier 2007) to indicate the areas of policy-making that are more likely to characterise bureaucratic involvement. For this reason, the focus of the analyses will also favour the policy-formulating and agenda-setting ability of particular expert groups wielding different types of policy ideas to do so.

Experts are important in modern policy-making, and permanent expert groups within government bureaucracies no less so. Ultimately, however, politics is the arbiter of who holds authoritative voice over issues; experts may fall out of favour as political power changes with government cycles, or due to increasing role of some types of political issues - which favour some ideas sets over others. Moreover, there may be differences in dominant ideas within a bureaucratic organization itself. For instance, one might imagine that the classic Weberian command-and-control logic of hierarchical bureaucracy was stronger at the higher echelons of civil service and more technically driven expertise in lower levels closer to the more specific policy formulation and actual production of bureaucratic decisions (Peters and Peters 2002, 72). The degree to which expertise has become the guiding logic of the bureaucratic organization surrounding decision-making – as opposed to more classically hierarchical notions - is therefore also a question that circumscribes this thesis. The specific contextual factors that affect these dynamics, and are inherent to each case, may shift over time or across cases. The general point to bring across is that there is a significant role for the type of bureaucratic structure in filtering expertise in different ways. This variegated filtering process, in turn, will favour the content of some expertise over others and thus make some types of expert advice more prevalent in policy decisions.

3.4.2 Institutionally bounded relevant experts?

In principle, the above arguments about the nature of expertise and the difference in which experts are relevant could be made for many more experts than those situated in different administrative and public functions. They make take the form of individuals who we might then term knowledge entrepreneurs, but they may also be conceived as a collective of some description, through either an agency, ministry or other grouping or more broadly as epistemic communities(Adler and Haas 1992; Haas 1992). The central point, is that these experts are in possession of relevant and non-general knowledge about the given policy field in question and that they are perceived as relevant to the policy-making process by actors in the political system for this reason – either through invitation into debates, consulting roles or formal administrative oversight or definitorial responsibility for policy.

However, in this way, most contributions to policy-making might be conceived as expert-input. We need to further delineate which types of experts we have in mind to study and why. The relevant experts in the study of something as dynamic as policy-making will of course be difficult to

determine a priori. However, we may make some preliminary sub-groups of experts that also reflect the focus on the institutional focus on bureaucratic structures of the thesis. These qualifications serve to ascertain that experts with significant institutional ties to bureaucracies and policy formulation are in focus.

First, is that the access to the policy process where experts may have influence must be of a formalized and somewhat permanent kind, in the sense, that their input into the policy-making is expected in principle. By formalized I do not necessarily require that rules exist for the inclusion for the involvement of e.g. a given ministry, but rather to limit the examination of experts to those that are already accepted as having expertise within a given policy field. Because of their expected involvement, they will therefore often be of a somewhat permanent nature in the institutional context, or at least have had a stable position over some time period sufficient for them to achieve the position of experts. Thus, it is not the shifting of inclusion of different expert groups into the policy process that interests this thesis. This is not an examination of the origin and attribution of legitimate expertise. Rather, it is on how the setup of bureaucratic structures affects the generation of expert policy input and the potential conflicts of policy ideas that exist between those that have already been accepted as having expertise in the field by other policy-makers (often the government who may request advice or policy-formulation capacities).

Second, another way to indicate institutionally relevant actors is through their continued funding by state finances. The reason why my thesis limits focus to those that are not private actors – in terms of their access to the policy process – is that public funding or control can be conceived as an indicator of the perceived importance of the function. Thus, in principle, the inclusion of ministry task forces, the special policy unit or publically owned companies in the policy-making process indicate their perceived importance to the policy outcome –through different forms of expertise or formal gatekeeping roles. Further, these groups are crucial to the puzzle of this thesis in that they represent groups that can be said to have a relationship to the bureaucratic structure of the case. That means that the organization of these expert-groups around the policy-making process represents a view into the institutional constraints on ideas, while those ideas can still be analytically separated from the constraints that affect them.

These experts are thus not just any experts. How the broader different institutional setups of bureaucratic structures are organized in the two cases is the reason why some experts and their ideas

are more important than others. Thus, as explained in the introductory chapters, if the broader puzzle of this thesis is the institutional constraints on policy ideas, the more specific is that of how different bureaucratic structures affect the types of experts and thus policy ideas that come to define energy policy following crises. Expertise may be located inside the civil corps or it may be a more autonomous actors which functions more akin to a politically instituted think tank (especially the Policy Unit and CPRS in the UK, spring to mind). Moreover, the use of external (to the political-administrative system) actors and agencies like public and private companies in steering committees or as consultants may also vary. In short, the location of the experts also vary with the contextual parameters of the specific case, but a common trait is that whatever position they have, the structure of bureaucratic system will affect their ability to influence the process of policy-making.

An expert from the point of view of studying bureaucratic structures and ideas in policy making is therefore: *Individuals or groups within the bureaucratic structure that have knowledge and skills to understand the relevant policy-field and who are directly or indirectly financed by the state and are a formal part of the decision-making process over time*

As indicated earlier, these definitions serve as heuristic delimitation to maximize the opportunity to observe and create specific knowledge of the importance of bureaucratic institutions for policy ideas within a limited policy area and not the general importance of experts to politics more broadly. This means that the type and range of experts studied using this definition are just a limited number of the total number of experts that may exist in the broader policy-making environment of the two cases.

3.4.3 Which type of expertise?

All experts are not created equal. Indeed, what is perceived as the authoritative knowledge varies over time and by policy area.

Experts studied in this thesis are those that directly or indirectly are financed by the state and are a formal part of the decision-making. This means that while it would be possible to extrapolate insights about the capture of a political process by specific ideas heralded by a group of bureaucrats who hold some specific set of expertise, it would be the expertise that was the object. Hence, insights from this study are about the role of ideas in a particular institutional context of

bureaucratic structures characterised by openness or closedness, which I further defined as the degree of expertise of bureaucrats themselves as well as the degree of political supervision. These two dimensions may vary across policy areas.

Inferences about the role of different actors in co-opting the political process can only be made in this thesis with some significant caveats. Studies that examine the role of different actors in coopting the political process or regulatory capture often emphasise how civil society or market actors outside the traditional decision-making procedure may co-opt a policy process. However interesting such studies indeed are (Rich 2010), and they do have corollaries to some observations made in this thesis, like the role of specific actors in defining and formulating stages of policy, it is not possible, per se, to examine the specifics of potential state or regulatory capture by special interests.

3.4.4 Groups of experts as coherent units

Examining conflicts between groups of experts such as EDF, CEA, Ministry of Finance in the French case and others assumes that these groups represent unified actors. It is true that actors inside these groups are not equivalent. However when acting within the decision-making processes of the administrative system of their respective political systems these organizations tend to speak with a singular voice, at least when representing the organization itself. This means that when comparing the ideas set out in the framework, the actual ideas identified are not necessarily at the level of individuals who may espouse them, but examined because they can be said to represent ideas present in the organisation as a whole.

It is not impossible that several ideas may exist within an organization at once. To the extent that several ideas exist, the point of this analysis is not the origin of these ideas within the organizations, rather it is how these ideas as represented by the organisations change over time and are fielded in interaction with other organizations; how different ideas underpin policy conflicts in different ways and finally how some ideas rise and fall. The introduction of an idea need not necessarily lead to its dominance in a point in time or space. The effectiveness of ideas also depends on the institutional and political context in which they exist. The analysis of each case will attempt to indicate when interactions like this exist. Furthermore, the chapter concluding on the analyses and their findings

attempts to put the ideational developments and policy trajectory of energy responses to the first oil crisis into context of which other non-ideational factors facilitated these developments.

3.5 Outcome factor: Policy ideas of experts

In political science, the study of the role and influence of ideas on politics has been increasingly popular. It began in late 1980s with work indicating the role of ideas or norms as causal factors. During the early 1990s, the development of a constructivist strand of literature within International relations began emphasising the constructed and intersubjective nature of "social facts". In positing anarchy as the main structuring characteristic of interaction between states and their propensity to war, the existing literature within realist and liberalist traditions (as well as their neo-forms) had been unable to explain or predict the end of the Cold War exactly because they did not emphasise this intersubjective and constructed element of anarchy (Wendt 1992). The literature on the role of ideas ballooned from this starting point and soon spread to other branches of social sciences.

Within comparative political sciences the cognitive turn led to a drive toward using ideas as explanatory factors for different political outcomes and most of the literature in 1990s and early 2000s dealt with the role of ideas as independent variable or causal factor in the description or explanation of political (often policy-related) outcomes (Finnemore and Sikkink 1998; Hall 1989, 1993). Much of the early debates centred on debates about the nature of ideas as explanatory factors. Discussions revolved around whether (or not) existing literature – especially within neo-institutionalist branches of historical and rational institutionalism - took ideas seriously as more than just "filler to shore up already existing research programmes rather than treat ideas as objects worth investigation on their own" (Blyth 1997).

The studies that spawned from this critique attempted to examine ideas as objects outside the instrumental and functionalist logics of previous attempts to incorporate ideas (Goldstein and Keohane 1993; Hall 1989, 1993) emphasised a multitude of different concepts to catch different ideas held by actors, but fundamentally shared the starting foundations of the intersubjective and constructed nature of ideas. The ideational turn was analysed using many lenses, a good overview of the different ways they have been applied in comparative politics and international political economy, respectively is through categorizations of *meaning*, *cognition*, *uncertainty* and *subjectivity* (Abdelal, Blyth, and Parsons 2010). As the field expanded in scope, the questions that

the literature attempted to grapple with invariably also shifted. One could argue that one of the initial steps in this new direction was already indicated when earlier work made the point that ideas do not float freely, indeed they are embedded in a political and institutional context which matters to their mattering (Risse-Kappen 1994). Whatever the starting point of this shift in the literature, what happened through this process of "taking ideas seriously" (Schmidt 2010b) lead to an increasing attention to the practical ways that ideas could be studied rather than the referencing to other research traditions to justify a new approach. Following these interventions in the literature, further scholarship has moved towards a less confrontational line of reasoning vis-à-vis other research traditions – like rational choice – and simply attempted to focus on a more pragmatic approach to how ideas can matter in different ways and contexts (Parsons 2016).

In an attempt to distance the study of ideas from previous categories of preferences and interest Carstensen & Schmidt move significantly in this direction by attempting instil a more holistic understanding of power in relation to ideas. To encompass this more widened scope of forms of power, they distinguish the different forms powerful ideas may take by distinguishing power through ideas, power over ideas and power in ideas (Carstensen and Schmidt 2016). Some extremely interesting research has formed from this new fork in the literature, which works much more pragmatically on the role of ideas in different contexts. An interesting example is the work on the surprisingly feeble foundations upon which commonly accepted macroeconomic indicators rest. By unpacking these different intersections, studies of ideas may illuminate both how ideas become powerful (their origin and political struggle over them) and how ideas actually exert that power once institutionalized (Mügge 2016). This has the potential to sidestep the cleavage between those who study ideas as weapons that are wielded by rational actors and those who believe ideas are so embedded in human thought that those ideas are believed to structure all action that follows (Mügge 2016, 422).

I would add to this debate, that in order for research to truly examine the conflict over ideas as well as the power they exert post-hoc it necessitates a longer term perspective. Research that aims to examine both these separate questions thus need a diachronic dimension in their study of ideas. Second, I would reiterate – although I do believe the literature and I are in agreement, if tacitly – that the institutional context is still of utmost importance when examining these aspects of ideas. For example, the work on economic indicators convincingly shows that the way we operationalize and define our mathematical models of growth or asset valuation standards have political and

potential redistributional consequences (Mügge and Stellinga 2015). That being said, the ideas themselves never exist in a vacuum (Risse-Kappen 1994). It is entirely possible that similar ideas may have different conditions for existing in various institutional settings. This may be due to inertia of existing rules, or dominant managerial cultures, or some other reason.

I should be clear. I am not saying that we therefore cannot draw valuable insights from these studies. What I am saying is that we need to be very careful to specify the conditions under which certain ideas mattered or not. The promises of doing so are numerous. First, perhaps most substantially, a carefully specified institutional context may teach us just as much about the power of ideas as the actual variation in ideational power. For instance, it may alert us to scope conditions of some ideas, or the ability of particular mechanisms of legitimizing some types of ideas to benefit their influence and not others. I am not saying this to be pedantic, but to emphasise that to really move from the question of "whether" ideas matter to politics and policy onto studies of "how" they matter (Mehta 2010), we need to be very careful about specifying not just the movement of the ideas, but the institutional context they exist (or do not exist) in. Second, such a renewed emphasis would ultimately make it easier to determine under which contextual factors an argument about the role of ideas is made. As such, it would a) make it much simpler to clearly specify new research questions for follow-up research b) think more critically about how any research findings can be generalized to other cases, policy fields, contexts.

The research topic of this thesis falls into this part of the literature, but shifts the focus slightly from the role of ideas to the role of institutional contexts on ideas. It attempts to do so by choosing two cases of policy development over a number of years in a policy field that is highly technical and susceptible to expert influence. Within this narrower field, the thesis explores the role of expertise from publically run bureaucratic structures to the policy ideas that conflict over the definition of policy choice in politics. In so doing, the thesis attempts to illustrate the role of different variations of bureaucratic structures on the organization of public expertise in a policy field and the subsequent policy ideas.

3.5.1 Policy ideas give meaning to policy

A policy idea is a cognitive construct containing explicit or implicit policy imperatives. At the most basic it is about how governmental actors link problems and solutions – and in so doing – enable

governmental steering. However, problems and solutions are not objective phenomena. Even rational-choice inspired approaches to public policy work under assumptions of "bounded rationality". In other words, human capacity for full information about a given problem and its potential solutions are ontologically asymmetric. This is more-so the case during times of "crisis"[18]. Labelling phenomena as "crisis" is neither neutral nor homogenous across contexts. Agents do not automatically and unproblematically respond to material shifts in easily predictable ways and even exogenous shocks, such as an oil crisis, must necessarily be interpreted by actors (W. W. Widmaier, Blyth, and Seabrooke 2007, 748). During crises, it becomes crucial for policy-makers to be able to ascribe meaning to the crisis in the sense that it is interpreted using policy ideas. The interpretations of an event like the oil crisis by actors should be understood as constructs containing different aspects of policy ideas, which provide policy actors with interpretive framework that allows ascribing meaning to what is experienced by actors. When experts in bureaucratic structures ascribe meaning to the oil crisis through policy ideas to solve the crisis, they essentially are wielding epistemic power by turning principled understandings into causal models (W. Widmaier 2016, 344).

A policy idea, in whichever aspect (see below) is a thus a cognitive construct within which an event such as the oil crisis can be *defined*, *diagnosed* and *explained* as *necessitating* particular sets of actions (Blyth 2007, 762)[19] (see also (Jones 2009; Stone 1989)). Policy ideas act as the manifestation of how experts understand a crisis. I will apply the concept of policy idea operationalized along three different aspects or modes of manifestation to show how crises become understood by experts in a given bureaucratic structure. These aspects proceed in three stages which also represent decreasing levels of abstraction[20].

However, when examining experts understandings it is crucial to emphasise that the necessary analytical move is the inverse. The identification of concrete policy problems associated with the crisis, as the experts define it, is the starting point of empirical investigation. From there, more or less consistent sets of problems and solutions may be amalgamated by the analyst. It should now also become clear, why such an analysis necessitates a longer time perspective to appreciate how

[18] Distinction must be made between "crisis" where information is less or more limited, which opens the space for rhetorical use of "crisis" by politicians or other elites in order to achieve preferences set independently of crisis. This problem is related to the fact that it is often hard to tell what beliefs were causal for several reasons 1) separating statements the person knows are false from what she "really" believes 2) determining a rank order of these justifications. 3) empirical claims by individuals can often contradict or be in tension with one another (Jervis, 2006: 646).
[19] Emphasis is mine
[20] Parts of the ideational literature has emphasised the need to separate normative and causal (or factual) aspects of ideas (e.g. Campbell 1998; Goldstein and Keohane 1993). While this may seem intuitive, there is no clear agreement on how to separate these elements and that normative and factual concerns often overlap in practice. My use of the term policy idea should therefore be understood in this broader sense of incorporating normative as well as factual aspects (see also, (Mehta 2010)).

shifting problems and solutions reflect up on broader views of the crisis and the implications for policy it may engender. I argue that maintaining a view of ideational elements, which actors are not just affected by, but may also affect and utilize, it would be consistent with this approach to argue that a valid hypothetical political strategy could be to maintain a crisis as an accident as long as political responsibility can in some way be shifted through blame-avoidance or other strategies.

3.5.2 Policy ideas operationalised

Moving to a lower level of abstraction, we can begin to theorize how policy ideas may be captured in the empirical material by analytical categories. The classic interpretations of how ideas shape policy outcomes is often referenced in the neo-institutionalist literature to the work of Peter Hall (esp. (Hall 1989, 1993). He famously distinguished between three levels of overall goals, instruments and settings of instruments to capture shifts in policy as a consequence of events that proved anomalous to prevailing paradigms of knowledge (Hall 1993, 291). Implicit in the distinction, and explicit in his writing, is an attention to how problems and solutions become linked through knowledge when policy choices are made. Ideational scholars have since developed this more explicitly – among classics e.g. (Campbell 1998, 2002).

The original rendition of this typology was intended to examine policy problems. However, I suggest the categories of goals, instruments and settings may usefully be applied to capture different aspects of policy ideas among experts. In this sense, what problem definition and solutions are associated with the crisis is part of the constitutive mark-up of the crisis per se. This is a necessary explication because Hall's original article is interested in studying the policy goals, instruments and settings associated with different levels of social learning, where the social learning primarily shifts at the third-order of paradigms. I make no such a priori theoretical claim. Instead, I perceive of the categories in a more heuristic manner. They exist to allow examination of dynamics of communicative interaction between political elites as they debate the crisis internally and how to deal with it. Moreover, I make no empirical assumptions about the general consistency between settings, instruments and overarching goals.

Further specification is also required in the theoretical understanding of the source of change. The source of change in the original typology is social learning which is understood primarily as a deliberate adjustment of goals and techniques of policy to respond to past experience and new

information (Hall 1993, 278). By itself, this is not well-specified enough for application as an explanatory model of change. While (Hall 1993) emphasises the disconnect between material factors and change when specifying the insufficiency of new economic developments as causes of paradigmatic change, he instead externalizes the this cause to a similarly 'objective' phenomena namely the accumulation of events which prove anomalous with the terms of the existing paradigm (Hall 1993, 280)[21].

As others have shown, policy experimentation does not have to follow from accumulation of anomalies incongruent with the interpretation of a dominant paradigm, such shifts may happen out of intentional acts with unintended consequences (Morrison 2016). Indeed, as recent literature on responses to the financial crisis of 2007-8 has emphasised, there is a puzzle as to why ideas may influence different policy areas differently – as (A. Baker 2015) have recently shown for monetary and fiscal policy – and how some ideas become successful and not others in affecting policy change – as (Chwieroth 2010) has shown in the decline of welfare state policy in Latin America. What this means, is that just as common knowledge among decision-makers may reflect material and structural positions of power of actors, they do not have to. Similarly, shifts in the dominant ideas and the overall goals, instruments and settings they prescribe cannot be assumed to follow from material shifts or objective events. Structures, as it were, do not come with an instruction sheet (Blyth 2003).

That being said, there is still considerable insight in the observation that changes in policy rely on ideational components that affect problem definition. Moreover, the three-tier structure is still a useful analytical tool because it allows disaggregating different types problems associated with the crisis. To apply the distinctions associated with policy to distinguish different aspects of manifestations of policy ideas, conceptual clarification is needed from his original formulation. First, Hall is deriving policies at a hierarchical level of policies (overarching, instruments and settings) which invokes a sense of dealing with policy solutions in his framework. Instead, I use his categories to refer to different aspects of the problems associated with a crisis. In the application of these concepts, we can extract more clarity about the conceptual boundaries of the category.

[21] One scholar notes that part of the strength of the argument is in the inherent duality of conflicting logics (Blyth 2013b).

Overarching policy goals are paradigms in the sense of being "embedded in the very terminology through which policy-maker communicate about their work, and it is influential exactly because so much of it is taken for granted and unamenable to scrutiny as a whole" (Hall 1993, 279). In empirical terms, these take the form of *dominant concerns* that instruments and settings must be coherent with. The example used by Hall is the replacement of employment with inflation as the primary concern of policy-makers (Hall 1993, 283–84). It is difficult to know exactly how such shifts manifest a priori, although one hypothetical way that it might manifest in terms of the oil crisis is overarching ideas of alleviating energy-supply constraints due to the Yom Kippur War. The way in which that idea mediated by the bureaucratic structure is what renders the particular dynamics of ideas among experts in that case.

The second level refers to the techniques or instruments associated with the overarching problem definition. Here I divert somewhat more from the original formulation, because of its heritage in typifying policies. Instead of understanding instruments as policy instruments (overlapping with solutions) that take the form of new regulation on monetary control and methods for planning public expenditures (Hall 1993, 283) I emphasise instruments more along the lines of the concrete variables or indicators that policy-makers refer to when defining the policy options in the crisis. Maintaining the example from above, a reference to the increasing hostilities among countries in the region, and need to secure crude-oil supplies through international diplomacy, would be an example of an instrumental policy idea.

The precise setting of those instrumental policy ideas refer less to the actual content or definition of policy ideas and more to the degree to which an instrumental idea is pushed. Obviously, if an open bureaucratic system reduces the possibility for a single instrumental policy idea to be agreed upon among experts, the question of setting may become less manifest in the analysis. If an indicator associated with the instrumental policy idea is highlighted by expert actors as varying in state (e.g. decreasing, if countable) it may be used as arguments for already implemented policy working or that the crisis is not longer present. An example could be the extent to which financial constraints have been taken sufficiently into account. Where the instrument itself refers to a particular operationalization of (often a measurable) aspect of the policy idea associated with energy policy it does not have to be the only instrument, whereas a change of setting can only refer to the same instrument.

3.5.3 Aspects of policy ideas

Table 2 Aspects of Policy Ideas

Content of different policy ideas	
Aspect	Definition
Overarching policy idea	Dominant concern of energy policy
Instrumental policy idea	Concrete tools referred to by experts (e.g. nuclear reactor type).
Setting of policy idea	Variation in state of policy instrument highlighted by experts

Analysing changes in policy-making in terms of the ideas that influence it therefore requires a keen eye to the different ways in which ideas can manifest and how the characteristics of the institutional context affect the dynamics of policy response in different policy areas. A crucial theoretical point, is that while ideational scholarship borrowing in one way or another from these types of three-level typologies often assume that different levels of ideational variation may interact, is rarely specified at the outset how this might occur. In the original formulation (Hall 1989, 1993) paradigmatic shifts were considered the overarching category not just in terms of the breath and inclusion of the category, but also in hierarchical terms of how it modelled the coming about of policy change. This meant that many ideational works borrowing from this model have indirectly or otherwise included an assumption of change taking place once a paradigm shifts through a shift in overarching ideas (Blyth 2013b). However, this may not necessarily be the case (Moschella 2015; Moschella and Tsingou 2013). Whether this implicit assumption to see policy change as theoretically deriving from shifts from the top-down are a reminiscence of the inspiration in Kuhn's work on paradigms I will leave unsaid. The point remains that in my application of the above categories I do not assume such a hierarchy and the connections between the different levels of ideas in bringing about policy change should instead be a question of empirics rather than tacit theoretical assumption. Without presupposing too much of the following chapters, what my analysis indicates is that this theoretical primacy of third order change underestimates other analytical dynamics in energy policy ideas in France and the United Kingdom.

Chapter 4 Method and description of sources

Before getting into the analyses of the cases in the coming chapters, it is necessary to reflect on the type of methodologies and logics applied when making analytical claims. This chapter will first set out the logic of using comparative case designs in qualitative studies and the limitations to generalizability. It then argues for the use of a diverse case selection strategy and process tracing to support the relationship between bureaucratic structure and policy ideas. Finally, it describes the use and collection of empirical archive material for use in the analyses.

4.1 Comparative case design

The methodology of the investigation advances from a comparative logic. The comparative case study logic is used across political science as a way of exploring the significance of causal factors across countries to establish the significance of certain casual factors for specific outcomes across countries. This is related to statistical analysis in which a large number of cases is compared with regards to a smaller number of independent variables and outcomes. However, in the study of the politics of different countries studies are often faced with a small number of possible cases (small N). As Della Porta (quoting Eisenstadt (1968)) suggests: *"Although in this approach the quality of control of the relationship between variables is low, it is often the only scientific method available for the study of macrodimensional, interdimensional and institutional processes"* (Della Porta and Keating 2008, 202).

This has pushed such studies in the direction of comparative studies that implies a parallel reasoning but within the limitation of small number of cases (small N). John Stuart Mill's methodological discussions have been a popular reference point for the establishment of the logics of a comparative case study (Box-Steffensmeier, Brady, and Collier 2008, 646; Della Porta and Keating 2008, 68, 204; George and Bennett 2005). It is worth reiterating some of these logics at the outset; because it helps us better understand the limitations of different logics of comparison and what can be done to alleviate them. Moreover, understanding where the claim to causality lies in these methods helps us better deal with the logical implications of the case selection strategy chosen. The principle methods Mill suggested were the: "method of agreement" and "method of difference" (George and Bennett 2005, 153–54).

The method of agreement aims to find similar independent factors, which are co-varying with outcome factors of two or more cases. By contrast, the method of difference aims to find different independent factors, which co-vary with different outcomes in two or more cases. In modern iterations, this terminology has been inverted so the focus is now on controlling the context of this relationship (or third variables). In most different case designs, which mirrors the method of agreement, control of the context (for third variables) is assumed by choosing cases where all other elements of the context are maximized but the variation of the explanatory factor is minimized. In this logic, the explanatory factors that are similar across cases are the ones that led to similar outcomes given. Conversely, for most similar case design, cases are chosen to exhibit minimum variation in the context but maximum variation in the explanatory factors. These two are by now well-known comparative logics in the literature, but are also significantly limited by fundamental challenges of over-and under-determination relating to the strict requirements on logic of elimination (George and Bennett 2005, 155–56).

A common problem for comparative research, as indicated by Theda Skocpol, is that it can be difficult to find cases that contain the differences or similarities required for a given research question and clear outcomes(George and Bennett 2005, 158–59)[22]. Moreover, there is a risk "overdetermination" in the explanations of comparative analyses (Della Porta and Keating 2008, 201). Because countries are complex entities we can never assume that similar countries are similar in all other respects than the explanatory variables in comparative analysis. Therefore, there is considerable insecurity in causal inferences in the sense understood by more quantitative approaches. While over-determination can of course be a problem in all attempts to model reality (Kratochwil in (Della Porta and Keating 2008, 81) it is a common risk in qualitative approaches as well (Vennesson 2008, 238).

This often makes the logic difficult to apply purely in investigations of countries. However, most similar and most different case designs are not the only ones. Indeed, a reasonable amount of energy has been spent by researchers in trying to more broadly examine the consequences of small-N case research and – especially –selection on the outcome[23] (D. Collier and Mahoney 1996; Geddes 1990; King, Keohane, and Verba 1994). This has focused on more universal criteria by which case

[22] See (Skocpol 2008, 37–40) for the full argument.
[23] What most quantitatively inclined research would term the dependent variable

selection can take place in research designs that rely on small-N of cases[24] but is not limited to the strict most similar or most different case selection (Seawright and Gerring 2008). Seawright and Gerring, 2008 suggests two basic criteria for case selection

1) representativeness of the cases of some wider population of cases and 2) useful variation on the dimensions of theoretical interest of the research.

Relating to the first criteria, the primary strength of the most different or most similar design logic is the claim to, in parallel to statistics, establish a (although to varying degree, see (Della Porta and Keating 2008, chap. 11)) generalizable casual claim through the control of other intervening factors between cause and effect. Irrespective of the general usefulness of this first criteria in seeking generalizable causal claims through qualitative small-n studies (D. Collier and Mahoney 1996, 63–64) one should be careful to not oversell the importance of the criterion. I would submit, that the importance of either of the two criteria shifts depending on the type of question the given research is interested in. Of course, it is relevant to know the range of cases that given analytical findings might apply to. Partially, however, this can be addressed by the researcher being very careful about the ambition of the analysis in the scope and reach of the conclusions one draws from the analysis – an assumption which less nomothetic approaches to case studies have mostly lived by[25].

Thus, while comparative studies might not afford the ability of certain generalizability but provides the basis for discussing generalizability in further studies. At the outset, a key concern for a researcher should therefore be whether the given cases represent theoretically interesting variation on the causal factor that the research project is interested in studying. Thus, I would be more inclusive in what I would term comparative case study research with the understanding that reducing the importance of the first criterion does shift the focus of the research towards the importance of the theoretical connections that it allows the research to generate. This affects the case selection strategy chosen but also investigations findings which will have more focus on theory generation and specification or the mechanisms through the indication of how theoretical works rather than the applicability of said schema to a wider set of cases.

[24] Cases, not observations per se. See also Gerring in (Box-Steffensmeier, Brady, and Collier 2008, chap. 28)
[25] To be fair, Gerring and Seawright are probably aware of this when they distinguish case studies with generalizable intentions from case studies with: "a very different style of case studies (so called) aims to elucidate features specific to a particular case" (Seawright and Gerring 2008, 296). See also: (Gerring 2006).

In light of challenges of utilizing the pure comparative logic, the focus of the present study on an ambition of theory generation and the establishment of causal mechanism, a less stringent approach to comparative case studies is required. This approach takes the vantagepoint of George & Bennett's description of combining the comparative logic with process tracing. George & Bennett, 2005 argue that scholars like Theda Skocpol have used the comparative case study logic supplemented by process tracing as a way of supporting the establishing causal relations and mitigating the obvious limitations of the method. The weight of reliance on the quasi-controlled comparative logic of the case selection strategy can then be shifted to the within-case examination using process tracing with the result that the wider research project and claim to causality is strengthened through the "unravelling of historical narratives" that the cases illustrate (George and Bennett 2005, 159). A similar point is also made by (Della Porta and Keating 2008, 219; Mahoney 1999; Mahoney and Rueschemeyer 2003, 365–67).

Acknowledging the limitation of the comparative logic in small N comparative studies, I will conduct a *diverse case design* which seeks a maximize the variation on the causal factor of bureaucratic structures and relying extensively on within-case process tracing to support the mechanisms through which policy ideas are linked with institutional structures like those. This follows the assertion that it is still worthwhile applying the comparative logic under the conditions of maintaining focus on the limitations of the method. Because this approach is different from the classic approaches outlines above, it is worth specifying how this relates to the logic of comparison. In most similar or most different case designs there is an inherent logic aspiring to some level of causal claim built into the selection strategy itself[26].

In following the case selection strategy of diverse cases the logic of selection is more akin to *typological* theorizing where a combination of variables are assumed to affect an outcome that varies across cases (Box-Steffensmeier, Brady, and Collier 2008, 651). This means that the logic of case selection does not inherently imply a causal claim through controlling the context like the most similar or most different designs. The implications are twofold. First, that the requirements of causality dealt with by Skocpol in relation to Mill's methods (explained above) are less strict. Second, somewhat paradoxically, this also means that because there is no inherent causal claim in the case selection logic, the claim of a relationship between bureaucratic structures and policy ideas

[26] Even if Mill's original formulation of agreement and difference was more cautious about such aspirations with very strict conditions (George and Bennett 2005, 155).

must be supported through an additional technique if not inherent to the case design itself. The chosen tool for this is process tracing. Before we turn to a closer examination of the case selection strategy of diverse cases and use of process tracing, it is worth expanding on the consequences for causal claims that these techniques have for the analyses. Because the analyses rely on process tracing to drive the argument of a relationship between the outcome factor of policy ideas and causal factor of bureaucratic structure, the claim to causality will have other limitations to those that can be achieved with other designs.

As a consequence, the study does not enable the clear testing of causal relations stricto sensu, but instead allows the analysis to give an *indication* of this relationship. As such, the comparative element and with-case process tracing strengthen the case for the significance of the identified bureaucratic structures on the formation of ideas and explores the hypothesis of how these bureaucratic structures function and impact ideas but does not provide conclusive empirical evidence to firmly establish this causal relation in similar cases. The use of process tracing takes the context into account (not the case selection logic) by showing the specific explanatory factors affecting the outcome in concrete instances and investigating if other factors affected the outcome simultaneously. In this way, the comparative and process tracing elements support each other in establishing a case for the significance of the explanatory factors of bureaucratic structures. However, it is worth underscoring that this does not imply a certain causal claim but rather an indication and specification of the relationship. As such, more analysis would be required to establish this causal relationship in a wider and more representative scope of cases.

4.2 The chosen case selection strategy and "casing"

The diverse case method aims for the "achievement of maximum variance along relevant dimensions" (Gerring in (Box-Steffensmeier, Brady, and Collier 2008, 650)). It may take the form of examining individual variable or values of multiple variables – the latter of which relies less on the more obvious diversity across one theoretically specified variable and instead follows a logic of typological theorizing that assumes effects of combinations of variables that varies across types (ibid: 651). The diverse case strategy requires that at least two cases be selected, because the variation across the explanatory factor and the outcome aims to show the outer-points of variation in the scope the theoretically relevant factors. In that sense, there is a minimally implied representativeness of the cases to a larger population because they represent the full variation of the population across the variation of the theoretically defined factors(Seawright and Gerring 2008, 297).

The logic implied in this case selection method, as applied to this research project, is that cases selected should help to explore the patterns of relationship between different institutional setups and policy ideas. Having only two cases, it of course means that representativeness in terms of the distribution of a potential and broader population of cases (domestic institution in other countries) may not necessarily represent the findings of the diverse cases selected. However, since the theoretically defined variation between types of bureaucratic structures (see the theoretical framework) can be broadly defined as open or closed bureaucratic structures, this issue is reduced while it cannot be eliminated. The selection of diverse cases thus aims to choose cases that represent relevant theoretical variation on the institutional causal factor as defined in the framework. The two cases selected are France and the United Kingdom. While both countries have a broadly common history as part of Western Europe, the two countries nonetheless represent very different forms of institutional setup.

France and the UK constitute prima facie examples of how oil-supply was insured bi-laterally rather than finding a solution through cooperation in the European Community. The two countries share the choice of non-community solutions, but also why France followed a path of Nuclear energy (Ikenberry 1986; Wade 1980) and the United Kingdom chose an expansion of coal and oil extraction (N. J. D. Lucas 1982, 101–2). The oil crisis hit both countries in two stages. First, the quadrupling of oil prices as a result of price increases by OPEC, and secondly, an oil embargo by

the OAPEC-alliance for U.S. support of Israel during the Yom Kippur war in October of 1973 (Bösch and Graf 2014; Venn 2002).

The two cases shared a preference for a national response to the crisis, which became evident when European Community attempts to settle on a common response inspired by a memoranda on common energy policy by the Commission a few years earlier (European Commission 1968) failed in December of 1973 as France and the newly joined United Kingdom made concessions about Israel to secure bilateral agreements for oil and avoid being labelled a "hostile country" (Dinan 2005, 70; Lenczowski 1990). As we shall see in the analysis, the configuration of policy ideas and institutions that supported these decisions were however, like the general policy trajectories, quite different.

Similarly to how the policy ideas may vary across the cases, the explanatory factor has to have an element of variation that can be indicate the causal relationship with policy ideas among experts in the two countries. The two countries are therefore selected also because they represent to different variations of bureaucratic structures. The United Kingdom is an open bureaucratic structure and France is a closed bureaucratic structure. This institutional diversity is hypothesised as the explanatory factor of why distinct configurations of policy ideas can be observed in the two countries – which is congruent with the policy trajectories illustrated above. The difference of these institutions have been explored and substantiated in the theoretical framework

4.3 Process tracing to support comparative logics

What is process tracing? In a very broad sense, it is descriptions of following a process linking events. This might be considered the modus operandi of most historically inclined work, be it in the discipline of history or social sciences. Indeed, much of the classic literature in social sciences depends on archival or interview knowledge to construct processes and make their analytical claims. Within the International Relations literature, Graham Allison's work on the Cuban missile crisis springs to mind (Allison 1969), but also within decision-making and in the study of power has such sources been crucial (Dahl 2005).

Past events are useful for social sciences because they have a certain distance to on-going events. They may therefore seem less in flux, or existing understandings of the events have been

established to analyse and discuss. Moreover, the practical point that making public of internal bureaucratic documents are often made available by nation-states after a set grace-period (often around 30 years) speaks to the point that studying past events may hold new insights. Such studies, if designed correctly, may teach us about aspects of past events that may be of importance when evaluating ongoing discussions. Case in point, is the energy policy discussions of governments during the first oil shock of 1973 which feeds quite well into ongoing debates on climate change and future energy demands and clean energy supplies that governments (and the world, if ICCP is to be believed) face in the 2000s.

Process tracing is a broad concept, but this does not mean it cannot be a useful technique for analysis if specified correctly. In general it is thought as part of a broader attempt to historicize the social sciences (George and Bennett 2005, 205). In broad terms, we might think of process tracing as a focused and structured narrative exploration of a causal path that leads to a specific outcome (Vennesson 2008, 235)[27]. A strength of process tracing is the ability to deal with multiple interaction effects (Hall 2003). Some process tracing methodologists suggest that process tracing can only make sense when carefully specified to examine the mechanisms through which a causal factor is linked with an outcome (Beach 2016). As such, the unit of analysis is the mechanism itself rather than the individual components of a causal claim. This, I think is an unnecessary reduction of the scope of the process tracing, and should rather be appreciated for the pluralism of different research settings and questions it allows us to adapt to (Hay 2016). Without going into the details of methodological debates about the use of the term of process tracing, it is necessary to point out that parts of the scholarship of process tracing methodology would therefore prefer to term the use of process tracing in this thesis as more akin to congruence analysis, because the focus is on the analysis on the causal factor (type of bureaucratic structure) and the causal outcome (specific patterns in policy ideas) and supporting their connection using careful examination of the historical record through archives, biographies etc. rather than outright examination of the linking mechanism between them. This choice is intentional. The purpose of the thesis is to examine the dynamics of change in policy ideas in their institutional environment. This formulation retains the focus on configurational logics of much of process tracing research and in the respect for multi-causal nature of qualitative research.

[27] This is a broader understanding of the use of process tracing than that supported by for instance (Beach and Pedersen 2013)

Using process tracing in this project has a number of implications for my research design. The choice of most similar systems design often risks a high number of intervening variables (a problem of over-determination) (Della Porta and Keating 2008, 215). In the language of quantitative methodology, this is because more than one independent variable co-varies with the dependent variable in a "theoretically meaningful way" (Blatter and Haverland 2014, 79). This means in effect that it, especially in country-size cases, can be hard to strictly construct sufficiently similar cases to satisfy the assumption that only one independent variable influence the dependent variable However, the fact that process tracing builds on the logic that observations must be linked in particular ways to result in the given outcome reduces the risk of this indeterminacy by examining in detail the context of how given factors interact in the two countries (George and Bennett 2005, 207). As mentioned above, process tracing in this way serves to reinforce the conditions of using most similar case designs in case choice in comparative political economy. In this way, the present method embraces both the multi-causal nature of social world, as well as also the multitude of pathways that may lead to an outcome (equifinality) but at the same time retain the ability to problematize co-variance between the independent and dependent variable in a similar case design by way of missing processual connections.

I is central to understand, that combining different approaches to causal analysis in process tracing (both through mixed methods designs, but also as a means of triangulation of data validity) is definitely compatible with process tracing. However, it is also necessary to stress that process tracing follows a different kind of "configurational" logic than more statistically inclined studies of co-variance ((Blatter and Haverland 2014, 80), see also (Ragin 2008)). This is, to large extent, a function of the kind of data that is often used. Where the nature of evidence of causal inferences in statistical approaches work under an assumption of unit homogeneity (that is, one observation is the qualitatively the same as another) process tracing observations are different. In my design, I will draw heavily on archive material to substantiate potential causal links, but how does one equate a personal letter between actors, a policy brief and a minutes of meetings among government leaders? One does not. The nature of observations in case study research applying different variations of process tracing do not understand observations in the same way that covariational logics – e.g. statistical regression analyses – do.

Instead, process tracing observations are "not different examples of the same thing, they are different things" (Gerring 2007, 179). This means that the nature of evidence in case-study research

is often opaque: e.g. non-comparable and non-countable. Rather than focus on multiple instances of X1 →Y (large N cross case) it therefore focuses on multiple different instances of explanatory factors in causal chains. X1 → X2 → X3→ Y (often containing multiple switches and feedback loops) (Gerring 2007, 173). By implication, the emphasis of this approach is more focused on the specific outcomes on the dependent variables and the combination of conditional causes relating to the independent variable that lead to these outcomes (Blatter and Haverland 2014, 80).

According to (Gerring 2007), in increasing the validity of a process tracing accounts the researcher has a set of options. More problematic is the verification along with estimations of relative uncertainty for each step and the model as a whole (Gerring 2007, 181–83). In this way, my research goal becomes examining causal chains that link specific configurations of different bureaucratic structures to different policy ideas (Vennesson 2008, 231). That is to say, the logic of causality implied here must be much more cautious, because the analysed influence of bureaucratic structures on policy ideas are configurational in nature. That implies that while the theoretical assumptions of different effects from open or closed bureaucratic structures are not in question, the particular interaction between different types of ideas and dimensions of bureaucratic structures may exhibit policy idea dynamics with some types of ideas rather than others.

Determining which parts of a causal chain to examine is dictated by theoretical importance and generally held prior assumptions. The threshold for which causal links to examine is therefore when common knowledge and obvious contextual factors makes the causal conclusion "trivial". That is, the general rule of process tracing focus should be on the links in the chain which are 1) weakest and 2) most crucial for the overall argument (Gerring 2007, 184). It is difficult to specify concretely which elements in the chain are going to be the weakest a priori, but the analysis should whenever possible reflect on the limitations and possibilities of other causes as claims are made. This should furthermore be reflected upon when summarizing the scope and certainty with which claims can be made when concluding on the findings of the analysis.

In conclusion, the process tracing approach to establishing and evaluating casual connections is more qualitative than statistical co-variance analysis but has the benefit of being able to substantiate or discard causal connections which might show signs of co-variance. This is the main reason that it is employed as embedded in a diverse case design where the qualification of process tracing within the cases provides additional verification and falsification of the postulated relationships by

specifying their process. Furthermore, the choice of process tracing also contributes to describe in more nuances the relationship between the independent and dependent variable. As such, while an expected causal relationship can be established by a most similar case design, the complexity of causal interactions within this relationship are explored and thereby provide additional knowledge to the relationships contingencies by the application of process tracing.

4.4 Use of historical sources in the social sciences

The dominating principle of academic empirical investigations is the collection of new primary empirical material for each specific investigation. While this is a general principle to hold on to a topic can simply be too large to study exclusively through primary sources collected by the researcher him or herself. At the same time, it seems improbable that social scientists would be able to amass enough expertise within a given historical period to rival that of historians. On this basis, Skocpol argues that historical data can be sufficiently drawn from existing secondary sources as evidence in a research project, mainly because the expertise and time requirements associated with such collection would render most macro-historical social science impossible (Skocpol 1984, 382). Whether or not primary or secondary data sources are viable to collect for a given research project of course depends on the scope and size of a given project. However, reading a bit closer, we can extract how she perceives the use of historical sources in social science.

In his study of puritan communities and deviance, Kai Erikson notes that while collection of primary source material is part of the method through which the research question is answered, it is stressed that the study is "sociological rather than historical". By this is meant, according to Skocpol, that while historical work would emphasise how this primary source material may cast new light on the "historical facts" or the puritan community in New England. Instead, sociological attempts to "add something to our understanding of deviant behaviour in general" (Skocpol 1984, 364).

This is not to say that all social science does, or even should, strive to study the general. But at the minimum, it does imply that comparative historical work may be utilized to derive further theoretical questions which could then be studied (King, Keohane, and Verba 1994). The distinction between historical and sociological use of historical sources thus helps us further limit how the use of sources are relevant for historically oriented social science. This puts into focus social scientists

selecting particular sources or bits of data, which may illuminate particular parts of a more structured explanation of the studied events. This enables a more pragmatic approach to the question where primary source material can aid the researcher illuminate key periods when available and allow utilization of secondary material in others.

4.5 Empirical sources

In the analyses of this thesis a combination of secondary and primary data sources are utilized to support the analytical claims. The primary sources are empirical material drawn from the national archives in France and the United Kingdom. The general approach to primary data collection in archives is sometimes limited by availability and access. Some of these limitations can be mitigated with planning and freedom of information requests in the United Kingdom (or so-called "Demande Derogation" in the French national archive system). Although in practice, access can never be guaranteed. In such cases, these limitations have to be worked around, for instance, by getting to information about meeting conclusions through other actors involved in a policy question.

The first step for collection of data is to have an idea (at least roughly) of what archive material will be relevant to the research question. In the case of this thesis that was provided primarily by secondary works within different disciplines of economics, history and social sciences that spoke to the research question on experts and energy policy. In practice, this meant checking footnotes, looking up on mentioned actors, noting down events or particular commissions they were part of – well-known techniques in the study of historical material (Brundage 2013, 115). Beyond these techniques, the actual collection and following of empirical traces requires a certain level of pragmatism because of the other limitations mentioned above. The online catalogue of the national archives in both country cases were helpful in allowing the more detailed examination of empirical traces across events and actors, because they allow searching based on tags that give a quicker overview of the content of different archive collections than would otherwise have been possible (Brundage 2013, 37).

In the methodological terms of the social sciences, the practice of mapping the development of ideas through following of ideational traces in archive material might be termed somewhat differently. In social sciences, we would probably refer to these techniques a form of non-probability sampling (Corbetta 2003, 221). Here, it is known in advance that the empirical material

collected will not be able to represent the variation of a broader population. However, as we saw in the discussion above, the process tracing observations are of a qualitatively different type to the comparable units of quantitative approaches and thus additional caveat apply to this similarity. Furthermore, we would require mentioning that while the technique of this thesis in dealing with historical material is similar to a variant known as snowball sampling, it does not share the same ultimate goal of necessarily representing a population of empirical variation. That being said, non-probabilistic snowball sampling is similar to the *working method* applied in following a trail of policy ideas in the archive material of different expert groups in the bureaucratic structures examined in this thesis. Here, the identification of relevant empirical material follows from referrals in the existing material examined within chosen time periods (Corbetta 2003, 222)[28].

As is the case for all qualitative research, the risk of ascribing too great importance to those individuals or empirical material that is available is a relevant concern. However, these problems can be mitigated by the analyses being sensitive to the views of other groups or alternative views presented in secondary sources, which can be incorporated into the interpretation of the findings in analyses. This mirrors traditional methods of source comparison of the historical discipline where "listening to different voices" is an integral part of the interpretation of historical events (Howell and Prevenier 2001, 69). It is in this sense I utilize a working method similar to snowballing in relation to gathering empirical primary material in the archives below.

The various empirical material collected and utilized have been selected in accordance with the above logic across a time-span from before the crisis in the early 1970s to the late 1970s[29]. Knowledge of the existing countries' institutional specifics in energy policy may also help this collection of data just described. For instance, specificities of course exist as to which departments were key actors due to structural differences in policy making procedures. In this sense, pragmatism does not mean unstructured – at least it should rather move the analyses in the direction of the more systematized examination of events and historical material. At the same time, it is necessary to emphasise the contingency that often can characterize more verstehen-oriented work in political sciences and therefore some level of flexibility must be maintained.

[28] Corbetta uses the example of hidden or hard to access groups of individuals, but the general logic of the data collection is similar.
[29] While some material from the late and early 1970s may have been collected and helped to inform of the general period it has not been applied in the analyses directly as empirical sources because it risks overlapping with the effects of the Iranian Revolution in 1979 and the second oil crisis that it helped spawn (Alm and Weiner 1984, 3; Venn 2002, 21–29).

In practice, this means that while a structured approach can be approximated (e.g. through a priori expectations, knowledge of some sources, relevant actors or institutional patterns from before the empirical data collection begins), it would be to betray the scientific curiosity to not follow up on hunches or snowballing from one source to another, if the examination of a particular idea or demands it. This should not be seen as betraying an otherwise structured examination, but as a balancing act between structured empirical scientific enquiry and story-telling.

4.5.1 Sources of empirical material in the two cases

The analysis of the crisis understandings of the two countries under examination rely on a combination of primary and secondary sources. Both types of sources will have been either obtained in digital form or digitized subsequently to the collection of sources for purposes of easing storage and systematization for analysis. Those sources that could be obtained from the archive in digitized form are have been referenced in the literature list of references (primarily cabinet meeting minutes in the United Kingdom). Other sources, which required note-taking, photographic or other manual recording in the research process, have been referenced in the list of archive material.

Several types of documents were collected from the archives and used in the analyses. They comprise in particular; internal meeting minutes, personal letters, reports (published and some unpublished), economic estimates and strategy papers. Here the focus was on the internal bureaucratic communication between ministries about the policies or problems associated with crisis and energy in the examined period. A more classically qualitative approach had to be applied for data selection for the simple reason of feasibility. Where it is possible to collect and analyse meeting documents for a specific group of people over the period it would be impossible within the timeframe of this project to examine the entire corpus of documents for even the select subset of ministries that were crucial in energy policy responses to the oil crisis.

For that reason, a combination of techniques were applied to reduce the amount of archive material to include and search through. While the archive documents themselves are not always digitized, the databases of their number, year, origin and even brief description of content is quite often available. In practice, the examined archive material for the two case countries amount to around

2000 pages of documents per country[30]. This in no way constitutes the entirety of the paper-trail constructed by the experts surrounding energy policy in the two countries. That being said, the collection method allowed snowballing (see below) from different departments and references of actors and groups across the government apparatus. A large part of these documents were possible to photograph and later extensively study in digital form on a computer. Moreover, while not the key to the analysis per se, the existence of OCR software made it possible for the computer to read text in the digitized archive material. This made double-checking of references, recurrent actors and key concepts possible across these many digitized documents. Further, this means that the views expressed by the different expert actors in the analyses can to the furthest degree possible for such work, corroborate the positions and points-of-view of the relevant involved actors. This means that selecting a broad range of internal communication in the entire period is possible as well as a general idea of when production of documents is higher or lower throughout the period. Beyond these practical techniques it is of course crucial that what is then selected for examination allows to examine the research questions and hypotheses to a degree where they can be answered. In other words, a more qualitative way of selecting the important data was needed. In the United Kingdom, this came in the form of the newly instituted (in early 1970[31]) Central Policy Review Staff (CPRS). This relatively small group of people were centrally placed within Whitehall by reporting directly to the Prime Minister, but also by being a key actor, if not driving force at times, of policy formulation in the area of energy policy. For these two reasons in particular, they form a good starting point for examining the internal debates and energy policy discussions during the period. Their central role and placement combined with their relatively small size meant that they relied quite heavily on interaction and communication with other ministries and as such they act as a good proxy for the ongoing debates on policy formulation in the period. Quite often, the archives of the CPRS will even include the internal documents and meetings of other relevant departments such that several of the quoted treasury or ministry of energy documents later found in their respective ministry archives were actually duplicated in the CPRS files. As a result, much of the empirical material was collected following a kind of snowballing technique (as described above) that originated in empirical archive material from CPRS. This helped to focus the empirical material to questions of energy, but also to be attentive, from the beginning, to the ways in which communication and

[30] Including cover-pages this was more than 2300 pages for the French archives and 1600 pages for the United Kingdom(this excludes the officially published cabinet meeting minutes of the UK government from 1973-1979 CAB128-52 to CAB128-65 which were also examined, at around 200-300 pages per document folder).
[31] See (Ball and Seldon 1996, 89–91) for a description of the context of its inception.

negotiation happened between different groups in the expertise machinery of the United Kingdom. These references and inclusions of cc'ed letters, updates, policy briefs on ongoing discussions, allows the analysis a reasonable level of certainty that relevant actors surrounding policy making have been represented by the analysis. To the extent that some groups are less represented, it would represent that they were indeed less involved. In this regard, the perhaps most surprising in the initial data collection period was the stark difference between the almost constant involvement of the nuclear expertise of the CEA in France and the relatively less central position of the UKAEA in the United Kingdom.

In the case of France, all the documents in question were obtained through access to the physical collections of documents located primarily in the Government archive branch of the French national archives in Pierrefitte, Paris. The archives analysed was more limited in availability than was the case for the United Kingdom. For instance, despite making initial requests for cabinet meeting minutes in the summer of 2017, the requested material had not been released a full year later. A number of other potentially relevant documents relating to the internal communication among key actors in energy policy were also limited in access. This means that the examination of the policy ideas among experts in France had to rely more heavily on snowballing archive material and generally on secondary sources of information, like historical accounts by other researchers of the internal debates. Combined with a similar snow-balling technique to the one applied in the United Kingdom, it was possible to examine archive material relevant to the analysis, but it required additional substantiation with secondary sources in a way that was less necessary for the case of United Kingdom.

The primary empirical basis of the analysis of crisis understandings and policy formulation attempts is the two types of data mentioned above. However, as to understand the context in which this took place, of course other sources may be included to strengthen or triangulate the validity of claims. When this directly affects conclusions of the analysis this will mostly take the form of memoirs or biographies of ministers during the examined period in the two countries. Other sections than the analysis will of course rely on more broad historical accounts for context.

Chapter 5 Analysis of Bureaucratic Structure and policy ideas in the United Kingdom

The following analysis examines the institutional dimension of bureaucratic structure and policy ideas of experts within energy policy in the period surrounding the first oil crisis of 1973 in the United Kingdom. The analysis proceeds in two major steps.

The first section analyses the institutional context of energy policy in the United Kingdom. The institutional analytical aspects are drawn from the dimensions of bureaucratic structure defined in the theoretical framework: capacity of the state, negotiation style and basis of expertise. In the case of the United Kingdom, the finding is that the capacity of state is relatively weak within the policy area of energy and is characterised by a multiplicity of actors in policy environment where access to debates is not clearly defined and shifting - despite principally being the purview of the state. The negotiation style in the area of energy policy is fragmented and characterised by personal contacts between experts, which in combination with consensus-seeking dynamics and power symmetry between actors results in ideational conflicts often being extended indefinitely. This helps to maintain status quo policy outcomes. The generalist nature of the basis of expertise of many of the expert groups means that ideational gridlocks due to these institutional dynamics can not be broken with reference to technical or authoritative knowledge. Instead, even technical policy issues involving actors who do possess policy specific skills tend toward politicisation and policy ideas not dependent on technical knowledge, which however, are not able to break potential gridlocks from disagreement, without political intervention into debates.

The second section of the analysis examines the policy ideas of policy experts within the open bureaucratic structure of the United Kingdom. It does so using the analytical categories of overarching policy ideas, instrumental policy ideas and settings of ideas that experts express in energy policy within this institutional context. The layout of the analysis is separated into two sections of before and after the oil crisis in the autumn of 1973. As will be the case for the analysis of the French case, this temporal distinction makes no assumptions about empirical or theoretical content in these two sections. The primary purpose is to ease reading and given a rudimentary distinction perhaps make it easier to spot changes in policy ideas. The three aspects of policy ideas are analysed in relation to the bureaucratic structures examined in the first section of the analysis.

Both sections together thus examine the institutional context and the way policy ideas are fielded by experts within an open bureaucratic structure.

5.1 Bureaucratic Structure in United Kingdom.

5.1.1 Capacity of the state: Planning the UK economy.

The capacity of the state in the United Kingdom is in many was a consequence of a history of free-market inspired approaches affecting the way state and society interaction should be seen. The approach to interaction between the state, market and civil society in the United Kingdom is generally consistent with a consensual approach. With regard to the market, it draws mostly from Anglo-Saxon free market thinking (Hall 1986, 35–37; Polanyi 1957; Shonfield 1965). The capacity of the state is weaker the more actors are actively involved and thus it is useful to examine the way in which the state interacted with the market.

Government intervention was not as broad as other countries, instead favouring a few select industries (aircraft, aerospace, nuclear). Remaining sums of government went to bail out ailing industries rather than more specific government action to reorganize industries along a planned strategy. Although there were examples of attempts to mirror the role of the type of strategic investment planning done in other countries, (e.g. the French Planning Commission) the U.K. equivalent never received the institutional power to become more than a consultation arena for different branches of state and market actors – foregoing the sanctions allowed to its equivalents in other European countries (Hall 1986, 55). Before the first oil crisis a few attempts are worth highlighting to illustrate this point. These trends crossed political lines.

For instance, the National Economic Development Council in 1962 by the Conservative government, or the Department of Economic Affairs in under the Labour government in the early 1970s. Both relied on some form of *consensualism* and failed to institute either sanctions or investment strategies due to a number of contextual factors, which mostly relate to a multitude of actors involved in decision-making and a Treasury reluctant on public spending (Hall 1986, 55). Another attempt was the creation of the Industrial Reorganization Corporation (IRC) with the purpose of reorganizing the economy to achieve economic growth, but its purpose was rather broadly defined and the mandate not particularly explicit, so while it did achieve some success in

facilitating mergers between industrial companies it primarily ended up functioning as a loan-giver to ailing industries.

Crucially, to an evaluation of state capacity to intervene, there was relatively little attempt to analyse the different sectors that might be the most economically optimal target of investment or reorganization. Moreover, the analyses that were created were so broad as to make comparison of sectoral performance impossible, thus rendering decisions-making to be made in a vacuum(Young and Lowe 1974, chap. 8). In fact, there was an active attempt to avoid the production of more expertise or knowledge within the area, which could have increased the potential for a stronger state capacity path to be chosen. Interestingly, this was seemingly an active choice by the IRC where emphasis was given to action rather than more calculated and strategic intervention in the economy: "We don't feel the need for economists…and we don't believe in great volumes of analysis. It is not a question of analysing a problem – there are plenty of Little Neddies[32] and twenty-five reports of everything – what is needed is action" ((R. Brooke, Deputy Managing Director of the IRC, quoted in (Young and Lowe 1974, 87))[33].These patterns lead to a characteristic of state capacity in the United Kingdom as relatively weak. Again, relating to our conceptual discussion in the theoretical chapter, this does not mean that state did not have power, strictu sensu, but rather that state institutionalized the relationship between itself and other spheres of society according to a general belief in consensus among different actor. This also meant that the policy tended to reinforce the relative strength of the private sector vis-à-vis the government leading in broad terms to a type of shared authority over the strategic policies that could be enacted (Hall 1986, 56).

It is always a challenge to positively show the absence of capacity in a case, if this parameter is not quantifiable or readily identifiable. However, the identification of other elements that exclusively exist instead of the strong capacity of the state can indicate this absence of a capacity. This is what is at play in the UK case. That being said, initially the French case shows clearer signs of shifting towards a less hierarchical command and control logic compared to earlier periods (see the analysis of the French case), the period around the early 1970s in the United Kingdom is not characterised by a similar shift. Rather, the preceding period under both Conservative and Labour governments in

[32] "Neddy" is British vernacular for a horse or donkey, in this context implying something akin to a person being silly. https://www.collinsdictionary.com/dictionary/english/neddy

[33] Young & Lowe, 1974 speculate that this mind-set was related to the IRC having been created in a context of rising political concerns over balance of payment problems (Young and Lowe 1974, 87). Nevertheless, the result was that no attempts were made to directly link the work of the IRC to a strategic longer-term plan for the economy.

the 60s before the crisis had served as the shift towards more strong state capabilities of *dirigiste*-type intervention by the state into the market and industry relations through instruments like investment allowances for industry. The crisis reverted this pattern back to state intervention primarily revolving around bailouts and other forms of economic aid to ailing sectors of the British economy. Moreover, this was a pattern consistent for both the Conservative Heath government (70-74) and the later Labour government under Harold Wilson (74-79). Especially the automobile sector received almost all of the regional aid in the period. Thus, the allocated funds to regional development went as financial subsidies to the ailing British Leyland, Rolls Royce and others.

A point could be made that these attempts at interventionist policies examples of strong capacity of the state rather than weak. However, it is relevant to note the almost complete lack of strategic effort to reorganise these sectors from the hand of the state and the management or structure of the companies that were being helped did not shift fundamentally after receiving help (Young and Lowe 1974, 79). While some of these attempts could be classified as corporatist in nature and thus as an attempt at some form of state control (Winkler 1976, 115), their practical implementation lack the control measures necessary for strategic steering of the economy that involves. At best we may term this a form of quasi-corporatism within the context of a general preference for cooperation (Hall 1986, 53) . The weak capacity of the state is corroborated by examples of mergers facilitated by the IRC, above. After the merger itself, little was done by the state to actively steer British Leyland or Rolls-Royce towards profitability or competiveness. This meant that these schemes effectively became a backstop for complete economic collapse of parts of private British industry, rather than an active attempt to direct and steer what types of goals and industrial sectors should be fostered in Britain.

This pattern of private autonomy holds to a broad number of interventions into the economy in the 1960s and 1970s (Young and Lowe 1974, 205). The resulting structure between the state and civil actors thus became one of *consensualism* that emphasised forums for bargaining between the different parties of the economy – namely industry and labour – rather than overt state steering through strategic investments or control. This means that while these interventions can be understood as state capacity, the fact they were applied in a way that limited the actual reorganizing capacity of the state on private actors, implies that the actual state steering that evolved from this was relatively limited in terms of defining the relevant sectors, actors and purposes thereof. This description is consistent with classic descriptions of the governance pattern of the economy in

Britain that emphasise a preference for laissez-faire approaches to the market and its actors (Polanyi 1957; Shonfield 1965) despite temporary corporatist inclinations.

5.1.1.1 Governance of the energy sector

As we gleaned in the introduction, the United Kingdom is rather well endowed with natural resources in energy, albeit at different stages of extractability at the time of the oil crisis. The dominant energy source continues to be coal through much of the post-war years. In addition to a large (and politically powerful) industry around domestic coal extraction and production, the United Kingdom has the potential to extract oil and gas from deposits in the North Sea which in theory makes the country less reliant on importing oil in the longer term. At the time before the oil crisis, the United Kingdom was however still highly reliant on importing oil to supply those parts of society that could not easily be substituted to other sources of energy that were more readily available (as we have seen). The history of the United Kingdom as a colonial power with historic ties to the Middle East may hold some relevance in explaining their preference for relying on diplomacy to insure stable supplies of oil imports. On top of that, the international market for oil was dominated by a few large corporations one of which had clear ties to the United Kingdom. Through a combination of diplomatic influence with the Middle East (especially Iran) and in particular British Petroleum (BP), it was believed that oil supplies could be maintained (Heath 1998) until domestic extraction from the fields in the North Sea could begin.

5.1.1.2 A mixed energy policy

To the extent that it makes analytical sense to speak of an energy policy in the United Kingdom as a coherent policy-phenomenon (a point that is debatable[34]) we may consider it as consisting of several prongs. One relates to the reliance on imported oil. The supply is insured internationally through influence with the British arm of large oil corporations as well as diplomatic ties to countries in the Middle East due to historical links between the United Kingdom and these areas. This strategy shifts over time as the oil crisis hits, both in recognition of some of the limitations of the aforementioned strategy, but also because domestic extraction of oil and gas becomes a viable option for a more stable supply of oil – as well as a potential income to the state. The initial effect

[34] See (Kuiken 2014) for an brief examination of the different parts that make up energy policy in the United Kingdom.

of the crisis was to upset the internal balance of energy. The OPEC price increases resulted in crude-oil prices being transferred directly to the product market, which meant that substituting of oil to coal resulted in coal prices rising in tandem with heavy fuel oil prices used for electricity generation. The gas market was relatively unaffected however because of a combination of monopoly of gas from the North Sea and favourable supply contracts (Kohl 1982, 101).

Another prong is the role of the state in relation to the energy-sector related to coal extraction and electricity generation. The importance of the coal miners' strike throughout the 60s and 70s are well-researched, if sometimes misunderstood (Hay 1996). The capacity of the state in this area of energy policy is likewise characterised as weak, because it has not restructured the relationship between actors in the economy. Instead, it has relied on existing systems of consensus that minimally interfere with existing systems of negotiation in the economy, like principles for triparty conciliation between unions representing the labour force and business groups representing industry and capital (Hall 1986, 44pp).

The final prong of the structure of energy policy in the United Kingdom is the nuclear energy. It is controlled by a multitude of actors with varying degrees of public control, but mainly it is controlled through cooperation between the United Kingdom Atomic Energy Authority and the Department of Energy. In principle, this is the area where capacity of the state should be greater because of more control over the involved actors. However, the number of actors involved in the nuclear policy creation leaves us with an image of a chaotic system of interests making up the nuclear policy.

5.1.1.3 Consensualism and protectionism

We are left with an impression of the capacity of the state in United Kingdom is characterised by consensualism and a general preference for laissez-faire of the economic sector. The capacity of the state is therefore weak in the sense of relatively limited occurrence of intervention, in the form of control and steering, into the economy and society at large. To the extent that state capacity is manifested, it often takes the form of different schemes to reorganize failing industries rather than actively seeking to create new industries. Moreover, the degree of reorganization actually results is sometimes difficult to ascertain and thus the intervention pattern is more so one of outright financial lending or bail-outs rather than direct control and reorganization of industry.

5.1.2 Negotiation Style: Fragmented and personal

The analytical dimension of negotiation style is an organisational dimension that attempts to capture the dynamic of interaction that is set by the institutional setup of the actors who are involved in policy formulation within energy policy in the United Kingdom. Because the institutional context of energy policy formulation revolves around a mixture of policy-advisory groups, Ministries and the Cabinet, the access to the debate is open to several diverse actors and prone to reformulative attempts. While the negotiation style is not completely open to the extent that anyone in the political system are heard, access to the energy policy formulation switches between actors on a case-by-case basis and thus, the number of actors remains high in the process as well as characterised by different actors with different functional positions in the political system.

This makes the entire negotiation style prone to asymmetric negotiations where both the competences and background of involved actors can vary wildly, but the hierarchy of power between these actors can become unclear – even within the cabinet influence over energy policy shifts around between ministries throughout the period examined. The interactions between the actors is also less regularised along certain recurring commissions or reports, for instance. That is not to say, that commissions regarding energy questions do not exist, but rather that they are not a regularised part of the institutional setup, but rather an ad-hoc act of political choice by government. The multitude of different actors, different non-specified functional roles and their eclectic level of influence on the process of policy formulation lends the negotiation style in the bureaucratic structure of the United Kingdom a certain level of ad-hoc and openly politicized character. In such an environment, coalition building between different actors in this system should be more frequent, but less stable than those formed in more closed and regularised systems of negotiation style that characterise more closed bureaucratic systems. It is to a closer examination of these structures we now turn.

5.1.2.1 Fragmentation and Politicisation

It is worth drawing some connections between these broader descriptions above and some more specific actors. Interaction in the Treasury, while reliant on coordination through the standard paper-trail of bureaucratic and ministerial work, it is perhaps even more so reliant on the use of

personal contacts among each other who know each other (Pearson 1981, 64)[35]. This pattern of coordination relying on personal contacts to ensure quality of outcomes exists outside the treasury as well. The Central Policy Review Staff (CPRS) was an advisory organization under the Prime Minister which was created a few years before the oil crisis, with the purpose of advising the government on various policy issues - one of which was energy policy.

In describing their work, key members of CPRS staff write how the type of cooperation that existed with the CPRS and other branches of government was not at all uniform. In their interaction with different groups of government, former members of the CPRS note how the willingness to cooperate varied across party-political lines as well as organizational differences. This was particularly noticeable surrounding the shifting of Secretary of Energy from Erik Varley to Tony Benn under the labour government, but also in relation to information exchange with the CEGB (Blackstone and Plowden 1990, 75–77). The Central Energy Generating Board was more willing to lend assistance and information to the CPRS' work in the nascent years after the CPRS inception in 1971. As that cooperation waned, the CPRS increasingly relied on information from the Department of Trade and Industry to make their reports and policy recommendations (Blackstone and Plowden 1990, 76).

This indicates the information exchange and shifting of actors in an open negotiation style. As for the link between experts in the CPRS and the Department of Energy, it was likewise a mixed affair. Under the two successive Secretaries of State for Energy (SSE) right before and right after the oil crisis there was amicable cooperation. According to Tessa Blackstone of the CPRS they got along "equally well" (Blackstone and Plowden 1990, 78), despite the fact that the first (Lord Carrington) was a conservative and the S.S.E. under the newly elected government after the crisis (Eric Varley) was from the Labour party. However, when the Eric Varley and Tony Benn swapped Ministries in June 1975 this cooperation halted almost completely (Blackstone and Plowden 1990, 78). In the open negotiation style, patterns of interaction are less regularised because the access of multiple shifting actors to the process of policy makes alliances with fixed actors less necessary, because no particular actor is in permanent control. Politicisation of issues or interactions between actors is a variant of this characteristic of open negotiation styles in an open bureaucratic structure.

[35] This characteristic is so prevalent, that some scholars have used the name of "mafia" to describe the type of close-knit family like similarity in frame of mind and level of intimate coordination between them. See also (Pearson 1981, 64).

The Department of Energy was set up the spring of 1974 to attempt to coordinate a coherent response to the oil crisis (Pearson 1981, 23). By civil service standards, it was a relatively small department numbering around 1200 people. By comparison the Department of Industry numbers more than 10.000 people at the time (Civil Service Statistics archive n.d., 26–27)[36]. The purpose of the Departments was to observe to the national energy interests, as a whole, in order to ensure that energy policy became coherent and coordinated rather than piecemeal policies for each industrial sector applied over medium or short term (Pearson 1981, 53). This coordinative function cements the intention of including many actors into the policy-process because the Department was not given direct mandate to control the policy, rather it should coordinate the views of the different actors that were assumed involved.

This further re-emphasises that the risk of fragmentation is present due to the open nature of the negotiation style. Perhaps because the role was intended to be coordinative rather than controlling, the department's role in terms of formal capacities and resources was somewhat limited. As for reduced formal capacities, this was especially the case with regard to the nuclear policy. The department was wholly reliant on the Atomic Energy Authority (AEA) for guidance (even to the extent that budgeting was done by the AEA itself, rather than the Department of Energy that, in principle, oversaw them). As will be examined later, the Department of Energy was made up of a combination of employees that could be spared from other departments, which might suggest that those departments did not want to give up their best employees (Blackstone and Plowden 1990). Whatever the case, any new department will take a while to get going in splitting up the different functions and working efficiently. This is more so the case if the department is made up of people with backgrounds in different departments – and rarely have formal training in the policy issue the new department should deal with (this point is elaborated in section 1.3). This is perhaps why the department was criticized for being too reluctant to take on new policies (Pearson 1981, 52).

While openness in the process of policy-making has perhaps not generated the level of public debate that was intended, the instigation of procedures for sharing committee on energy meeting minutes with the public was a cardinal political view of Minister Tony Benn(Benn and Winstone 2005, 390). If nothing else, it indicates a willingness to open the policymaking to more actors

[36] Of the 693.921 civil service staff in 1975, the size of individual departments vary significantly. For instance, the Scottish Land Tribunal has only 7 civil servant employees whereas Ministry of Defence employs 266.470, or staying on the civil side, inland revenue at 73.470 (Civil Service Statistics archive n.d.).

beyond Whitehall and industry groups(Pearson 1981, 52). This leaves us with a negotiation style between experts within the U.K. bureaucratic structure as quite open and prone to intervention across departments and groups.

5.1.2.2 Personalized interaction

A characteristic worth emphasising about the negotiation style in the bureaucratic structure of the United Kingdom is also that it tends to emphasise personal relationships. This is significant because personal relationships are illustrative of a more open negotiation style. When negotiations rely on personal interactions, they reflect the assumed opportunity to change positions between different actors on an ad hoc basis. These examples are illustrative of the fact that the efficacy of cooperation between experts in the policy sector surrounding energy was characterised by fragmentation and a high level of personal connections, which cannot be reduced to merely party-political disagreements.

These observations are similar to structural characteristics of the type of negotiation and interaction described by Heclo and Wildavsky when describing the indispensable use of the “chat” as a more general tool of the everyday working of British Government (Heclo and Wildavsky 1974). This means that rather than regularised and formal interaction in committees or in meetings, the actual day-to-day coordination among experts takes place outside the traditional arenas of negotiation between smaller groups of individuals who rely on personal relationships (Pearson 1981, 64). While this lends the experts within the U.K., bureaucratic structure a certain level of flexibility in achieving goals, it provides less stability in its operation compared to the more closed and structured interaction of France (as we shall see later).

It is worth drawing attention to a key difference in the pollicisation this may cause compared to different bureaucratic structures. Every bureaucratic structure in connection with a political system of course is accountable to and has a share of political influence exerted upon its working (at least it should, in democratic systems of government), but it does not have to be the same. In comparison to, e.g. France, the U.K. the negotiation style of experts in the policy field of energy is not only more fragmented and more personal in nature, but also organized around much more directly politicized organizations. The expertise that weighed in on energy policy within the publically controlled expertise system (as defined in the theoretical section) was primarily from the

Department of Energy or Treasury (which is part of Whitehall) or from the CPRS (which was part of the Prime Minister staff)(Pearson 1981, 20). That is not to say that there cannot be political influence in France. These categories are ideal-typical, and of course, an organization like the CEA, in France, was reporting directly to the President. However, a significant analytical difference is the difference between autonomy within a politically defined mandate (the CEA) and the characteristic of the U.K. where public experts in energy policy operated in, and relied on for information, a network of actors in a more actively politicized environment than that of the EDF and the CEA did in France.

5.1.2.3 Open, fragmented and personal

The negotiation style of the bureaucratic structure in the United Kingdom is characterised by fragmentation due to the many actors that are often involved across different departments. Perhaps due to the coordinative role ascribed to the Department of Energy, this effect of including more actors in policy negotiations is increased[37]. The interaction of different groups of experts in the bureaucratic structure of the United Kingdom seems to mirror the reliance on the "chat" observed by other scholars. We observe similar trends in the reliance of the Department of Energy on different agencies for their functioning and the CPRS mentions the reliance on personal ties in departmental interaction. This leaves an impression of the negotiation style of the bureaucratic structure in the United Kingdom as open, fragmented and reliant on personal interaction to function. The open nature of the negotiation style may also lead to more politicized formulation of policy advice rather than technical. The effect on policy ideas is expected to be ideational instability and more fundamental shifts in policy as opposed to more gradual or incremental changes over time.

5.1.3 Basis of expertise : Highly educated generalists

The basis of expertise in the bureaucratic structure aims to relate those actors that are involved and allowed access to negotiations on policy formulation to the skills and competences that are brought to these interactions by experts.

[37] This effect is further increased, as openness of government becomes a key point for the department under Tony Benn in 1975 onwards (Pearson 1981, 50).

5.1.3.1 Highly educated, classically trained

The expertise among the public experts in the government of the United Kingdom are historically educated at higher degrees like the universities of Oxford or Cambridge – colloquially referred to as "Oxbridge". While the Fulton Report of 1968 attempted to change this pattern, its effect was somewhat slow to trickle down into actual practice(Pearson 1981, 71). Thus the civil servant employment patterns were bound by educational requirements that restricted access to administrative and executive roles in the public administration of the United Kingdom (Peters and Peters 2002, 116). The makes it difficult to argue anything other than that the educational level of the experts in or surrounding the government at the time of the oil crisis is a class of highly educated experts. Some studies suggest that up to around two thirds of civil servants in the United Kingdom have an educational background from the "Oxbridge" pair of elite universities – even if this hiring pattern of choosing only candidates from the universities of Oxford or Cambridge is declining from the 1980s onward (Drewry and Butcher 1991)[38].

5.1.3.2 Lack of technical expertise among experts

The majority of experts in public roles were drawn from elite universities, in particular Oxbridge, as we saw above. Another relevant question is which type of education these highly educated civil servants received. Here a significant pattern of "classic"-schooling appears. In the relevant period around 1970-74, during which the oil crisis hit, the distribution of major educational types were that 52 % of the college majors of civil servants had a background in the humanities. Another reasonably large group, around 26%, had a background in natural sciences and only 3% in law (Peters and Peters 2002, 118). Perhaps even more surprisingly, the entire civil service of the United Kingdom employed only 19 people with a background in economics in 1963. While this number shifted to 106 trained economists in 1967, the general pattern was still consistent with this generalist-characteristic of the United Kingdom civil service (Committee on the Civil Service, Fulton, and Fulton 1968, 17). This illustrates a pattern of emphasis within the U.K. civil service on general education as opposed to the attainment of more technical skills emphasised elsewhere. This typifies the generalist school of public bureaucracy where general intellectual ability and post-

[38] The elitist nature of the education system in in relation to the civil service in the United Kingdom has even penetrated into mass-culture references. In the TV-show "Yes, Prime Minister", the senior civil servant "Sir Humphrey" in describing the need to reduce power of the masses, mentions the need to protect higher education: "The universities, both of them". Similarly, the different civil servants often wear ties corresponding to the colleges of the Oxbridge university they were trained at. (If the right people don't have power - Yes, Prime Minister - BBC 2010).

secondary education is the primary criteria for eligibility when selecting among candidates for the civil service.

The system is essentially a remnant of the Northcote-Trevelyan report of 1854, which set out the basic tenets of the civil service in the United Kingdom. The report distinguished intellectual from routine work – and the selection of civil servants on that basis (Northcote and Trevelyan 1954, 10–11). The access to senior civil service of government is thus directly linked with education (Committee on the Civil Service, Fulton, and Fulton 1968, 64–65). Since then attempts have been made to break this pattern. Most proximate to the oil crisis was probably the Fulton Report, which argued for a change of the elitist hiring in the civil service (and Whitehall more broadly)(Committee on the Civil Service, Fulton, and Fulton 1968). However, despite these attempts the tradition of hiring classically educated employees from the universities has persisted in that arts and humanities make up more than half in higher civil service in the United Kingdom all the way up to the late 1980s, sometimes referred to as a system of "talented amateurs" (Peters and Peters 2002, 93).

That is not to say, that the primary hiring patterns of the United Kingdom prevents specialized knowledge to permeate parts of the experts surrounding government. Part of the philosophy behind seeking the generalized, but highly educated, background in candidates is exactly that they would be able to adapt to the constant flow of information and shifting political climate. However, this does mean that significant parts of the expertise in the administration of government in the United Kingdom relies heavily on in-the-job training. This is not necessarily a problem per se, but it does leave recruits with a disadvantage in dealing with technical or economic questions at the outset of their careers (Peters and Peters 2002, 93).

An analytical implication of this characteristic of the educational background is that special or disciplinary knowledge does not dominate debates between experts in a given policy field. When a policy field is characterised by technical questions, the validity of claims based on technical grounds need to be first accepted by the actors involved. This does not mean that it is impossible in an open bureaucratic structure to have policy discussions based primarily on technical arguments, but rather that the validity of this type of arguing has to be accepted by those involved on a case-by-case basis. The implication is that closed bureaucratic systems where technical knowledge and

functional specialization characterises the basis of expertise will be less prone to politicization of policy areas than open ones.

5.1.3.3 Basis of expertise in specific organizations

Having noted the generalist nature of the basis of expertise in the open bureaucratic system of the United Kingdom, we now turn to specific organizations – or groups of experts surrounding government and policy-making. The specific organizations described are relevant to the analysis of the energy policy before and after the oil crisis because they in particular represent key actors in spreading policy ideas for the energy policy in the United Kingdom at the time. That is not to say that other organizations have no relevance, and they will be mentioned in the analysis, but that these chosen organizations represent an empirically variation in positions across the period, which helps illustrate the usefulness of the theoretical framework for showing the connection between policy ideas and institutional structures.

Department of Energy

As the seriousness of the oil crisis settles in with politicians, the creation of the Department of Energy in 1974 was an attempt to combine the disparate policy areas related to energy to better deal with ensuring energy supplies in the future (Heath 1998, 505) . While there had been different departments related to questions of energy after the war (e.g. Ministry of Power and the later Ministry of Fuel & Power) this was the first time an attempt was made to combine energy policy under one department (Kuiken 2014).

The lack of expertise and the relative youth of the department, along with the way in which it had been cobbled together with personnel that could be spared from other departments, meant that the D.E. was extremely reliant on other agencies. The fragmented nature of the background of the department employees in the beginning does not necessarily mean they were unable to function as a department. After all, some of the key civil servants that were moved to create the Department of Energy had a background from the Ministry of Fuel and Power. For example, Sir Jack Rampton joined the Department of Energy as Permanent Undersecretary of State and came from DTI with a background in Ministry of Technology, but ultimately his education background was as an Oxford alumni who began his career at the Treasury (Pearson 1981, 28). Thus, while expertise can be

gained through training in the job, it indicates that expertise at the top civil service level came from experience, not educational specialization. This re-emphasises the point that the bureaucratic structure of the U.K. is characterised by a lack of educational specialization among these experts along with the pattern of departments being created from personnel drawn from several diverse departments – even in the case of one of the most senior of positions in the Department of Energy.

Reliant on other agencies

That is not to say that the pattern of drawing employees from other departments was an unusual phenomenon. As mentioned above, it was one of the primary ways in which advancement took place in the U.K. system of civil service. Employment and training in-the-job is what allowed movement across different departments. This pattern probably also helped reinforce the need for general training that allowed the civil service to be ready to apply skills in a variety of different fields, rather than specialization in a narrower field. This pattern was the case also with agencies in policy fields that dealt with issues of high technical complexity. When the United Kingdom Atom Energy Agency (UKAEA/AEA) was formed in 1954, many civil servants were transferred from the Ministry of Supply to fill their ranks[39]. This helps explain part of the close connection between experts in the civil service and the external experts working at the AEA. Because of this existing administrative capacity at the AEA, additional resources were not added to the Atomic Energy Division of the Department of Energy. Thus, checking budgets and controlling policy essentially became the remit of the AEA itself (Pearson 1981, 42–43). The lack of specialized knowledge in the Department of Energy regarding nuclear energy is and the reliance on the AEA whom their, in principle, oversaw does give the impression of an external authority of expertise driving the decision-making of the department and its Minister . This pattern of reliance is not unique to the Department of Energy, even if their control is further limited by lacking proper budget controls of the AEA. Another example of this reliance is during the investigations by the Comptroller and Auditor General into the financial scale of the AEA's reactor programme. In their reply to the audit, The Department of Trade and Industry (DTI) espoused a view that they saw no reason to question the AEAs competences in reactor development or the quality of their forecasting techniques by which future economic benefits of reactors were based (and thus, indirectly, what costs could be

[39] That is not to say, that the AEA did not employ technical expertise at the time of their inception or later. Of course there were both engineering and physics graduates in this agency. The point is that the pattern of filling new agencies or ministries with personnel from other departments required a certain ability of civil servants to apply their knowledge across many different specializations.

justified in the here and now) (Williams 1980, 200). One scholar traced this view of the expertise of the AEA back to a doctrine espoused by Sir Friston How of the Atomic Energy Office in the Department of Energy in mid 1950s[40]. In a reply to the Select Committee of 1967, Minister for Technology at the time, Tony Benn, expresses a similar view to those just illustrated. One scholar summarized the view as essentially boiling down to: "…ministers, who knew nothing of nuclear technology, advised by civil servants, who also knew nothing of the technology, would appoint members of the Authority, who would infallibly get the technical and economic answers on nuclear energy right" (Burn 2014, 177–78).

The CPRS

The Central Policy Review Staff (CPRS) was formed under the Government of Edward Heath to support the Government and supply advice on policy issues. Organizationally, the CPRS sat alongside the Policy Review Group in reporting directly to the Prime Minister's office (Pearson 1981, 20). The policy areas that the CPRS supplied expertise to was relatively broad. Often the topics or issues dealt with were in some way tasked by the Government. Their role in energy policy was relevant at several points in time before and after the oil crisis hit in 1973 (Blackstone and Plowden 1990, chap. 5).

The specific educational background of CPRS does not at face value make them experts on energy policy, as not many employees had a background in energy. A couple of caveats apply, however. First, it is the case, that in the beginning of its existence, the CPRS was not highly staffed on people with specific experience from the energy industry. However, two successive directors of the CPRS had a background in the energy industry and under their leadership, especially Lord Rothschild, made these areas a focus for the CPRS. Moreover, the relative lack of expertise in Whitehall as a whole on matters of energy meant that while the CPRS were not wholesale technical experts on the topic they quickly managed to build expertise in the topic to a degree not otherwise found within government. This was probably aided by the fact that the newly formed Department of Energy consisted mostly of whatever personnel could be spared from other departments and was therefore

[40] The department relied primarily on the Authority for information, thus " you had to go to 'those who know' and they were 'almost all in the Authority'" (Burn 2014, 177).

relatively ill-staffed, perhaps paradoxically, with expertise in the field of energy. Thus, the CPRS quickly became an authority on the subject (Blackstone and Plowden 1990, 76).

5.1.4 Basis of Expertise in the United Kingdom

Table 3 Basis of Expertise in the United Kingdom

	Department of Energy	**CPRS**	**Treasury**
Academic origin of personnel	Oxbridge	Oxbridge	Oxbridge
Type of academic training	Classics, in the job training. External input from AEA	Classics, but some economic and natural sciences from senior staff and external network of experts	Classics, in the job training in economics.
Overall education basis	Classic	Mixed	Classic

5.1.4.1 Limited specialization and politicisation

The basis of expertise in the bureaucratic structure of the United Kingdom is less complex than in the French case. It is characterised by a similarly high level of educational background for senior civil servants and experts, but by less variation in the substantive education type. Most of the experts within the bureaucratic structure have a generalist background at one of the two major universities Oxford or Cambridge (Oxbridge). This pattern is reinforced in the career paths of civil servants who attain special expertise in the job, rather than during their education. This fosters an environment where experts jump from department to department, which again, reinforces the lack of highly specialized roles among experts. This pattern is evident in reliance on other agencies by the Department of Energy, or the reliance on external expertise by the CPRS – despite existence of some internal expertise. This supports the other structures of open negotiation style and weak capacity of the state. One effect of this, is that while it is of course possible to have technically complicated policy discussions within such a system, it is not the norm, and when it happens, either the specialized expertise completely dominates the policy area or there is a more open conflict

about the political nature of such policies. Thus, ad-hoc decisions and the risk of politicisation is ever-present in a bureaucratic system whose educational basis is not based on technical specialization and functional roles derived from it.

5.2 Bureaucratic structure in the United Kingdom

A few key comments can be made with regards to the open bureaucratic structure that the United Kingdom mostly resembles. The capacity of the state to intervene and steer the direction of the economy or control actors is generally weak even if there is some nuance to this after the labour government comes into power after 1974. While the public does hold control over some aspects of the economy through public ownership or shares in private companies (e.g. BP), the willingness to utilize this influence to shape the relationship between state and other societal actors is low. The general trend of state intervention in the United Kingdom follows patterns of consensualism where agreement is sought through existing institutional arrangements rather than attempting to actively steer them.

The negotiation style in energy policy is characterised by a multitude of involved actors who operate in a level field. While some actors are regularly present in energy policy, the precise number and why is much more irregular in nature than elsewhere (e.g. France). Because negotiations are open in this way, this results in ad-hoc membership of commissions and interdepartmental meetings dealing with energy policy. The knock-on effect is consensus-seeking behaviour among the experts involved because their power symmetry results in veto points according to the number of actors in specific negotiations. In addition to this fragmented nature, the negotiations tend to rely on personal connections to make agreement between experts possible. The basis of expertise in the bureaucratic structure of the United Kingdom is characterised by high level of education of most of the experts involved in energy policy questions. Most senior staff is drawn from Oxbridge Universities, but with few exceptions are of a generalist bent rather than specialized in a particular field (even economics). Even with the exception of the Atomic Energy Agency (AEA), the general pattern is still that generalist backgrounds dominate the expertise in energy policy in the United Kingdom.

5.3 Dynamics of policy ideas among experts.

Before the crisis

The dynamics of policy ideas among experts in the United Kingdom is affected in various ways by the bureaucratic structure. Before we go in to the examination of the interaction of different policy ideas with dimensions of the open bureaucratic structure of the United Kingdom, we need to briefly situate this analysis in the energy policy developments surrounding the oil crisis. The energy policy is not dominated by one particular energy source becoming the key element of a national energy policy. Interestingly, this holds across the period, that is to say, the advent of the oil crisis does not allow one set of policy ideas associated with a particular energy policy to prevail over others. The energy policy of the United Kingdom as dealt with by experts is centred on three core sources of energy.

The first is the oil sector. Before and in the beginning of the crisis, the key concern is ensuring oil supplies. Initially this is primarily a diplomatic issue, which is sought dealt with through international bilateral connections with oil exporting states (especially Iran). These diplomatic relations are seemingly selected on the basis of personal connections between Edward Heath and the Shah of Iran as well as historical legacy linking the two (Venn 2002, 83). After the labour government comes to power, focus of oil policy shifts towards the future extraction of oil from the North Sea. Here the question lies in maintaining national control over oil extraction and ensuring public interest. BNOC is set up in part to make up for the limitations of previous licensing deals that significantly limited state capacity to directly ensure oil supplies.

The second is the coal sector. The United Kingdom has a large domestic sector of coal mining companies that extract and supply electricity generating coal power plants. Historically, this sector has been important, as part of the industrialization of the United Kingdom and with that has come political power of the unions that organize the workers in this sector. The context of coal miners' strikes before and after the oil crisis throughout the 1970s cannot be ignored when examining the energy policy ideas of experts in the United Kingdom. What is perhaps interesting, as we shall see in the analysis of policy idea dynamics, is that the importance of industrial action and the coal sector is more important during cabinet meetings than when comparing with internal documents

from groups of experts (although more important for those experts directly connected with ministries).

The third is the nuclear sector. The state capacity in the nuclear sector in the United Kingdom is principally run through the R&D arm of the United Kingdom Atomic Energy Authority (AEA). However, not being directly linked to the political machinery (unlike the CEA in France, for instance) the specificities of policy are only indirectly affected by the AEA through influence on the Energy Department, CPRS or other ministries. While technical expertise exists in the form of the AEA, their role is conditioned by existing in a context of other expert actors who hold as much authority as them, despite not being technical experts. Ultimately, the political decision for a nuclear energy policy lies in the political system. Like in the French case, the question of nuclear policy revolves to a large extent around the instrumental ideas related to choice of reactor technology. The expert groups surrounding government were consistent with the cabinet meeting opinion that options should be kept open, thus no firm decision was made. The UK had an existing technology in the gas-powered MAGNOX reactor from which the subsequent AGR was developed. Allowing for multiple different sub-types of the AGR to be developed had in combination with unforeseen problems spiralled cost and extended deadlines for construction of the four AGRs ordered (Burn 2014, chap. 9). At the same time, several prototype reactor types were constructed an operated since the 1960s. The "Dragon" High Temperature Reactor (HTR), the "Winfrith" Steam Generating Heavy Reactor (SGHR) and a prototype of a Fast Breeder Reactor (FBR). Briefly, this resulted in the order of SHWGR in 1974, but in 1978 the AGR returned (Williams 1980, 241). A combination of factors lead to this back and forth.

The bureaucratic structure of the U.K. in being more open allow many different actors to affect the outcomes of policy. Combined with an attempt to seek consensus on issues, the question of reactor choice was for a long time bogged down in "keeping options open" and not restricting the UK nuclear programme to a single technology. Worth noting, is that the AEA itself followed this approach in allowing various AGR designs to be built at the same time. This meant that risk of failure in terms of cost increases or delays was increased. Also of note is the role of particular ministers. The treasury view throughout the period was that cost should be curtailed. In order to keep research and development ongoing while waiting for problems to be ironed out with the AGR reactors already under construction, the Secretary for Energy decides to push for the development of a Steam Heavy Water Generating Reactor in 1974. This never amounts to more than a prototype-

reactor, however. The perceived failures of AGR and alternative technologies in LWR split the expert groups of Treasury and CPRS on one side and the Department of Energy (and AEA) on the other. After 1975, the active will against nuclear technology by Tony Benn as Secretary of State for Energy is partially to blame for the impasse in further developments, but he is to some extent at odds with views of much of his own staff. By 1978, the AEA and Department of Energy view that AGR can be salvaged prevails and the AGR is again chosen as the main reactor technology.

5.3.1 Capacity of the state

5.3.1.1 Overarching idea: Ensure energy supplies through market.

The overarching policy idea before the crisis with regard to energy policy is to *ensure energy supplies* and maintain *industrial stability* in production of domestic energy sources. There are two principal dimensions to this approach. Both approaches are consistent with allowing separate spheres of society maintain the institutional structure and attempts to affect the existing order of relationships between actors are relativity minor. In general, policy selection is affected by the weak state structure, but with different manifestations given the specifics of the energy area in question.

The first relates to ensuring supplies of oil. This is primarily understood through an international dimension that emphasises the use of influence with multinational oil companies, in particular British Petroleum, to ensure supplies of oil(The National Archives (TNA): CAB128/53 n.d., 193). As the oil crisis is about to hit in the autumn of 1973, the question of oil supplies has already been debated within the bureaucratic structures of the United Kingdom and its government (Blackstone and Plowden 1990, 76–77). Nonetheless is still comes as somewhat of a surprise to the Government that their influence with BP cannot be utilized to achieve special treatment in terms of higher quotas of oil supplies than other countries (Heath 1998, 503). This shifts the governments approach to attempt to achieve oil supplies through more diplomatic means. Specifically, Prime Minister Edward Heath raises the policy idea of the diplomatic solution in a cabinet meeting (The National Archives (TNA): CAB128/53 n.d., 75). The Prime Minister mentions his good relations with the Iranians and that the meeting in a ski resort in Switzerland the previous year had allowed an understanding to be reached that the United Kingdom would not be hit by sanctions imposed by OPEC, because the Iranian government would talk to the rest of OPEC on behalf of the United Kingdom to supply them with oil (The National Archives (TNA): CAB128/52 n.d., 3). Moreover,

the Prime Minister's personal relationship with Sultan al Nahyan of Abu Dhabi was very good the United Arab Emirates would continue to supply the United Kingdom with all the oil they needed (Heath 1998, 502). This point of ensuring oil supplies through diplomatic means rather than outright attempts to control speaks to the general laissez-faire attitude of the United Kingdom towards the economy.

That being said, the ability of any one country to reorganise the international market for oil is probably quite limited. It is however telling how little was done by the government after they realised BP was not going to help them and acted as a multinational corporation which delivered oil supplies to countries equally in accordance with sanction criteria. The mobilization of state capacity before the crisis takes the form of overarching idea of emphasising the circumvention of oil supply constraints through existing structures of diplomatic relations and industry-labour relations. Rather than attempt to control these circumstances, the overarching policy idea of energy supply maintenance becomes defined in terms of protecting the status quo of the international oil markets and their organisation around producer countries and multinational corporations. An alternative overarching policy idea could have been to seek to control multinationals through cooperation with other countries. That is not to say that state capacity is not mobilised, but it is mobilised in a way that does not actively shift the power balances of existing structures of the energy dependence of the United Kingdom. This lack of concern for the home market on behalf of a British-based private company surprised and "deeply shamed" the Prime Minister (Heath 1998, 503).

The second dimension of the overarching idea of ensuring energy supplies is through the domestic dimension of the energy question. Here the case for the United Kingdom manifesting as weak is perhaps even clearer, because the possibility for direct control over relations between actors is much greater in the domestic sphere than the potential influence on multinational oil corporations or oil producing states. While oil and gas extraction plans are underway in the early 1970s, the primary source of energy supplies available to United Kingdom at the time is coal and the associated industry. This was a key concern for government before the crisis (Ball and Seldon 1996, 176–83). Some years before the oil crisis the Heath Government had had issues with maintaining stable industrial relations that prevented conflicts. The general economic issue at the time related to balance of payments problems and one way the government attempted to deal with this was through different forms of reducing the growth of labour costs: e.g. reducing the wage-increases of workers. The coal mining industry in the United Kingdom is quite old and therefore has had ample time to

develop strong networks between trade unions and labour. The relatively well-organized labour force in the coal-mining industry acted in their own interests when attempting to limit these policies. This lead to strikes and supply issues as well as power cuts in several periods throughout the 1970s, but more relevant to the response to the oil crisis was that it had recently happened in 1970 – a few years before. This was probably significant for why the government saw this particular issue of *industrial conflict* important for policy[41]. The open nature of the bureaucratic structure meant that the government expresses a general trait of maintaining the structures of labour-capital relations as they are rather than changing them, which supports an overarching idea of providing stable energy sources from these structures. This is the case before the crisis, but also as it becomes clear that the coal sector will become important as potential offset for limited oil supplies in the immediate run-up to the crisis.

In the early 1970s, the weak capacity of the state manifested as attempts to *coordinate* and facilitate a compromise between the parties of the economy (labour and capital) rather than outright control of the situation. Despite the severity of the risk to the coal supplies of the United Kingdom and the increasing risk of greater reliance on this domestic energy source, should oil in different forms need to be supplanted, the government maintained the approach that *consensus* should be sought through existing modes of cooperation[42]. The fact that the government in the beginning allowed the process to be controlled by several actors external to itself, through a process of conflict resolution that was more in the hands of the parties of the economy than itself as well as the clear purpose of achieving consensus was perhaps a smart electoral move to avoid critics, but emphasises the characteristic of the state capacity of the United Kingdom as weak in a setting where it could principally have more control had it chosen to.

This is perhaps part of why the premiership of Edward Heath has been, somewhat unflatteringly, described as: *"(That) of a skipper of a yacht changing course dramatically when confronted by very hostile weather, than a conductor of an orchestra, who persisted with his score regardless of the disasters befalling his musicians and their instruments"* (Ball and Seldon 1996, 13). What such a

[41] This is also the impression given by (Heath 1998, chap. 18).
[42] A good example of this is in a preparatory statement (at the time not yet publicized) from the Prime Minister in January, 1974. The PM goes through the attempts to seek an agreement with NUM and the continued efforts to seek a compromise, but that the 3-day work week has to be instituted to limit consumption despite the economic hardships it may cause. Even understanding the economic implications, the Government still decides to work toward a solution within existing relations of power between actors in society. Instead describing the insistence on overtime bans by unions as "That is their decision, and they are perfectly entitled to take it" Letter from Prime Minister's office to Chris France, Roger Dawe, John Caines, William Armstrong and John Hunt. - *Secret and Personal.* 11. January 1974. (PREM 15/2174)

description underplays is the role of the existing institutional environment where decisions had to be made. The diplomatic dimension of the overarching idea of ensuring energy supplies is affected by the weak role of the state vis-à-vis international actors that make up the oil supply. Heath had possibilities and incentives to deal differently with the unions in the coal sector and the industrial conflict, but the consensus-approach (we will examine in detail below) was remarkably consistent with existing patterns of state-society relations and derived from a weak capacity of state.

There is obviously a difference in the practical possibility and scope of state action in relation to international oil supplies and other countries compared to domestic societal actors. In that sense, the international oil dimension to the overarching policy idea of ensuring energy supplies is an easier case to make for the influence of weak capacity of state[43]. That being said, it is still worth highlighting, that other options for ensuring supplies are not chosen, for instance in relation to British Petroleum which the government had a substantial stake in (Pearson 1981, 123)[44]. We are thus left with an overarching policy idea of ensuring energy supplies, which is defined by the government through existing institutional structures – international for the oil question – and domestic for the other energy sources, primarily coal and related industry. The general outline of this policy idea means that role of the state is rather limited in terms of affecting the relations and actors. We now turn to the more instrumental ideas that characterised these dimensions.

[43] This point would apply generally when distinguishing the potential applicable state capacity when comparing the national sovereign territory with the international system of states.
[44] At the time of the oil crisis, the Government of the United Kingdom held a 48% stake in BP, although this was reduced in 1977 (Pearson 1981, 123). See also (Sampson 1975).

5.3.1.2 Instrumental idea: Diplomacy and industrial relations

The instrumental policy ideas chosen for ensuring energy supplies reflected the weak capacity of the state in an open bureaucratic structure. The international diplomacy dimension is perhaps an obvious point, because most states have limited ability to direct affect the relationship of actors in the international system, barring the threat of war. The policy idea was affected by the indirect support for the existing system of multinational oil companies and oil producers, which the United Kingdom had thought it could benefit from through personal connections, special diplomatic arrangements and influence with the oil companies.

In practice, this instrumental idea meant that the United Kingdom would negate the supply constraints on oil that would result from the OPEC embargo. This was going to rely on both cooperation with British-based oil companies like BP and Shell whom the cabinet expected preferential treatment from vis-à-vis other countries in Western Europe. Initially this does not give great evidence for the significance of the effect of the bureaucratic structure of a weak state on policy ideas. However, when preferential treatment for UK is not forthcoming the Prime Minister is surprised, but still does not seek alternative solutions (Heath 1998, 503), which supports the significance of the weak capacity of the state in the presence of the instrumental idea. This aspect of the instrument of diplomatic solution is tenuous when it becomes clear BP and Shell intend to distribute the remaining oil supplies in accordance with the embargo to stay friends with the oil producer countries (Venn 2002, 121). This results in personal ties becoming key to the diplomatic instrumental solution when the Edward Heath suggests his personal connection to the Shah of Iran and conversations in an alpine resort in Switzerland on the basis of which the Prime Minister believes the United Kingdom will be able to ensure oil deliveries from the Iranian state oil company (The National Archives (TNA): CAB128/52 n.d., 3)[45].

The fact that the government did not plan beyond this work-around to oil shortages shows that they did not fully believe in the ability of the oil producers to maintain the export limitations on oil, because they would internally disagree among themselves and eventually the sanctions would lift. This view is reflected as an option among several expert groups. In a meeting with representatives of the U.S. Treasury, the Department of Trade and Industry arrived at the conclusion that the

[45] For a slightly more cautious, but consistent retelling of the potential for Iranian oil supplies, see (Heath 1998, 508).

sanctions would not hold, and that the United Kingdom and the United States should attempt to facilitate the breaking of cohesion in the block of OPEC members on the question of sanctions[46]. The CPRS raises a similar point when evaluating the risk of oil supplies and the economic situation in in an interdepartmental meeting between the CPRS, DTI and Treasury in December of 1971[47].

Another aspect of the instrumental policy ideas relating to the capacity of the state is the domestic dimension of the oil crisis. Here, the instrumental policy idea of industry cooperation to achieve stability in both labour-capital relations as well as productive output of the coal sector is seen as crucial. This is because part of immediate reaction to the oil crisis is an attempt to reduce the reliance on imported oil as much as possible. This requires stopping production of oil-fuelled electricity generating plants and increasing production in the coal industry to shift electricity production to coal-driven power plants[48].

Before the crisis, minutes from cabinet meetings mirror this concern for minimising industrial conflict through agreements between the parties of industry, even if the reference to energy concerns is not always explicit. One section on industrial affairs deals with the industrial conflicts over wages in electricity supply and coal industry without explicitly referencing the oil crisis and instead emphasises the possibility of solving this wage-conflict within the terms of the counter-inflationary policy stage 3 programme (The National Archives (TNA): CAB128/53 n.d., 191, 208). Over the period of the Heath government, the link between energy supplies and instrumental policy ideas to maintain the overarching policy idea of industrial stability becomes more explicit. As the embargo hits, more and more meetings the follow-up discussions to separate issues of industry conflict and energy stocks emphasise the direct link between decreasing oil energy supplies and the problem of industrial action - especially in the coal mining sectors as coal serves as a supplementary buffer for the balancing reduced oil imports into electricity production (The National Archives (TNA): CAB128/53 n.d., 209).

[46] *Confidential: Note for the Record – Talk with Secretary Simon* (Qh0869). 26th. July 1974 .- CAB184/165. (Central Policy Review Staff Files. Central Policy Review Staff Report 'Energy 1974 and After')
[47] *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[48] This is an explicit strategy suggested by the CPRS as early as 1971 and repeated again in 1973.
An Energy Policy For Britain – A report by the Central Policy Review Staff. May 1973 – CAB184/114 (Central Policy Review Staff Files) and *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

As the overtime work ban is approved by miners unions it becomes crucial for the government to ensure de-escalation of conflict between capital and labour forces in the electricity production sector(Heath 1998, chap. 18). A clear example of the explicit linking of the government of electricity supplies and industrial conflict is when the Electrical Power Engineers Association chose to strike. On the 14th of November 1973, the Prime Minister urges both secretary of state for employment and the Minister of Industry to urgently find a way to solve the potential problems in domestic energy supply within the parameters of the Pay code (The National Archives (TNA): CAB128/53 n.d., 180–81). This means that energy supply is directly linked with industry stability, in this case and that the solution should be found within the parameters of wage-increases allowed by the pay-code, but using the tools of cooperation with unions and industry to make this a reality. A day later, this was accompanied by attempts to limit reliance on foreign imports of oil by reducing both industrial and motor oil consumption by 10% is introduced on the basis of a meeting in Ministerial Committee on Economic Strategy and The Central Electricity Generating Boards had indicated a plan to reduce oil consumption by 10% for electricity production.

These combined policies attempted to reduce reliance on oil imports, but had the effect of making the United Kingdom increasingly reliant on the remaining sources of energy, increasing the importance of stabilising industrial relations in the coal sector. The coal supply industry was already at lower than regular production, as coal as a source of electricity, at the time, reduced output by around 20% as a result of an overtime ban by the union of miners. Combined with the risk of industrial action by the in the electrical supply industry electrical power engineers from earlier in the year, this ran the risk of actual out-right power cuts due to inability to supply electricity for the grid (The National Archives (TNA): CAB128/53 n.d., 182). In late November, the policy idea of industrial stability becomes even more important as it is realised that with current stocks of coal and continued supply problems uninterrupted electricity supply could no longer be guaranteed by February (The National Archives (TNA): CAB128/53 n.d., 208). This happens while there is a spreading of over-time bans across unions, which risk reducing the amount of workers available to alleviate the supply of coal.

Despite this intensification of the problem of energy supplies, the Prime Minister does not attempt a new policy idea but continues with utilizing existing institutional structures of ensuring industrial stability by urging the secretary of state for employment to emphasise to the Trade Union Congress (TUC) the impact on coal and electricity supplies that are being felt by continuing industry disputes

(The National Archives (TNA): CAB128/53 n.d., 215). The increasing severity of the oil supply issues and their knock-on effects on reliance on other energy sources makes the stability of domestic energy supply industry crucial, but the state is not willing to attempt to apply power to reorganise the interaction between actors in order to ensure it despite increasing severity of the problems. We see the indication that the weak capacity of the state supports the instrumental ideas of supporting non-state actors in achieving overarching ideas. However, this push the dynamics of solutions towards outside actors, which provides for more ideas tied to different actors but shifts the emphasis on different ideas according to which actors succeeds in supporting overarching ideas

The area of nuclear policy is also affected by this need to shift reliance onto other energy sources. In December 1971, CPRS lays out their view of future oil economics and supplies in Ministerial Committee Economic Policy. The view of future oil supplies is rather grim. The CPRS evaluates that the possibility of a wholesale replacement of oil with alternative fuels is not likely. Given potential increasing demand for oil, the prices are likely to increase, even if oil producing nations decide not to increase prices (which the CPRS also finds unlikely)(p. 1)[49]. The CPRS suggests a diversification of energy demands of United Kingdom away from oil towards natural gas and increasing focus on discovering and extracting domestic oil supplies – a crucial factor being that "we can keep it for ourselves. It will not help us if it goes into the pool"(p.2)[50]. Besides increasing oil and coal stocks as soon as possible, they recommend that expected run-down of coal in the U.K. is examined in detail, to better understand the probability of using coal stocks. Finally, they recommend the use of surplus heat from nuclear power generation in industry and a "maximum acceleration" of nuclear power to generate electricity (p. 3)[51].

One might think that state capacity would be strong in questions relating to nuclear energy where state controlled agencies like the Atomic Energy Authority had upheld control over the research and construction requirements for nuclear industry in the United Kingdom (Pearson 1981, 103–4). Of course, the control by state over nuclear energy tends to generally be greater than in other energy areas because of the enormous capital requirements, sensitivity of the research, and not least its

[49] *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[50] *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[51] *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

relation with national interest and military nuclear weapons development – and a wish from governments to limit the spread of nuclear weapons (Simpson 1983, 2, 60).

In this area, we might therefore expect the greatest difficulty in observing weak state capacity affecting instrumental policy ideas. Internal documents around the nuclear policy suggest a key concern was the organization of the industry. Meeting of Ministerial Committee on Economic Strategy on May 1, 1972. ES(72)20 suggestions to reorganise the nuclear industry. Structural weakness of the nuclear industry is related two elements. 1) AGR is considered faulty and uncompetitive with Light Water Reactors developed in other countries 2) until then the industry had consisted of two separate design and construction consortia, which the market for nuclear reactors is simply not big enough to support in the United Kingdom. What is interesting is that there seems to be a broad interest in simplifying the nuclear construction business from two consortia into one. While this would seemingly result in less competition (which was the argument used by the Central Electricity Generating Boards at earlier times for having 2 separate consortia) this is no longer supported. Instead they now agree with the AEA and Select Committee on Science and Technology that reorganisation into one consortium was necessary (p 4-5)[52]. One might think this would result in less competition, but the involved expert groups agree that the new consortium should look more like Westinghouse or GEC in the United States, which are full companies that have integrated R&D development, design, construction and assembly into one organisation (p. 4-5)[53]. On one hand, this focus on competitiveness in the heavily state-involved nuclear industry is indicative of a capacity of the state, the way the state is engaged in shifting the structure of industry within nuclear energy it is not fundamentally shifting the organization towards more control, rather they seem to prefer it becomes more similar to the private company structure of the American nuclear industry.

[52] *Draft DTI revision of GEN 100(72) – Reorganisation of the Nuclear Industry* (Qa391). 13. June. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[53] *Draft DTI revision of GEN 100(72) – Reorganisation of the Nuclear Industry* (Qa391). 13. June. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

5.3.1.3 Setting: Small interventions in foreign relations and industrial relations

The general setting of policy idea is that the instrumental ideas of diplomacy and industrial relations should be maintained which entails that the existing structures of industry cooperation are utilized to ensure energy supplies in the United Kingdom. The setting of each reflects the influence of weak state capacity in minimizing intervention which can be illustrated in three different areas of energy policy.

In the area of oil, the setting of the diplomatic policy idea is increased by the use of existing diplomatic ties or even personal contacts of ministers. The first relies on good relations with Iran to put pressure on OPEC for the United Kingdom to be exempt from embargo quotas on oil supplies. The latter attempts to utilize personal connections between Prime Minister Heath and the Shah of Abu Dhabi to ensure oil supplies to the United Kingdom. What these settings of policy ideas have in common is that they mobilize very little of the existing state capacity to ensure energy supplies. The first relies on already existing relations and the remit of implementing these policy goals are essentially a question for the Foreign Office. In the setting of policy ideas relating to personal connections between political leaders, the relevant state apparatus in play is even less clear, because it seems the actual policy idea relies on ad-hoc ties between individuals rather than any form of state capacity to organise or influence relations between actors.

On the domestic side, the setting of policy idea of least intervention had two major effects on the coal energy sector. Both are consistent with the state operating within existing structures of seeking cooperation with industry actors in the market to solve problems. One way that a minimum of intervention maintained energy supplies was by increasing coal productions and cancelling closing of coal pits. The increasing reliance on domestic energy sources meant that planned closures of coal pits were delayed to maintain production in the coal mining sector and ensure coal supplies to generate electricity in case supplies of heavy fuel oil were restricted or absent.

Another way the domestic energy source of coal was sought to be increased to off-set oil restrictions was by attempting to shift as much energy consumption toward domestically controllable energy sources. The setting above increased coal supplies by increasing the number of available pits for mining. Another way least intervention was sought in this sector was maintaining the existing number of work-hours of miners, which was sought through the traditional triparty

deliberations between capital and labour. A key concern for the government was to limit the use of over-time bans within unions in the mining industry (as we also saw above). If the miners unions agreed to widespread over-time bans this would result in reductions in the workhours of miners and thus the potential supply of coal in the sector. Despite understanding the severity of this problem (Heath calls it a crisis in his autobiography(Heath 1998, 350–52)) the capacity of the state is not mobilized in new ways compared to the existing system of cooperation through triparty bargaining despite the understood severity of the problem.

5.3.2 Negotiation style

In an open bureaucratic structure, there are more actors involved. The negotiation style is therefore characterised by multiple directions and ideas being in play. In such a system of relatively symmetrical power-relations, most actors hold similar influence over a policy issue and thus their ability for specific policy ideas to dominate. The general tendency becomes the generation of a conservative trend where the status quo is maintained and it is difficult for any one policy idea to dominate the agenda. In pluralist bureaucratic systems like those, the primary way that change is enacted is through strong political powers that may override or dominate the otherwise symmetric relations of power between experts. Change of policy ideas happens primarily in cases where political power supersedes the logic of the open bureaucratic structure.

5.3.2.1 Overarching idea: Coordination among multiple experts

The general pattern of the negotiation style in the United Kingdom before the crisis is that the different groups of experts in the bureaucratic structure coordinate across and between each other on multiple issues on a per-topic basis. The pattern by which a given issue is chosen for coordination is sometimes politically defined by cabinet asking for a view on a given issue, but often it can also follow from previous meetings where individual experts or groups ask for a given issue to be taken up at a later time.

The department of Energy did not exist before the oil crisis had hit, and thus in the period before, energy policy was a combination of interactions between various experts from different ministries and working groups. This was partly the case for most energy issues, but in particular, for questions relating to oil policy the institutional makeup was complex. First, historically what became the

Department for Energy had had an unstable development. It began as the ministry for power, which in 1969 was absorbed by the Department of Technology in 1969 and then by the Department of Technology and Industry (DTI) in 1970, until drawing personnel from the latter and becoming a separate Department of Energy in December 1973 after the oil crisis had hit in the autumn. This tumultuous history and resulting departmental instability goes some way towards understanding the lack of a coherent energy policy in the beginning (see also (Kuiken 2014)). The relatively small size of the department of around 1200 people, noted earlier, also indicates the reliance on other groups for their work. Second, most decisions on matters of oil policy had been taken by cabinet based on advice from a number of different ad-hoc working groups that consisted of actors from different expert groups drawn from the Treasury, Foreign and Commonwealth Office and Ministry of Power. Moreover, many of these groups relied explicitly on advice and technical data directly from domestically based multinational oil companies like British Petroleum and Shell (Kuiken 2014, 274).

The closest to an equivalent to what became the Department of Energy was the coordinative role of the Department of Trade and Industry (DTI). Their overarching policy idea was cooperation between industry and agencies related to nuclear issues. They suggested restructuring the institutional setup of nuclear policy so that decision-making was moved from the Atomic Energy Agency and more directly onto the demand side of the nuclear industry, which meant the electricity generating boards, in particular CEGB and the Government who they saw as ultimately accountable for the R&D spending costs that will continue to be necessary for the foreseeable future(p. 6).)[54]. Thus, energy policy was an amalgamation of unstable departmental structures and coordination between multiple ministries and working groups that relied on private companies for part of their technical expertise.

The CPRS had done work on estimating the effects of increases in future oil prices which they presented to ministers of the government in summer of 1973 according to former CPRS staff (Blackstone and Plowden 1990, 76). This report represents the general view of the CPRS that oil prices were going increase and have tremendous effects on the balance of payments for the United Kingdom – even under the least worrisome of the three price-scenarios they projected from[55]. This

[54] *Cabinet Ministerial Committee on Economic Policy – Oil Economics and Supplies*(EPC71). December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[55] *An Energy Policy For Britain – A report by the Central Policy Review Staff. May 1973* – CAB184/114 (Central Policy Review Staff Files).

report became the basis from which the CPRS drew their conviction of shifting U.K. energy supplies away from oil to the extent possible – until domestic supplies could be extracted from the North Sea. According to Tessa Blackstone, the CPRS was however quite alone with this idea and many other departments were in outright disbelief about the projected oil prices and simply refused to believe the validity of the more severe oil price scenarios sketched by the report (Blackstone and Plowden 1990, 77).

A coordinated policy response was needed according to the CPRS, which included focus on control of the future North Sea oil and increasing production and cancelling closure of coal pits to off-set reductions in imported oil due to higher prices. They also emphasised to get nuclear reactor developed as a means to supplant other energy sources. This entailed keeping existing AGR development alive and not necessarily start developing new technology alternatives - like the SGHWR[56]. The coordination attempted between different expert groups, and explicitly mentioned as a future goal by the CPRS. The fact that no coherent policy existed meant that policy was an amalgamation of suggestions and goals, which overlapped policy-areas, and competences of different departments. When disagreements existed, several policy developments might therefore be delayed or stopped. Thus no clear overarching policy idea was suggested by any of the experts involved

5.3.2.2 Instrumental idea: Consensus

This splitting of oil policy between different expert groups meant that consensus had to be sought for advice to reach cabinet. This also meant a certain level of symmetry of power between the involved expert groups as no one group had a claim to authoritative policy ideas that could dominate the policy advice.

Within oil policy, this can be seen before the oil crisis. In reference to an interdepartmental meeting in late 1971. The CPRS director notes a disagreement between the Department of Trade and Industry and the CPRS on how the oil policy should look. In the meeting, the DTI follows a general idea of seeking cooperation between the government and the multinational oil companies, in particular the domestically based ones like BP and Shell (Heath 1998; Kuiken 2014). This is

[56] Letter to the Prime Minister from Lord Rothschild – *Nuclear Reactors* (QA 0548). 28th June. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

consistent with the overarching diplomatic instrumental policy idea of capacity of the state seen above. The DTI believes that the official interests of the oil companies should be supported by the diplomatic resources of the United Kingdom in attempts to achieve better licensing deals. The instrumental policy idea of diplomacy is invoked in order to support the private interests of multinational oil companies in the belief that benefits to oil industry (especially those based in the United Kingdom) is advantageous to the energy supplies of the United Kingdom. CPRS believes supporting multinational oil companies is resources that could be spent better elsewhere rather than have the Foreign Office lobby for multinational companies. This is partially also, because the CPRS does not believe the international oil companies will necessarily do what is in the interest of the United Kingdom. When suggesting that this policy idea is left behind, the reply by DTI is, according to CPRS, that "BP would not like it".[57]

The CPRS instead followed an instrumental policy idea of *maximizing domestic energy sources*. This approach seems to much more focused on domestically controllable energy resources. While the CPRS are aware that full shift away from oil dependency in the economy is unfeasible, they generally believed that moving towards greater reliance on domestic sources of energy was preferable to relying on international diplomacy. To this end, the CPRS attempts to calculate the cost savings to the balance of payments if parts of oil consumption could be shifted to indigenous energy sources like coal. Their internal debates and calculations estimate that temporary subsidizing of the coal industry would allow an increase of 10 million tons of coal per year, which they estimate would save £38 million pounds over a 15 year period. This leads the author of the CPRS document Dr. Anthony Fish to conclude "The case for supporting coal is obvious"[58].

These differences in policy instrument ideas cannot be immediately solved because of the negotiation style in the bureaucratic structure of the United Kingdom does not allow for one group of experts to decide above others. In essence, this results in a group of actors who all have a veto on which policy ideas should be followed as the division between CPRS and DTI showed above. In such a context, the veto-power results in a decision-making stalemate, which must be broken in order for decisions to take place. Attempts by the CPRS to involve the Prime Minister in the debate

[57] *Confidential letter to the Prime Minister from Lord Rothschild* (Qa01401). 8th December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[58] Document to Wade Gery, Lord Rothschild, C.R. Rose and F.E.R. Butler from A. Fish *Oil versus Coal* (Qd0425). 8th December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

can be seen as an attempt to shift this stalemate by involving political decision-makers in the debates among experts. In a personal letter to the Prime Minister from the director of the CPRS, Lord Rothschild expresses the variation in policy ideas among experts during debates in the interdepartmental committee on oil. From these debates, it had become clear that CPRS was much less optimistic about the future oil prices than the rest of the experts involved (in particular the DTI). This difference of opinion mirrors the overarching idea mentioned in the section on capacity of state that oil supplies can be ensured diplomatically. CPRS disagrees with the DTI about this and somewhat mockingly notes: "(DTI) also believed we should treat the oil- producing countries as reasonable equals and not as brigands - having a nice cup of tea with them from time to time, if that is the right beverage"(p. 3)[59]. One might argue that this is simply to inform the Prime Minister of debates. However, it is also the case, that if experts can not agree on a common position, then political intervention is required to break the deadlock[60] (alternatively decisions can be extended by the expert groups, if they agree to do so – see nuclear below). Thus we see that the negotiation style of UK pits several instrumental ideas against each other but that the ideas prevailing a given by political intervention and (as indicated by the previous section) the political interpretation of the development and success of these ideas.

In the area of nuclear energy policy, some interesting observations can be made about the interaction pattern between different expert groups. The fact that energy policy is much more spread across several energy policies covering different energy sources in the U.K. only reinforces the tendencies of the negotiation style being characterised by multiple actors and ideas. In the area of nuclear policy, we might have expected a particular dynamic to be less prevalent in that there might be a greater potential for technical debates to dominate the agenda given the subject matter. But rather, the existing negotiation style pattern between the multiple involved experts leads to symmetric power relations characterising the debates. Increasing the seeming technical complexity of the policy area does not specifically seem to matter. As we shall see, this entails that consensus is sought between actors since no particular expert group is a priori able to dominate the interaction and the result becomes extending one of the two policy advice into the future, thus maintaining the status quo. This power symmetry between expert actors is despite the participation of the Atomic Energy Authority at many of these meetings (which as the UK equivalent of the CEA in France has

[59] *Confidential letter to the Prime Minister from Lord Rothschild* (Qa01401). 8th December. 1971 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[60] Tessa Blackstone notes, when describing the working of the CPRS, the importance of the position and regular contact with the Prime Minister's Office (Blackstone and Plowden 1990, 29).

the technical knowledge to potentially shift the negotiation style to a more technical form). During an interdisciplinary meeting between the DTI, CPRS, the Treasury and AEA the topics of the current and future structure of nuclear construction industry and choice of main reactor technology for nuclear power plants are debated. Among the different actors the attempts at consensus means that an attempt to seem agreeable to the concerns of other actors, while making your own arguments.

This point is perhaps clearest when Treasury and CPRS criticize the existing AGR reactor technology for not having lived up to the expectations that were promised about export potential of the technology and that there are still significant problems with the current AGR reactor designs current under construction in the U.K.. Treasury and CPRS seem to prefer the import-option for reactor design, but on the other hand are in favour of a previous concern raised by the DTI (and AEA internally) about the need to reform the nuclear construction industry. Especially the Treasury believe that restricting the current two big consortia of nuclear construction companies into one consortium that is more similar to an integrated corporation like Westinghouse or GEN in the United States would be a crucial first step before any decision is made about specific reactor types to develop further. CPRS has a less clear-cut opinion of particular reactor types, but generally agrees with the sentiment of the Treasury that no choice needs to be made right at this moment and thus are also in favour of the restructuring effort before decisive choices are made in nuclear reactor policy. In this way, the fundamental differences in instrumental policy ideas among the DTI and AEA on one hand and Treasury and CPRS on the other results in a stalemate of expert policy ideas. Either agreement is found by way of one of the groups giving concessions and thus leaving their instrumental policy idea, or focus is shifted towards the areas where agreement is possible.

The result is the latter. The DTI and AEA both concur that the export potential has not been fulfilled, but that this should not necessarily mean a complete abandonment of the AGR technology or to begin importing foreign reactor designs like the Westinghouse-designed Light Water Reactors from the United States. Moreover, it is possible to begin new designs based on Steam Heavy Water Generating Reactors without much new retooling which should allow a prototype to be up and running in a year or two – which could allow for future experts of that technology - while the AGR design is being fixed. DTI and AEA both agree that restructuring efforts in accordance with the suggestions of the Vinter commission should be a first step for the nuclear policy and that nuclear reactor choice can be postponed.

What we observe in this meeting is a consensus-orientation that leads to the question of reactor type being pushed into the future and agreement on future talks of industry organisation. This is the result of multiple instrumental policy ideas being in play in a setting where no one actor holds an ability to veto or dominate the negotiation. This power asymmetry even extends to the highly technical nature we might have expected to find when discussing nuclear reactor choices. Instead, the meeting ends up postponing the technical choice, not for want of discussing it, but because there are variations in opinion which are not easily overcome. Even in cases where the AEA are present, whom we might have thought could hold authority on the subject matter of nuclear questions, the style of negotiation remains a cordial and consensus-oriented one. In that sense the negotiation style of the open bureaucratic structure in the United Kingdom can be said to foster status quo policy-making where choices are often made when either the policy is sufficiently broadly defined that all actors can agree to it, or that consensus can be achieved by extending crucial decisions into the future[61].

5.3.2.3 Setting: Consensus and ideational inertia

This splitting of oil policy between different expert groups meant that consensus had to be sought for advice to reach cabinet. This also meant a certain level of symmetry of power between the involved expert groups as no one group had a claim to authoritative policy ideas that could dominate the policy advice

In general, the negotiation style requiring consensus means that most of the energy policy ideas rarely reach the level of debate their individual setting. Thus, we rarely see debates between CPRS or DTI for instance focusing on the particular degrees to which instrumental policy ideas should be followed. If following a policy idea requires consensus and there are conflicting instrumental ideas about the energy policy area in question, it becomes difficult for discussions to reach a point of detail where settings of ideas can be debated. This is perhaps not surprising given that the bureaucratic structure can affect policy ideas in the case of the CPRS and DTI who, after all, represent very different instrumental policy ideas on how to deal with oil supplies – CPRS

[61] *Note on interdepartmental meeting between DTI, Treasury and CPRS*. (Qb453). 6th april. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

preferring to maximise the domestic sources of energy and DTI preferring to increase cooperation between the government and multinational oil companies.

It is perhaps slightly more surprising that this limiting dynamic of a negotiation style with many veto-actors also applies for the area of nuclear energy. At face value, we might have surmised that a greater level of technical sophistication involved in the policy matter at hand (nuclear physics and engineering being of the this sort) would result in the ensuing interaction patterns between experts to more quickly find a common ground on basic principles and then be able to debate the settings of a consensus on instrumental ideas. However, this is not the case. Instead, we see a similar dynamic to what occurred in the area of oil policy. The mechanism is slight different this time, however. Rather than outright to seem agreeable to the concerns of other actors, while making your own arguments, disagreements are accepted between the Treasury and CPRS on one hand and DTI and AEA on the other. The result becomes that the instrumental policy idea that separates them regarding the domestic or international sources of reactor technology is completely sidestepped – but not due to any one actor dominating the debate and removing the options. Rather, the involved experts agree they should rather focus on restricting the nuclear industry, which takes the form of a reduction in the number of consortia that constitutes the industrial production-side of the nuclear policy. Thus, the bureaucratic structure in the nuclear setting leads not only a stalemate but to one which concludes in the, at least temporary, abandonment of the general policy idea.

5.3.3 Basis of expertise

5.3.3.1 Overarching idea: Generalists and politicisation of technicality

The general pattern that senior civil service consists primarily of classically trained university graduates is even more pronounced before the crisis. The Fulton report and civil service archive statistics both note the slow increase in number of employees with specialized training – especially economics and natural sciences. Often they were generally trained at one of the Oxbridge Universities (Civil Service Statistics archive n.d.). This pattern reinforces some of the general tendencies observed in the negotiation style about the lack of technical debates dominating interaction between experts. That is not to say that experts in the United Kingdom cannot debate technical issues, but the fact of most of them lacking specialized training or technical skills means that the debates take on a more openly political nature. These debates are more likely to be

intervened in by other political actors and policy decisions are therefore difficult to close debates around a decision because no particular basis of argument is more legitimate than others. The fact that no particular expertise was expected to dominate policy views on the basis of special knowledge is institutionalised in the coordinative preference for the policy-making within energy policy.

The DTI had very few resources or formal capacities to control the AEA within nuclear energy (as did the department of energy when it was later formed). Their relatively meagre size combined with lack of specialization made the department highly reliant on outside sources of expertise in policy-briefs, which was expressed explicitly by Tony Benn when he was Secretary for the DTI (see section 1.3). The lack of competence among several groups of experts within the bureaucratic structure of the United Kingdom was a more general phenomenon with the exception of the AEA, the CPRS comes closest to explicitly stating this lack of specialized knowledge competence. The CPRS admits to this limitation of technical knowledge as early as 1972. Upon being asked to comment on the possibility to shift energy demands from oil to other sources of energy, a key CPRS employee jokingly remarks when having to evaluate the technical details of different reactor choices to accelerate nuclear electricity production:

"No one in CPRS understands documents (like these) …is it something to do with the effects of LSD, or what?...So, we can't form an informed independent opinion" (p. 1) [62].

While this is perhaps the strongest expression of this sentiment among different groups of experts, the CPRS also delivers an argument for how it is that coordination of such technical issues then function in a bureaucratic structure where technical specialization is not a strong characteristic. The same letter goes on to explain, that because different reactor choices affect the time-scales for construction, it relates directly to the expected demand curve for industry. Because the nuclear industry is expected to supplant some of the electricity generating requirements from oil and coal, the spill-over effects from these choices can be evaluated in terms of their consequences rather than on technical terms. In a sense, the CPRS starts from the policy implications on other energy sources – and the policy idea of ensuring energy supplies - and works backwards to gauge which policy

[62] Letter from A. Fish to Rothschild – *Our Dependence on Oil* . 1. January 1972. CAB184/57 (Central Policy Review Staff. International Oil Questions).

ideas to adopt with regard to reactor choice[63]. Applying a similar logic allows much of the debates between different expert groups in the bureaucratic structure of the United Kingdom to make sense. The overarching policy ideas stalemate identified in the sections previous, are thus reinforced. This becomes clearer when we examine the lack of technical argumentation in instrumental policy ideas.

5.3.3.2 Instrumental idea: Generalists and keeping options open

As we saw above, the debates about otherwise technical matters thus become driven by policy ideas that are affected by technical choices rather than the technicalities themselves. This reinforces the characteristic that no one particular expert group can dominate the discussion because the negotiations reflect policy ideas not directly related to understanding of the policy choice in question but rather to its expected consequences to other policy ideas – importance ascribed to which varies across expert groups.

A relevant starting point is during the spring of 1972 in an interdepartmental meeting between the Treasury, DTI, CPRS and AEA. The meeting discusses the future of the nuclear industry in the United Kingdom and what policies should be advised for government.

The Treasury pushed a policy idea of expenditure reductions above other concerns. Treasury takes the view inspired by a previous DTI report, on the structure of the nuclear industry, in suggesting merging and reducing the number of different consortia that make up the production capacity for nuclear plants in the United Kingdom. This would allow the nuclear industry to work more efficiently, which effectively would reduce cost. Where the Treasury differed from the DTI was that they did not believe any further choices regarding reactor technology and specific technicalities could wait until such a reorganisation had taken place. They feared that waiting would create strong pressure groups with special interests in persuading the government to invest extensive public expenditure on further research and development into a particular reactor type. Essentially, this would mean that spending on nuclear power plants should be limited to maintain sufficient technological capability to develop more advanced nuclear reactors once they were expected to become viable in the 1980s[64]. This effectively meant curbing spending on more nuclear power

[63] Letter from A. Fish to Rothschild – *Our Dependence on Oil* . 1. January 1972. CAB184/57 (Central Policy Review Staff. International Oil Questions).
[64] *Note on interdepartmental meeting between DTI, Treasury and CPRS.* (Qb453). 6th april. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

plants beyond what is necessary to keep the industry alive while restructuring industry to become more cost-competitive, but limiting the influence of this smaller group.

The Department of Trade and Industry and the Atomic Energy Agency believed that restructuring the industry to fewer consortia that make up the production of nuclear power plants was a good idea. However, they were in disagreement with the Treasury in that they thought a new reactor technology should not be imported from outside the United Kingdom. Both expert groups agreed that the export potential of the AGR had fallen short of previous expectations. They suggested that research be maintained on the AGR reactors since five plants were already under construction. Completely abandoning the development of the AGR at this time would demoralise the industry.

The CPRS takes a rather pragmatic view on the topic of nuclear policy. While some level of pragmatism is perhaps always required in an open bureaucratic system for negotiation to be achieved, we can gauge how indifferent the CPRS had been to the technicalities of nuclear reactor choice by examining their internal discussions before the above meeting took place. CPRS had in the spring of 1972 been internally debating what line to take on the question of nuclear reactor choice. Internal memo from Robin Butler to Lord Rothschild, John Rosenfeld and Robert Wade-Gerry [65]. In the letter, Butler explains the predicament with regard to choosing between different nuclear reactor types. Notice that the argument do not derive from technical descriptions of advantages or disadvantages, but rather from concerns over issues with existing AGR reactors being built and keeping the industry supported until a choice can be made about the future viability of the domestically developed AGR reactor.

"Unless we order an AGR before the bugs have been got out of the present ones or an SGHWR before it is designed or a PWR before the safety inspectorate has formulated its regulations, there is nothing we can order before late 1973..(thus).. no nuclear plant can come on stream before 1979" (p. 2)[66]

This effectively meant that any increases to electricity demands before then would have to be met by fossil fuels, which is exactly the price and availability of which the CPRS had before been

[65] *Letter from F.E. Robin Butler – Nuclear Reactors.* (Qd0992). 27th march. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).
[66] *Letter from F.E. Robin Butler – Nuclear Reactors.* (Qd0992). 27th march. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

worried about (see above). Thus, in the interdepartmental meeting in the spring of 1972, the CPRS has to make a choice in this dilemma of sub-optimal choices. While the CPRS leans towards importing PWR technology from the Americans or Germany, similar to the Treasury, they end up following the same line as the treasury by recommending to postpone a decision on the specificities of reactor types before it would be necessary (p. 2)[67]. It is important to note, that the view of the CPRS compared to the Treasury is driven more by a policy idea of positive pragmatism in the face of technological problems with existing domestically developed AGR reactors while accepting nuclear energy as a general solution to ensuring energy supplies rather than the cost concerns ideas that are dominant within the Treasury.

What is particularly worth noting about the instrumental policy ideas floated by different expert groups is that the ideas take this less technically defined form and instead relate to more classic political distinctions – although this is consistent with the approach outlines by the CPRS in the previous section. This is despite the presence of the AEA at the interdepartmental meeting and the fact that the topics relate to nuclear industry organisation and nuclear reactor development choices – all topics that require a high level of technical sophistication to maintain. Despite this, the debates themselves revolve around more classic distinctions between political actors. The Treasury pushes a policy idea of expenditure reduction, which leads them to suggest importing technology rather than spend for potential economic gain in the future. The DTI and AEA have similar policy ideas about ensuring domestic production capacity by supporting industry both through maintaining ongoing AGR construction and through ironing out of problems, but also to select a new reactor type that is more likely to become an economic benefit in terms of exports in the future. From the views of the CPRS during the meeting, and their internal debates, we can affirm that while they are more confident in the need for nuclear energy than the views put forward by the Treasury, the CPRS did not have a clear preference for one nuclear reactor over another on technical grounds. Rather the question was a pragmatic one, to solve a dilemma between bad options that left the nuclear industry without anything to produce for several years, which, crucially, made the United Kingdom more dependent on fossil fuels for electricity generation in the interim period

[67] *Note on interdepartmental meeting between DTI, Treasury and CPRS*. (Qb453). 6th april. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

5.3.3.3 Setting: Primacy of non-technical knowledge

Settings of ideas of the basis of expertise in energy policy generally reflect the patterns of non-specialized knowledge characterising the debates. The consequence of this is seen in relation to several of the analysed instrumental ideas.

One way we can observe the primacy of non-technical knowledge in the response to the CPRS report on the future of oil supplies. Despite drawing on the economics discipline to make projections for different scenarios of prices for future oil supplies, the general consensus was that while it was a worthwhile report to do, several ministers simply did not believe the scenarios for future oil prices were realistic (Blackstone and Plowden 1990, 77). Similarly, the legitimacy ascribed to economic special knowledge was reduced when CPRS based views on future oil dependence on this work in interdepartmental commissions between CPRS, DTI and Treasury. DTI in particular, did not accept the veracity of the different price scenarios the CPRS had projected and believed in any case that if there was a future oil supply reduction in the world market, then the intimate connections between the United Kingdom and BP and Shell would garner them special privileges in terms of oil supplies not given to other countries. Thereby the basis of knowledge of the involved actors push the discussions away from the technicalities and knowledge on the particular issue to a discussion of political relation (ibid).

Returning to the discussion of nuclear reactor choice, we could have assumed would be more likely to involve debates of a technical kind they instead represent reductions of the technical aspects into settings consistent with instrumental policy ideas. In the case of the Treasury, they generally are not keen to recommend reactor technology, but would prefer purchasing pressurised water reactor systems (PWR) from either the Germans or the Americans because there had already been significant operational experience with these designs. While Treasury admits to some issues with safety, they believed that these issues could be overcome in the next two years, although no argument is given to support this timeline (p. 2) [68]. What is important to the treasury is the setting policy idea of reduction of cost in the industry through the cheapest and most reliable reactor technology. This policy idea setting is defined in terms of general political goals rather than any

[68] *Note on interdepartmental meeting between DTI, Treasury and CPRS.* (Qb453). 6th April. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

technical arguments about the particular policy object or any kind of technical reasons for a particular design over another.

The fact that the Treasury pushes for the option that maintains budget frugality is perhaps not the most unintuitive finding. However, it is slightly surprising that a similar tendency can be observed with the two expert groups consisting of the DTI and AEA - the latter of which is an expert on the technical matters of nuclear reactors. They believed that in order to protect domestic industry a second research project could be started with a Steam Generating Heavy Water Reactor (SGHWR), which had the advantage of allowing the U.K to keep up with new technological innovations while supporting the maintenance of technical capabilities in the nuclear industry for a later time. Moreover, the possibility to later export the SGHWR technology to third countries would be preferable to importing technology that did not have this option[69]. The setting of the instrumental policy idea of protecting the nuclear industry is argued for using arguments that have no direct relevance to the technical choices that are being made. Given the general educational basis of the bureaucratic structure in the United Kingdom, this should not surprise as a general pattern. However, it is significant that it takes place so obviously even when technical expertise is at hand in the debates. The resulting policy dynamic is similar to what was described in the instrumental ideas section above. Treasury, CPRS, DTI and AEA all agree that the more pressing matter is to reorganize the nuclear industry rather than setting a direction for the technology to be used and thus they decide to postpone the decision of specific reactor choice[70].

[69] *Note on interdepartmental meeting between DTI, Treasury and CPRS.* (Qb453). 6th April. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

[70] *Note on interdepartmental meeting between DTI, Treasury and CPRS.* (Qb453). 6th April. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions).

After the crisis

The oil crisis hits in the autumn of 1973. At the same time, a series of strikes among coal miners over the winter months occur and we see the creation of a combined department for energy issues. These developments culminate with the election in February of 1974 see the incumbent conservative government under Edward Heath exchanged by voters for the labour government under Harold Wilson (Ball and Seldon 1996, chap. 14)[71]. The capacity of the state manifests in different ways under this new government, but the general pattern of a weak capacity of the state still exhibit influence on the ideas behind attempts by the new government to take greater control of the oil extraction in the North Sea.

The creation of the department of energy as an anchor point for a combined energy policy could potentially have had a changing effect on the consensus-seeking nature of expert group deliberations; however, this is not the case. The pattern of several different areas of energy sources defining the energy policy also continues after the crisis has hit. The analysis of the negotiation style surrounding the specific oil policy ideas regarding the North Sea oil show that politicisation and intervention across departments characterises the debates – with the Department of Energy standing somewhat alone after Tony Benn is selected as minister in 1975. Within nuclear energy, the basis of expertise is most clearly seen again as being relatively devoid of technical discussions. Reflective of the split among experts political intervention is required from Erik Varley in 1974 to select the SGHWR reactor and later in 1978, Tony Benn reverts this decision to continue the domestically developed, and otherwise cancelled, AGR design (Williams 1980, 338).

[71] For an interesting perspective on how the 1974 election became the break with the paradoxical combination of political stability with economic instability that characterised much of the post-war period, see the chapter by Bogdanor in the same volume (Ball and Seldon 1996, chap. 15).

5.3.4 Capacity of the state

5.3.4.1 Overarching idea: Indirect control of domestic oil

The overarching policy idea relating to oil supplies is a general concern with maintaining energy supplies. The international strategy from before the crisis is maintained. The United Kingdom had maintained relatively good relations with parts of the Arabic world before and during the oil crisis. The diplomatic dimension sought before the crisis, Prime Minister Edward Heath informs cabinet that a personal guarantee has been given to him d been given to him by the Iranian Shah that oil supplies would not be limited from Iran something which is confirmed by a note on oil allocations from the Department of Energy to the Prime Minister in March 1974[72]. While Kuwait was a potential problem, the promises of the largest oil producer of the OPEC alliance, Saudi-Arabia, to not decrease supplies to the U.K. put the British oil import situation in a potentially better diplomatic situation than other European countries (esp. the Netherlands) (The National Archives (TNA): CAB128/53 n.d., 217). For sake of comparison, it is worth noting that France attempted to follow a similar approach by way of being part of what OPEC countries in the UN diplomatic context called "non-hostile" countries, which meant their oil supplies were not supposed to be affected by sanctions (Venn 2002, 18–19)[73].

The oil crisis hits in autumn of 1973 and the cost of oil increases manifold as a consequence. By December, the risk of overtime-bans continuing and resultant strikes in the coal-mining sector is putting pressure on the government. The Department of Energy is created over the Christmas holiday in 1973, but before much can happen in this new department, an election is called on the 28th of February 1974 leading to the cessation of government to the labour party. As the Labour government comes to power, the question of ensuring energy supplies is maintained as an overarching policy idea. The government attempts to deal with the different areas of energy policy does seemingly shift the passivity of the state with regard to energy policy somewhat. In the area of oil policy, the capacity of the state is applied to seek control over the future oil supplies to be gained from the North Sea (Donoughue 1987, 150). This is an interesting nuance, because the limited way

[72] Letter and note from Eric Varley to Prime Minister - Oil allocations – projected oil supply, demand and stocks to end September 1974. 18. March 1974. (PREM 16/251). The note on page 2 says: "Since these figures were prepared, the Government deal with Iran has been finalised» As a result a further two to three million tons of crude and products should become available before the end of September."

[73] In judging the effectiveness of the oil-as-a-weapon strategy of OPEC, some scholars have noted how it effectively accelerated the process of oil being sold in a world market rather than governed through diplomatic bi-lateral or multilateral supply agreement. An acceleration of the internationalization of prices on oil would effectively reduce the potential impact of future supply constraints by producers (Goldthau et al. 2010, 40).

in which this ends up occurring in the analysis indicates the resilience of the weak capacity of the state to minor shifts in overarching policy ideas.

Thus, without pre-empting the subsequent analysis too much, there are some limitations to the actual change this brings about. Several critiques exists that the licensing of fields between private and public actors could have been more to the advantage of the public. Essentially, they maintain that private oil companies got the long end of the deal because of being better prepared than the government (e.g. by knowing where and how much oil might be in different fields), but also due to a lack of will in the government to push for a better deal on the splitting up of the seabed through international courts (Pearson 1981, 122; Sampson 1975, 193). Backing up this view of a less fundamental shift than might on the surface seem to be present are internal documents from the Treasury evaluating the revenue tax on oil that followed when oil began being extracted.

The document suggests a general agreement that the government knew the initial taxation scheme had been of a more cautious nature and thus that the government could have pushed harder on public interests vis-à-vis private interests at the time[74]. While the overarching policy ideas still seems to be affected by a weak capacity of the state, the overarching policy ideas of domestic oil does shift slightly, if cautiously under the labour government. Some of these later debates speak directly to the state-society control in ensuring energy supplies that the capacity of the state attempts to capture. It is at least part of the nuance of the developments, that there are internal debates between DTI and other cabinet ministers about the degree to which nationalizing oil extraction is beneficial and whether other concerns should take precedence.

In a note for a cabinet meeting, then Secretary of State (FCO) James Callaghan (later prime minister), notes the severity of the situation and compares the negative effects of the balance of payment problem to the effects seen during the depression. He is concerned with the ability of some of the wider-reaching suggestions (e.g. by DTI) to "Powers which disturb the psychological ambience and cannot be implemented for lack of the necessary manpower should be postponed while energetically pursuing our aims of wider and stricter controls over the private sector" (p. 6)[75].. Thus, while there are internal discussions of the use of greater reach of state control in matters of

[74] *Notes for meeting on GEN137 - UK/USA Double Taxation Treaty and Review of North Sea Fiscal Regime*. (A866). 26 July 1978. - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime).
[75] *Secretary of State – Some thoughts on medium term strategy for the chequers meeting of the cabinet*. (Qa880) 11. November 1974. - CAB184/165. (Central Policy Review Staff Files. Central Policy Review Staff Report 'Energy 1974 and After')

energy, and in particular, in domestic oil extraction, the internal debates suggest discussions about the breadth and intensity required. Therefore, while a greater role for state intervention is debated in relation to the overarching policy idea of ensuring energy supplies, in practice, there is still a preference for non-intervention and industry relations are still seen as vital for energy production despite ideas being a little more informed on state intervention. We see this distinction between domestic and international concerns in the instrumental ideas pushed by Treasury and Department of Energy (something we also observe in the negotiation style).

5.3.4.2 Instrumental idea: Compartmentalized public control

The newly formed Department of energy was headed by the Secretary of state for energy. After the election in early 1974, Edward Heath's conservative government lost to the labour party lead by Harold Wilson. The overarching policy idea of ensuring energy supplies that had been followed by the department under Lord Carrington (albeit short period of existence) was continued under Erik Varley who became the new Secretary for Energy in the Wilson government. Erik Varley quickly got to work on drafting the outlines of a multipronged domestic response to the oil crisis. He laid out this plan during a cabinet meeting in early July of 1974. The policy ideas represented in this plan represent a slight shift in mentality towards oil policy in the United Kingdom compared to earlier. The instruments of this policy idea within oil involved five different but reinforcing elements: it required creation of the British National Oil Corporation (BNOC), instruments of taxation for company profits from the continental shelf extraction, including closing of loopholes in tax regulation, conditions for government participation in future licences (The National Archives (TNA): CAB128/54 n.d., 276–77).

These policy ideas reflects a shift in the structure of energy policy compared to the previous government towards a more explicitly active state role in the extraction of domestic energy resources and reflecting an explicit goal of "*move towards majority public participation on all licenses*"(The National Archives (TNA): CAB128/54 n.d., 277). This is an example of attempts to increase the public control over a particular part of the energy sector through instituting a public actor in the market for oil extraction. The conditions under which such an actor operates and how it shifts the conditions for other market actors is an indication that some more interventionist policy ideas were being selected despite a generally weak capacity of the state. This is perhaps the best example of overt attempts to publically control future revenues from the North Sea fields. However,

it bears mentioning that the internal debates (also examined in negotiation style below) suggest the shift is not as stark as it may seem. As already mentioned, the government was aware that the tighter public control over licensing came with much less cost associated than would have been possible. As Tony Benn and Erik Varley switch ministerial remits in June 1975[76] the agenda of Tony Benn largely follows the path set by the contours of the Petroleum and Submarine Pipe-lines Act in 1975 of establishing a primarily state-controlled company to ensure state involvement in the energy extraction from the North Sea Oil and Gas fields.

The nuclear energy policy shifted relatively slowly despite attempts by the electricity generating boards to seek an immediate expansion of domestic nuclear energy sources similar to what happened in France (Williams 1980, 208). The combination of increases to coal supplies made possible after agreement with the coal industry parties right after the labour government got into office in 1974 and the increasing availability of oil from the North sea was probably condition for the possibility that nuclear energy policy could be procrastinated to the extent that it was (Kohl 1982, 101, 105).

Between 1974 and 1975, work was done to establish an understanding of the supply situation with regard to nuclear energy. Here the general view of the weak role of the state is visible among several of the involved expert groups that co-author the report. Moreover, the number of expert groups involved again illustrates how many actors are involved in debates and their need to coordinate a common opinion on a given question. Within nuclear energy the discussions around the procurement and supply stability of uranium in UK nuclear power plants is discussed. After the crisis, an interdepartmental study group consisting of members from Department of Energy, AEA, BNFL, CEGB, CPRS, FCO and the institute of geological sciences is set up to write a report on the uranium supplies for the U.K.

What remains is an impression of the active role of government being rather limited. While it is fair to say, that an indirect role in procurement is played by the government through the publically owned British Nuclear Fuel Limited (BNFL)[77] it is worth noting the explicit way in which the government role is described in the report. Only a single section of the full report notes the role of government and essentially relegates it to use of diplomatic ties to facilitate connections where country-to-country

[76] For the different views of this, internally, very contentious move, see (Benn and Winstone 2005, 320–24; Donoughue 1987, 52–56; Wilson 1979, 143–45).
[77] BNFL was created as a publically owned company in 1971 from the former production arm of the Atomic Energy Authority

interaction is necessary to ensure supplies or potential agreements surrounding cooperation[78]. Thus, while the shift in policy instruments in oil policy gave a clearer image of a wish to grant greater public control (with some caveats) the type of role envisioned for direct government intervention is limited in nuclear energy to diplomatic help to secure overseas agreements for joint ventures for uranium mining. What is more, the combined group of experts that wrote the report emphasise that conditions for such intervention favours the commercial interests involved: "… action at Government level would need to be carefully coordinated with the commercial negotiations"(p. 17)[79].. That would mean that while the government of course has a role in the creation of facilities that utilize the nuclear material, the conditions under which they should be acquired seem to leave a lot to market forces and government role as a facilitator rather than strategic controller.

5.3.4.3 Setting: Limited intervention

The setting of policy ideas affected by capacity of the state in the United Kingdom after the crisis reflect the slight shift in focus in one area of energy policy and the maintenance of status-quo in another. In the area of oil policy, we see the largest shift of policy ideas towards a seemingly greater public control over the patterns of interaction in oil extraction. The increased setting of public control is difficult to evaluate per se, since the reference point is a somewhat new set of instrumental policy ideas – state controlled actors in the market for oil extraction and licensing.

That being said, it is worth repeating the limited scale at which the licensing cost and to which fields they apply are followed through by the state. This is both a critique in the literature as well as a point of contention within the government as we saw above. Furthermore, it is worth noting that while BNOC was a publically controlled company it was only partially owned by the state. To some extent, the state capacity of the United Kingdom was maintained through partial ownership of British Petroleum who held 20% of North Sea Oil. This level of control was however reduced in 1977 when the Government decided to reduce its holdings in BP from 48 percent to 31% with an explicit intention to maintain the relationship between the state and private companies in a way that did not breach with what was considered the "traditional practice of non-intervention in the administration of the company as a commercial concern" (Pearson 1981, 123). This meant that while the institution of BNOC did mean more interventionist settings of policy ideas than what had

[78] It is not clearly specified, but what this probably implies is cooperation on the SGHWR reactor project since it technically similar to the nuclear reactor technology in utilized in the Canadian CANDU-reactor.
[79] *Study of the Security of Uranium Supplies to the UK*. (EG 7/211). Study of security of uranium supplies to UK: final report 1974-1975.

been previously seen in the area of oil energy it is also worth noting some of the explicitly chosen limitations regarding these ideas are still emanating from the overall weak capacity of the state bureaucratic structure.

In this light, while the setting of policy ideas related to oil are towards more interventionism, these changes need to be put into a diachronic context to gauge their individual changes properly. The debates around which parts of the North Sea seabed represented international and domestic waters – and thus were eligible for state control – the role of the government had previously also been on the cautious side vis-à-vis private enterprise. The potential for oil extraction from the North Sea outside the coast of Scotland was already known by multinational oil companies before the British government(Pearson 1981, 122). In defining the national boundaries in the Continental Shelf Act in 1964, the U.K. was allocated 35% of the North Sea, despite potentially being eligible for a larger share of the oil-rich seabed had the issue been taken further (e.g. international courts) (Sampson 1975, 193).

In nuclear energy, the setting of policy ideas of capacity of the state is actually moving the opposite direction to the pattern seen in oil. Moreover, it is moving towards less control in an area of energy policy where states tend to keep tighter control (Simpson 1983). Of course, the policy ideas that relate to acquisition of nuclear fuels do not make up the only aspect of nuclear energy policy. However, it is interesting to note that the debates in nuclear fuel acquisition, which involve a majority of expert groups and less politicians, are characterising tendencies of following existing modes of operation for the state capacity: in this case, to seek a relatively weak state capacity through primarily aiding other existing actors to achieve cooperation to acquire nuclear fuels.

5.3.5 Negotiation style

Before the crisis we observed how the different groups of experts in the bureaucratic structure coordinate across and between each other on multiple issues on a per-topic basis. Moreover, the area of energy policy was formally split across several departments with overlapping competences. After the crisis, the creation of the Department of Energy partially addresses this by creating a common department for the policy area. However, the negotiation style is still characterised by a multitude of different expert groups and the role of the department is limited to coordinating policy. These dynamics lead to lowest-common denominator consensus on several occasions and the politicization of the energy policy area does not become less pronounced after Erik Varley and Tony Benn switch places as head of the Department of Energy in 1975. This leads to conflicts with other groups of experts in both oil policy and nuclear policy with the Treasury and CPRS, among others.

5.3.5.1 Overarching idea: Tighter coordination

One of the final changes that Edward Heath manages to institute before a snap-election in the spring of 1974 changes government to labour is the creation of the department of energy over the Christmas holiday in 1973. The explicit goal of the department was to facilitate better coordination within the many areas of energy that had characterised energy policy of the United Kingdom until then. In that sense, the creation of the department might be expected to reduce some of the patterns exhibited by the negotiation style in the bureaucratic structure of the United Kingdom. This is because a strong coordinating actor with agenda setting privileges at the centre of energy policy debates would be expected to be able to reduce the tendency to for a multiplicity of different policy ideas to draw in different directions even if the number of actors involved is not reduced.

This is not the case. The key problem is that the creation of the Department of Energy does not constitute the introduction of a new actor into the negotiations that has formal power to decide on a direction (Pearson 1981, 53). The role of the department is primarily to coordinate the different policy areas related to energy rather than to combine the different expertise into one big department. One the one hand its creation does attempt to simplify some of the institutional decision-making issues that have characterised the organisation of expertise in energy policy in the U.K. before the oil crisis by making one government department responsible for the coordination and creation of

national policy. On the other, the size, competences and formal remit means that it does more to seek consensus and coordination than to outright select policy ideas or change number of actors involved in decision-making – even if it does attempt centralise the discussions around a particular department. Within the legal framework that the department does allow for, there has been conflict among the many involved actors as to which policy instruments should be used to effectuate this tighter coordination of energy policy to facilitate the overarching policy idea of ensuring energy supplies. As we shall see in the policy instruments, the increased use of taxation on companies was not favoured in the area of oil, because several expert groups and other departments did not agree to them – sometimes because they considered the specific ideational instruments too strong interventions[80]. The overarching policy idea of tighter coordination is thus fostered within the context of the existing open bureaucratic structure where the Department acts as another veto-player whose role is to better coordinate interaction of the others. While this might arguably have been effectual in centralizing energy debates among experts to always involving a particular actor, this did only increase the tendency for negotiations to be characterised by attempts to seek coherence and thus a need for agreement which leads to status-quo maintenance unless political intervention into the debates expert-groups is made. We will now turn to how different policy instruments manifested in these negotiations between different expert groups.

5.3.5.2 Instrumental idea: Public control versus diplomacy and expert gridlock

The instrumental policy ideas affected by negotiation style after the crisis represent itself in two different areas. The first is the way in which an increased role of public control in domestic oil extraction is debated. The other is the area of nuclear policy. Where the first has high levels of direct political negotiation between department heads and Ministers, the second is more driven by experts themselves.

Tony Benn and the Petroleum Revenue Tax

When Tony Benn becomes Secretary for Energy, he pursues the agenda of trying to maintain national control of public oil fields. The instrumental policy idea that he pushes is taxation through the Petroleum Revenue Tax, which was first introduced by his predecessor Erik Varley in early

[80] According to the former advisor to Harold Wilson and James Callaghan, this was referred to as "Bennery" by rest of Whitehall (Donoughue 1987, 52).

1975. At that time, there was some trepidation about pushing too hard on the PRT because especially the FCO and Treasury were afraid of the international repercussions. Especially with regard to the United States. Benn wishes to increase the PRT so the public gets a greater share of the oil revenues from the North Sea. The ensuing debates between the Department of Energy under Benn and especially the Treasury are indicative of a distinction in policy ideas among ministries as to whether international or domestic concerns should primarily influence energy policy.

The Treasury under Denis Healy is supportive of a greater public share of the profits from the North Sea oil fields and is personally in favour of the changes to the Petroleum revenue tax suggested by the Department of Energy under Tony Benn[81]. However, the Treasury believes that this support for the PRT increases must be a balanced approach that takes into account the partnership between private and public sector. This entails securing the needs of the community through a fair share of benefits arising from national resources in the North Sea while also taking into account the risks involved for the private sector and the need for a fair rate of return on investment into developing oil extraction in these areas.(p. 3)[82]. This indicates that while there is agreement on the instrumental idea of taxation by the state of private companies, the Treasury is not willing to go as far as the suggestions by the Department of Energy and perhaps more interestingly, they believe that oil policy should be considered in lieu of international concerns rather than primarily the goal of the policy. This initially seems to produce a stalemate of ideas described above as part of the open negotiation style.

However, this picture is mitigated by the fact the aspect of this debate that it consists primarily of actors with direct political power, not through the employment at a department or similar. Thus, it can indicate the role of political influence on decision-making when asymmetries of power are allowed to dictate a discussion – as opposed to negotiations involving less political actors. This is clear on the question of whether the state-controlled oil company (BNOC) should continue to be exempt from the PRT or should instead operate on equal ground to other market actors in the North Sea. The treasury through Denis Healy believes this exemption for public companies should be removed (p. 2)[83] . The Department of Energy on the other hand believes that BNOC should

[81] Notes for meeting on GEN137 - UK/USA Double Taxation Treaty and Review of North Sea Fiscal Regime . (A866). 26 July 1978. - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime)
[82] Letter and statement to Secretary of State for Department of Energy from Private Secretary to Exchequer B.S. Morris of Treasury - *Proposed Changes in PRT*. (A1084). 31. July 1978.
[83] Notes for meeting on GEN137 - UK/USA Double Taxation Treaty and Review of North Sea Fiscal Regime . (A866). 26 July 1978. - (CAB 184/486)

continue to be exempt from the PRT tax, a point on which the Treasury disagrees, but which seems to be a view more broadly shared in government when the cabinet secretary mentions in a letter: "Mr. Benn is isolated on this one"[84] . In addition, the Treasury believes that maintaining special status for BNOC in terms of tax exemption on the basis of it being a public company would bring the United Kingdom into conflict with other countries in the European community they recently joined. According to the Chancellor, BNOC's exemption has already attracted critical attention of the EC commission although no formal complaint has been raised yet. If the special exemption for BNOC is removed it would potentially become easier to make the United States accept an increase to the PRT because it could be argued that the government no longer discriminated in favour of BNOC (p.2)[85].

The internal conflicts over the role and limits of public intervention in the area of oil policy are evident in relation to another aspect of the North Sea oil. The conflict is once again between the Department of Energy and Treasury. The Department of Energy argues that the current negotiations with private oil companies about the licensing and drilling rights should involve the department of energy since it relates to questions of oil extraction and control over public energy sources. The department of energy is refused access to the deliberations and instead they take place between Inland Revenue and the relevant private oil companies. Treasury disagrees with the department of energy about intervention on the legal basis that inland revenue is not allowed to disclose taxation details from private companies to other departments and further that the Department of Energy has no legal statutory influence on questions of taxation – despite the fact that they relate to taxes on energy productions in publically controlled fields. The fact that "discussions cover in detail the companies' contractual arrangements with foreign governments.." which makes it "simply not possible for officials other than Inland Revenue to have a seat at meetings with the companies" (p. 1)[86].

The discussion between them is escalated to the level of the Prime Minister, when Tony Benn as acting Secretary of State for Energy writes a personal letter to the Prime Minister arguing for the

[84] Letter from Secretary of Cabinet, John Hunt, to Mr. Wicks - United Kingdom/United States Double Taxation Treaty and Review of North Sea Fiscal Regime (A07681). 18. July 1978 - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime).
[85] Notes for meeting on GEN137 - UK/USA Double Taxation Treaty and Review of North Sea Fiscal Regime (A866). 26 July 1978. - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime).
[86] Letter to the Prime Minister from Chief Secretary to the Treasury- *Tax loopholes open to oil companies* (A923). 3. October 1977 - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime).

allowed presence of his department in talks with private oil companies[87]. Here we see how the negotiation style with multiple different departments and overlapping areas of competence directly affect the conflicts between experts. Moreover, the area of energy policy relating to oil, seems also to have a greater direct involvement by political actors like Tony Benn and Denis Healey. This is consistent with the open bureaucratic structure and weak capacity of the state, as some of the policy instruments suggested by Department of Energy are not consistent with existing structures of relationship between the state and market. This manifests in conflicts between the Department of Energy on one side and the Treasury on the other over whether domestic or international concerns should weight most heavily on petroleum revenue taxation. This ideational conflict is lost by the Department of Energy, as attempts to involve higher political intervention into the conflict fails, when the Prime Minister sides with the view represented by the Treasury.

Nuclear energy ideas

The nuclear energy policy is another area where we can observe the instrumental policy ideas that manifest within the specific negotiation style of the bureaucratic structure of the United Kingdom. A key difference from the example in oil above is that these debates are rarely escalated to discussions between a few key ministries that involve the ministers themselves. Rather the pattern of policy ideas as they manifest here may have origin in a broad political concern, but are debated primarily by experts. In nuclear energy, most actors seem to agree that the current form of the AGR reactors have been a failure and the plants currently underway are riddled with expensive production problems.

Fear of technological irrelevance, European competition and future path ahead

Soon after the Labour government comes into power, Lord Rothschild of the CPRS has a meeting with the new Secretary for Energy, Erik Varley. Rothschild notes that the Minister is worried about being left behind in cooperation on nuclear technology development and has quandaries about which future nuclear reactor technology the United Kingdom ought to support[88]. Specifically, the Minister was worried about speed at which other European countries were deploying low cost Light

[87] Letter to the Prime Minister from Secretary of State for Energy, Tony Benn - *Tax loopholes open to oil companies* (A713). 27. September 1977 - (CAB 184/486)(Taxation and energy policy: review of North Sea fiscal regime).
[88] *MEETING MR. VARLEY/ROTHSCHILD*. (Qa0340). 30 April 1974. - CAB184/165

Water Reactors and that in 15 years' time the United Kingdom would have inadequate nuclear capacity[89]. While Rothschild is at first unsure what this implies for specific choices, he sees the instrumental policy idea of increasing cooperation on nuclear technology development as consistent with the existing view within the CPRS[90].

The CPRS has since before the crisis believed that the nuclear energy programme faced a dilemma between construction failures of the AGR, time to develop an alternative technology (or import one) while keeping the nuclear industry alive in the meantime (as we saw earlier when they sided with the Treasury on buying LWR technology). Therefore, CPRS saw the instrumental policy idea of international cooperation on reactor technology development as a way to alleviate cost and reduce the risk of falling behind other European countries in the technological development on nuclear energy. By 1974, the CPRS is frustrated of the failure to ensure such cooperation to take place.

Internal correspondence emphasises the need to quickly do something to make sure cooperation (of fast breeder technology) is going ahead with all possible speed, which requires CPRS to attempt to affect policy more: "It seems to me that our past record over nuclear reactors has been too bad for it to be justifiable to leave all this to chance (and, by implication, the Department of Energy!)"[91]. Another internal letter puts the responsibility for these delays at the lack of coordinative role from the department of energy in ensuring cooperation on FBR development with the French and Germans: "The Department (of energy) did not think the time ripe for such a report. I suspect that this latter reason is largely a post hoc rationalisation of the Department's failure to fulfil their remit."[92]. The CPRS thus shares the view of Erik Varley that the choice of nuclear reactor technology should be made soon so that the United Kingdom does not fall behind other countries in a rapidly developing field but also, for CPRS more importantly, allow the United Kingdom another source of electricity to buffer against in case oil supplies become scarcer.

From the analysis of the negotiation style within nuclear energy before the crisis, it was clear that there was disagreement between the CEGB and CPRS (and Treasury) on the instrumental idea of

[89] *MEETING MR. VARLEY/ROTHSCHILD*. (Qa0340). 30 April 1974. - CAB184/165
[90] At first, Rothschild believes this is pushing Varley to veer towards LWR reactor technology (which likely would imply some form of licensing or import of technology), but after conferring with Sir John Hunt Rothschild realised it might also mean that the Secretary had decided to support the further development of the domestically developed AGR reactors but was worried about the wisdom of such a decision. See, MEETING MR. VARLEY/ROTHSCHILD. (Qa0340). 30 April 1974. - CAB184/165
[91] *Letter from AB Urwick to Sir K. Berrill – Fast Breeder Reactors* (Qa794). 23. October 1974. CAB184/165 (Central Policy Review Staff Files. Central Policy Review Staff Report 'Energy 1974 and After')
[92] *Letter from JRS Guinness to Sir K. Berrill – International Cooperation on Fast Breeder Reactors*. 23. October 1974. CAB184/165 (Central Policy Review Staff Files. Central Policy Review Staff Report 'Energy 1974 and After')

pushing a new SGHWR reactor design as a complete alternative to the AGR. The CEGB maintained the line that they had indicated before the crisis that the choice of reactor types and alternative technological choices were unclear and that this therefore required choices to be kept open with regard to choosing Fast Breeder Reactors or high temperature reactors as new technology for nuclear industry to construct[93]. This seems to indicate that the CEGBs instrumental policy idea of domestically developing the SGHWR before the crisis had more to do with preventing the Treasury and CPRS preference of ordering licensed LWR reactor designs from foreign companies than it had to do with the purported benefits of developing the SGHWR as a future export technology. Rather, the secondary purpose of maintaining work on the AGRs already under construction may have been the preferred option despite the admitted failures of the programme.

Breaking the institutionalised expert-gridlock

Some of the existing expert groups in the United Kingdom have realised that the policy ideas of different expert groups are entrenched with different actors. CPRS believes that the different expert groups have vested interest in one or the other reactor technology choice[94] and therefore attempt to get a second opinion with advice from Lord Hinton and Dr. Rotherham[95], which they discuss at a meeting with CPRS officials in the spring of 1976. Hinton and Rotherham believe that minor licensing of technology elements and redesign would allow the prototype SGWHR at Winfrith to scale from 100MWe to around 200MWe and allow the UK to be in a dominant competitive position in around 4 years. This, in turn, should give them plenty of opportunity for exporting the technology and increasingly so "when one of the US reactors (which was of a competing LWR reactor design) blows up" (p. 1). Beyond that, a firm decision should be made to research the future technology of fast breeder reactors.

It was imperative that this resulted in a larger scale installation because it would not allow the generating board to redesign a finished product (p.2)[96] The key concern is that speed is of the essence to get decisions locked in, so development could start. Hinton and Rotherham seem to share

[93] *Letter from F.E. Robin Butler – Nuclear Reactors.* (Qd0992). 27th march. 1972 - CAB184/57 (Central Policy Review Staff. International Oil Questions). and *Nuclear reactor programmes – Agreed note of a Meeting on 20th December 1974.* (RC/16/01). 20th December 1974 - CAB184/165
[94] According to Lucas,1982, this is not an unreasonable observation. He claims the "CEGB did not hide their intention to kill the SGHWR within this committee, and it succeeded". At the beginning of 1978, the UKAEA was forced to recommend to the government that work on the SGHWR be discontinued. (In: (Kohl 1982, 105))
[95] Lord Hinton and Dr. Rotherham had a common background with AEA but worked together when they both joined the GECB in the late 1950s where Rotherham joined as Member for Research in 1958 and Lord Hinton had become Chairman the year before. In 1966 Hinton became chancellor of Bath University of Technology where Rotherham joined as Vice-chancellor in 1966 (University of Bath - Rotherham catalogue n.d., 4).
[96] *Note for the record of a meeting at 4:15pm on Monday 9*. February 1976. (Qd04597) - CAB184/292. (Energy policy: Fast Reactor Project 1975)

the view previously espoused by CPRS that part of the problem of the current nuclear policy has been the multitude of different imperatives from different actors that has characterised the developments so far. They argue that development is best ensured by separating development from influence of Whitehall and AEA. (p. 2) [97].

The findings of this report show us a few things. First that the question of reactor technology has still not been firmly taken despite officially cancelling the AGR reactor and starting development of SGHWR in 1974, even if most actors in the area of nuclear energy want to see the field develop. This point is explicit raised when they argue: "If Cabinet could agree to proceed with the Fast Reactor on the lines suggested in our Report, it might provide a healthy lesson for the CEGB and the Consortium to tell them that, as they have delayed the SGEWR for so long, government feels that it ought not to be proceeded with, this and a decision to proceed with the Fast Reactor as suggested in our Report might really wake people up" (p. 1) [98]. The external experts express views consistent with the negotiation style characterised by multiple veto-actors. The different instrumental policy ideas on reactor technology has held up the development, because agreement could not be achieved and instead gridlock ensued. Moreover, the introduction of a new expert group into the discussion of nuclear technology is indicative of the open nature of negotiations reinforcing the institutional pattern of the negotiation style of the United Kingdom with multiple veto-actors with competing policy-ideas.

[97] They suggest that a project similar to what they describe could probably be developed by R.V. Moore (chief reactor designer of Caldor Hall at AEA) if he could be isolated from Whitehall and AEA leadership influence. See,.*Note for the record of a meeting at 4:15pm on Monday 9*. February 1976. (Qd04597) - CAB184/292. (Energy policy: Fast Reactor Project 1975)
[98] Letter to Dr. Hart from Lord Hinton (Qa2876). 23. February 1976. (CAB184/292)

The chat and undisclosed personal communication

This report and the surrounding debates is relevant for another aspect of the instrumental policy ideas in the negotiation style of the United Kingdom. It illustrates how the instrumental policy ideas among experts rely on personal relationships between experts to insure support. These personal communications function similar to the "chat". The department of Energy has correspondence with the CPRS over a period of time debating the points of this report, despite not explicitly being part of the remit of the report or wanting to involve the authors in that follow-up debate. The interaction pattern reinforces the personal nature of interaction in the bureaucratic structure of the United Kingdom. In the cover-letter to the report sent by Sir Jack Rampton of The Department of Energy to Kenneth Berril at the CPRS, he expressed the desire to be "kept informed" of further discussions on the topic, but that Hinton and Rotherham *not* be shown the views of the Department on the issue.[99]. This level of explicit secrecy reinforces the role of personal interaction and makes transparency of debate more difficult.

In their comments, the Department of Energy questions the veracity of the claim that a domestic reactor technology is, as they claim, the sought goal by the authors of the report[100]. The type of cooperation suggested by the CPRS before (and also by the report in question) is not preferred by the Department of Energy. Instead, they prefer cross-country cooperation only in specific technical issues like the cooperation of centrifuge development. This more pragmatic and ad-hoc type of cooperation emphasises a level of flexibility in the nuclear policy seen earlier with the Central Electricity Generating Board when discussing future reactor designs before the crisis. The department re-emphasises their instrumental policy idea of a domestically controlled solution, which is more in line with AEA and GECB when they note they are explicitly against cooperation with other countries that involves shared control over programmes[101]. These specific policy instrument ideas are quite similar to what we saw before the crisis and thus within nuclear policy the same issues still exist and do not seem to be decided on. What is more, this pattern is consistent with the expected policy pattern of a negotiation style, which is characterised by many actors who hold veto power over what decisions can be agreed as the advised policy to follow.

[99] Letter to Kenneth Berril from Jack Rampton and report(Qa2599). 9. January 1976. *Fast Reactor: Report by Lord Hinton and Dr. Rotherham . Comments by Department of Energy* (RC/18/03) (CAB184/292)
[100] Fast Reactor: Report by Lord Hinton and Dr. Rotherham . Comments by Department of Energy (RC/18/03) (CAB184/292)
[101] "We would not be in favour of the sort of dual control embodied in the original CENTEC and URENCO structure" (p. 3)

The role of Tony Benn?

In part through the back and forth dynamics just illustrated, the decision of Erik Varley in 1974 to go with the SGHWR reactor has thus been procrastinated. In a letter to the Prime Minister, the Secretary of State for Energy informs that the cooperation in nuclear technology is moving ahead between France and Germany and that the U.K. might be left behind. He emphasises it is wise to make clear the commitment of the United Kingdom: "…But I think we should wait until we are more certain about our own position before deciding how best to follow up internationally" (p. 2)[102]. The decision on reactor technology was previously claimed by the CPRS to have been due to the Department of Energy. However, it is not clear from this position that Tony Benn (and the wider labour government) preferred the domestically developed AGR reactors as later claimed by observers (Blackstone and Plowden 1990, 81; Kohl 1982, 105). Tony Benn's own diaries suggest he is puzzled as to the sudden change of direction when he is asked to cancel the SGHWR on June 6th 1976 (Benn and Winstone 2005, 328).

It is probably fair to say that Benn did not have much faith in the American LWR designs preferred by Treasury and CPRS which he notes he "shall fight like a tiger". On the other hand, he also explicitly claims to have no particular preference for either the SGHWR or the AGR (albeit he thinks Britain ought to be proud of its achievements in the field)(Benn and Winstone 2005, 329). It is no secret that his general political views made him a friend of the coal unions, but that does not directly have to translate into being against nuclear power. That being said, later interviews indicate that he had become increasingly disillusioned with nuclear power as a technology (Dale 2009). Irrespective of the underlying motives for this move, the implication of waiting in a system otherwise prone to gridlock between experts is just that – a further procrastination of the development of the nuclear programme. In the absence of a political intervention into the expert groups that disagree on instrumental ideas of the nuclear policy, an open negotiation style like the one in the United Kingdom is prone to indecision. It is not until in 1978 when a political decision is made by Tony Benn and the government to revert to the AGR reactor technology that was left behind in favour of SGHWR in 1974 (Williams 1980, 258). If nothing else, these developments of back-and-forth in the nuclear policy area shows that instrumental policy ideas may shift over time,

[102] Letter from Secretary of Energy Tony Benn to Prime Minister (Qa2790). February 6th 1976. (CAB184/292) Energy policy: Fast Reactor Project 1975.

but as we have seen before and after the crisis, debates between veto-actors can stifle decision-making based on these ideas.

5.3.5.3 Setting: Multiple expert groups and multiple veto-points

The settings of policy ideas reflect the instrumental policy ideas identified above. Within the nuclear area, the CPRS develops an instrumental policy idea of cooperation on nuclear development to speed up the development of nuclear reactors. The report by Lord Hinton lays the blame for procrastination of nuclear reactor development on the AEA. Interestingly, the debate surrounding this report does not directly involve the authors of the report. Instead, the negotiation style of the bureaucratic structure in the United Kingdom again presents us with the characteristic of the personal communication and function of the "chat" in decision-making. The deliberations about the findings of the report and the impetus for catching up on reactor development is responded to by the Department of Energy in a personal letter to a member of the CPRS.

The settings of the instrumental ideas of cooperation are laid out in terms of remaining flexible and preference for ad-hoc cooperation on individual technologies. These settings of cooperation are conditioned by the negotiation style in the bureaucratic structure because they represent patterns of interaction where a flow of informal policy ideas is shifted between expert actors in a way that is not transparent to all the relevant experts in the policy field. This means that even if there were not the tendency to seek consensus already noted, it would also be difficult to achieve any kind of decision on the basis consensus on policy ideas one expert group is not willing to share with others. It is difficult to say exactly how widespread this phenomenon is, but it seems to make the already observed consequences of the negotiation style that is prone to status-quo and indecision even more likely.

5.3.6 Basis of expertise

5.3.6.1 Overarching idea: Tighter coordination of non-technicality

After the crisis hits, the Department of Energy is formed and this changes the potential basis of expertise in the bureaucratic structure of the United Kingdom. However, the department is relatively small organisation by Whitehall standards (Pearson 1981, chap. 2). The new department also resembles previous patterns of the basis of expertise among departments in the bureaucratic structure of the United Kingdom. While there had been a shift in the number of economists hired from the early 1970s to 1974, the larger share of employees were still classically trained – often at one of the Oxbridge Universities (Civil Service Statistics archive n.d.). The way in which the addition of the Department of Energy to the group of expert actors affects the debates is thus mostly by reinforcing the general trend of multiple actors interacting on an equal footing resulting in the need for consensus. Perhaps not entirely surprising this was part of the intent when setting up the department. This point is directly reflected in the purpose clause for the creation of the Department of Energy which emphasises the role of the department as being the "coordination of the different energy concerns into one coherent national energy policy" (Pearson 1981, 53). This pattern reinforces some of the general tendencies observed in the negotiation style about the lack of technical debates dominating interaction between experts.

That is not to say that experts in the United Kingdom cannot debate technical issues, but the fact of most of them lacking specialized training or technical skills means that the debates take on a more openly political nature. The changes resulted in comparing the period before and after the crisis is thus primarily that the role of the DTI is reduced in favour of the Department of Energy, but whose degree of specialization among employee backgrounds is similar. The overarching policy idea within energy after the crisis is thus still ensuring energy supplies, but when examining the instrumental ideas and settings of ideas forwarded by different experts, we can observe how the generalist nature of the basis of expertise reinforced some of the institutional pressures we observed in the negotiation style.

5.3.6.2 Instrumental idea: The dominance on non-technicality even in nuclear policy

Perhaps a good illustration of the effect of the generalist basis of expertise on policy idea content is in the areas of energy policy where we would expect it most likely that the opposite would be observed. In nuclear policy, we would expect the most tendency for technical discussion to take place given the requirement for policy choices are related to choices about nuclear reactor types, organisation of industry to support highly complex productive capacities, future technological advances – all of which require long lead times and thus must be thought through thoroughly before making decisions. These factors speak toward nuclear policy as being the area where the expectations of the basis of expertise about open or closed bureaucratic systems should be strongest[103].

In a meeting on the 20. December 1974 the Central Electricity Generating Board, National Nuclear Corporation, South of Scotland Electricity Board, AEA, British Nuclear Fuels meet at the atomic energy division of the Department of Energy[104]. Since this is a full year since the creation of the department and present at the meeting are several actors, who should have specialized technical expertise related to nuclear energy questions, we would expect technical debates to be present here, if not for the bureaucratic structure of the basis of expertise in United Kingdom.

Again we see a pattern of the specific policy ideas being in play have very little to do with the technicalities associated with nuclear energy. The department of energy primarily serves a coordinative role during the meeting, by summarizing the views of other participants, which speaks to the negotiation style described earlier. This tendency is continued even when debates begin to substantiate the instrumental policy idea of the department of flexibility in cooperation, which means to develop cooperation on nuclear technologies independently on different technologies, rather than fixing cooperation to an entire project consistent with views expressed by the NNC and AEA (p. 4)[105].

[103] This point is a general argument about the specific nature of nuclear technology and policy relating to it and the implications of the theoretical framework. As such it should apply equally to the French case as well. However, due to dominance of nuclear energy as the primary energy policy response to the oil crisis, indirect control within the case by comparing the dynamics of different energy policy areas is less opportune for the case of France compared to the U.K., which is characterised by an energy policy that encompasses several energy sources and areas.
[104] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')
[105] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')

This means that the lack of technical debate surrounding the instrumental policy ideas thus end up reinforcing the tendencies of the open negotiation style. For instance, the AEA agrees that cooperation in necessary but emphasises the need for flexibility in the type of cooperation and that industry preferences should be taken into account when deciding on which form and what should be cooperated about. The reason for flexibility is that cooperation on nuclear development is not fixed around one particular technology, but instead requires multiple concurrent technologies are kept in play. This necessitates a level of flexibility in the type of cooperation the United Kingdom follows. As development in the nuclear field continues internationally, multiple different technologies are being developed and it is necessary to foster independent links on each advanced system (p. 3) [106]. It is not clear whether this is because the future dominant form of nuclear reactor technology and associated auxiliary technology (steam boilers, turbo-alternators etc.) are in flux or whether the AEA believes the UK must maintain expertise in all of them to hedge bets on which technology becomes dominant (similar to fears expressed by Erik Varley and Benn). Whatever the form of cooperation, the AEA believes "industrial preferences should carry most weight" (p. 6)[107].

The CEGB and NNC are not entirely convinced that the development of Fast Breeder reactors is far along enough that deep cooperation should be immediately followed. Fast reactors is still in developmental stages and not as far along as believed (p.2). NNC is also questioning whether the Fast Breeder reactor is a definite choice of technology choice because no clear argument had been forwarded about this versus other types, which would affect the choice of cooperation partners. In any case, NNC view is to keep the options open (p. 3). This is consistent with the view of part of the nuclear industry in that CPRS noted that General Electric Corporation did not believe it was beneficial to develop a Fast breeder reactor (p. 1)[108].CEGB is supportive of the idea of seeking separate links on different types of technology because neither currently developed nuclear reactor technology options of Fast Breeder Reactor or High Temperature Reactor technology was entirely settled yet. This meant that the UK should keep options open with regard to reactor technology as well as the ensuing cooperation that would be needed (p. 3). A case for adopting a LWR design can according to the CEGB still be made, but it would have to be licenced and then developed domestically with the international cooperation primarily being on solving security concerns (p. 2).

[106] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')
[107] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')
[108] "misgivings about it - have been and are, often, expressed. These were voiced so emphatically by Sir Arnold Weinstock (of the General Electric Company)" *The Fast Breeder Reactor by Central Policy Review Staff*. September 1974. (EG12/148).

The NNC holds a similar view that if cooperation should be sought, NNC prefers the French (p.4) because German cooperation involved taking shares in different companies located in Belgium and Holland as well, which complicated matters. Cooperation with the French was also consistent with interests of the Americans who were licensing their LWR technology to the French. (p. 8)[109].

It is clear from this meeting that many different opposing policy ideas on the direction of nuclear policy are in play. While agreement exists that cooperation may be beneficial there are differing opinions on the type, size and depth of cooperation that should be sought. The sophistication of debates is not at a level where the technical implications of different reactor technology is actually debated, rather the state of the technological development is questioned by several parties (especially the NNC and GECG). The AEA and the Department of Energy seems to have similar views as to the need for cooperation, but the AEA is more fixed on domestic preferences of industry and developing a national programme rather than the coherent transnational cooperation on a single project envisioned by NNC and GECB. It seems that the reference to policy instruments of flexible cooperation and hedging on multiple technological developments in a context of multiple experts result in more variation in instrumental policy ideas. However, in the absence of a language to weigh the pros and cons in a way that makes hierarchical preferences possible across actors, this results in fewer resources to decide on particular ideas. This reinforces the dynamics of the open negotiation style identified earlier.

CPRS orders a report from Lord Hinton in an attempt to receive information about reactor choice that is not affected by departmental interests they believe are present in discussions of what nuclear reactor technology the United Kingdom should chose to adopt in the future. The report reveals that the technical merit of the previous policy ideas that have driven nuclear policy has been problems of leadership rather than technological choices per se. According to Hinton, part of the blame must be laid at the feet of the government and the AEA. The first nuclear programme based on MAGNOX reactors was too large and too much time and resources had to be spent on servicing the programme rather than developing new technologies. Moreover, the CEGB were forced to construct the planned number of power plants even if fossil-fuel based plants were cheaper. Finally, when the next development in reactors came in the form of the AGR the CEGB made several mistakes. They specified pressure and temperature criteria well beyond those that had been tested in the Windscale

[109] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')

prototype AGR-reactor. Furthermore, they attempted to minimize cost of construction by the least reliable construction consortia in the nuclear construction industry (p. 9-10)[110]

"We must assume that growing energy demands can only be met by nuclear fission and fission energy can only be based on uranium." (p. 11)

CEGB has few engineers, which was part of the reason why the ordering process of AGR went as wrong as it did. The organization responsible for ordering the nuclear power plants can only make as good demands on industry as they are technically able to make claims for. The resulting lack of innovation in the industry follows from this (p. 24, paragraph 87). "Only now is a single central department being formed; history has ensured that the reserves of well trained engineers in it are limited. On the Board of the CEGB there are no engineers with design and construction experience." (p. 24)[111]. The report ordered by CPRS thus questions the know-how resources available to the CEGB in order to make policy choices in nuclear energy that are based on technical merit. This reinforces the impression that technical debates are not determinant for the instrumental policy ideas in the bureaucratic structure of the United Kingdom after the crisis.

5.3.6.3 Setting: Multiple veto-points of non-technicality: forms of cooperation

Settings of ideas of the basis of expertise in energy policy generally reinforce the patterns of non-specialized knowledge characterising the debates and its effects on settings of ideas that we also observed before the crisis. The consequence of this is seen in relation to several of the analysed instrumental ideas.

As the instrumental ideas identified above, the majority of debates relate to broader political concerns with the structure of the energy policy relating to nuclear energy rather than technical questions of nuclear energy. This was evident when examining the interdepartmental meeting that involved the Department of energy, Central Electricity Generating Board, National Nuclear Corporation, South of Scotland Electricity Board, AEA, British Nuclear Fuels. The recurring pattern from before the crisis is that despite selecting interactions that involve groups of experts that should have the best conditions for counteracting the pressures of generalist as characterizing the

[110] *The Fast Breeder Reactor by Central Policy Review Staff*. September 1974. (EG12/148).
[111] *The Fast Breeder Reactor by Central Policy Review Staff*. September 1974. (EG12/148).

bureaucratic structure of the basis of expertise, the bureaucratic structure of a generalist approach to policy ideas are framed or fielded by experts. They focus on the different ways that cooperation may be organised to improve the technology of the nuclear programme. None of the experts go beyond indicating best-practice examples. .E.g. they might mention the setting of an idea to increase cooperation on turbo-alternators, but these ideas are framed in terms of the general structure of cooperation that is sought (p. 3)[112]. That is, similar to what the instrumental ideas emphasises about whether cooperation should be organised around larger projects such as cooperating with other countries on developing a full nuclear installation or whether it should take the form of cooperation on individual, separate technologies. The basis of expertise in the bureaucratic structure of the United Kingdom seems to affect the type of content of the setting of legitimate policy ideas even in areas where it is most likely that technical content should be the basis of debates and supports the significance of this bureaucratic structure on policy ideas. The consequence for policy is reinforcement of the trends examined in the negotiation style because no legitimate claim can be made that particular specialized knowledge of a policy field should shift the power of one setting of an idea over another.

[112] *Agreed Note of a Meeting on 20 December 1974 – Nuclear Reactor Programmes* (RC/16/01)(CAB 184/165) (Central Policy Review Staff report 'Energy 1974, and After')

5.4 Conclusion

The analysis of expert policy ideas within the bureaucratic structure of the United Kingdom identified several analytical findings. The analysis has generally highlighted the way in which multiple expert actors are involved in energy policy across several energy sources, but whose policy ideas interact in different ways with the open bureaucratic structure.

The capacity of the state in the United Kingdom is characterised by an absence of strong state capabilities and intervention capabilities. This makes politicians and experts inclined to select ideas that are less based on state capabilities and more on other actors' resources. Additionally, expert groups are structured in a way to facilitate coordination of policy ideas, but not decision-making. Diplomatic ties and industrial relations are two forms policy ideas of relying on other actors' resources for policy goals, which is a recurrent pattern. In expert debates, disagreements between different departments about policy ideas that should define the oil policy in the North Sea show that concerns for international diplomacy and multinational oil companies sometimes outweigh the influence of concerns for ability to manipulate energy demands toward other energy types – and to increase taxes on some of them. The Department of Energy focuses on coordination and consensus. There is some weight for the political dimension of coal unions early on, but it is less critical among experts within government after the labour government comes into power. The importance of maintaining industrial stability in the coal sector is however still emphasised by minister in cabinet meetings. These patterns repeat across the periods before and after the crisis.

The variation between the policy ideas between the period before and the period after the crisis is not that pronounced in the United Kingdom. Partially, this is due to the inherent stability and status-quo that is maintained by a negotiation style that is characterised by interactions between many actors which are in a symmetric power relationship where no one group can dominate the views of another. This is evident from the many attempts to find consensus between otherwise differing policy ideas. In addition, the particular configurations of each dimension of bureaucratic structure have in several instances reinforced existing tendencies in another dimension. While the capacity of state pushes for policy ideas that rely on other actors, the negotiation style in the bureaucratic structure of the United Kingdom also invites a range of actors to contribute their own policy ideas. This results in a plurality of actors and policy ideas in play. This is in turn supported by the basis of expertise, in which policy ideas are debated at a general level rather than in their technical specifics.

This results in debates on policy ideas operating mostly at the level of instrumental ideas rather than the settings of agreed upon ideas, which reinforces status-quo outcomes. Illustrative of this trend were for instance the differences between expert groups about the Petroleum Revenue Tax after the crisis, or the differences between policy ideas of CPRS and Treasury on one side and AEA and DTI on the other in the topic of reactor choice before the crisis. The common solution is to defer decision on issues that can be argued to wait, and agree on the general outline of those that can be agreed upon – in the latter case, the restructuring of the nuclear construction sector into fewer consortia. This gives the negations a certain level of inertia and bias towards maintaining the status quo.

Domestically the supply insurance is maintained through coalmines and expectations of oil in future. Nuclear energy shifts back and forth due to politicisation of technical choice[113]s. The capacity of the state in nuclear was defined in terms of facilitating diplomatic ties that allow existing actors in the industry to operate more freely. The need to involve many different expert groups in the energy policy development means that technical discussions are not as sophisticated as otherwise could have been the case. Moreover, the structure of power symmetry between the expert groups means that an emphasis is on consensus. When this cannot readily be achieved, questions are pushed for debate at a later time. The negotiation style becomes one focusing on flexibility as seen in the nuclear policy, where choices are pushed around through a constant concern to not be left behind technologically and to maintain the domestic industry, but which effectively results in staggering the nuclear programme.

The lack of specialized training for much of the expert groups involved in policy means that in particular nuclear energy policy becomes characterised by debates that instead focus on implied policy outcomes. The technical choices before experts are thus rarely directly debated as technical choices, but instead in terms of their implications for the industry, diplomatic relations or future development possibilities. This reinforces the pattern of consensus-seeking both before and after the crisis. The CPRS explicitly notes the inability of discussing the policy ideas at a level of the technological choices required and this characterises the debates across time. As the meetings between expert groups on the different stages of nuclear policy before and after the crisis indicate, this pattern of non-technical debates is consistent within nuclear energy discussions even when the

[113] By comparison, as we shall see, politicisation in France was within the context of strong technophilic tendency and support from strong state capacity to intervene and shape future industry.

expertise of the Atomic Energy Agency is involved. The last point is crucial for how the role of the bureaucratic structure must be understood by examining its three analytical aspects. Alone, the educational background might seem to be sufficient explanation of energy policy outcomes: United Kingdom experts were predominantly generalists and French were predominantly technical experts. However, when examined alongside the category of open or closed negotiation style, we observe that the existence of technical know-how can be limited by the type and form of negotiations that characterise the struggles between different policy ideas of experts. Moreover, the Department of Energy following these limitations is mostly relegated to coordinating the different views of involved expert groups rather than controlling the policy direction per se.

The fact that the framework of open bureaucratic structures applies in terms of weak capacity of the state across different political party governments reinforces the point that this is a structurally distinct tendency, not a consequence of politics per se. That being said, it is within the formal remit of the political incumbents of government to formulate and legislate on policy that they see fit. The "disengagement" policy line of the conservatives in the early 1970s can be seen as an attempt to limit the role of the public in social life, which may have succeeded in some manner by introducing managerial practices of the private sector into parts of the public sector (Young and Lowe 1974, chap. 12). However, in terms of changing the open or closed nature of the bureaucratic structure, there was limited changes compared to the existing trend of large federal departments despite attempts to reduce tendencies for interdepartmental compromise (Young and Lowe 1974, 130–31).

Chapter 6 Analysis of Bureaucratic structure and policy ideas in France

The analysis that follows combines the focus of the theoretical framework on institutional factors and policy ideas of experts with the empirical record of energy policy in France in the period surrounding the oil crisis of 1973. Similar to the previous analysis, it has two major sections.

The first section analyses the specifics of the institutional setting for French energy policy. It does so, by examining the bureaucratic structure of France from the analytical categories of capacity of the state, negotiation style and basis of expertise. These three dimensions are drawn from the theoretical framework. In the case of France, the finding is that there is a high capacity of state within the policy area of energy, which is characterised, by a limited number of actors in a closed policy environment where access is maintained by state channels. The negotiation style within this domain is highly technical in nature and focuses on specificity of policy solutions to problems that require particular skills. The negotiation of policy equilibria and coalitions among expert groups is made possible by the basis of expertise in specific disciplinary knowledge held by experts and the formalization of policy involves recurrent actors holding such skills.

The second section moves on from the institutional setting of the bureaucratic structure to analyse the role of ideas in such a context. This part of the analysis examines the ideas fielded by the experts in a particular bureaucratic structure. The cut-off point between before and after the advent of the oil crisis has been chosen as autumn of 1973. This choice of layout of the analysis is primarily for pedagogical reasons to aid the reading of an analysis that spans a period of several years before up until the late 1970s. The distinction as laid out here thus makes no a priori assumptions about the theoretical or empirical content. That being said, if changes do occur before and after, it would be easier to pick up having made a rudimentary distinction between the before and after an event. The analysis in this section is organised along the same three analytical dimensions of capacity of the state, negotiation style and basis of expertise, but attempts to examine how policy ideas at different levels of operationalization (overarching, instrumental and setting) operate in these analytical aspects of the institutional environment. The broad theoretical purpose of this move is to better pin-point analytically the areas where different aspects of policy ideas and an

institutional environment interact. More specifically, it helps illuminate how the dynamics of expert policy ideas shift, or not, during crises in a particular bureaucratic structure.

6.1 Bureaucratic Structure in France.

The theoretical chapter examined the ways in which the bureaucratic structure in the case of France can be considered closed because of the centralized and insular nature of policymaking combined with a limited number of, primarily, publically driven or directly state-controlled actors who helped define policy. The capacity of the state in such a context is strong due to its ability, and willingness, to manipulate or directly control the interaction of societal actors in the economy. Interaction between the groups of expert actors involved in such policy-processes are generally formalized in nature and characterised by regularised patterns of communication. Partially due to the state capacity to intervene in society, the basis of expertise, that is to say, the competences of the experts themselves tend to mirror more specific roles and their educational backgrounds to be more specialized.

6.1.1 Capacity of the state

This analytical aspect of the open or closed nature of the bureaucratic structure aims to illustrate a couple of dimensions about the French case. Generally, the aspect of capacity of the state seeks to examine how many actors are involved in governance of given policy fields – in particular energy. These patterns of state capacity reflect historical choices about the degree of state involvement in societal affairs and the power asymmetries that exist between the state and other actors. More specifically, it speaks to state involvement among the relevant actors in policy formulation. This involves gaining an understanding of how frequent and deep the involvement of state is in the energy policy of France.

The period following the Second World War was a time of reorganization and renewal in many aspects of European societies. This was no less the case for the way the state operated in the economy. As opposed to other European countries, notably Britain, France never adopted an Anglo-Saxon free market capitalism as a model for their economy or the consequent state governance or -lack thereof - that follows (Hayward 1972, 287). Instead, France favoured what we may term a *traditional statist* approach to governance where the government by political power of coercion

through the medium of law and legal dominance can dictate the functioning of the economy as well as the actors within it. Be it through state monopolies, nationalisation or other direct intervention and limitation of free enterprise. These broad ideas about a centrally controlled and directed economy has become known as (a variant of) *dirigisme,* the philosophical roots of which can potentially be traced back to Rousseau and the concept of the general will (Hall 1986, chap. 7).

The fact that the French state conforms more to a strong side of the spectrum does not mean that the status is not a dynamic. In relative terms, the shift of capacity between state and other actors may shift over time. To a great extent the immediate couple of decennials following the second world war were characterised by an unwillingness by Government Departments as well as private industry to enter into contractually defined commitments (Hayward 1972, 288). In many ways, this reticence to integrate the state, nationalized sector and dominant firms in the private sector into tighter cooperation reflected disequilibria that had characterised the fourth republic (Frost 1991, 115–16). In the decade between the mid-1950s and the mid-1960s, France underwent changes that marked a transition away from a traditional- to modern capitalism. The geographically diffuse group of small business areas that used to be the key clientele of the state was replaced by a corporate- and managerial- elite that was spatially centred around the capitol[114].

The demonstrations and industrial conflict that spurred in May and June of 1968 resulted in a crisis that shifted the relative balance of state to society and industry by changing the dominant organization patterns[115]. The *traditional statist* approach organized around a legalistic command and control logic where the state controlled subservient companies or organizations through law became associated with the failures that caused the crisis. This meant a shift away from the sole focus on hierarchical legal superiority of the state vis-à-vis the organizational environment that makes up, society at large. While not a wholesale abandonment of this approach, it ushered in a period of recourse to voluntary contractual obligations between state and other actors as opposed statutory obligation by law (Hayward 1972, 287).

However, the dominance of these contracts should not be overstated. The shift did not mean the complete replacement of state evolvement or the complete abandonment of *dirgisme* in French governance. Instead, it has served to reorient the organization of the relationship between state and

[114] A nice overview of this transition can be found in (Kuisel 1981).
[115] For an examination of the union side of this shift, see (Lange, Ross, and Vannicelli 1982, 41pp)

the rest of society towards a less legalistic and more voluntary agreement structure. In principle, this has meant the introduction of new tool into the governance of French economy and with it a new focus on markets as a separate but corollary element to French governance. The general shift of thinking is illustrated in Pour Nationaliser l'État by the 1968 research group led by Bloch-Laine of the *concerted economy* based on explicit cooperation between industry and government. The caveat being, that the role of the state is still tantamount. One of the planners of the Minister of Finance from around the period noted the increasing reliance on market forces in saying:

"…to recreate the market when it can exist, such is the primary mission of the Government"(quoted in (Hayward 1972, 289)

This ushers in a new role of markets, which are no longer a legally controlled object of the state, but rather something that should work in conjunction with state to create society. The key difference to a more clearly liberal organization of the economy and less state control is that the state still maintains a key role in not only shaping the market, but actively creating it when it is deemed to be able to exist – presumably also by government. While a shift away from traditional statist dirigisme, it is thus not a complete wholesale adoption of liberal market relations and diminished state role – or even reduced intervention. Rather, the concerted economy was to be a tight cooperation between industry and state planners. As noted by the President of the French Employers Federation in 1968 "The salient feature of this new phase of our economic development is the decisive role the States will be called upon to play..." (quoted in (Hayward 1972, 287)). In a paradoxical sense, the turn towards quasi-contractual obligations, rather than the legal domination of traditional statist dirigisme, meant that the new form of state-society relationship ushered in a central role for the state in intervening on behalf of French industry.

This combined acceptance of international competition and profitability as a yardstick of growth merged and actually increased the role of state in managing the competition of the French industry vis-à-vis international companies and interests. Dirigisme had changed, but was not forgotten. This particular combination of pressures is what later allowed the fostering of what President de Gaulle called *National industrial champions*. The general economic governance of the period can be seen through this prism, and even later, the echoes of these policies are existent today through former French public monopolies. The content and form of dirigisme and the tools applied by French government to govern the country has thus changed over time, but in the period examined by this

thesis the general characteristic of the French case is that the role of state cannot be ignored. The planning commissions of the economy were key throughout the period and the role of the French government was significant even after accepting the failures of traditional statist approaches and acceptance of profitability and international competition - to the extent that the industry itself looked to government.

6.1.1.1 Governance of the Energy sector

As we learned in the introduction, the French economy was generally more reliant on oil imports than the United Kingdom. That being said, there were some areas of French colonies that had oil reserves. In particular, the discovery of oil in Algeria in the mid to late 1950s meant that France had somewhat of a pathway to insure energy security through oil fields within, if not France itself, then its territories. Here again, the role of the French state was clear. The edict *code petrolier saharien* which dictated an even split of profits from French oil fields between the French state and the oil industry (which was dominated by French public monopolies). Moreover, the French state was given priority supplies of oil from French owned territories(N. Lucas and Papaconstantinou 1985, 15). This meant that by the late 60s France actually produced around 80mTe of oil to a national demand of 70mTe, effectively making France energy independent within oil in this, albeit short, period (N. Lucas and Papaconstantinou 1985, 17). Throughout the period from the discovery and beginning extraction of oil in Algeria up until the oil crisis in the early 1970s the oil consumption in France grew – mostly at the cost of coal which went from more than 40% of total domestic energy consumption in the mid-1960s to around 16% in 1973. This development was mirrored by the share of oil in total energy consumption, which in the period from 1965 to 1973 actually rose faster in France than in the U.K.

Part of the explanation for the difference in share of oil in the energy mix lies with the higher importance given to domestic coal production in the United Kingdom rather than in France. In fact, the French actively preferred oil to coal. Would that make it possible to argue the French capacity of state was actually not as strong as the preceding analysis has claimed? As with many questions, it is a matter of the relevant perspective. It is fair to say that compared to coal- and nuclear sectors which were predominantly state owned monopolies, there was a lower share of public control through ownership in the oil sector (N. J. D. Lucas 1979, chap. 1).

This meant that the state capacity in the oil sector was generally weaker, compared to other energy policy areas. Part of this was through institutional heritage of the oil licensing system of the 1920s was quite restrictive in allowing state involvement in the oil sector. That being said, the oil sector operates under different conditions for control than does other sectors. The weaker bargaining position vis-à-vis oil producers than other areas of policy, but also simply reflects that the fundamental determinants of oil market (like growth of supplies, buying and selling prices as well as rates of profit) could not reasonably be controlled by the French state through regular policy tools like licensing of oil extraction and refining to oil companies (e.g. Esso and Cie. Francaise de Petroles BP). In addition, the control that the French state could hold on oil production through French former territories (esp. Algeria) show a considerable state involvement through ownership, with Elf-Aquitaine, Shell-Francaise having 70% and 35% state ownership respectively making up 50% of sold oil productions between them (N. J. D. Lucas 1979, 6).

6.1.1.2 Why did oil supersede coal before the oil crisis?

While part of the explanation of the growth of a non-state controlled energy source was allowed can be explained by reference to the influence of high-ranking Gaulist politicians in the French oil industry, it is also, by extension worth noting, that the reliance on oil was seen as a way that French energy supplies could be insured to the greatest extent. If that meant collaboration with industry on less traditionally statist conditions it still served the purpose of insuring national supplies of oil where France were given priority. A fact, which melded well with the French independence sought by De Gaulle at the time. In this perspective, the access to cheap oil where licensing rules allowed the French state to dictate the conditions of industry involvement can be seen as the most preferred option. This interpretation is corroborated by the speed at which the French state attempted to take back control of the energy sector when the oil crisis hit and it became evident that access to cheap oil was no longer going to be a viable option.

Nuclear energy provided the alternative, which would allow both control of the production of energy of a higher amount of total energy demand to lie with the French state. By controlling domestic energy production the state effectively was able to manipulate a basic input factor of the economy as well as a proxy for international competitiveness (because lower domestic energy costs reduces production costs for French companies thus increasing their relative competitiveness vis-à-vis other countries). At the same time, it allowed the Gaullist ideas of energy independence to come

into full force with the selection of national champions which essentially allowed the state to both insure energy independence as well assume more direct control in the economy over companies. It would entail creating an entirely new focus on technologically advanced industries which themselves, it was believed, create expertise and products which could be a competitive advantage in its own right for the general benefit of the French economy. In this light, perhaps it was not surprising why a wholesale shift to nuclear energy became the policy response of the French following the first oil crisis.

6.1.1.3 Nuclear energy policy – a return to dirigisme

The nuclear energy sector thus became the place where the French state put most of their focus into a response to the oil crisis of 1973. This is also where we really see the French state take back control of the energy policy that had previously relied more heavily on private oil industry, not all of which was French nor subservient to state control through demand and supply policies or pricing schemes. Key to the nuclear energy policy of the French state was, as often the case, the planning commission, as noted above. Because nuclear energy was not just a question of industrial construction, but also of technology development, the role of policy development and formulation fell on a number of agencies under direct French state control, in particular relevance to the actual energy policy choices in nuclear were the nuclear development agency and public energy supplier.

These were the two big public agencies responsible for nuclear research and development and energy production, respectively: *Commissariat à l'Energie Atomique* (CEA) and *Électricité de France* (EDF). Key to the story of the dirigisme within energy policy in France is how these agencies interacted and negotiated the policy advice that became the basis for French nuclear policy. It is by examining these two organizations in the period before and after the oil crisis that we come to understand the trajectory of French energy policy in more detail and why the nuclear policy that the French state preferred ended up looking the way it did. While the ultimate decision for energy policy decisions lay with the Council of Ministers, the CEA and EDF held considerable formulation and definitorial power over the nuclear energy policy that came to define the energy policy response to the oil crisis in France. It is to these actors, we now turn.

6.1.1.4 Nuclear energy is the battleground to examine

Électricité de France (EDF) was created after the Second World War in direct opposition to the previous structure of energy supplies in France and with a view to rebuild French electric infrastructure under the auspices of government control (Jasper 1992, 654). Before the war, the electricity supply in France had consisted of a multitude of private suppliers running on a number of different frequencies and voltages. Attempts were made in the interwar years to alleviate these problems through a series of policy instruments concessions for long distance transmission of electricity, national bodies through which producers could cooperate and standardize production and transport of electricity across the country. Despite such efforts, the end of the Second World War saw a chaotic energy production sector. There were still 54 different companies producing electricity from 86 thermal stations. About 100 companies utilized some 300 hydraulic stations for electricity production. 86 different companies were responsible for transport and transmission across long distances and, finally, all of this was encompassed by 1150 different distributors (N. J. D. Lucas 1979, 10).

Predictably, this led to problems of interoperability and unreliable energy supplies throughout the period. The solution envisioned by politicians, engineers and labour unions was a single standardized electrical network, which was to be controlled by a single large national company as opposed to the multiple smaller private companies from before. The law that passed in April 1946 effectively nationalized all the private electricity suppliers into one publically controlled entity; Électricité de France. This new public organization was accountable only to the Ministry of Finance for expenditures and to Ministry of industry for its development programme (Hecht 1994, 660). This new entity saw as its primary task to stabilize the electricity supply under public control. This quite quickly led the EDF to examine the possibilities of nuclear energy in achieving this goal. The interest of EDF into nuclear energy probably started already in the early 1950s under the auspices of Pierre Ailleret, the research division director at EDF and concurrent member of the steering committee of CEA (Hecht 2009, 80).

Commissariat à l'énergie atomique (CEA) was created the year before EDF in 1945, with the purpose of "scientific and technical research with a view to the utilization of atomic energy in the several areas of science, industry, and national defense" (Hecht 1994, 660). It was seen as a way to increase French status in international relations following the display of military power that was the human disasters of the nuclear bombing of Hiroshima and Nagasaki during the Second World War. Moreover, it was also believed to help speed up the recovery of the French economy following the destructive effects of the war on the economy and society. In short: To build a nuclear bomb and to kick-start a potential economic sector of high technology (Roqueplo 1995, 178).

Different from the EDF, the CEA was created with an explicit mandate of autonomy and was thus not accountable to political influence of any particular ministry nor required to follow similar financial controls as other state enterprises (Hecht 1994, 660–61). French industry were primarily involved in the work of CEA through stakes in the engineering and construction company *Franco-Américaine de Constructions Atomiques* (FRAMATOME), which was initially formed to allow the Westinghouse-developed design of PWR-reactors to be built in France by the Franco-belgian Schneider Group, Empain, Merlin-Gérin and the American Westinghouse company. As well as the production division of CEA: *Compagnie Generale des matieres nucleaires* (COGEMA). The first was a conglomerate bidding for the construction orders set out and defined by the French state and the latter were directly financed and controlled by the French state through the CEA[116] (N. Lucas and Papaconstantinou 1985, 2).

[116] As a side note, in 1982 the French control of FRAMEATOME was increased by higher share of ownership by French industry company Creusot-Loire as well as increased political control by CEA in the company. After merging with COGEMA in the early 2000 and renaming to AREVA NP the French state reacquired majority control through EDF (which the French state holds a majority share) assuming ownership of AREVA NP in 2018. Effectively returning both COGEMA and FRAMATOME under French state control, only now, under the auspices of the EDF – a power shift also mirrored in this analysis.

6.1.1.5 French dirigisme and the energy sector

This part of the analysis has emphasised the continued, albeit shifting role of the state in the French economy. The story is in many ways of how dirigisme has permeated French industrial and economic policy throughout the period after the Second World War up until the first oil crisis. The interaction and cooperation between markets and state have changed from almost non-existent to a cooperation based on the idea of concerted economy. This broader outline of the capacity and willingness of the state to intervene in societal and economic affairs becomes manifest in the focus on selecting and supporting the international competitiveness of domestic industries into "national champions". Within this context, the energy sector is but one example of how this state capacity to intervene has been observed, but one of the more strongly felt. The shifting points from coal to oil and then to nuclear were explicit state interventions in the economy and in the case of nuclear, the major actors involved in the development of the industry were either in close cooperation, by doing the bidding of with the state, or explicitly state controlled actors. This pattern of close state involvement and publically controlled (by ownership or otherwise) agencies and companies leads us to expect these patterns to affect the policy ideas that permeate energy policy in France.

6.1.2 Negotiation Style

The second analytical dimension of negotiation style is an organisational dimension that attempts to capture the dynamic of interaction that is set by the institutional setup of the actors who are involved in policy formulation within energy policy in France. Because the institutional context of nuclear policy formulation revolves round closed commissions and functional merit for access the number of actors involved is reduced. The actors that are allowed access based on these rules are therefore more bound by these positions. This means coalition-building between different institutional actors within these closed commissions is more difficult. The closed nature and size of these interactions means that regularised patterns of negotiation may lead to more technical rather than politicized formulation of policy advice. The effect on policy ideas is expected to be ideational stability characterised by incremental changes over time.

6.1.2.1 Closed negotiation arenas with functional requirements of membership

Regularised interaction of similar actors based on their association with specific agency or specific technical expertise. This meant that the total number of contesting policy ideas held by involved actors that can possibly be in play is reduced with the number of participating actors.

It is not an uncommon contention among several observers of the history of French energy policy that it was dominated by few groups of individuals with very similar beliefs and educational background (Jasper 1990, 83–85; Picard, Beltran, and Bungener 1985; Simonnot 1978). Interestingly, it was not the actual number and similarity of the people involved that dictated their ability to be involved with and access policy formulation for a for the nuclear energy policy. This may have spoken to the techno-philia and ability to reach agreement among members (a point we return to in the analysis of policy ideas), but the primal condition for influence on policy is access to key agencies and commissions that formulate policy advice for politicians. Access to any of these venues requires either a senior position one of the relevant public agencies (or in few cases, French private industry involved with commission advice).

Judged by numbers employed by them in the most key of these commissions, the numerically highest probability to be part of central formulation of nuclear policy required a technical background and employment with either EDF or CEA - through attendance at advisory commissions like *commission pour la Production d'Électricité d'Origine Nucléaire* (PEON)[117]. The style of negotiation that took place within these agencies was for this reason characterised by similar tasks of making policy recommendations for nuclear policy for the government to decide on. This advisory and policy formulation role did not shift fundamentally in the period examined. Moreover, besides shifting political support towards the nuclear energy programme following the oil crisis of 1973, the authority of the agencies involved was not questioned by politicians to the extent that the institutions ceased to have influence in the relevant commissions.

6.1.2.2 The planning commission for nuclear energy: PEON.

[117] An argument could be made according to which their presence in these agencies depended on a common background in an elitist community of schooling which connected several of the top agencies and bureaucrats within them as well as politicians in France. This, however, is a question of how individuals gain entrance into existing bureaucratic and governmental structures, not which form these structures take and how they mould the interaction styles of the participants. We will return to the former question in the aspect of bureaucratic structures relating to basis of expertise.

In a more closed bureaucratic structure, where there fewer points of access, where does policy originate? The answer is necessarily a complex one, and some simplification is necessary. This reduction in complexity is necessary also when the policy choice examined within energy policy quite clearly favoured one form of energy – nuclear – over other sources. Within this sub-set of energy related policies, who helped bring about the policy?

The role of the Delegation Generale D'energie (DGE) under the ministry of industry is a relevant starting point because the Directeur General is one of the closest things to a permanent secretary of minister for energy that the French political system has. The directeur sits at the intersection between the administrative capacity of the bureaucracy of the state and the political leadership in the Conseils des Ministres – who he reports and presents to. He has a small staff that in many ways are similar to a minister's cabinet and is even on occasion referred to as the (unofficial) "Minister for Energy" (N. J. D. Lucas 1979, 138). However, despite similarities, the small size of the DGE means it is highly reliant on information from other agencies and groups like the public enterprises (e.g. EDF) or through committees.

The most important and influential advisory committee for nuclear policy is the aforementioned PEON commission (Frost 1991, 191–97; N. J. D. Lucas 1979, 141). The commission was instituted by President de Gaulle in 1955 to advise the government on the formation of nuclear policy. The composition and access to this commission thus speaks to the relevant actors, power distribution, as well as proxies for the type of interaction style that would have existed. The commission reports to the Prime Minister and members are drawn from the highest levels of the French bureaucratic system, public enterprises and are appointed by government appointment. The formal nature of the access requirements meant the meetings took on a regularised form of similar groups of people who were present due to either functional requirement or particular expertise.

The commission consisted of the highest members of the CEA and the EDF, representatives from three departments (directions) of the Ministry of Finance (Budget, Trésor and Direction de la Provision), the planning commission and major companies of the nuclear and oil sectors (Hatch 2015, 153). Two types of membership existed, members by right (due to position in key agencies) or members by temporary appointment each four years. The latter made possible some flexibility in membership and opens the possibility for a less technical and more politicized negotiation style when formulating policy advice. Over time, the relative composition of actors did actually shift

somewhat between actors (for instance the Ministry of Finance increased its presence from 1968-1970) and may go some way towards indicating politicization. However, it is worth noting that while increased oversight may have been attempted by Ministry of Finance, they held no membership of right in the early 1970s and the general composition was still heavily skewed towards technical expertise and the EDF and CEA were particularly numerous, with their representatives making up almost half of the total commission (N. J. D. Lucas 1979, 141–42).

That is not to say that the number of representatives in the guiding body for a policy area necessarily means greater influence. The fact that regularity of attendance and influence in the PEON commission was relatively constant over the examined period does not mean there is no contestation of decisions, or that re-opening of decisions is impossible. After the nuclear energy programme had been chosen as the answer to the oil crisis with the introduction of the Messmer plan in February of 1974 the state investment into nuclear programme seemed inevitable. Despite this clear favourite status, the Ministry of Finance continued to attempt to limit the scope and cost of the programme, as they had done previously, throughout the remaining examined period.

As will be noted in the analysis of ideas below, the CEA and EDF had attempted to increase spending on a government funded nuclear programme for a longer period before the oil crisis and a combination of resistance of the Ministry of Finance within the PEON commission as well as less political support from the Council of Ministers who would have to approve such a plan meant that it was not until the trigger of the oil crisis allowed both to shift (Hatch 2015, 152–53). What is worth re-iterating is the relatively closed nature of this commission and the high technical level of expertise that dominated it. The reports issued by this body acted as a guide-line for nuclear policy choices available to policy-makers and the makeup and conflicts of ideas within this organizational body is thus highly relevant when examining French energy policy in general and nuclear policy in particular.

6.1.2.3 A counter-factual: Outside influence?

Not just that less ideas were floated, but because the main task of defining and formulating a nuclear policy was left primarily with the experts in the PEON commission, the possibility for outside influence on the policy ideas was limited. In that sense, even if there were of course fault-

lines of conflict over ideas about the nuclear policy proposals, they were rarely, if ever, directly questioning the nuclear policy itself, rather its technical makeup and cost.

This should not be understood as if there was no political activity outside of the machinery of bureaucracy and state-industry collaboration that debated and contested the nuclear policy direction, especially after the expansion of the programme in the aftermath of the Messmer Plan in 1974[118]. However, even the perhaps most famous of the initial public outcries were illustrative of exactly the point that decision-making was centralized around Conseil d'État and the agencies that defined nuclear policy. Examining this event may help to illustrate, that if the energy policy choices in France were less centralized and closed, this demonstration should have less reason to have existed. Moreover, the quandary that the fundamental openness of the policy formulation was not opened further following this event shows how insular the process of policy-making was around the issue of nuclear energy in particular.

The attempts to build the Superphénix nuclear reactor at Creys-Malville in the south east of France in the summer of 1976 were perhaps the best example of this initial public discontent with the nuclear policy - which by critics was considered to have been decided without consultation of the populace. Because of the proximity of the location to both the German, Swiz and Italian border, it also became an example of international organization of popular resistance. That being said, the demonstration, or "anti-nuclear celebration"[119] (Jasper 1990, 238–39) was a relatively calm affair in the beginning despite the mishmash of nationalities and between 2000 – 3000 people in attendance perhaps because of the explicit non-violent stance of the organisers. The violent reaction of the French state through the CRS which by use of tear-gas and clubs removed the attendees backfired on the authorities when local authorities arranged public hearings on both the nuclear programme and the violent reactions of the state towards citizens. (N. J. D. Lucas 1979, 197–99). The incident at Creys-Malville is perhaps the earliest event involving several thousand demonstrators. It is also indicative in that it mirrors the primary public pattern of contention with the nuclear programme in this period was primarily strategies relating to public demonstrations (Kitschelt 1986, 69).

[118] Named after the Prime Minister Pierre Messmer (described in more detail in the analysis of policy ideas in section 2.2)
[119] "fete anti-nucléaire

Perhaps surprisingly, the hearings that followed did not lead to condemnation of nuclear programme itself, rather the way in which democratic processes had been surpassed by not consulting local populations as well as the violence with which the state had attempted to remove protesters from the site at Malville. Thus, the socialists and communists of the local council condemned the undemocratic nature of the decision-making and the socialists requested a halt to the Superphénix until demands for more consultation and openness were met, but did not fundamentally disagree with neither the Superphénix nor the nuclear programme in general. The same held for the Communists and the presidential majority of the council who made up the two other factions to field proposals following the hearing (N. J. D. Lucas 1979, 199).

In hindsight, the development of public opinion in France towards the nuclear programme can perhaps be gleaned from the outcome of this event. Jasper, 1990 notes how the initial support for nuclear programme was low in France compared to other nuclear countries like U.S. and Sweden, but throughout the 1970s and 1980s actually turned towards a higher number of the population actually being more accepting of nuclear energy (Jasper 1990, 261). This is a curious development given that the fundamental claim of the criticism, that the state was making centralized decisions about policy that affected local populaces without notifying or consulting them in advance, was probably true – even before the violent reaction by state towards demonstrators. Because the Conseil d'État had in fact approved a declaration d'utilite publique (DUP) submitted by the EDF for the construction of the Superphénix at Malville despite criticism from local representatives that they had not been consulted on the decision (N. J. D. Lucas 1979, 197).

6.1.2.4 Insular and controlled by formal rules

The negotiation style in the bureaucratic structure of France is generally rather regularised around either specific agencies or their work in advisory commissions, which involve an inter-ministerial group of actors. The most important advisory commission for nuclear energy is the PEON commission whose members are formally members due to function or government appointment – all of which represent agencies, ministries or French public (and to a lesser extent, private) industry. This regularised and functional approach to membership means relatively few substantial shifts in the nature of negotiation around formulating policy advice. Because the temporary membership is only each four years, the ability of any one member group to increase its presence is minimized. Moreover, this means that meetings become resistant to increased pressure from ongoing political

struggles and interests – even should they reach the Council of Ministers. When changes in membership occur, there may be shifts in power among spenders and savers, but the general composition is biased toward high technicality by design. This affects the reliance of negotiations on personal or ad-hoc agreements.

The insular nature of these negotiations can also be gauged by another angle. By examining the way in which the bureaucratic structure has dealt with opposition from outside the select few who are allowed attendance in the meetings. The public disaster of the handling of the Creys-Malville reactor site is instructive in this regard. It illustrates the centralized nature of the decision-making with regard to nuclear policy, but the turning point of the critique against government was exactly that the process had been a closed affair between involved agencies and the central government, not involving local authorities or politicians in the matter. We are thus left with an impression of a highly insular and regularized proceeding of meetings between technical experts, who, while their representation shifts over time may indicate shifting power balance and some degree of politicisation of the nuclear energy policy formulation, these shifts happen very slowly at the institutional level.

6.1.3 Basis of expertise: Technical skills

The previous section attempted to identify the actors that are involved and allowed access to energy policy formulation in France. This section on the third analytical category of basis of expertise in the bureaucratic structure describes the skills and competences of those actors that are involved and allowed access to negotiations on policy formulation. By affecting the ideational positions that actors take in negotiations, this ultimately affects policy (the dynamics of which are examined in section 2, below). In the French case, the level of technical skill is high among the involved experts because of a background in the French grande école education system. This reinforces the technical nature of the policy advice given by experts to politicians on concrete energy policy.

6.1.3.1 Strategically placed specialists

The substance of the educational background of the experts in the French bureaucratic structure varied by position and the specific conseil général that the individual was *placed* in. This wording is chosen specifically, because the French state was perhaps as keen to control the educational

background of the employees in state functions as they were about controlling access requirements to the schools described above. This helped create a group of highly educated bureaucrats who were strategically put in positions where they might best serve the purposes of the state (Quermonne 1991, 179). This point can broadly be gleaned when examining the educational background of French bureaucracy around the time. While there are no reports on the subject exactly on the eve of the crisis, a report from the early 1980s encompasses the period of the first oil crisis and should therefore reasonably represent the pattern of high educational background. At that time, the share of senior civil servants with a college degree stood at 93 percent with some college background accounting for the remaining 7 percent. No senior servants employed in senior civil servant roles had only a high school diploma as their educational background (Peters and Peters 2002, 114). The clarity of the pattern should make uncertainties less pronounced even if the numbers do cover several different areas of educational expertise.

6.1.3.2 The distribution of educational backgrounds – technical and specialist

Thus, while the large share of high level of education among civil servants in France is obvious, we need to further examine their substantial expertise to speak to how the educational background can help us examine the basis of expertise as part of the bureaucratic structure. This may help to indicate to us the type of technical or functional (or otherwise) expertise held by experts in the bureaucratic structure of a country, which may affect the policy ideas of a field of experts. France is not uncommonly compared to other Western countries with regard to their general focus on legal training. Of course, modern bureaucratic systems whose authority is at least in part derived from legality of their decisions does require legal training for most of their employees. The grandes écoles system in France has been responsible for the education and training of most of the senior civil servants in the French bureaucracy and thus the educational basis of the bureaucratic structure reflects this. This meant that special training in fields like law, economics and statistics are predominant among French bureaucrats.

This dimension is given an additional level of elitism and exclusivity by concentrating much of the legal, management and economics training at post-graduate institutions in the grande école system – in particular in the ENA (Peters and Peters 2002, 120). The Ministry of Finance drew many of their employees from this exact educational mould of social sciences and law. One of the most prestigious schools for this kind of educational background is the École Nationale d'Administration

(ENA). The graduates of the ENA were often referred to as "*enarques*" because of their educational training in economic analysis and statistics (Jasper 1990, 95). By the early- to mid-1960s, this former group of civil servants began dominating the erstwhile traditionalist Ministry of Finance, shifting their focus toward coordination of public and private sectors and inducing economic growth. This was in contrast to the preferred directing of growth followed by traditionalists of the Gaullist background - something Gilbert Devaux, Finance ministry representative in the board of EDF, characterised as transitioning from civil servants who were "literary" to "quantifiers" (Frost 1991, 119; Picard, Beltran, and Bungener 1985). This pattern still holds today, in particular at the economy and finance ministry, where 61% have an educational background from the ENA (Bilan statistique des principaux corps ENA et Polytechnique au 31/12/2012 | Portail de la Fonction publique n.d., 8)

This is not the entire pattern, even if Social sciences and Law dominate the general educational background of surveyed senior civil servants. In particular, engineering, physics and chemistry had a strong presence in the French bureaucratic structure through employees in the state engineering corps and the extremely powerful planning commission. In a country where the economy is characterised by a high level of state intervention and *dirigisme* (described in the section on state capacity) the role should not be underestimated of those bureaucrats who are responsible for the state-level strategies and plans for the future of the French economy.

The group of natural scientists are thus a relatively smaller share of the total than those of law and social science background, but no less important – especially in areas of infrastructure, planning, and the energy policy. The natural scientists were drawn from post-graduate schools much like law and economics were from the ENA. In the case of engineering, physics and chemistry the perhaps most prestigious school for such training is the École Polytechnique, which since the French revolution in the late 18th century has been educating top graduates from the French education system. A degree from this grand école was required to be admitted into one of the state engineering corps from which many employees of the public energy policy experts were drawn (Silberman 1993, 91). These employees working for the public and drawn from the top of the students at the top post-graduate school were known by drawing their title from the school, being collectively known as *polytechniciens,* whereas those from other schools, who would often not be selected for senior public positions and rather work in the private sector attracted less social status from their otherwise similar background by being known merely as *ingeneur civil* (Hecht 2009, 23).

6.1.3.3 Technical expertise in CEA and EDF

In energy policy, the role of the *Commissariat à l'énergie Atomique* (CEA) and *Électricité de France* (EDF) has been noted above. Both CEA and EDF drew most of their workforce from the grand école system in France. Throughout the history of modern French education system the engineers of the highest status have been those of the state engineering corps, two in particular – the Corps de Mines and Corps de Ponts et Chaussées (the members of which were known as "Mines"). Enrolment into one of these corps required attending the most prestigious of engineering schools (the *École Polytechnique*[120]) and the two corps would then select among the best graduates of this school. Where the CEA drew most of their workforce from these two corps, the EDF also drew employees from the École Nationale d'Administration (ENA) that were focused on economic analyses and statistics (Jasper 1990, 83). Through this institutional path, a special cadre of technical experts were created which came to be extremely important in terms of their representation in many parts of the French state administration.

Many individuals from this cadre of grandes écoles background came to be situated at the top of the key organizations that came to define French industrial policy more broadly and energy policy in particular. (Simonnot 1978) identified a group of 28 people as "les nucléocrates" because of their influence and managing of public or private industries related to the nuclear programme out of which 20 were from *École Polytechnique* and one an economist from ENA (Simonnot 1978, 24–25). These people were trained and held positions of influence and power because they were in possession of technical and specialist knowledge that made them privileged but also responsible for effectuating on the knowledge on nuclear energy which would promise economic benefits to the French nation. This great responsibility can also be seen in the authority attributed to them in colloquial language. As Jasper, 1990 quoting a former CEA employee, notes: "X speak only to Mines, and Mines speak only to God"(Jasper 1990, 85). That of course does not mean that conflict did not arise either in everyday work or in longer drawn policy battles (as we shall see later), but it does mean that they had a certain common ground in their status as the educational elite of France imbued with a certain level of national pride and sense of civic duty. That the organizations principally run by people with similar educational background, sense of public service and belief in

[120] Graduates of Polytechnique are sometimes known as "X" due to the importance of mathematics in the educational programme (École Polytechnique - Accueil site de l'Ecole Polytechnique n.d.)

technological innovation, were very much in accord about overarching ideas, is in this respect not surprising and nuclear energy was just the sort of technological project they could all rally behind.

6.1.4 Basis of Expertise in France

Table 4 Basis of Expertise in France

	EDF	**CEA**	**Ministry of Finance**
Academic origin of personnel	Engineering schools but also ENA	Predominantly Polytechnique and Engineering schools	Predominantly ENA
Type of academic training	Technical expertise plus capacity to utilize language of economic discipline (quantification, statistics).	Technical Expertise (physics, chemistry, often background with one of the two national engineering corps).	Economic and statistical expertise. (quantification and statistics).
Overall education basis	Mixed	Predominantly technical	Predominantly economic

6.2 French bureaucratic structure

The preceding examination of the French bureaucratic structure suggests a couple of key observations can be made. Historically, the capacity of the state to intervene in society is generally strong, if shifting over time. In the period following the Second World War, this shifted towards a more cooperative interaction between state and private market actors, but where the state still had a key role in protecting and insuring international competitiveness of domestic companies. The Gaullist concept of national champions fits into this pattern and it is through this lens we may also understand the energy policy of France – and the nuclear policy in particular.

The negotiation style within energy policy formulation follows a pattern of centralized decisions that are controlled by commissions whose membership are controlled by the government, insured either for perpetuity through functional and rules-based membership.. This makes the negotiations quite insular and less receptive to ad-hoc political pressures. The composition of these groups is dominated by technical experts who sit in either publically controlled agencies or industries and are thus indirectly reporting to the state.

The basis of expertise in the French bureaucratic structure is unique in a number of ways. While the educational background of senior civil servants is skewed towards law, like most other modern bureaucracies, two key differences are central. Most of the civil servants in senior positions have a background in the post-grad educational system of grandes écoles. These elite schools are responsible for the educational training of most of the higher echelons of public employees and they thus make up a particular cadre in themselves. Among these, there are two major groups split between the social sciences and economists trained at ENA and the natural scientists trained at Polytechnique. Second, within energy policy the predominant expertise is drawn from technical backgrounds. The membership constellation in the PEON commission, and thus policy formulation within nuclear energy, is highly technically biased toward the French public engineering corps who draw most of their members from top students of the Polytechnique.

6.3 Dynamics of policy ideas among experts.

This section explores the dynamics of ideas among experts in the bureaucratic structure of France. It highlights these dynamics in the context characterized by a closed and technically focused policy-making that is formalized around specific recurrent actors. The section examines how ideas among experts was affected by the capacity of the state, negotiation style and basis of expertise in turn at the levels of overarching ideas, instrumental policy ideas and setting of policy ideas.

Before the crisis

The policy ideas that can be traced among experts in France have their dynamics affected in different ways by the closed bureaucratic structure examined in the previous sections. Before going into the analysis of specific policy ideas within the bureaucratic structure, we have to situate the analysis of these policy ideas in a context of the energy policy developments surrounding the oil crisis in France. In contrast to the United Kingdom, the French case is to a greater extent dominated by single energy source, especially after the crisis. Thus, the energy policy developments of France are primarily centred on the area of nuclear energy. While complete substitution of oil as an energy source is not viable (especially in transportation) the general pattern of policy ideas among experts in France is dominated by the rapid and enormous expansion of the civil nuclear energy programme.

The state capacity in the nuclear sector is divided between the research and development agency Commissariat à l'Energie Atomique and the public energy utility Électricité de France as the most important expert actors. They push the nuclear programme through their influence in the PEON commission united around an overarching idea of nuclear technology to modernise French society and economy. Similar to the United Kingdom, the conflicts can be observed at the instrumental level of policy ideas. Here, the choice of reactor technology and the policy ideas of military use of nuclear technology for plutonium extraction of the CEA clashes with the instrumental idea of low cost electricity of the EDF. This ideational conflict changes the power dynamics in the PEON commission when the similarity of basis of expertise of the EDF and the Ministry of Finance allow the two to form a new coalition around the instrumental idea of cost. This allows a shift from the CEA supported and domestically developed gas-graphite reactor technology - of which seven reactors had already been built throughout the 1950s and 1960s (N. J. D. Lucas 1979, 66–67). The

EDF thus manages to gain support for a nuclear programme built around an imported reactor design from the American Westinghouse. As the crisis hits, this has become the new path of the nuclear programme and, besides the Superphénix research reactor, exclusively LWR reactors are ordered from then on (N. Lucas and Papaconstantinou 1985, 45–46). After the crisis, the difference in the setting of the idea of cost by the EDF and Ministry of Finance makes their collation untenable as the pressure from the Ministry to reduce spending on the expansion of the nuclear programme proposed under Prime Minister Messmer in early1974. In response, the strong capacity of the state to steer the strategy and response to the crisis is supportive of the CEA and EDF once again uniting around their overarching goal of expanding the nuclear programme.

Because the French bureaucratic structure is closed, the number of actors involved does not shift markedly over the period. This does not mean that the institutional structure results in status quo outcomes. Instead, we observe how the combination of state capacity through public planning and strategic planning allows the experts in the relevant commissions an extraordinary influence over defining the policy trajectories that are eventually set into motion by politicians. Rather than the negotiation style supporting of keeping different options open, what we see here is an ideational conflict over the type of direction for nuclear policy, which is solved by coalitions forming between different expert actors. At first, the shift to LWR designs of the EDF depends on the educational basis of the EDF and Ministry of Finance to be compatible. After the crisis, the EDF and CEA resist the Ministry of Finance because the capacity of state of grand projet is supportive of the overarching policy idea that unites them.

6.3.1 Capacity of the state

6.3.1.1 Overarching ideas: Public responsibility for technological development

A general trait of the French organizational structure around energy, and in particular nuclear, is the centralization of decision-making in public agencies and public energy producers as well as their technological enthusiasm. Key players in the energy policy following the first oil crisis were of course the governments themselves. However, the already existing organisational structures for expansion of nuclear energy and their proximity to power made their immediate influence on policy-making more apparent than in the more clearly politician-controlled fits-and-starts observed in the case of United Kingdom. Key actors in this organizational structure were the CEA and EDF,

in particular. The French institutions responsible for research and development and production arm of nuclear energy, respectively. Both the CEA and EDF public enterprises expressed a focus on nationalization and public control of key industries, but also a clear attempt by politicians to steer the economic recovery as well as future trajectory of France. The role of these organizations was key in defining the national nuclear programme, which in turn is perhaps one of the better examples of a 'grand projet'.

In examining the dynamics of the development of the nuclear programme, we also gain insight into the grand programmes model of state directed and controlled national innovation of industry system in France under successive governments up until the 1980s (Zysman 1982). While the role of private enterprise is not absent, the institutions that make up French (and to a wide extent also the UK) are during the 1960s and 1970s overwhelmingly state monopolies. To the extent that state monopoly exists in electricity, supply, coal mining and sales of gas and the there is a tremendous level of state involvement in all these sectors (N. J. D. Lucas 1979, 6–7) . Of these publically controlled companies, it is worth noting that gas, coal and electricity through nuclear are, with one exception, fully state controlled. There is therefore no reason for favouring one energy source over the other from the point of view of institutional control on part of the state. While the oil market is less controlled due to its more international nature and lack of domestic supplies in France, the French government still had considerable formal control through legislation (N. J. D. Lucas 1979, 6–7). In the French case, the choice of nuclear energy as the primary energy solution to the oil crisis can of course simply be regarded as a structural necessity based on lack of domestic resources.

However, when the dynamics of the development of the highly state-involved process of developing a civil nuclear programme are examined it becomes clear that the story is more complex. Especially in the conflict between different public organizations of the monopolised and state-controlled nuclear industry and their interaction with agencies like the ministry of finance or their ability in fielding ideas in planning commissions were crucial for the eventual outcome. It is therefore also in the interaction and conflict between these agencies that we observe the crucial moments of energy policy shifts through the years following the first oil crisis. In particular, understanding why specific energy policy choices were made in favour of others, e.g. reactor choice, but also the surprisingly reduced influence achieved by financial concerns from the ministry of finance is worth noting. The role of private industry is thus substantially less than the influence exerted by these public agencies in shaping the contours and investment decisions of French energy policy. In particular, the

Ministères des Finances and Ministère de l'industrie as well as the commissariat du plan because their formal power extends over all the organizations that make out the eventual energy mix of France (N. J. D. Lucas 1979, 7). How may we consider these specifically French capacities of state as linked with the ideas of experts?

It is worth noting how the political system may facilitate certain overarching ideas. The nationalization of public enterprises after the Second World War was in large part a function of de Gaullist French nationalism. This broad set of overarching ideas for energy policy linked political autonomy of France, the international status of France as a great power following the loss of Algeria (and other colonies) as well as a physical and military *force de frappe* in the form of nuclear weapons with the nuclear development of technology and industry. For President De Gaulle it followed that the achievement of these national goals would have to link the development of any nuclear programme and French controlled institutions (Hecht 2009, 93). This also helped cement the general consensus that energy policy was primarily a public venture, not a private one. This set of ideas mutually reinforces the role of experts in the public employ whose task it became to effectuate some of these broad ideas into actionable policy. It is worth noting, that Gaullism as a descriptor became more than just the general policy directions and ideas of De Gaulle himself. It became synonymous with the fundamental principle of public control over energy policy through state controlled energy enterprises. This became the overarching consensus both within the ministries and departments that dealt with energy policy, but also a unifying idea across the political spectrum throughout the period before the crisis (Jasper 1992, 654).

Such broad agreement was however not enough to eliminate disagreements within the actors of that same policy area, in part because they were affected differently by it, but also because they perceived a different role for their respective institution vis-à-vis these ideas. Thus, the 1958 return of De Gaulle to power in France acted as a conditioning political factor for the expansion of the nationalist technophilic visions of the CEA – an organization originally co-created by de Gaulle. As Hecht, 2009 notes, it was hardly possible to find an institution with stronger political backing than that of the CEA in the nascent years of the Fifth Republic (Hecht 2009, 94).

That being said, the broader political support for the overarching idea of a publically controlled energy policy manifested elsewhere in the political spectrum when, during the first funding debates

for the public nuclear energy programme entered Parliament[121]. Here the link between the nuclear programme and De Gaulle's idea of a "force de frappe" were directly connected and in so doing, the role of the proposed nuclear energy programme became one of reinstating France as a great nation through military might. The State secretary for atomic energy, Felix Gaillard, thus linked the perceived lack of French industrial capacity and the nuclear energy programme, thus effectively making "the CEA's future budget…a national issue" (Hecht 2009, 60). Combined with some skilful manoeuvring between the left and right of the political spectrum, he managed to get the CEA budget approved and at the same time link the creation of plutonium, not with a bomb, but as part of a grander solution to a problem of energy independence, a view even, the then Prime Minister, Antoine Pinay shared (Hecht 2009, 63). These broad ideas about the central role of the state in influencing energy policy (and other policy areas in general) affected which specific organisations were involved in formulation of policy. Because the CEA had previously been set up by De Gaulle to research and develop the technical solutions that would allow both a French-based development of a new technology that could reinvigorate the domestic industries as well as insure the military role and international independence of France, the role of the CEA increased as a result of these broad ideas being present.

[121] CEA seems to have been well-aware that linking of their research task with the military dimension was important at the political level. In a report on future budgets of the CEA they imply that reduced budget for research personnel might also affect the branch dealing with Military application of nuclear energy.
Note sur les problèmes d'effectif» et de personnel (424528). 22. October 1973. Energie Nucléaire - politique gouvermentale - 4, 24528,09 (CEA – Comité interministériel). p. 3-4.

6.3.1.2 Instrumental idea: The national champion

The high capacity of the state was maintained in the instrumental ideas of the energy policy. The role of the CEA as a publically controlled entity allowed state control over the development of the project that was consistent with the overarching ideas of fostering an invigorated French industry through technological advances in nuclear energy as well as obtaining the military force of a nuclear weapon. The form of this invigoration of French industry was the instrumental idea of national champions. The creation and expansion of a publically controlled nuclear programme with the practical goal of producing weapons-grade plutonium was linked with industrial invigoration by the CEA.

In order to research and develop nuclear power (and the output material of plutonium, which may result) it is necessary to build a reactor. The CEA followed the idea of finding and grooming the national champions by locating private industry contractor to help them build the reactors[122]. This selection, rather than bid for the project, was supposed to foster a "policy of champions" which would associate the selected private companies with the prestige of the nuclear programme despite the fact that the complexity and size of the project meant it might not accrue immediate profit[123]. The CEA would thus be able to further its goal of obtaining plutonium as well as shaping the industrial policy for the future of France – in the short term improving industry base in France and longer term improving the economy as a whole. The private companies who were elected "champions" were supposed to accept this both out of a belief in the nuclear programme as a long term investment project, but also because the know-how they would gain would allow them profits through future export of this technology (Hecht 2009, 66). This latter promise would be crucial for developments in the future.

The assumed link between economic invigoration of the broader French economy and the idea of "national champions" meant that in the eyes of the CEA there were few concerns beyond speed. The faster a reactor systems could be up and running the faster would be the equalisation of the technological prowess of French industry vis-à-vis other countries and the extraction of plutonium

[122] The CEA engineer in charge of coordinating the G1 and G2 UNGG reactors at Marcoule is on record for noting that the industrial director of CEA, Taranger, had meetings with most of French industry, but who were not overly keen on the project, in the end only four companies were interested (quoted in full in (Hecht 2009, 66)).

[123] The attention to the international competitiveness gained by national industry by being part of the nuclear programme is given greater attention by the CEA in periods following the crisis. See, *Note - à l'attention de Monsieur le secrétaire général du Gouvernement - Communication du ministre de la recherche et de la technologie sur les activités de recherche civile du Commissariat a l'énergie atomique (CEA) October 16. 1989 (4, 24528,09).*

would allow the eventual creation of a nuclear bomb and make France a great (military, if nothing else) power in the world scene. However, the primary concern for the CEA was the development of reactor technology and the selection of private industry to build them. The economic benefits were antecedent concerns that were more assumed that actively calculated into their choices. This meant, that the high capacity of the state led to a state-controlled organisation leading the energy policy and intervening directly in the French economy by selecting those companies who would partake, but also that their economic fortunes and know-how build-up relied on the cooperation of the CEA.

6.3.1.3 Setting: Choices of champions and gains for industry

With no clear strategy for how the instrumental idea of national champions would lead to increased know-how, export potential and growth in French industry, the chief concern became plutonium extraction over energy generation and speed over know-how for industry. These choices help to illustrate the later ideational conflicts with other public experts in the energy policy formulation of France (namely the EDF).

Before the crisis, the primary concern for the CEA was still to maintain a nationally anchored nuclear programme, which followed the overarching policy idea of a militarily strong France. The reinvigoration of French economy and society was still a concern, but they were antecedent to the concern of ensuring plutonium extraction. The capacity of the state was most strongly felt in the way that, in particular CEA, selected the national champions among French industry to build the reactors they needed. In the early periods of the post-war years, 1950-60s, this was primarily related to how fast a reactor could get up and running to produce the maximum amount of plutonium. At the outset of this process, relatively few companies in French industry was however particularly interested in making the capital investment and planning necessary to partake in the nuclear programme which could also be seen from the very high cost of the bids that were submitted to the CEA for the construction of the Fessenheim plant (Lindberg 1977, 146–47). It was also less clear how exactly these national champions would garner enough know-how from the process of building parts of nuclear facilities because the CEA was the primary research arm of the entire programme. This meant that unless the CEA was willing to actively share know-how with industry actors, their competitive research gains would be limited – something the CEA was not willing to do in the

beginning[124] Part of this, might also be related to the dominant role of the CEA, who by an large, dictated requirements to industry.

This combination of factors had a couple of effects. The relatively unilateral concerns of the CEA to their own nuclear reactor development and purposes of plutonium extraction helped create a gulf between the CEA and EDF (which we will examine later). While it is difficult to assess the cost-benefit calculations of individual companies[125] the inability of industry to convert the status of national champion into a profitable endeavour can be indicated by the by the fact that by the 1960s only a few reactors had been ordered by other countries (Jasper 1990, 75–76; Lindberg 1977, 148) casting into doubt the promise of a high-technology export gain for industry with only a single reactor exported to Spain (Vandellos) (Picard, Beltran, and Bungener 1985, 197).

The period of the nuclear programme before the oil crisis is thus characterised by a capacity of state that is interventionist in the economy, but through policy ideas of experts that are more consistent with the political goals of the De Gaulle-era of French politics which attempted to establish France as a great military power on the international scene. Some internal documents suggest that the CEA shifted policy ideas towards a recognition of these limitations and toward a more industry-focused support in the early 70s[126]. However, the general thrust of the pre-crisis period is one dominated by the CEA and settings of policy ideas in the capacity of the state are more consistent with concerns of military independence than concern for industry competitiveness or profitability from the expansion of the nuclear sector.

[124] Hecht, 2009 notes how not even the EDF was privy to the planning and design stages of the nuclear programme in the late 50s and early 60s – despite having a key role as the public procurer of the turbines that ensured power generation for the nuclear power plant (ref).
[125] This is no less difficult because parts of the nuclear industry in France consisted of private companies that were not wholly French. Thus what might be tax-deductible costs for a domestic French company, would not be for another Frost describes some of these complexities in relation to electrical equipment firms and risk assessment in the broader energy industry (Frost 1991, 171–86).
[126] *Note Sur Les Programmes du C.E.A. Dans Le Domaine De l'Electronucleaire* (DgAIN,INT 73,476). 21. Sept. 1973– Energie Nucleaire - politique gouvermentale - 4, 24528,09 (CEA – Comité interministeriel).

6.3.2 Negotiation style

6.3.2.1 Overarching idea: Technophilic unity

The key actors involved in the nuclear energy programme in France were the CEA and the EDF. These two organizations were involved in most formulation of policy that would be recommended to policy-makers. Thus, examining their interaction and form of negotiating a policy for France can illuminate the overarching ideas that shaped the nuclear energy policy of France.

The limited number of actors which were often directly controlled by the state or (in the case of industry) selected by state actors to participate in the enactment of nuclear policy meant that the interaction between actors was initially rather amicable at the level of the overarching ideas. That is to say, there was a general technophilic tendency among both the CEA and EDF and much of the policy formulation thus became a question of rather technical problem-solving rather than politicized conflict of interest[127]. Another aspect of the amicable cooperation between the two organizations were that EDF had no clear preference for nuclear reactor technology or types in the beginning (Jasper 1990, 75)[128]. The EDF simply understood their mandate and task as supplying energy to France, because growth and technological advancement was understood as being linked with electrification of society.

The overarching ideas driving the nuclear energy policy in the 1950s and 1960s in EDF was one of increasing the supply of electricity through the exploration of this new technology. Their origin in a process of nationalization and technological optimism regarding the potentials of nuclear energy thus made them obvious allies of the other big agency of nuclear energy development in the CEA (which had been created just the year before EDF in the same general zeitgeist). Consistent with this overarching common interest in the state-controlled development of this new technology there were no clear preferences in the EDF for what precise form the implementation of this policy should take. Thus, up through and until the mid-1960s EDF showed no particular preference for a specific nuclear reactor design, but kept to the mantra also espoused by the United Kingdom of keeping possibilities open (Nau, 1974 in Jasper, 1990: 75). As an electrical utility, the main concern

[127] This may partially have been out of necessity, because France did not have the resources to sustain separate programmes, thus it was needed that the EDF and CEA needed to cooperate on a single programme

[128] A regional manager of the EDF is referenced as having likened a nuclear reactor to any other thermal boiler – as just another way of boiling water (Picard, Beltran, and Bungener 1985, 193). Besides being a technical simplification indicating a somewhat uncomfortable or problematic level of knowledge of the organization that has to run said reactors, it also is indicative of how little thought the EDF gave to the specifics of nuclear reactor technology and choice in the early 1960s.

for the EDF was the development of a reactor technology that could produce the most energy at the lowest possible costs, which was assumed to allow greater electrification of production in the economy and society as a whole, both of which were seen as congruent with modernising France.

The technophilia of the EDF was similarly present in the CEA. Despite a politically motivated restructuring in the 1950s had cleared out a large part of the physicist staff from the organisation and replaced them with engineers and economist bureaucrats (Frost 1991, 126–29) there was a continued and widespread support of the goal of research and expansion of nuclear energy (Jasper 1990, 74). The reasons for this were both related to a national nuclear programme as a source of national pride in maintaining a high-technology government programme, but also in the defence function the extraction of enriched uranium allowed in terms of weaponized nuclear bombs. These two ideas were key for the overarching capacity of the state for De Gaulle in initially creating the CEA (Hecht 1994).

As mentioned before, the PEON commission was the guiding advisory body for nuclear energy policy formulation in the French state. The EDF and CEA made up most of the members of this commission and they made recurrent (often yearly) recommendations for the future development of the French nuclear programme. In 1968, the commission came down in favour of the CEA line by recommending the continuation of work on UNGG reactors based on French (CEA) design. The argument went, that expected costs and costs would be lower in the future due to improvements in the technology compared to other energy production technologies (Simonnot 1978, 240pp). This meant that the CEA now had support for the further expansion of their gas-graphite reactor type. This decision-making process was mostly centralized and the nuclear energy programme was in the period between the 1950s and 1960s mostly presented as "…a technical problem solely within the domain of a small group of experts, and not as a political problem capable of generating controversy and of being the object of a public debate" (Garraud, 1979, 450-51 quoted in (Baumgartner 1989, 51). This process resulted in at least five gas-graphite reactor based nuclear power plants being constructed as a consequence of CEA and EDF cooperation in the period from 1955 to 1969 (Hecht 2009, 96).

This highlights the relative agreement between the EDF and CEA on broad the overarching idea of the nuclear policy. The fact of expanding the nuclear energy programme was not a question, the technical nature of the discussions around choices of technology to utilize for nuclear reactor types

likewise. The negotiation style also bears this out. Both organisations were highly technical in their approach to policy-formulation, their venue for debating these issues were the PEON commission meetings and the result of these debates the PEON report which only they and a handful of industry representatives and other state ministries were present. The fact that both organisations considered energy policy, in particular nuclear, as a technical exercise did not mean that they could not disagree even if they thought broader political conflict over the issue was not a threat. So why would these two actors disagree when they were part of the same cadre of "techniciens"[129]?"

A conflict looms: Technical choices and nuclear reactors

The fact that the institutional structure made the negotiation style in French energy policy more cooperative and based on technical know-how resulted in interaction that was generally more focused on solving engineering problems rather than problems of political interest. That does not mean, that conflict over ideas cannot occur, however. Sometime during the mid-1960s a more explicit manifestation of inter-organizational conflict came to the fore. So, it does not mean that they did not at times, or even often, had different, or conflicting, agendas. In that sense, reactor choice and especially the type of reactor chosen can be viewed as distinct political, industrial, and technological statements (Hecht 1994, 658) reflecting the different policy ideas at play between these two main actors[130]. The planning process around the G2 plant is useful to illustrate how this focus on speed and plutonium extraction by the CEA set the stage for conflict with the other big actor in French energy policy; *Électricité de France*.

The key to this illustration is that the EDF and CEA were unified around the overarching policy idea of nuclear energy as a technical way in which the French economy and broader society could be modernised. In illustrating the cooperation and problems therewith, the section also illustrates how very specific technical choices can represent proxies for policy idea variation between them. In so doing, the section pre-empts some of the analytical categories covered in the subsequent section on instrumental policy ideas, but it is necessary to show how unity in the overarching idea was

[129] For a historical exposé of the connotations associated with the concept of "techniciens" in French public discourse, see Hecht, 2009: chapt. X
[130] One should be careful when examining and emphasising the conflicts of interest between actors in a closely knit organizational structure of decision-making such as that of French energy policy . The EDF, CEA and other relevant state agencies acted so closely together at times, that their employees had offices in each others' departments (Jasper 1992, 655). The general characteristic of 'French etatism' in the field of nuclear energy policy in particular does not negate the existence of sometimes quite explicit oppositional or conflictual interests over specific policy choices between these actors.

maintaining cooperation before the underlying instrumental policy ideas became too much of a problem for their coalition, which the section on instrumental policy ideas then examines.

From the outset of the process surrounding the design of the G2 nuclear reactor it was made clear that EDF was in a secondary position to the CEA. While technically present at monthly meetings with industry, EDF overarching aim of high electricity generation and low cost were generally low on the agenda. First, the EDF was significantly constrained in the process. The utility was not expected to voice concerns, was often not informed of design changes affecting its work, contracts with industry were subservient to those of the CEA and industry and, finally, the main contribution EDF did make to the design process was a "energy recuperation installation" which was considered an auxiliary addition to the main design – so auxiliary, that it was in fact housed in a separate building to the main nuclear installation.

It was quite clear that electricity generation and supply, the main instrumental idea of the EDF, was not the driving idea of the process. Moreover, the "classic" components of the installation relating to energy production were specified in great detail ahead of construction both in terms of features and cost, the "nuclear" part which was responsible for the actual enrichment of uranium and creation of plutonium, the principal purview of the CEA, was not subject to such financial and organizational constraints (Hecht 2009, 67). Beyond the reduced role and influence the EDF ideas were given at this surface level of design, there were other factors relating to more technical aspects of the reactors themselves, which favoured CEA ideas of plutonium generation and extraction rather than electricity generation to achieve energy independence.

To understand the implication of power asymmetry between the two agencies of these choices, it is necessary to, briefly, sketch how a nuclear reactor generates electricity. A nuclear reactor works by the use of controlled nuclear fission, whether military of civil in purpose(K. Baker 2015, 14). Electricity is creation by splitting heavy atoms with a high atomic number, often isotopes of uranium or plutonium, which have similar weight because the nucleus that makes up the atom holds a comparable number of neutrons. These atoms may exist in different sub-forms according to slightly varying number of neutrons[131]. These variations are termed isotopes and different ways in which these manifest is often denoted with a number after the chemical symbol of the element to

[131] Although always with the same number of protons, as that defines their place in the periodic table of elements

indicate the sum of neutrons and protons in the atom(Simpson 1983, 3). This is relevant to the study of which ideas were allowed to dominate the early French nuclear programme, because the details of the design and construction choices make the reactor better or worse at creating the stable isotopes of plutonium 239 or uranium 235 that are the most useful for nuclear weapons production. Moreover, as a general rule, these so-called "pure", or "weapons grade" materials are most efficiently produced by a reactor if it is operated in a manner that is detrimental to the most efficient production of electricity (Simpson 1983, 4).

The one sided-nature of asymmetry of influence is indicated by the derogative way in which the CEA referred to the first tests by the EDF in utilizing waste-heat to generate electricity as "Ailleret's toy" after the EDF director of research (Frost 1991, 189; Picard, Beltran, and Bungener 1985, 187). More specific technical choices support this dominance of CEA's instrumental policy ideas in several stages through the design of the G2 reactor - in favour of the instrumental ideas of plutonium generation, but detrimental to electricity generation.

For instance, the time a fuel rod spends in the reactor chamber. To the CEA the time fuel rods underwent irradiation was the simplest way to control the right mix of Pu-isotopes for later use in bombs. To insure minimum irradiation time the CEA contracted with the contractor (SACM[132]) for a solution that allowed changing the fuel rods while the reactor was in operation(Hecht 2009, 71)[133]. This came at the cost of a very expensive concrete and metal construction allowing automatic loading and ejection of fuel rods into the reactor – thus speeding up the production of non-poisonous plutonium. This increased the total cost of the reactor design, but also decreased its usefulness for electricity generation through the attached steam turbines by ejecting the fuel rods before they were fully spent, increasing fuel use of the reactor. Crucially, though it came at the cost of heat, because the rods were ejected before they hit peak temperature(Hecht 2009, 71). By making

[132] Societe Alsacienne des Constructions Mecaniques ; A conglomerate of electrical and mechanical engineering companies put at the head of the group of companies chosen under the "national champions" policy by the Direction Industrielle at the CEA. Any contracts for construction or design work for the actual reactors were between the CEA and SACM who then subcontracted to the other companies and coordinated their efforts in design and construction, especially on the G2 reactor (Hecht 2009, 66)

[133] On several occasions CEA notes the role of high pressure in creating electricty with nuclear processes, it is therefore highly unlikely the preference for technologies that maximised enriched uranium at the expense of electricity generation were a coincidence and not a deliberate choice. See for instance : *Confidentiel: Note de Synthese*.. 2. November 1973 (424528). Energie Nucleaire - politique gouvermentale - 4, 24528,09 (CEA – Comité interministeriel). This is repeated several times over the years in different reports. For instance also in 1978 : *Production Combinée de Chaleur dans les centrales nucleaires* (424528.09) 17. Februrary 1978. Comité interministeriel du Energie electro-nucleaire. Energie Nucleaire - politique gouvermentale - 4, 24528,09

this design choice, the instrumental idea of the CEA to generate plutonium for nuclear bombs became superior to the instrumental ideas of the EDF of electricity supply.

These three factors increased cost of the overall design, increased fuel use and decreased the heat output below optimal levels for electricity generation (ibid). In fact, it wasn't even possible for EDF engineers to calculate the optimal values of pressure, temperature and CO2 for electricity generation, because the CEA had not specified the aluminium cladding surrounding the fuel rods to withstand the necessary levels of heat for that purpose.(Hecht 2009, 73). This meant that at best the G2 reactor would be able to produce around 25MW under optimal operational conditions (Hecht 2009, 75). Not that the low output of electricity was the main issue, in fact, even obtaining that became a problem for the EDF because the CEA required the reactor to run all the time (for heat variation to not damage the fuel rods) and at maximum capacity. A constant and high supply of electricity from the nuclear reactor was a problem for the EDF because the demand of the electricity grid itself was not constant. In absence of an ability to control output, the EDF had to install a de-superheater before the steam-generator to essentially dump hot steam that would otherwise have overwhelmed the electricity grid had it been turned into electricity (Hecht 2009, 73).

By 1958 when French politicians wanted a nuclear bomb, the preparatory work had already been done, in part at G1 and G2, on plutonium extraction and it meant that the first French nuclear bomb test could take place only a few years later in February 1960. In this way, a set of choices regarding the engineering makeup of nuclear reactors illustrates a divide between the instrumental ideas of the CEA and the EDF. The negotiation style was highly technical and regularised between a limited number of actors. At the overarching level of ideas, there was coherence between the technophilic visions of an expanded French public nuclear programme to ultimately improve the French economy, but as has been hinted the instrumental ideas through which these two actors saw these overarching ideas were quite different. The CEA emphasising the military dimension of extracting plutonium for nuclear weapons and an increased role for France in international relations and the EDF preferring low-cost and plentiful energy generation to achieve a modernisation of the French economy. It is to these instrumental policy ideas we now turn.

6.3.2.2 Instrumental idea: Relative cost versus weapons.

As the examination of the ideational underpinnings of technical choices regarding the G1 and G2 reactor showed above, the CEA overarching ideas of French national military strength was clearly dominant of the EDFs ideas of plentiful electricity supplies. The general type negotiation style is still consistent with previous descriptions of technical meetings and report-driven interaction between a limited number of state-related actors. What shifts at this level of analysis, is that when we examine the operational instrumental ideas that different actors follow to achieve their overarching ideas, the differences in ideas are more likely to show – despite general agreement about the use of nuclear power, the idea that this would generally benefit the nation of France and the economy.

To understand how conflicting ideas began to emerge we need to examine the introduction of a new instrumental idea that EDF begins to utilize in their work, in their reports and as basis for arguments within the PEON-commission. This ideational instrument took the form of a quantifiable indicator in the ministry dossiers on nuclear energy. The most prominent and widely used is when EDF begins to estimate cost/kWh produced by a given reactor design. The quantifiable measurement of cost per kWh became a crucial part of EDFs insistence on no longer just supplying the most possible energy, but allowed EDF to emphasise supplying energy at low cost[134].

This focus on cost opened further the demarcation between the CEAs ideas of plutonium extraction for military purposes and nationally controlled nuclear reactor designs because it introduced competitiveness into the cost equation. Not only would this legitimise EDF in criticizing the CEA reactor programme on cost grounds, but also it would, at a later point, allow the electricity production of the EDF to begin competing with and supplanting other types of energy sources. This idea became so dominant and central to the work of the EDF that its former general manager, André Decelle, noted "the CEA aimed for the Nobel Prize, the EDF for the price per kWh" (Quoted from Picard, Beltran, and Bungener 1985, 197).

[134] This allowed EDF to push questions of competitiveness, cost and relative cost of reactor designs – aspects they lament not having reached broader use in the public utilities. P. 5. *Concurrence de la production autonome - Commission de l'exploitation.* 23. March. 1972. Production Autonome (19830369/11).

A new method: kWh/centimes

Even though the 1950s had been characterised by fierce conflict between management and employees in the EDF over the introduction and use of computers in the workflow (Frost 1991, 201–5) the period leading up to the crisis saw a shift in their application among the personnel responsible for the PEON reports. The introduction of the quantifiable measure of cost per kWh along with the advent of computers allowed the EDF to conduct optimization-studies, which modelled reactor design choices according to the goals of energy supply that EDF wanted to achieve. It is not that most of the involved actors had not attempted to do cost calculations before (indeed it is the bread-and-butter of most financial ministries), but the concurrent machine-assisted nature of these operations made possible entirely new and more accurate modelling. Calculations that had previously been done by hand and attempting to find the best compromise with relatively little economic data available were now modelled using much more data and many more variables.

The increased sophistication that these models entailed allowed the EDF to fine-tune the cost and goals not just of a combined project, but also of specific elements of a reactor design[135]. This allowed much more fine-grained optimization at the planning and design stage of, for instance, the most electricity generation for the least use of uranium fuel thus increasing the unit power of the plant and inversely decreasing the cost per kWh generated (Hecht 2009, 106–7). This new tool thus allowed the EDF a kind of experimental method through which to test different design parameters of a reactor design before actually beginning construction in any way. By the early to mid-1960s the cost of kWh was so thoroughly worked into the workflow of the EDF that even the Ministry of Finance took note of the level of level of detail the models of optimum(Hecht 2009, 108).

Wider comparison possible

The idea of the cost per kilo-watt-hour allowed the EDF to make modelled comparisons between competing reactor designs and thus not only criticise base cost of the UNGG programme of CEA, but also allow comparison with other international reactor designs. This led the EDF to estimate costs of the French UNGG reactors and the American-designed PWR reactors. Comparing the Saint-Laurent des Eaux (Loir and Cher, reactors) with the American Oyster Creek reactor both capable of generating around 500MW electricity output. 1100 francs /kWh for the UNGG reactor compared to 880 francs for the American PWR design. The CEA and EDF both agreed on this

[135] My translation.

finding, but disagreed fundamentally about what this finding should entail and they eventually published separate reports in early 1967 (Picard, Beltran, and Bungener 1985, 197).

This led cost-estimations comparisons for cost/kwh reactor capacity built where thus heavily in favour of American-made light water reactor designs compared to domestic French reactor designs. It is worth noting, that these comparisons were based on available data of costs of reactors which at that point in time was somewhat uncertain. Simply put, the nuclear technology was such a new endeavour that reliable data for actual costs were sparse and sensitive to the level of optimism of the underlying assumptions about future cost reductions, number and quality of problems and so forth. This means that the data used for American estimates were not necessarily any more correct than the French ones[136]. In fact, most of the estimates of LWR costs that EDF relied on, were based not on empirical data on LWR costs, but on speculative, and thus arbitrary, cost estimates for nuclear power plants currently ordered as opposed to actual operational data (Jasper 1990, 77).

The ideational battleground: reactor technology

The primary venue for this conflict of ideational instruments was in the PEON commission, which had previously been in general support of the instrumental ideas of the CEA. In 1968, the PEON report was somewhat ambiguous in its wording, perhaps indicating significant awareness by the involved parties of the potential conflicts over its conclusions. Despite the careful wording, the report essentially favoured the Light Water Reactor type over the existing nuclear plants utilizing UNGG reactors championed and designed by the CEA (Lindberg 1977, 148). Thus, it was recommended that after the already planned Fessenheim 1 and 2 plants were completed there would be no additional need for UNGG reactors. The crucial point concerning this choice is that the main argument for the choice of LWR reactors entailed two elements. The first that a prototype reactor was to be constructed, with EDF as the main principal of this task as opposed to SACM for the G1 and G2 reactors. Secondly, but perhaps more important, the argument that was used to justify the future reactor types was the lower cost of electricity nuclear power plants based on this reactor type would provide (N. Lucas and Papaconstantinou 1985, 20).

The fact that EDF had succeeded in introducing a new instrumental idea of cost / kWh in a strong guiding body and shifted their own instrumental ideas from electricity supply to supply at

[136] See for instance (Bupp and Derian 1978) on the ungrounded cost-estimates for LWR utilized by the PEON reports. To this day, the general cost of French nuclear power programme is shrouded in uncertainty (Grubler 2010).

comparatively lower cost. While the consultative bodies of the French planning commissions are powerful, they are not omnipotent and this was sufficient for these new ideas to shift the fundamental design choices and speed of the nuclear programme. In 1968, one of the primary obstacles for such a shift to occur was the strong support the CEA received from President De Gaulle. The president was preoccupied with the project of national grandeur through technological progress – of which domestically developed nuclear programme was a key part. De Gaulle was therefore not immediately willing to abandon the nationally developed nuclear reactors of the CEA only on cost grounds (Picard, Beltran, and Bungener 1985, 197). When Pompidou came to power as president in 1969, the idea of French national independence espoused by De Gaulle took the backstage and the overarching idea that France should achieve national grandeur through technology was linked with an idea that economic activity was the way through which such a goal could be achieved. Hence, French industry had to become "competitive" in the international market (Frost 1991, 198; Hecht 2009, 118). Thus, EDFs push for a licenced, lower-cost reactor design was met with a much more amenable political leader and became the last key to the abandonment of UNGG.

The conclusiveness of the shift away from the UNGG reactors became clear in future PEON reports. The PEON reports of 1970 and 1972 were much less ambivalent than that of 1968 and bore out the finality of this shift. Not only was the American-licenced Westinghouse design for an LWR now the principal reactor technology followed by the French nuclear programme[137], the planning commission's Sixth plan (1971-5) involved a rapid expansion of the nuclear energy production capacity of France. The planned reactor construction programme eventually incorporated into the plan involved eight reactors delivering at least 8000 MWe. This was further amended and increased by the 1972 PEON report suggesting an even larger programme of fourteen to fifteen reactors equivalent to 13000 MWe of electricity production capacity to be constructed from 1973 to 1977 – around 3 per year (Jasper 1990, 90). The shift from natural uranium graphite reactors was complete. Thus, out of all the reactors recommended for construction after the 1968 PEON report onwards, only a single one was of the UNGG type and all others were planned as light water variants (PWR)(N. Lucas and Papaconstantinou 1985, 45). The EDF's ideas of cost and electricity supply

[137] See also CEA acceptance of this shift : Note Sur Les Programmes du C.E.A. Dans Le Domaine De l'Electronucleaire – Archive name and ref : Energie Nucleaire - politique gouvermentale - 4, 24528,09 – Subdocument name : CEA – Comité interministeriel – Document identifier : DgAIN,INT 73,476. 21. Sept. 1973.

had won out against the CEA's technological optimism and focus on the military aspects of nuclear power.

6.3.2.3 Setting: Cost comparisons

The introduction of the cost/kWh marks a shift in the instrument of the idea of energy supply held by the EDF. However, while principally just a methodological and computational innovation, it suddenly allowed the discussion of cost and comparisons between different nuclear reactor designs to happen on a perceived more scientific basis. It may be questionable whether the data used for these new modelled comparisons was reliable(Bupp and Derian 1978, 87; Frost 1991, 197). However, it allowed the slow shift towards competition and a shift in the instrumental idea of the EDF. It shifted from an idea of supplying energy to suppling energy at the lowest cost - the latter which allowed nuclear electricity costs to be compared with other forms of sources in the broader energy mix.

In this way, the negotiation style of the French bureaucratic structure meant that *Electricite de France* (EDF) saw its mission as congruent with the overarching goal of modernising French industry and society in general that was also espoused by the CEA. EDF being an electrical utility it perceived the goal being best achieved through energy independence. Nuclear energy was a natural choice that allowed both the overarching goal of modernising France through energy independence. Where the differences to the CEA occurred were in setting of the instrument of energy independence. The EDFs insistence that modernising the French society was linked with energy independence led them to see nuclear energy as the best way to achieve producing and distributing the most energy at the lowest possible cost(Hecht 2009, 80).

6.3.3 Basis of Expertise

The common educational background of several of the actors involved in energy policy formulation helps us understand the possibility for conflict or coalitions over different policy ideas. At the different levels of ideas (overarching, instrumental and settings), congruence or divergence can facilitate or disrupt the conditions for coalitions between actors. As we observe in the case below, a common overarching policy idea may make a coalition between actors possible, but if the substance of debate relates to instrumental ideas, inconsistencies at this level may render actors less likely to cooperate and rather conflict due to these variations in instrumental ideas about energy policy. Before the crisis, the overarching ideas of technological optimism had reduced conflicts between the EDF and CEA to some extent, but which began to dismantle as the cost / kWh is introduced by the EDF.

6.3.3.1 Overarching idea: Technological optimism unites

At the overarching level of ideas, the common ground between the CEA and EDF can be illustrated in the shared technological optimism of both organisations. This technological optimism[138] is a general element of French post-war history, where technocratic planners would portray technological development as the embodiment of being French and state-driven modernisation through technology as a means to unify the French nation (Hecht 1997, 381–82). In the area of energy policy, this optimism was perhaps particularly strong because the substantive discussions among actors were of a highly technical nature and at a very high level of sophistication. This meant that more general issues of whether technological solutions as a means to achieve economic growth or energy independence were not explicitly questioned – at least not by the CEA and EDF whose main purview it was to develop and implement the nuclear energy programme.

More crucially, the educational background of most of the senior employees in both organisations were drawn from the ENA and Polytechnique, where the ideas of technocratic planning was seen as integral to the modernisation of the French state. At the overarching idea level, the technological enthusiasm of much of the cadre of civil servants in the French state meant that technologically advanced solutions that could be fostered as national projects coalesced well with both the

[138] Technological enthusiasm as used by Hecht refers to Thomas P. Hughes' American Genesis: A Century of Invention and Technological Enthusiasm, 1989. He applied a rather general definition of optimism for "technology", the latter of which he defined as "the effort to organize the world for problem solving so that goods and services can be invented, developed, produced and used" (Hughes, 1989: 6).

overarching ideas of technological optimism present among experts within the state, but also with the overarching ideational goals within the capacity of the state as a whole in the period after the second world war in France.

6.3.3.2 Instrument: Cost – A new coalition between EDF and Ministry of Finance

Given to clear coherence between overarching ideas of technological optimism in the CEA and the EDF, it is puzzling how the Ministry of Finance and the EDF eventually form a seeming alliance against the particular version of the nuclear programme envisioned by the CEA. All three organisations draw many of their employees from the grand école system mentioned above. This means that the general belief in promoting goals for the French nation are present throughout. However, there is a significant variation the EDF, CEA and the Ministry of Finance in relation to the share of employees that have a predominantly natural science background emphasising physics, chemistry or engineering and those who hail from more social disciplines like economics and statistics.

These two broad differences can be retraced in the specific educational backgrounds of senior personnel that ultimately result in a different mixture of educational basis from which the organisations draw their expertise. As noted before, the CEA drew most of its personnel from the Polytechnique, which emphasised natural sciences and engineering and is thus predominantly characterised by technological optimism and the overarching goal of modernising the French economy. By contrast, the EDF drew a significant amount of their personnel from the ENA, which emphasised governance through economics, and statistics while also having a significant number of engineers on staff and, due to the purpose of the organisation, was very technically inclined as well. However, the educational basis in the EDF is more mixed between ENA and Polytechnique than that of CEA. This meant that the EDF leadership as well as many of their employees were more readily able to understand and accept some of the types of arguments and analyses also fielded by the Ministry of Finance who similarly drew personnel from the ENA.

This manifested in its strongest form during the conflict between the EDF and CEA over the choice of reactor technology. While the specific choice of reactor technology cannot be directly related to educational background of the experts, the inclusion of cost models and projections in the EDF that was more consistent with their instrumental idea of electricity supply led them towards alternatives

to those preferred by the CEA. Thus, while both agreed the expansion of the nuclear programme, their instrumental ideas were significantly different; the CEA wanted weapons and the EDF wanted cheap electricity. Moreover, once the EDF invents and spreads the use of computerised sophisticated models of cost / kWh for different reactor types, these types of arguments are much more in line with the cost perspective of the Ministry of Finance than the comparative perspective of the CEA. The alliance between the EDF and the Ministry of Finance can thus be seen as a shared a devotion to economic rationality through their focus on cost. The EDF advocating modernisation of France through an expansion of the nuclear programme and instrumental idea of supplying low cost electricity and the Ministry of Finance emphasising balancing the economy through budget restraint.

6.3.3.3 Setting: Cost per unit and cost as budget restraint

Part of the reason for this difference lies in the different settings of these instrumental ideas of cost. The meaning ascribed to cost is simply different between the two organizations. The EDF and CEA draw many of their engineers from École Polytechnique. This comes with a certain level of technological optimism and is part of the explanation for the coherence of overarching goals between the CEA and the EDF. As we saw, it was instrumental ideas and their setting that separated them and led to eventual conflicts over reactor choice, not their technological preferences for nuclear energy or the belief in a strengthening of the French economy though state steered energy independence. The EDF carried that technological enthusiasm with them into their modelling of costs. In the analysis of nuclear energy compared to other forms of energy they simply took a more optimistic stance regarding the likely development of technology (Jasper 1990, 94). This affected their assumptions both in terms of the speed of that development of nuclear technologies, but in particular also in its ability to improve output and reduce costs.

As was also noted earlier (section 2.3) By comparison, the Ministry of Finance draws many of their employees from the École Nationale d'Administration (ENA). The graduates, often referred to as "enarques" are trained in economic analysis and statistics (Jasper 1990, 95) more so than the focus on engineering, physics and chemistry which unify the X from Polytechnique. This also affects how they would understand terms like cost. The ideas held by the Ministry of Finance generally consists in a "cost perspective" which emphasises keeping the budget in balance (Jasper 1990, 93). In other words, they tend to be less characterised by the technological optimism that is the case for

the CEA and EDF. This made the Ministry of Finance naturally sceptical of the claims for nuclear energy made by the EDF. However, the view of reducing cost of energy through reductions in kWh/centimes or cheaper reactors was not necessarily resisted by the Ministry of Finance. Instead, the variation in the settings of ideas held by the EDF and the Ministry of Finance in the period leading up to the crisis were around the degree to which the Ministry believed the expected cost reductions in cost per kWh generated by the nuclear reactors and the overall project costs envisaged by the EDF (Jasper 1990, 102–3)[139].

The formal financial constraints that the ministry of finance were able to wield over the French energy policy were therefore quite substantial – and indeed, they were both present and critical of the costs in most of the PEON commission reports. However, having structural formal power simply explains how a given actor may interfere with the behaviour of another actor – e.g. the EDF. Formal powers of finance does not explain why an actor choses to wield said power or not. For the EDF, their introduction of cost and "rentabilité" (Frost 1991, 132) and extensive use of models had allowed them to defeat the CEA in part with Ministry of Finance support for the switch to LWR reactors. On the other hand, this cost perspective had helped the EDF, but the conflict with Rue de Rivoli showed the, perhaps unrealised, technological optimism in the assumptions of their models. While not able to break the coalition between the EDF and the Ministry of Finance against the CEA on the form of the nuclear programme, this difference in the setting of the idea of cost between the EDF and the Ministry of Finance would become important after the crisis.

[139] To this day, the actual cost of the French civil nuclear programme is debated among scholars. See (Grubler 2010).

After the crisis

The Yom Kippur war and the OPEC alliance introduction of oil supply constraints changed the conditions for energy policy and the ideas that helped inform its trajectory. As the oil crisis hits in 1973 the immediate reaction from the French government is one of somewhat downplaying the issue. Perhaps surprisingly, given their reliance of imported energy – especially within the oil sector – the French government did not immediately act. Instead, the French along with the United Kingdom maintained a pro-Arab stance in the United Nations (N. Lucas and Papaconstantinou 1985, 39). Despite diplomatic attempts to diminish the supply constraints on oil, the price of oil could not be constrained in the same way. Within a couple of months the oil prices had quadrupled (Lindberg 1977, 130). Something had to be done.

6.3.4 Capacity of the state

6.3.4.1 Overarching ideas: Modernisation through expansion of nuclear

The overarching ideas of modernising France through state-led initiatives was maintained after the crisis hit. On March 5th 1974, the Messmer Plan was approved by the Council of Ministers and became a symbol of the French state's ability control its environment despite the crisis, this reinforced the existing tendencies to nuclear policy being a closed system of actors (Jasper 1990, 148–49). The plan entailed the launch of thirteen 1000MW light water reactors (Hecht 2009, 319) an effective doubling of the nuclear electricity capacity EDF had in operation at the time (Jasper 1990, 156). While only 12000MW of the planned 13000MW were completed on time, it is still a remarkable increase in capacity over such a short period. Moreover, it represented a doubling down on the LWR nuclear technology which the only operational engineering experience held by the EDF was with the construction of the prototype reactor at the Franco-Belgian border at Chooz (Lindberg 1977, 132)[140]. How could such a large recasting of the energy sector involving the level of technical sophistication required for something like a nuclear reactor be chosen and executed in such a short time-frame?

First, the choice to go with an expansion of the nuclear energy programme of such magnitude and as the primary source of solutions to the energy shortage coming from the oil embargo is consistent

[140] More were planned, and especially the plant at Tihange was underway, but it was not operational until the end of 1974 (Lindberg 1977, 132).

with several aspects of institutional factors already examined. The fact that the response to the crisis had to come on the back of an agreement in the Conseil des ministres and the backing of central government emphasises the role of the strong capacity of the state in the response. The capacity of the state to do so was filtered through the existing intuitional channels of influence available to the government, which meant the PEON commission and the actors involved there. The French government held considerable power over several sectors of energy production in France, but perhaps few as directly as the control over the nuclear programme, which was funded and run by state-agencies who cooperated with select French industry.

The response of expanding the nuclear energy programme also fit with the overarching idea of modernising France espoused by many elites in the French administration(Jasper 1990, 148). Combined with the technological optimism of many of the key agencies involved the choice of nuclear power as a grand projet over other sources of energy becomes more understandable. To substantiate how this overarching idea of French managerialism and technological optimism circumscribe the choice of nuclear energy, we can examine some hypothetical options that would have been available to government.

An exercise in choosing between hypothetical choices when one knows the outcome may seem confusing, but it may help illustrate the influence of the technological optimism and state-managerial ideas we saw earlier. Such hypothetical choices will necessarily be simplifications. In policy, it is rarely a zero-sum game between two or more solutions. For instance, while nuclear was the choice of on the eve of the crisis, other policy solutions were also followed later. For instance, conservation became a topic with the creation of Agence pour les économies d'énergie (AEE) later in the year of 1974. The conservation programme aimed broadly at conservation and not specifically at reductions in electricity consumption and half of the investments were aimed at industry as opposed to households – where EDF penetration through electricity use was strong (N. Lucas and Papaconstantinou 1985, 57). Interestingly, in early 1974 the Ministry of Development, Industry and Science wrote a report to the cabinet of ministers about the problems of energy consumption in the industry. However, rather than note the potential disparity between conservation and increased electricity use under an energy mix driven by nuclear energy, they suggested immediate research into the possibility for water reactors and more resources for personnel that

could evaluate the effects of nuclear energy[141]. It thus seems, that rather than in conflict with conservation, nuclear energy was understood as a solution to the problem of high energy usage in a time of high prices and concerns over supplies of energy. Moreover, several attempts to have legislation approved was met with rejections in the Council of Ministers (N. Lucas and Papaconstantinou 1985, 57) and in 1975 Giscard D'Estaing helped establish the Delegation aux Energies Nouvelles (DEN) whose task was to promote the idea of renewable energy and to assist in defining objectives for industry (N. Lucas and Papaconstantinou 1985, 59).

One of the conditions for the speed at which such an ambitious expansion of national industrial and energy policy was the pre-existing plans and institutional capacities already in place. This means that the actual choices made by Prime Minister Messmer were circumscribed by the winning ideas in existing institutions. We might even have expected different choices if we examine his background. We found in the analysis of the choice of nuclear reactor type before the crisis that the EDF skilfully employed a set of ideas involving the linking of cost with electricity supply. This was a persuasive argument within the PEON commission, with the Ministry of Finance and for the private industry which had been somewhat underwhelmed by the ability to gain knowhow and exports from the CEA-backed UNGG reactor programme. However, it was not before the military man President De Gaulle was replaced with Georges Pompidou as President that, in the words of former minister of foreign affairs Maurice Schuman: "the style changed" (Picard, Beltran, and Bungener 1985, 200).

The nationalist pride in a French developed reactor gave way for the cost concerns raised in particular by EDF and Ministry of Finance. This shift in leadership can also be viewed as a shifting of overarching ideas. Pompidou was a banker by trade and emphasised international competitiveness as opposed to the national independence and glory espoused by De Gaulle (Hecht 2009, 125). This conjecture can be strengthened by the fact that Pompidou attempted to find European (and outside) cooperation for the nuclear reactor programme (Bussière 2003, 251). When Georges Pompidou falls ill in 1973-4, it is Pierre Messmer, like De Gaulle, a former military man, who must take the decision of how to respond to the oil crisis. Here we might have expected him to potentially support a domestically developed reactor programme like the UNGG championed by CEA and De Gaulle few years before. Was the expansion of nuclear energy programme even the

[141] *Note sur les problemes de consommations d'energie dans l'industrie*. - Comite sur l'energie - 19830369.7. Paris, 15. Fevrier . 1974. Section 4. Page. 3-4

most rational choice going forward? As mentioned above, only one LWR reactor was actually operational at the time and so a return to previous UNGG-designs with which the French had more operational experience might not seem as outlandish. Going one step further, we might think in terms of the hypothetical choices that existed to Prime Minister Messmer at the time beyond the nuclear energy option. Supplies of oil were only fundamentally threatened in the beginning months after the crisis(Jasper 1990, 159), and soon the problems became related to the increased prices rather than actual supply it was therefore the immediate trade balance issues resulting from this increase that faced the French Government in late 1973 and early 1974.

6.3.4.2 Instrumental idea: Grand projet, but which one?

After the crisis, the strong capacity of the French state is employed again in the instrumental policy ideas that drive the response to the oil crisis. The grand projet policy idea is utilized, but perhaps we should try to examine some of the choices facing the government and how different expert groups within nuclear energy acted. It is difficult to know exactly the type of analyses led the government to the nuclear programme expansion, we can however examine some options that would have been available to Prime Minister Messmer as President Pompidou's health was failing.

By comparing these options to the advice of experts and the seeming preference for strong state capacity in France, we can attempt to arrive at how instrumental policy idea of a grand projet concerning the immediate expansion of a domestic nuclear programme fit with these. One scholar summarizes the options available to Messmer as including: 1) paying the increased oil prices and hope they will eventually fall and increase exports to compensate for the trade imbalance 2) developed renewable energy resources 3) discouraged consumption e.g. through conservation of energy 4) deploy nuclear reactors (Jasper 1990, 159). The first option might have worked. As it turned out, the oil prices did fall again. An element of electoral candidacy might have crept in to sway Mesmer's mind here. It is possible he was expecting an election following Pompidou's failing health. While the second option was sound, it would have had limited potential to solve the immediate energy problems facing France.

This left the choice to one between reducing energy consumption by curbing consumption through different forms of policy – conservation being one and the final option of expanding the nuclear programme. Out of these options, Messmer chose the last. It can't have been because there was no

uncertainty about the nuclear programme. As we shall see, the Ministry of Finance had throughout the PEON-reports criticized the cost and size of the programme and its long term- as well as short term- financial viability and actively supported conservation efforts of the AEE (as mentioned above).

In the choice between technological enthusiasm and cost, the solution of the technological enthusiasts, in particular the vision of the EDF, was likely more politically salient a response under the assumption the Messmer was thinking about a coming election. However, this is not the only factor. What is also worth emphasising, is that the instrumental policy idea of the EDF of "tous electrique, tout nucleaire" was consistent with the latter option, but in direct conflict with measures of energy conservation. Alongside this policy idea of extending electricity beyond other energy sources, which had internally been a policy idea in the EDF since at least the early 1970s[142], the response to the Oil crisis also entailed centralizing the responsibility for electrification of the French rural regions which previously had been under the control of local energy suppliers to the auspices of the EDF[143].

To the CEA, an EDF-dominated nuclear programme using licenced reactor technology competing with the CEA's own previous designs was probably not their preferred option. However, the possibility to expand the nuclear programme is consistent with the technophilic idea of how to reinvigorate and modernise French economy and internal documents bear out this support was present in the early onset of the crisis during the autumn of 1973[144] . This meant that the energy policy of France was to become primarily driven by nuclear power generation, a source of energy which was actively sought to displace other energy sources in the energy-mix, a line which was endorsed by the Government, and a further centralization of electricity supply responsibilities with the supplier of energy that the state held considerable influence with due to it being a public company.

[142] Letter from Directeur general of EDF Marcel Boieux to Délégué Général à l'Energie Jean Blancard (19830369/11). 31. October. 1974 - Plan a Moyen Age EDF 1974 – 1980 – 1985.
[143] A meeting of the contract programme between the state and the public energy supplier explicitly references the decision of the Prime Minister to shift responsibility of electricity for rural areas with the EDF, effectively cementing the role of EDF as primarily supplier of energy for the majority of France as well as centralizing power over the energy policy. Reunion du 29. Novembre 1974. Contrat de Programme ETAT-E.D.F – Preparation de L'avant n 4
[144] *Note Sur Les Programmes du C.E.A. Dans Le Domaine De l'Electronucleaire* (DgAIN,INT 73,476). 21. Sept. 1973– Energie Nucleaire - politique gouvermentale - 4, 24528,09 (CEA – Comité interministeriel).

6.3.4.3 Setting: All is electric

After the crisis, the role of the CEA is diminished as the reactor choice driving the expansion of nuclear programme falls on a different design than that developed by them. The CEA still holds a strong expert influence on the nuclear policy, but their position is less omnipotent vis-à-vis especially the EDF. The capacity of the state is applied to expand the nuclear programme, but the setting of the policy idea of this grand projet is no longer as consistent with CEA policy goals of plutonium extraction and nuclear weapon development.

The diminished role of the CEA and their policy ideas is mirrored by the increasing role of the EDF. The instrumental policy idea of the EDF of achieving cheap electricity to supplant other electricity sources is expanded with the "tout électrique, tout nucléaire". The strong capacity of the state is thus wielded to extract the most electricity generation from the nuclear programme as possible. This has some very real effects on the types of nuclear reactors being built and the specific technical choices being made.

One key difference between the period before the crisis and the one after is the shift in the roles of the CEA and the EDF. This has effects for the role of other actors within the area of energy policy broadly, and nuclear energy specifically. In particular, the resistance from the Ministry of Finance begins to increase on the PEON commission both through increasing number of Ministry of Finance personnel on the commission (N. J. D. Lucas 1979, 142), but also because their formal powers over the EDF are stronger than those over the CEA (as described in the analysis of the French bureaucratic structure).

The implication for the setting of policy idea of cheap electricity generation is that the state capacity to intervene in the economy becomes more multifaceted. The different actors that have influence attempt different policy suggestions to limit each other or alternatively aid each other's policy ideas. The CEA actively reference PEON commission recommendations and the need to provide the EDF with the most reliable and economical techniques to produce nuclear energy[145]. As we will see in the section on negotiation style, the CEA and EDF unite around an instrumental idea of technological solutions against the Ministry of Finance's instrumental policy idea of balancing the

[145] *Note Sur Les Programmes du C.E.A. Dans Le Domaine De l'Electronucleaire* – Energie Nucleaire - politique gouvermentale - 4, 24528,09 – Subdocument name : CEA – Comité interministeriel – Document identifier : DgAIN,INT 73,476. 21. Sept. 1973. Page 2. Paragraph 3.

budget and jointly attempts to expand the nuclear programmes cost and scope. The institutional dimension of a strong capacity of state in France thus interacts in different ways with the patterns of actor behaviour and settings of policy ideas that are followed by the different expert groups that help define the energy policy response of France after the oil crisis.

The overarching idea of a state-led intervention utilizing existing plans is consistent with the view that Messmer either did not care about the particulars of the reactor-debates between variations of the nuclear energy programme. Instead, he simply saw a potential "grand projet" which the French state already had expertise in implementing and which could act both as a longer term solution to energy supply constraints, but also as a signal to the French people that the government was doing something to solve the problem. The response to the crisis of choosing the nuclear programme is thus an example of applying a pre-existing solution to a not yet existing problem. The strong institutional capacity of the state was best applied in the existing form to the area of nuclear power, and thus the setting of the policy idea of grand projet became the expansion of the nuclear programme as the preferred response to the crisis.

6.3.5 Negotiation style

6.3.5.1 Overarching idea: Technological optimism versus cost

To understand the more specific choices of nuclear reactors and debates over cost, we need to again examine the negotiation style between key actors in setting the formulated energy policy. More specifically pertains to the ongoing ideational battles between technological optimists and cost benefit ideas within different parts of the relevant actors of the public government response to the energy crisis. Let us turn to the former, first. The PEON reports can once again shed light on which ideas were dominant and what recommended policy choices were available to the Government at the time of the crisis. Furthermore, they allow us to indicate what ideational underpinnings supported the nuclear policy following the crisis.

Negotiation of the substantive energy policy response to the energy crisis involved the same key actors as those that were present before the crisis. The key experts were again located in the powerful PEON commission were the planning of the civil nuclear energy programme was mainly a debate between the technological optimists in the EDF and CEA and the Ministry of Finance on the

other hand. These ideational fault lines were illustrated in the final PEON report before the energy crisis.

In April 1973, the PEON released a report on recommendations for the nuclear policy. To achieve this goal of supplanting other energy sources with nuclear generated electricity, the PEON 1973 suggested an acceleration of the 8000MWe planned construction to a 13000MWe in the five years between 1978-82 (Simonnot 1978, 269). Here the logic of everything nuclear ('tout nucléaire') from the EDF idea set is explicitly incorporated as a goal for energy policy. Even outside the PEON commission, the CEA argues with reference to the common report with EDF to argue for the economic soundness of nuclear expansion[146]. Not only should the nuclear energy programme be accelerated, but also it should focus on replacing other energy sources. EDF's instrumental ideas had at this point become common French policy. A few months later, the oil crisis hits. This prompts the government to act, and they request a revised report from the PEON commission on how a potential acceleration of the nuclear energy programme could take place.

As the oil price spikes to 400% of pre-crisis levels, the EDF and CEA led commission submits a new report to the Ministry of Industry which is released in February of 1974[147]. The programme suggested the same increase from 8000MWe from the previous report to 13000MWe, but now PEON suggested the construction of an additional 13000MWe no later than 1980 and that the initial 13000MWe be installed in the period 1974-5 instead of the planned 8000MWe planned for that period in the previous report (Simonnot 1978, 269)[148]. This was February 1974. Within a very short span of time after this report, the government, with Pierre Messmer at the helm in the absence of the deathly ill Pompidou decides with the rest of the Council of Ministers on an expansion of the civil nuclear programme[149].

On March 5th Prime Minister, Pierre Messmer, announced the new expansion of the nuclear energy programme[150], curtailing most of the cost concerns of critics. The relatively small group of nuclear

[146] *NOTE SUR L'EVOLUTION DE LA DIRECTION UES PRODUCTIONS* p. 8CEA – Direction de Productions (424528) 24. October 1973. Energie Nucleaire - politique gouvermentale - 4, 24528,09 (CEA – Comité interministeriel).
[147] As Simonot, 1978 also notes, this report is indeed quite short by PEON standards, and contain no annexes of additional calculations of estimates beyond those in the main corpus of the report. This indicates some level of expediency might have been required in producing it.
[148] EDF repeats this increased push in a report on the effect on the price-increase on oil after the oil crisis. *Estimation d'intérêt des programmes nucléaires 1976 et 1977.* EDF: Etudes Economiques generales. 3. October 1974. Plan a Moyen age EDF 1974-80-85. - 205.4.9220. (Contrat de programme avenant 4 1974-1975)
[149] James Jasper speculates with reference to the former EDF director Louis Puisseux that the decision may have taken as little as three days consideration by the government (Jasper 1990, 157). See also, (Puiseux 1981).
[150] Reunion du 29. Novembre 1974. Contrat de Programme ETAT-E.D.F – Preparation de L'avant n 4.29. Novembre 1974 - Plan a Moyen age EDF 1974-80-85. - 205.4.9220. (Contrat de programme avenant 4 1974-1975).

energy experts in the PEON commission had managed to enshrine their policy ideas into the recommendations into the official national response to the energy crisis. Not only had the technological optimists defeated the cost-perspective of the Ministry of Finance, but the EDF in particular, had managed to expertly insert their instrumental idea of replacing electricity from nuclear energy with other sources of energy. It is to this last aspect, we now turn.

6.3.5.2 Instrumental idea: The commercial shift and substitution by electricity

Already since the defeat of the CEA in the battle over which reactor design should be at the basis of the French nuclear programme had the EDF followed the objectives of expanding the reach of electric power use as well increasing the supply. On December 23rd 1970, the EDF had signed a contract with the state to allow it to actively market electricity in competition with other sources of energy (Jasper 1992, 88). This shifted the EDF from a provider of electricity focused on maximum supply, or as later, at the lowest possible cost, to also actively seeking to increase the use of electricity (of which nuclear would be the primary source) at the cost of other energy sources. The slogan for this campaign became known as "Tout électrique, tout nucléaire" ("All electric, all nuclear")(Hecht 2009, 319).

The genesis of the commercial shift of the EDF came in part from the Nora report on the profitability of national companies(Frost 1991, 248–49). The goal for modern national companies should be to pursue increased autonomy for management through "contracts" and "rentabilité"[151](Hecht 2009, 110) which they were to pursue with minimum direct intervention by the rest of the state.[152] Notice how specific forms of capacity of the state intersect with negotiation styles that are formalized around a limited number of actors. The instrumental idea of substitution by electricity that came to characterise the post-crisis period was a consequence of a coalitional battle between the policy ideas of public agencies that represented the strong capacity of the state - the winning of the EDF vis-à-vis the CEA in defining the specific form of the nuclear energy programme[153]. At the level of the specific instrumental idea, the idea of cost-effective energy

[151] "Profitability" is a slightly misleading translation because public companies do not earn profits. "financial viability" is perhaps a better term, also preferred by Hecht, 2009.
[152] Jasper, (1990: 89) notes that Simon Nora in writing the report was inspired by some of the managerial practices already in place at EDF, therefore it is unlikely that the report itself was the origin of these ideas within the EDF. Indeed, as Hecht, 2009 notes, the EDF had since critique of the financial viability of some of its hydroelectric programmes in the mid 1950s instituted practices involving rentabilité (Hecht 2009, 87).
[153]: In the autumn of 1973, the CEA makes explicit note of the criteria for the scope and focus of the nuclear programme should be the cheapest and most reliable way to produce cheap electricity with no mention of nuclear weapons or concerns over reactor types. See, page. 2. Paragraph 3. Note Sur Les Programmes du C.E.A. Dans Le Domaine De l'Electronucleaire – Archive name and ref : Energie Nucleaire - politique gouvermentale - 4, 24528,09 – Subdocument name : CEA – Comité interministeriel – Document identifier : DgAIN,INT 73,476. 21. Sept. 1973

production that could insure French economic self-sustainability in terms of domestic electricity production was similarly reinforcing the overarching ideational goal of the capacity of the state.

In practice, this new instrumental idea meant the EDF could act as a commercial actor and actively seek to expand the use of electricity in different parts of the French economy. The commercial strategy that followed these new ideas of competing with other energy sources was primarily effective in the household sector, where the share of all-electric new constructions went from 5% in 1970 to 50% in 1975[154]. The nuclear programme was a natural extension of this new idea of competing actively with other energy sources. It was in France's interest to achieve economic growth. This would require electricity. Therefore, the more electricity the EDF could produce at a low cost, the better. Scaling up the nuclear energy programme was a great way to insure both the future importance of the EDF but also to build enormous capacity of electricity(Jasper 1990, 89). Furthermore, since France relied on imports for most other energy sources, the substitution of these sources, in particular oil following the oil crisis, with electricity from domestic nuclear power would only further improve the situation. The expansion of the nuclear programme pushed in the PEON commission is example of such attempts, but it was not until the oil crisis the ideas of substitution of other energy sources and drastically expanded nuclear capacity became national policy. Now the EDF could thus fully shift to achieve the overarching goal of modernising France through the instrumental idea of supplying low cost electricity – and electricity at the expense of other sources of energy (Jasper 1990, 90).

Looking back across the period after the crisis, it is interesting to note how the CEA and EDF co-exist and cooperate to push common techno-optimist ideas about nuclear energy in the period before the crisis. Later, even before the crisis hits, differences in ideas begin to emerge and conflicts arise around the instrumental ideas that are followed by these two actors. By and large, the EDF managed to make their ideas dominant, but in the wider perspective one has to wonder if the same trajectory would have been possible without the CEA being present.

We have seen how the institutional surroundings help determine the types of interaction that takes place in a given policy field. The French nuclear energy policy is a relatively closed affair, with

[154] The link between household heating and electricity demand increases can also be identified in EDFs push for the use of electric heat pumps See, *DEMANDES D'INFORMATIONS COMPLEMENTAIRES SUR LE " PIAN SEPTEMBRE 1974 » d'E.D.F » (p. 2)*. Plan a Moyen age EDF 1974-80-85 - 205.4.9220

limited actors holding particular positions and expertise in regularised and formal settings. These conditions made it possible for the CEA and EDF to share a common front against other actors who attempted to curtail or limit the scale and level of ambition that could be attempted with the nuclear programme. To some extent, the relative protection of the CEA from these pressures due to their immediate proximity to the President and their separate funding, meant that control over policy choices through limited spending from the Ministry of Finance was limited. In that sense, it is hard to imagine the trajectory that eventually made the EDF able to dominate the policy formulation with their policy ideas without the CEA. Had the CEA not been present in the earlier period, it is not at all certain that the overarching ideas of technological optimism that the CEA and EDF represented would have won out inside the PEON commission.

The negotiation style of the bureaucratic structure in France meant that the number of involved actors in policy formulation was limited to a relatively small group of experts drawn from similar organisations across the examined period. This seems to suggest, that while some changes in ideas are present before and after the crisis, especially the shift towards nuclear energy as the primary energy policy reaction to the oil crisis (and the acceptance that electricity generated by that programme should supplant other energy sources like gas, oil and coal where possible) there is nonetheless an indication that these different ideas are reinforcements or consistent with the ideas present before the crisis. Worth noting, is also, that the shift in ideas did not come from outside the already existing group of policy experts. Instead, the changes that takes place in the dominant ideas on energy policy in France are in fact coming from the same actors that were present before the crisis. Thus, the loci of ideational change is dependent on the institutional makeup that allows coalitions to form around policy ideas of experts in a given policy field. From the point of view of attributing analytical strength to different aspects of the theoretical framework, it does seem reasonable to conclude, that while ideas can and do change in times of crisis, the patterns of change follow existing trajectories that are in large part dependent on the institutional surroundings that determine how many, who, and the type of expertise they hold.

6.3.5.3 Setting: Resistance of cost from Ministry of Finance

The trajectories of change in energy policy ideas within the nuclear programme at the level of instrumental ideas emphasised the role of a limited number of actors holding formal positions. The technical nature of the interaction in these fora meant that arguments that contained economic and

technical concerns were strong. At the overarching idea level, this manifested as a debate between technological optimists in the CEA and EDF against primarily the Ministry of Finance. At the instrumental level of ideas, the substitution of other energy sources with electricity from nuclear power implied a stronger position for the EDF vis-à-vis the CEA goals for the nuclear programme (electricity production vs. plutonium). At the level of settings of these ideas, the more prevalent debates were between the ideas of the EDF and the Ministry of Finance.

First, the debate was about the conditions for substitution of energy sources with nuclear electricity as sought by the EDF. The difference in cost understanding between Ministry of Finance and EDF resulted in the former attempting to restrain the expenditure on expanding the nuclear programme and thus the spread of electricity by means of capacity constraints and limits on the reduction in unit costs per kWh that the EDF was attempting to achieve. For the EDF, kWh/centime had been an instrumental idea that made possible the attainment of surplus energy through French technological advances and the general betterment of the French economy. For the Ministry of Finance, on the other hand, cost was the overarching policy idea that drove most of their other actions. The reason, for this difference lay in the dominant expertise of the overarching policy idea of the two actors. For the EDF the overarching goal was energy production through technological advances. Cost was an instrumental idea that facilitated the faster attainment of this goal, because a particular type of nuclear programme was preferable to another in this regard. For the Ministry of Finance, the overarching policy idea was the fiscal restraint of the nuclear programme as such.

Second, the technological sophistication of the EDF arguments about costs had previously lent them considerable leverage in the PEON commission – and was at least partially responsible for them succeeding to supplant CEA ideas about plutonium extraction. Throughout the remainder of the 1970s, the principal ideas of the Ministry of Finance were the same, but they were only partially successful in reducing the scope of ambition in the nuclear programme's expansion. The cost, by which they meant expenditure, of the nuclear programme was high in absolute terms and associated with a great deal of uncertainty and they expected demand for electricity, which would finance the returns, would probably not continue to rise as it had in the past they argued. Finally, the Ministry of Finance attempted to curtail the influence of the EDF in the PEON commission in several ways. They attempted to obtain seats for three of its directors on the commission, which succeeded, and eventually the Ministry developed its own energy model to go against the optimistic forecasts of

cost and demand predicted by the EDF (Jasper 1990, 171–72; N. J. D. Lucas 1979, 149–54).This became the one of several attempts to undermine the veracity of the EDF arguments.

In the following years following the launch of the Messmer plan, the Ministry of Finance supported the creation of an agency to promote electricity conservation. The AEE that was set up in 1974 to develop and encourage conservation of energy. A strong economic case against the use of electricity for space heating was built on the work of this agency (ibid). This was in direct conflict with EDF's idea of expanding the use and increasing the demand for electricity. As we saw earlier, the commercialization strategy that followed from the idea of "tout électrique, tout nucléaire" were primarily effective in the household sector. The Ministry of Finance's attempts to reduce consumption of electricity would thus both reduce the demand for electricity (and thus further expansion of the nuclear generation capacity), but also a key way in which EDF was financed. More crucially, perhaps, changes to the demand curve of electricity would negatively affect the modelled predictions of the nuclear programme cost made by the EDF. Thus, the idea of conservation ran counter to increasing the scope of application and capacity of electricity sought by the EDF.

The closest the Ministry of Finance came to realising their ideas was perhaps in limiting the setting of the instrumental idea of electricity generation and substitution of other sources of energy by the EDF. In the December 1974 PEON commission recommendations, the same year Messmer announced his plan to respond to the energy crisis. The technological optimists in PEON were pushing for a 20000MWe order to be made in 1975 and for 7000MWe to begin construction every following year. The Ministry of Finance argued that better forecasting models were needed and attempted to delay the programme and instead argued for 8000MWe to be ordered in 1975 and begin building 5000MWe for the two following years (Jasper 1990, 173). When the PEON commission ended up recommending 12000MWe ordered in 1975 and 6000MWe started in 1976 and 1977 the ministry can at least have been said to delay the most optimistic of the technological optimists(Simonnot 1978, 274–79).. Given that the previous Minister of Finance was now President (Giscard d'Estaing) it is perhaps testament to how deeply embedded these ideas were that the Ministry of Finance was not able to muster more resistance to the nuclear programme's expansion. The mentioned compromise programme was adopted by the government on August 6th, 1975 (Jasper 1990, 173).

6.3.6 Basis of Expertise

6.3.6.1 Overarching idea: Shifting coalitions - Technological optimism redux

As the crisis hits, the ideational trajectories of the two organisations are no longer as coherent. The French state decides on an expansion of the nuclear programme to increase the commonly agreed goal between the EDF and CEA of energy independence, the differences in instrumental ideas play a big role. In principle, the CEA and EDF are thus still unified in the overarching idea of furthering the modernisation of the French economy through state intervention in the economy. The difference from the period before the crisis is that the power balance is now clearly shifted towards the EDF as the main actor of the French energy policy. The more significant ideational conflict after the crisis therefore exists between the EDF and the Ministry of Finance rather than EDF and CEA.

The common educational background between the technological background of the EDF and the CEA personnel is what made cooperation between the two possible and for their common support of the nuclear programme to dominate the energy policy discussions in the PEON commission. This commonality persists after the crisis as well, but the significant shift is that the EDF is now the dominant of the two actors. The dynamics we saw before the crisis, where the conflict was primarily between the CEA on one side and the EDF and Ministry of Finance on the other has thus shifted. Now, that the questions relating to substantive technological choices that separated CEA and EDF have been resolved, the conflict lines between actors shift. As the nuclear programme is set to expand with the Messmer Plan in early 1974, the conflict lines shift towards implementation costs. This conflict line is stronger between the EDF and the Ministry of Finance.

At one level, this is because the Ministry of Finance has stronger budgetary control over the EDF than it does over the CEA. On the other hand, the financial control-dimension cannot explain the new dynamic alone, because we would have expected to see the conflict line of the EDF and Ministry before, rather than the cooperation they showed against the CEA on the questions regarding reactor technology choices. The substantive weight given to ideas of cost from the educational background of economics in EDF and Ministry of Finance in defining the nuclear programme are thus a relevant factor when understanding the conditions for cooperation between actors in the area of nuclear energy. The emerging conflict line between the EDF and Ministry of Finance emphasises the dual nature of the educational background in the EDF. On the one hand,

they generally agree with the CEA in the notion of letting the expansion of a technological solution to the energy crisis drive modernisation of the French state. On the other, the EDF also has an affinity for the types of cost-projections and economic planning that is preferred (and indeed made) by the Ministry of Finance. This educational flexibility is what allows the EDF the skilfully adapt their cooperation with either the CEA or the Ministry of Finance throughout the period. Before the crisis, the EDF cooperated with the Ministry of Finance on the basis of the idea of cost to push through their idea of modernising the French economy though cheap electricity. As the conflict between the Ministry and EDF becomes prominent in the period following the crisis, the commonality between the CEA and EDF again surface to allow the technical concerns to supersede economic ideas of cost as budget constraints pushed by the Ministry of Finance.

6.3.6.2 Instrumental idea: EDF: disciplinary flexibility

The mixed nature of the educational basis of expertise in the EDF is the condition for the coalition between the Ministry of Finance and the EDF against the CEA-led nuclear programme in the period before the crisis. The instrumental policy idea of cost that united the EDF and Ministry of Finance before the crisis (and was important in building an alliance against the CEA-programme) is less stable. First, the size and singular focus of the energy policy response to the oil crisis led the Ministry of Finance to criticize the programme on budget grounds alone. Beyond the attempts to constrain budget spending on the nuclear programme, the situation also brings into further light the difference between the idea of cost in the EDF and the idea of cost in the Ministry of Finance. As mentioned, the use of statistical modelling and computerisation of cost-projections is partially what had allowed the EDF to speak to the cost-perspective of the Ministry of Finance in the ideational conflict over the type of nuclear reactor programme[155]. In a sense, the EDF had utilized a non-technical idea of cost/kWh to obtain support in the PEON commission in the technical discussion of nuclear reactor programmes between the EDF and the CEA. Once the EDF had become the primary actor in defining the nuclear programme of France, the cost-perspective became subservient to the idea (that they still shared with the CEA) of modernising the French economy through the development and expansion of a French nuclear programme.

[155] The modelling techniques are also used to predict power demands during different seasons under different assumptions about the weather. *EDF: PASSACE DES HIVERS 1S78/79 ET AU-DELA - COMPLEXITE.DES METHODES D'AJUSTEMENT DE LA PUISSANCE. September 28th 1977. Production Autonome (19830369/11).*

The PEON 1973 report bears out this shift. Like other reports, it contains several viewpoints represented by the different groups in the commission. Here we can observe how the CEA and EDF who were in conflict over instrumental policy ideas earlier suddenly unify against the Ministry of Finance. They introduce a distinction between objective and subjective concerns. This terminology is used to differentiate those who believed in a furthering of the nuclear programme and those who wished to constrain it. Essentially, those who are against the expansion of the nuclear programme and increased market-share of nuclear energy to other energy-sources are branded as following subjective agendas instead of basing their arguments on objective facts (Simonnot 1978, 267–68). This is indicative of a complete dominance of technical expertise in the organising body of nuclear energy in France. It delegitimizes any policy ideas that are not consistent with expansion of the nuclear sector and allows the CEA and EDF to completely ignore the concerns of cost-perspectives from the Ministry of Finance. Cost, in the sense of budget-constraints that the ENA-inspired perspective of the Ministry of Finance, became much less important.

From this, it is clear that the technical and engineering background of the EDF personnel had a stronger influence on the type expertise than economics and statistical background from the ENA. That is not to say that the latter was not significant. They were instrumental in being able to ascribe meaning to the trajectory of energy policy in a way that was more consistent with the ways of thinking in the Ministry of Finance. This allowed the EDF considerable leverage against the CEA in the otherwise technical debates on reactor choice. However, as the technical debate over reactor choice ends with a programme that favours the solutions preferred by the EDF, their technological optimism again become superimposed on cost-perspectives. The increasing conflict between the EDF and the Ministry of Finance becomes evident in a number of occasions throughout the period following the announcement of the Messmer plan.

In November 1977 the Assembly Finance committee were preparing the 1978 budget, the Ministry of Finance voice their concerns and doubts about the economic sustainability of the French nuclear programme and attempts to restrain EDF spending by heavily criticizing several aspects of the French nuclear commitment. The committee criticized the size of the programme, its costs compared to other energy sources, coal in particular, the debt required to build, maintain and extend it and finally the composition of the PEON commission which representation heavily favoured technological optimists in the CEA and EDF . The broad range of critiques indicate that the Ministry of Finance was still not fundamentally sold on the idea of nuclear as the solution to either

achieving French independence or to increase the technological sophistication of French industry and their international competitiveness (Jasper 1990, 241).The ministry was however unable to change policy trajectory of the energy sector. The Council of Ministers itself decided the number of reactors to be ordered each year, which gave the EDF enormous leverage against the Ministry of Finance. Efforts to introduce energy conservation measures and thus reduce EDFs stated instrumental idea of economic growth through the increased supply of electricity and expanded use at the cost of other sources were effectively blocked at the council of ministers (Jasper 1990, 242; N. J. D. Lucas 1979, 152–56). So complete in fact was the dominance of the EDF vision for a nuclear France that many EDF officials had not even heard of the existence of the report and the critique of the nuclear programme that it represented (N. J. D. Lucas 1979, 105).

6.3.6.3 Setting: Disciplinary differences setting of "cost"

In the period before the crisis, the main constellation of actors debating the nuclear energy policy was the CEA, EDF and Ministry of Finance. While the period before the crisis was characterised by a commonality in technological optimism between the technical experts in the EDF and CEA, it was the alliance EDF and the Ministry of Finance made possible by a common concern for economic cost of the programme as well as a common language for communicating these concerns in statistical projections that allowed the idea of cost to dominate the debate and for the EDF to eventually change the reactor choice from the CEA-designed French UNGG-reactors to a licenced LWR reactor from Westinghouse. In this sense, it was the commonality over an economic idea that allowed the EDF and Ministry of Finance to shift the otherwise highly technical debates over nuclear reactor choice to the favour of the EDF.

The mixed nature of educational background in the EDF is what made it possible for employees of the organisation to speak both the language of technological optimism, an idea more aligned with the CEA, as well as the language of cost, more aligned with the Ministry of Finance. The particular setting of cost was, however, as we saw earlier, not exactly the same between the EDF and the Ministry of Finance. The former utilized cost measurements to better understand how cheap electricity could be produced, not to limit production of said electricity, whereas the idea of cost in the Ministry of Finance was predominantly a question of over-all budget restraint. We might consider the EDF idea a question of relative cost (kWh/centime) and the Ministry of Finance a question of absolute cost. Moreover, the EDF refers to the cost of the output of the energy

programme and the Ministry to the cost of the energy programme as such. The mixed educational background allowed to two ideas to cohere as substantially leading to the same purpose of the Ministry of Finance during the ideational conflict between the CEA and the EDF.

The CEA wanted nuclear power to produce plutonium for weapons, at the detriment of total cost and relative cost. While cost estimates existed, they were never a driving instrumental policy idea for the CEA and they never became as sophisticated as those of the EDF (Hecht 2009, 120). The EDF wanted nuclear power to produce cheap electricity, which happened to support arguments for overall cost of the nuclear programme as well (albeit somewhat questionable, as we have seen). This allowed a collation between the Ministry of Finance and the EDF against the CEA in the period leading up to the oil crisis, but after the crisis and the expansion of the nuclear programme became a stated government policy, the difference between the setting of cost in the cost idea of the Ministry and the EDF became clear. In this period, the EDF and CEA again became the technological optimists from before their conflict, and the Ministry of Finance attempted to restrain the budget cost of the nuclear programme suggested in the PEON commission (and elsewhere).

6.4 Conclusion

The analysis of the policy ideas of experts in the institutional context of the bureaucratic structure of France identified several interesting analytical findings. The analysis has emphasised how relatively few centralized expert actors are involved in energy policy predominantly concerned with nuclear energy. The different ways in which the policy ideas of these experts interact with the closed bureaucratic structure in France makes different coalitions possible and empower some expert policy ideas over others.

The strong capacity of the state has an effect throughout the period both before and after the crisis, however the dynamics of policy ideas vary. The CEA and EDF have a large role to play due to their dominance in the PEON commission. Their overarching ideas both emphasise the modernisation of France and an element of French nationalism. The institutional conditions for these ideas are supportive, because the a strong capacity of state in managing the economy as well as having an active role in fostering economic growth through domestic initiatives like a nuclear energy programme is consistent with the technophilic overarching idea that unifies the CEA and EDF. The instrumental ideas that the CEA and EDF follow are however somewhat different. At the level of instrumental ideas, the CEA sees this ensured through nuclear energy and a "force de frappe" and the EDF sees this through energy independence and cheap electricity generation.

These variations in instrumental policy ideas between the CEA and EDF can both exist within a strong state capacity configuration. However, which ideas win in cases of conflict cannot be explained alone with reference to the non-pluralistic nature of negotiations or the unity in a technophilic overarching idea of the future growth of the French economy and society. Ideas either win in closed bureaucratic structures when they have a dominant position due to their legitimacy in terms of the type of expertise they represent or through the preferred position they have already obtained from before. The key to both were coalitions that formed around different policy ideas of actors. The CEA was in the latter position due to being the development arm of the French state in nuclear energy and thus was an extension of the *dirigiste* capacity of the state. Even if the EDF had expertise within nuclear energy, it was not sufficient to affect the hierarchy of preferred policy ideas at this level.

Negotiations among experts tended to take place in commissions and tend to be highly technical in nature. The period before the crisis was characterised by a formalized style of negotiation between the EDF and CEA. The conflict that emerged between them was on a technical basis on the specific choices regarding the development goals of nuclear reactors. The introduction of a new measurement by the EDF of kWh/centimes allows them to begin fashioning reports that that involve comparisons and projections of costs across different technical choices for nuclear reactors and affiliated auxiliary technology. The technical and formalized nature of the negotiation style meant that debates remained at the level of instrumental ideas. After the crisis hits and the shift to a new instrumental policy idea of substitution of all other energy sources by electricity takes the forefront.

The reason why one particular technical idea could suddenly shift the instrumental policies that dictated the energy policy is a function of a bureaucratic structure where cost-concerns could unify instrumental policy ideas between the Ministry of Finance and EDF. This was facilitated by the basis of expertise in the closed bureaucratic system of France that is characterised by similarity in disciplinary language between the ENA-trained parts of the Ministry of Finance and EDF. This allowed the technical debates, especially located in the PEON-commission, to shift towards concerns with electricity production which constitutes a dividing line in instrumental policy ideas between the CEA and EDF. The question of costs becomes the substantive debate that breaks the unity around an overarching idea of nuclear energy as a grand projet and shifts the dominant ideas toward instrumental policy ideas which the Ministry of Finance and EDF can unite around.

The EDF allies with the Ministry of Finance over a seemingly common instrumental policy idea of cost. This coalition is made possible by a shared background in the basis of expertise between the two actors – specifically a common appreciation and use of the disciplines of statistics and economics. Substantively, the coherence between ENA-schooled economist and statisticians in the EDF and Ministry of Finance make it possible for common ground around an instrumental idea of cost to form between the two. This instrumental idea of cost defeats the idea of domestically developed reactor technology and plutonium extraction. Institutionally, we would also expect the coalition or conflict to form between EDF and Ministry of Finance because of the formal control over budgets that the Ministry has over the EDF as opposed to the CEA.

This allows an instrumental policy idea on cost shift the balance of power in favour of the EDF to win support for a new reactor technology and thus shift the path French nuclear energy policy. As

the crisis hits the consequences of this ideational battle mean that the choices available to the strong state are defined by EDF instrumental ideas rather than those of the CEA previously. The ideational foundation of the alliance between the Ministry of Finance and EDF is later put into question when the differences in setting this idea become apparent. The EDF focuses on cost as a relative measure per unit of energy generated where the Ministry of Finance consider cost in relation to an absolute budgetary restraint of policy programmes – a view that the EDF does not share – they want to increase the size and scope of the nuclear energy programme. At that point, the EDF and CEA shift back towards a unity around the overarching ideas of technophilia and nuclear energy, but now, defined through technical policy choices that reflect underlying instrumental policy ideas of the EDF.

Beyond the empirical findings of the analysis, a few theoretical implications may be hinted at, if not generalized per se. One relatively clear finding of the examination of educational basis of expertise is the observation that coalitions between expert actors are more likely to form if they have educational backgrounds that are similar enough that they communicate in a commensurate way. The temporary alliance between the EDF and the Ministry of Finance was made possible by their similar focus on cost and ability to communicate these policy ideas in a similar manner – e.g. statistical analyses and computerised simulations of costs and parameters of nuclear construction.

However, as the crisis response becomes more clearly crystallised as an expansion of the nuclear programme, the EDF instead formed a coalition with the CEA around a common technophilic vision of the future of France. This may have implications for how the connection between institutional constraints and policy ideas are conceptualised in that not only can the specific substance of an idea (e.g. the dominance of a particular type of economic discipline (Ban 2016; Chwieroth 2007a, 2010)), but the tools by which policy ideas are formulated also matter for the ability of a given policy idea to gather support even in contexts of relatively few and highly specialised actors. Of course, this observation should not be generalized lightly, but there is potential that a hypothetical pattern similar to this may occur in other contexts of highly technical and formalized interaction of expert actors.

Thus, the more general hypothesis this raises for other policy areas and cases could be formulated as: Alliances between constellations of actors is dictated by the similarity of their educational background of experts in the groups. When a constellation is dominated by three actors where two

are similar, but one is similar with another actor, that similarity becomes the significant one for creating conditions for alliances on policy ideas. An implication for the future study of the intersect between different types of institutional organisation of expertise and policy ideas should therefore pay more attention to the specific technical substance of the policy ideas. A fruitful way to take these observations further might be gleaned in work done on the policy-implications of different forms of economic modelling (e.g. (Mügge 2016; Mügge and Stellinga 2015)). This is because despite their seeming objective and technical nature, small variations may potentially result in large policy changes - should they be implemented.

One way this analysis of a closed bureaucratic structure has aided these studies of how ideas matter is by indicating the potential for power balances to be shifted in closed bureaucratic structures. That is, ideas at lower levels of abstraction like the instrumental ideas of the EDF and Ministry of Finance can shift power balances between the policy ideas of actors even in closed institutional settings where less outside expertise can intervene and shift the policies in question. Moreover, the stability of the ideational coalitions depend in part on the coherence of the agreement of instrumental policy ideas at the level of settings of ideas. This has implications for classic typologies of policy ideas as changing in paradigmatic shifts from “above”. Rather, change in policy can happen from shifts in the dominance of policy ideas at lower levels of abstraction and high levels of technicality.

Chapter 7 Comparative Conclusion and Perspectives

This chapter draws together the different insights from the chapters of the thesis and attempts to contextualise the findings of the analysis in a broader frame of social science research. First, it reflects on the broader theoretical and empirical puzzle of the thesis in relation to the stated research questions. Secondly, it examines the findings of the individual analyses before synthesising some combined findings from the analyses as a whole. Finally, these findings are put into perspective in terms of what they may imply for the future study in the discipline of social science, and the broader relevance of the thesis for other phenomena like the climate change agenda and populism are illustrated.

7.1 The Broader Goals and Research Questions of the thesis

The theoretical "puzzle" of this thesis was the way in which institutional contexts matter for the dynamics of policy ideas. Specifically, it examined the influence of institutions on ideas through the concept of open or closed bureaucratic structures, and different aspects of policy ideas operationalised as overarching policy ideas, instrumental policy ideas and settings of policy ideas. The analysis limited the focus on policy ideas to expertise within the policy field of energy policy. This was partly because the energy policy response was an obvious starting point for examining responses to the first oil crisis, but also because the technical complexity of alternative policies supported by different policy ideas allowed the analysis to speak to broader questions of the importance of experts and knowledge in advanced economies. The focus on energy policy was opportune in examining the dynamics of ideas because it requires focus on longer time spans, and, thus, this explicit temporal diachronic aspect of the analysis was designed in a way that it could pick up potential variations in change dynamics over time.

The empirical question, which served as a backdrop of the investigation, was the different ways in which countries react to similar stimuli. More specifically, it related to the question of how the intersect between international crisis and domestic solutions are mediated. The focus on policy ideas within energy policy among expert groups in this field was examined in France and the United Kingdom. These cases were interesting to examine in that they represented diverse variation on the causal factor of institutions, which was operationalised as open or closed bureaucratic structure. More broadly, the examination of energy policy responses to a common crisis may potentially

indicate dynamics which would be relevant to take into account in more recent periods where the question of global climate change is tackled by states.

The investigation was guided by a main hypothesis and two sub-hypotheses. The main hypothesis was:

Differing bureaucratic structures helped shape ideational exchange and negotiation about policy responses to the first oil crisis in France and the United Kingdom

The two sub-hypotheses were:

1) *Bureaucratic structures varied across the cases.*
2) *The bureaucratic structures influenced the dynamic of ideational development in different directions.*

To answer the main hypothesis, the two subsequent research hypotheses had to be formulated. One relating to differing bureaucratic structures and one linking these structures with policy ideas among experts. The first sub-hypothesis was: *Bureaucratic structures varied across the cases*.

The theoretical framework was developed, which examined the twin aspects of institutional and agency factors. The institutional dimension was operationalised as open or closed bureaucratic structure. This was considered a subset of institutions in each case, but which has relevance to the role of expert ideas in different ways. The three dimensions of a bureaucratic structure illustrated the role of weak or strong state capacity, pluralist or closed negotiation style, or technical or generalist educational basis of experts. These broad analytical categories were then examine for each country case. The United Kingdom was found to mostly resemble an open bureaucratic system, and the French case most similar to the characteristics associated with a closed bureaucratic system. The first sub-hypothesis was thus answered in the first section of each case analysis when the bureaucratic structure was examined.

The second sub-hypothesis: *The bureaucratic structures influenced the dynamic of ideational development in different directions*. It had to examine the policy ideas among experts in these bureaucratic structures in both cases. The theoretical framework utilized the more fine-grained

heuristic conceptualisation of overarching policy ideas, instrumental policy ideas and settings of policy ideas to capture the variation in policy ideas among experts in the energy policy field across the time period from before the oil crisis up until the late 1970s. This allowed the analysis to capture the different ways in which ideas manifested among experts in the two cases across a longer time period and speak to the dynamics of ideational change and continuity without assuming punctuated shifts.

7.2 Main analytical points and dimensions in the United Kingdom

In the analysis of the United Kingdom, a number of interesting findings could be identified. While there are a few examples of increasing attempts to allow public control over some areas of the energy policy in the period after 1975 (domestic oil production, in particular) the general pattern of the capacity of the state in the United Kingdom is one of absence of intervention. That is not to say, that the state does nothing throughout the period, but that the ways in which state capacity manifests is through the utilization of existing institutional structures. We observe this in preference for triparty bargaining in the coal sector, or the concern for international diplomacy in the oil sector. Even when attempts to increase the Petroleum Revenue Tax (PRT) might be argued as expressions of stronger state action, these policy ideas are reduced in intensity by international concerns and thus limits state capacity to set a higher PTE.

The resultant policy idea dynamic is that experts are inclined to select ideas that are based on the resources of other actors rather than state capabilities. Diplomatic ties and stabilizing industrial relations are two such forms of policy ideas that rely on other actors' resources for policy goals. We can observe this in expert debates over the policy ideas that are held to define the oil policy for the North Sea. Here different departments field different policy ideas. The Treasury shows a partial support for the PRT, but also refers to an idea of *attractive investment* for multinational oil companies in the North Sea as well as a *diplomatic* policy idea that other departments share vis-à-vis the United States. These policy ideas sometimes outweigh the influence of concern for the ability to manipulate energy demands towards other energy types. The political dimension of coal unions weighs heavily, but its focus seems to decrease among experts after the labour government under Harold Wilson comes into power. The importance of maintaining industrial stability in the coal sector is, however, continued as a topic of focus among ministers within cabinet meetings.

The differences in policy ideas between the before and after period of the crisis is less pronounced in the United Kingdom compared to France. The negotiation style of a closed bureaucratic system is partially the explanation for these dynamics. It is characterised by interactions between many actors in a symmetric power relationship where no one group can dominate the views of another. This leads to maintenance of status-quo and difficulty in policy ideas to shift trajectory of energy policy. One clear illustration of this is the multitude of attempts to find consensus between otherwise differing policy ideas. Counter-factually, this general tendency could potentially have been counteracted had the Department of Energy had stronger formal institutional powers to dictate energy policy ideas vis-à-vis other actors. This is not the case, however, and while it is unfair to say the department does not do anything, its addition does not fundamentally shift the effect the bureaucratic structure has on policy idea dynamics. Existing patterns of coordination and consensus are thus reproduced. It is worth emphasising how the negotiation style and state capacity reinforce each other in this regard.

In the United Kingdom, the weak capacity of state favours policy ideas that rely on multiple state-society actors and the negotiation style in the bureaucratic structure of the United Kingdom also invites a range of actors to contribute their own policy ideas in a context of power symmetry. The result is a plurality of actors and policy ideas are in play. This, in turn, is supported by the basis of expertise where policy ideas are not discussed in their technical detail, but rather at a general level. Analytically, the effect is that discussions of different policy ideas among experts operate primarily at the level of instrumental ideas rather than the settings of agreed upon ideas. In itself, this does not necessarily have to lead to stability in policy ideas. However, it reinforces status-quo outcomes, not necessarily due to agreement, but because every expert group has veto power, and the lowest common denominator, below which agreement is blocked, is at the level of overarching policy ideas.

This illustrates why only examining different aspects of ideas is insufficient to understand idea change. Despite disagreement over instrumental policy ideas being able to shift the dominant expert groups and resultant policy in France, then in the United Kingdom debates can thus not proceed beyond the most general level of agreement. We see these types of dynamics among expert groups in debates about the Petroleum Revenue Tax and even in the more technically demanding debates on nuclear reactor choice. The latter case, in particular, shows how the basis of expertise has different impact on the types of arguments that are legitimate claims to authority in a policy area.

This is the case in the difference between the instrumental policy ideas of CPRS and Treasury on one side, and AEA and DTI on the other in the topic of reactor choice before the crisis. The common solution is to defer decision on issues that can be argued to wait, and agree on the general outline of those that can be agreed upon – in the latter case, the restructuring of the nuclear construction sector into fewer consortia. This gives the negations a certain level of inertia and bias towards maintaining the status quo. These technical debates on nuclear energy questions highlight how the negotiation style with a lack of veto-power among symmetric actors, with a political style of discussion that does not necessarily favour technical knowledge in the fielding of policy ideas, can combine to reinforce status-quo dynamics in parts of the energy policy.

Domestically, the overarching policy goal of ensuring energy supply is maintained through coal mines and expectations of oil in future. Nuclear energy shifts back and forth due to politicization of technical choices and the aforementioned bureaucratic structure dynamics. The capacity of the state in nuclear policy was defined in terms of facilitating diplomatic ties that allow existing actors in the industry to operate more freely. The need to involve many different expert groups in the energy policy development means that technical discussions are not as sophisticated as otherwise could have been the case. Perhaps, more importantly, is that the technical expertise of some expert groups does not grant particular advantages in terms of the authority of policy ideas vis-à-vis other expert groups.

This is a significant difference compared to the French bureaucratic structure where technical knowledge was widespread and imparted, on those expert groups who held it, considerable authority in policy ideas (although not sufficient by itself). Moreover, the structure of power symmetry between the expert groups leads to an emphasis on consensus in the negotiation style. When such agreement is not forthcoming – often quite quickly - then questions are pushed for debate at a later time. The negotiation style becomes one focusing on flexibility as seen in the nuclear policy, where choices are pushed around through a constant concern to not be left behind technologically and to maintain the domestic industry. The dynamic between expertise and politics thus becomes one of politicians having to push experts for clear recommendation for policies rather than experts pushing policy ideas on politicians.

The more general training rather than specialized knowledge among most of the expert groups in the United Kingdom means that nuclear energy policy debates become characterised by a focus on

implied policy outcomes rather than evaluating policy choices on their technical merits. The technical choices before experts are thus rarely directly debated as technical choices, but instead in terms of their implications for the industry, diplomatic relations or future development possibilities. This reinforces the pattern of consensus-seeking both before and after the crisis.

The CPRS explicitly notes the inability of discussing the policy ideas at a level of the technological choices required and this characterises the debates across time. As the meetings between expert groups on the different stages of nuclear policy before and after the crisis indicate, this pattern of non-technical debates is consistent within nuclear energy discussions when the Atomic Energy Agency is involved. Moreover, the department of energy following these limitations is mostly relegated to coordinating the different views of involved expert groups rather than controlling the policy direction per se. This also means that political intervention is sometimes required to break the indecision-dynamics in some parts of the energy policy. The strongest example of this is the nuclear reactor debates which go back and forth on several occasions throughout the period ultimately decided by ministers rather than a consistent recommendation from experts.

This is worth expanding a little on this point, because it speaks to the role of formal politics in relation to the expertise that it increasingly relies on. It is of course the formal remit of the political incumbents of government to formulate and legislate on policy that they see fit, in this sense it may seem counter-intuitive that any political system can be described as weak[156]. A seeming counter-factual might be the "disengagement" policy line of the conservatives in the early 1970s. It might be construed as an attempt to limit the role of the public in social life, which may have succeeded in some manner by introducing managerial practices of the private sector into parts of the public sector (Young and Lowe 1974, chap. 12). However, in terms of changing the open or closed nature of the bureaucratic structure, there was limited changes compared to the existing trend of large federal departments despite attempts to reduce tendencies for interdepartmental compromise (Young and Lowe 1974, 130–31). The fact that the framework of open bureaucratic structures applies in terms of weak capacity of the state across different political party governments reinforces the point that this is a structurally distinct tendency, not a consequence of politics per se.

[156] Perhaps outside of descriptions of "weak" and "strong" states in relation to some material factor in the international system of states. Here the reference point for the descriptor can be somewhat intuitively operationalised (if nonetheless conceptually debated as key to outcomes).

7.3 Main analytical points and dimensions in France.

The analysis of expert policy ideas within the bureaucratic structure of France identified several analytical findings. The analysis emphasised how the expert groups of the CEA and EDF have a large role to play in the policy ideas within energy policy discussion due to their dominance in the PEON commission. The strong capacity of the state has an effect throughout the period both before and after the crisis through managing the economy as well as having an active role in fostering economic growth through domestic initiatives like a nuclear energy programme. This is consistent with, and supportive of, the overarching ideas of CEA and EDF who both emphasise the technophilic modernisation of France and an element of French nationalism.

The instrumental ideas that the CEA and EDF follow are, however, somewhat different. At the level of instrumental ideas, the CEA sees the overarching policy idea of modernizing France ensured through nuclear energy and a military "force de frappe". The EDF, on the other hand, sees this through energy independence and cheap electricity generation. These variations in instrumental policy ideas between the CEA and EDF can both exist within a strong state capacity configuration. However, which ideas win in cases of conflict cannot be explained alone with reference to the non-pluralistic nature of negotiations or the unity in a technophilic overarching idea of the future growth of the French economy and society. In closed bureaucratic structures the ability of policy ideas of one expert group to win vis-à-vis others can be due to a number of factors. It can be due to their legitimacy in the expertise they hold, which both EDF and CEA held. It can be through the ability to create alliances with other actors to support a policy idea, or through the preferred position they have already obtained from previous institutional arrangements. The CEA was in the latter position due to being the development arm of the French state in nuclear energy and thus was an extension of the dirigiste capacity of the state.

The negotiation style in the closed bureaucratic system of France was characterised by negotiations among experts in formal commissions and tended to be highly technical in nature. The period before the crisis was characterised by a formalized and amicable style of negotiation between the EDF and CEA. The conflict that emerged between them was on a technical basis on the specific choices regarding the development goals, and thus types of nuclear reactors that should define the energy policy in France. The technical and formalized nature of the negotiation style meant that debates remained at the level of instrumental ideas. It is not until the EDF begins introducing a new

measurement of kWh/centimes, which allows relative cost comparisons between different reactor technologies to be included in their reports. Especially, the ability to generate cost projections for different technologies allows potential alliances to be formed between other expert groups in the PEON commission. After the crisis hits and the shift to an instrumental policy idea of *substitution of all other energy sources by electricity* takes the forefront.

The reason why one particular technical idea could suddenly shift the instrumental policies that dictated the energy policy is a function of a bureaucratic structure. In this context, the cost-concerns could unify instrumental policy ideas between the Ministry of Finance and EDF thus create the conditions for a common alliance of Ministry of Finance and EDF against the CEA. The creation of the kWh/centimes measurement is a key condition for this. However, another facilitating factor was the basis of expertise in the closed bureaucratic system of France that is characterised by similarity in disciplinary language between the ENA-trained parts of the Ministry of Finance and EDF. This alliance is made possible by a shared background in the basis of expertise between the two actors – specifically a common appreciation and use of the disciplines of statistics and economics.

A coherence between ENA-schooled economists and statisticians in the EDF and Ministry of Finance makes it possible to form common ground around an instrumental idea of cost between the two. This allowed the technical debates, especially located in the PEON-commission, to shift towards concerns with electricity production, which constitutes a dividing line in instrumental policy ideas between the CEAs concern with military use of nuclear technology and the EDFs instrumental policy idea of generating cheap electricity. The question of cost becomes the substantive debate that breaks the unity around an overarching idea of nuclear energy as a grand project of the EDF and CEA and shifts the dominant ideas toward instrumental policy ideas to one of cost which the Ministry of Finance and EDF can unite around. The combination of a new measurement and common educational basis thus made a new alliance between expert groups possible, which increased the influence of policy ideas of the EDF instead of those of the CEA.

This allows an instrumental policy idea on cost to shift the balance of power within the PEON-commission in favour of the EDF to win support from the Ministry of Finance for a new reactor technology and thus shift the path of the French nuclear energy policy. As the crisis hits, the consequences of this ideational battle and new coalition between the Ministry of Finance and EDF mean that the choices available to the strong state are defined by EDF's instrumental ideas of cheap

electricity generation and the substitution of other energy sources by electricity rather than the military-aspects highlighted by the instrumental policy ideas of the CEA, previously.

The ideational foundation of the alliance between the Ministry of Finance and EDF is later put into question when the differences in setting of this idea become apparent between them. In short, the EDF focuses on cost as a relative measure per unit of energy generated, where the Ministry of Finance considers cost in relation to an absolute budgetary restraint of policy programmes. By contrast, the EDF seeks to increase the size and scope of the nuclear energy programme in direct opposition to budgetary constraints understanding of cost. At that point, the EDF and CEA shift back towards a unity around the overarching ideas of technophilia and nuclear energy, but now, defined through technical policy choices that reflect underlying instrumental policy ideas of the EDF. The development in the policy ideas that define French energy policy across the period of the oil crisis can thus be explained with reference to shifts in the coalitions that supported specific policy ideas among groups of experts. A key part of this story, however, is how the bureaucratic structural aspects of educational basis and negotiation style affected the conditions for the ideational coalitions for shift back and forth.

7.4 Main findings of the two analyses

Many dynamics and actors have been highlighted both in the analyses themselves and in the summary conclusions above. Therefore, it might be useful to briefly sketch the key findings of the analyses that become evident when comparing their ideational dynamics and differing open or closed bureaucratic structure which shed new light on the interaction between institutional structures and ideas as well as the level at which ideational change is expected to take place. This is not just as a general corrective to existing models (Blyth 2013b), but a specification that the configuration of institutional structures in which ideas operate affect the change dynamics.

The French case illustrates that the coalitions that allow support for a particular policy idea are more likely to be found at the level of instrumental ideas in cases where technical debates are prevalent. This was because the strong state capacity reinforced the existing few expert groups in their formalized and technical negotiation style. Here, we saw how the EDF and CEA generally agreed on the technical conditions of what to debate and how, but disagreed on instrumental ideas. Likewise, it was the agreement on instrumental ideas on cost between the Ministry of Finance and

EDF that allowed a coalition to form that could supersede the instrumental idea of the CEA on military use of nuclear technology. It is also crucial to note, that the educational basis of the EDF and Ministry of Finance played a conditioning role for this ideational coalition on cost. Because the two organizations had similar expertise from the ENA on statistical and economic modelling and projection, the arguments that the introduction of kWh/centimes allowed the EDF to forward were consistent with a way of thinking in the Ministry of Finance. When disagreements arise about the setting of the instrumental idea of cost after the crisis, the EDF and CEA unify around the instrumental ideas of the EDF and their common overarching policy idea of developing French society through nuclear technology.

The case of the United Kingdom highlighted that support for a particular policy idea requires unanimity or political intervention, otherwise the dynamics of ideational development favour the status quo. In the open bureaucratic system of the United Kingdom, the educational background played a different role in that the generalist background of most experts meant that the technical dimension of policy issues were rarely allowed to dominate discussion. This in turn meant that conditions for coalition-building around ideas was much more politically contentious and not driven by specific disciplinary similarities in arguments or ways of thinking. In the negotiation style characterised by an emphasis on consensus among multiple experts who act as veto-players, different policy-ideas can be kept in a constant deadlock of ideational battle due to institutional characteristics of the negotiation. The weak capacity of the state meant that shifting concerns of a large number of actors was allowed to influence negotiations already prone to gridlock. This shifts the loci of ideational battles compared to the French case. Accordingly, ideational change thus often comes from political intervention in the expert debates rather than from ideational battles among experts themselves.

Before moving to the more general insights, contribution and perspectives of these analyses it is worth reflecting on the role of politics in expertise. Crucial to this study has been the role of institutional context for how expert ideas gain traction. This meant examining the experts and their interaction surrounding energy policy. These are partially analytical choices to allow the analyses to speak to the research questions that inform the study. However, part of the distinctive differences between the two cases of the open bureaucratic structure of the United Kingdom and the closed structure in France is the role of politicians. What does this mean for the role of the elephant in the room of alternative explanations: was it just politics? To some extent, this answer is always partially

true in social sciences. Indeed, to extent, politics of yesteryear may be said to embed itself in the institutional setup of a given policy field. The key here is the different way that politics is activated in relation to policy ideas.

In the French case, political intervention was required to decide on the ultimate direction of policy – but the path of a nuclear future was already debated, laid out and significant ideational conflict and alliance formation (with e.g. Ministry of Finance) had already taken place among technical experts of the CEA and EDF. Politicians were not called upon to direct the everyday decision-making of energy policy. The relatively closed, technically driven experts of the PEON-commission had the debates and the EDF route prevailed over another technical group in the CEA (ultimately, both somewhat against the will of the Ministry of Finance).

In the case of the United Kingdom, the role of politicians is continually required to achieve policy outcomes because of characteristics relating to especially the veto power of experts and consensus-nature of the negotiation style as well as the predominance of general knowledge among experts rather than technical expertise. In a sense, the political dimension is thus incorporated as an external push in the closed bureaucratic structure in France, and as a more continual reliance and incremental force in the open bureaucratic structure of the United Kingdom. That being said, it would be interesting to expand the scope of the analysis of the openly political context (parliamentary debates, governmental support and shifting programmes and origin as well as broader political discourse). This would allow us to better gauge the intersect between politics and expertise in each case.

7.5 General insights from the analyses, contribution and perspectives for future research

What have we learned from examining these two cases of response to a crisis within energy policy? This section indicates how insights from the thesis contribute to different aspects of social science research and perspectives for future research.

7.5.1 Diachronic analysis of change in ideas

One crucial, if perhaps somewhat evident implication is **t**he importance of historical analysis in the study of ideas. This may be a somewhat intuitive point, but in the context of the findings of this thesis it bears repeating. Studying change (of any kind, in principle) presupposes the analytical lens applied has a dimension along which change, and continuity can be mapped. The solution of this thesis was a longer term diachronic study that examined a single crisis, but mapped several years of policy dynamics before and after the crisis. This is necessary to actually pick up and register such changes, because their manifestation may initially not look like a shift and their eventual effect can only be gauged over time. Therefore, the case studies that emphasise the role of ideas have to take the temporal nature of ideas and policy change seriously into account. This is even more relevant in cases where the policy field is slow to shift and the practical implementation of policy choices may take many years to come to fruition (building power plants, standardising electricity systems etc.) or when technological choices and implications are opaque.

7.5.2 Contribution to the understanding of ideational change

The conclusions to the analyses of this thesis indicate that ideas do not only change due to fundamental shifts in paradigms, but more likely due to piecemeal undermining of a paradigm by second order ideas. This creates ripples through the entire policy-arena where eventually new paradigms become visible as alternatives to old – initially due to new instrumental ideas (e.g. France, EDF on cost). This is a further specification of the way through which ideas may develop and change over time not initially understood or at least specified by classics in the field (e.g. Hall, 1993, variants of which still permeate the literature).

The analysis attempted to examine the effect of different institutional setups to policy idea dynamics within energy policy. It did so by focusing on three dimensions of institutional characteristics that were called the bureaucratic structure. The United Kingdom and France were examined because they seem to represent two extreme cases of bureaucratic structures where the former is open and the latter is a closed bureaucratic structure. The study of policy ideas among experts in these two different bureaucratic structures were then analysed across a number of years around the first oil crisis in 1973. At a more intuitive starting point, this was done on the assumption that crises would be the place where breaks with existing institutional patterns would be more likely. From a theoretical point of view, it also contributed to the understanding of the classic paradigmatic views of policy change, because it is during times of crisis that paradigms are often said to break down. The focus of the analysis of policy ideas in energy policy around a crisis thus served to highlight the dynamics of how this might happen. This is relevant for the study of ideas, because a dominant explanation relies on a concept of paradigmatic shifts, which assumes policy change follows as dominant zeitgeists are replaced with new ones creating a cascade of policy change in its wake. Studying crisis should be a critical case for such an argument, because it is exactly in the period of the crisis that we would expect the strongest influence of ideas to shift a paradigm and a new dominant idea to replace an existing one.

The analyses, however, show that the story in the cases are not as straight forward. It is hard to contest that there was a paradigmatic shift in the policy trajectory of French energy policy immediately after the oil crisis with the introduction of the nuclear programme pushed for by Pierre Messmer in 1974. However, this policy did not represent a fundamentally new ideational paradigm. Instead, these ideas had existed for a long time (in differing forms) within public agencies of CEA and EDF. Moreover, it was the conflict between the ideas of these two agencies that helped define the trajectory of French energy policy along a nuclear path as well as the specifics of the form it would take. Resistance did persist from actors like the Ministry of Finance who were pushing a cost-perspective emphasising *balancing of public finances.* They were effective in some level of limitation to the speed and scope of the policy trajectory, but they were not able to shift the direction or supplant the dominant ideas that supported it - which effectively led to EDF attempting to supplant all other forms of energy in the French energy supply with electricity.

In the United Kingdom, the open bureaucratic structure meant that multiple veto-actors were able to contribute policy ideas to the overall energy policy. This meant that a constant flux of policy ideas

were present, but also that deciding between them was made institutionally difficult. In a context where energy policy had historically been organised around several different actors and ministries, even attempts at centralizing decision-making and setting up the department of energy to coordinate policy ideas did not change the effect of the negotiation styles. They remained consensus-seeking and reliant on agreement or the weak capacity of the state in directing the energy policy of Britain. This meant that policy dynamics were more ad-hoc and shifted back and forth on key policy decisions like nuclear reactor technology, or agreement was reduced to the lowest common denominator of agreement. This resulted in talks of restructuring industries or shifting around of taxes on oil extraction thus relegating decisions to the discussion on policy setting of more marginal impact and being reduced in scope or final decisions being procrastinated.

The theoretical framework of the thesis made these analytical insights possible through a number of moves. First, the analytical framework is insistent on the active incorporation of institutional and ideational factors into the analysis of idea dynamics and the role of expertise in politics. In research, these factors often interact or condition each other in different ways. Using this framework, the analysis is forced to examine them together and this allows the findings of the thesis to reflect synthesis of interactions that would otherwise have been difficult to spot. This duality in the framework represents an active intention to move the literature on the role of ideas in politics towards an explicit appreciation of the institutional contexts within which ideas matter – part of the contribution of the analytical framework should therefore also be seen in this light.

Secondly, the bureaucratic structure part of the framework attempted to incorporate aspects of the institutional context at different levels of generality. The capacity of the state related to broader questions of the power of the state vis-à-vis other spheres of society. The negotiation style attempted to capture the institutional context in which actors (including experts) operate to achieve outcomes, the openness and number of actors involved including the dynamics of interaction is important because it helps illustrate the contours of the arena in which ideas can be fielded by experts. Finally, the basis of expertise attempted to touch on the type of expertise that was dominant in the interactions between different actors in achieving policy outcomes. This dimension was added to include a more substantial understanding of the types of arguments that were forwarded by experts. This added complexity was balanced by the additional focus it allowed on how different aspects of the institutional environment all play a part in conditioning the policy ideas that eventually receive support. It is important that they are analysed together, because as we saw when

comparing the United Kingdom and France, the types of expertise that become dominant varies. Why not assume it is simply the type of expertise that explains different policy outcomes? Well, partially, it was. At the surface level of comparing basis of expertise and the policy ideas of experts between the two countries, it is clear that significant differences exist between technically-driven commissions in the French case and more openly political and general specializations among experts in the United Kingdom. However, that is not to say that technical expertise did not exist among experts in the United Kingdom. Especially, when comparing the nuclear policy expertise, it is clear that the UKAEA holds significant technical know-how. So why did they prevail in the French case and not in the United Kingdom? Due to the other aspects of the bureaucratic structure affecting the overall dynamic of interaction among experts. When examining the capacity of the state in the United Kingdom, we see the greater propensity to involve multiple spheres of society. This openness is reiterated in the negotiation style where multiple different actors are involved on ad-hoc basis in policy discussions. Because these interactions are institutionally geared towards consensus no one group of actors can dominate the agenda, and because technical know-how is not characteristic of the majority, the outcomes of deliberations cannot be arrived at through technical merits. The dynamic of requiring explicit political intervention to solve what in France are primarily technically-driven problems arises from the combination of the analytical aspects that make up the bureaucratic structure.

7.5.3 The role of politics in a system of experts and pre-existing institutional boundaries

It is worth emphasising, that the finding that institutional characteristics can affect policy idea patterns is not equivalent to the role of politics being completely mitigated. What it does suggest, is that the role of political intervention is in part influenced by the type of open or closed bureaucratic structure. In the case of France, there is no denying that a strong state capacity is also corollary to a strong role for politicians. Indeed, part of the story why the CEA was perhaps unprepared for an alliance between EDF and the Ministry of Finance was that they had since their inception been directly responsible to the president and their finances outside the direct budgetary control of the Ministry of Finance. These are of course political choices. Similarly, it is the final say of the “Conseil de ministres" that decides to implement a particular nuclear policy as suggested by the PEON commission. At several steps along the way, politics matter.

The point is, different bureaucratic structures affect when politics matter. In the closed bureaucratic structure of France, politics matter in the sense of conditioning by setting up the institutions and in the final decision on a policy. Indeed, to argue that a strong capacity of state through dirigisme is not an expression of some form of historically entrenched politics, would also be an unnuanced reading of the historical and political record of France. That being said, it is crucial to note the formally insulated nature of the expert groups, their relative autonomy from ad-hoc political interventions and the extent to which the politicians eventually simply implemented the energy policies as suggested by the PEON commission.

The nature of politics in the open bureaucratic structure of the United Kingdom was much different. The expert groups were of a much higher number and relied on coordination among experts who had formal input, but no clear dynamics of the bureaucratic structure allowed the policy ideas of one or the other expert group to dominate the discussion. Partially, this can be traced to the idea of cooperation among different actors being supported at the capacity of the state. The dynamics of the negotiation style similarly allowed many different actors to push different policy ideas without a clear way to differentiate winning from losing ideas. This results in a dynamic back-and-forth procrastination of different policy issues. The final decision between which often required direct political intervention into the expert debates, as was seen on the shifting choices on nuclear reactor technology through the 1970s.

7.5.4 Empirical relevance of the 1970s oil crisis for today?

Newer developments in energy policy are intersecting with new policy agendas. Obvious areas are questions of environmentalism and the problem of climate change. Many countries, not just the countries studied in this thesis, face these new problems, with tremendous political, economic and technical challenges. This thesis has attempted to tease out and examine to very different responses to a common problem of the oil crisis in two separate countries and emphasised the domestic political dimension of the actors involved and the ideas that drive them. The question of how policy change comes about is an age-old question in political science, but as we are faced with new problems, solutions, actors and interests will come into conflict, and the battleground will be fought over which actors should define the problem in such a way that their solutions apply to it. This means that solutions are not subsequent to problems, instead they may indeed be pre-existing and

gain prominence as new ideas rise and obtain influence. This observation makes it all the more crucial to examine the pre-existing institutional patterns that characterise the countries in question.

The 1970s are often highlighted as a paradigmatic period – most notably for broad historical changes and the end of the Trente Glorioueses, but also theoretically as an anchor for much of the ideational scholarship on ideas (see chapters one and two). For energy policy, the period is likewise relevant. The first oil crisis and the 1970s highlight a shift in energy mixes away from imported oils and towards other sources. With the caveat that the world of today is not the world of the 1970s, we may still tease out some implications for energy policy, sustainability and climate change from what was examined in this thesis. The theoretical implication of this thesis is that the victory of some policy ideas over others, even in highly technical policy spheres like those relating to energy, rely on more than the content of their ideas to achieve influence. The specific institutional context in which the policy ideas operate matters greatly to the dynamics of interaction between experts and the types of ideas that come to characterise policy formulation. This means that great attention must be given to the existing institutional setup of expertise in the given country when attempting to manipulate the energy mix from highly reliant on fossil fuels to other sources. What is more, this requires a keen eye to the different actors involved in the process and how they are involved if successful transition to sustainable energy is to be achieved. This obviously is relevant to questions of the future and role of nuclear or oil as energy sources, which have been extensively examined in this thesis, but also to broader questions of alternative energy sources.

New developments in this field and the challenges to common energy transition problems in the face of climate change have multiple dimensions that are different from those explicitly dealt with in this thesis. Primarily, this difference is the much more integrated nature of economies and political systems (in particular within the EU) compared to the early and late 1970s. Examining the dynamics of these policy trajectories in energy and how actors are dealing with the crisis of climate change thus requires a much more openly international and multi-level approach than was applied in this project. Nonetheless, there are insights gained from the results of this thesis, which may help us identify relevant points of interest when trying to steer a large-scale policy transition within energy following a crisis. In particular, the role of nationally specific institutional patterns that often reflect the unique historical legacy of the country in question. These specificities become embedded as institutional parameters that affect the operation of politics. More specifically, an application of the framework of this thesis would highlight the role of existing institutional structures in affording

specific types of expertise's access to the policy debates. Moreover, this dimension would be combined with an attention to how the interaction between the different experts was structured. Is it a more open structure that involves a multiplicity of different experts? Is there a formally given hierarchy of interaction or do they field policy ideas on an equal footing? If the latter is the case, which mechanisms or actors exist in the system (or outside it) to alleviate gridlock in the process of policy formation? Such attention would allow us to specify ex ante which countries or sectors would be more difficult to achieve a transition to more sustainable sources of energy. A study of the role of ideas in any field of policy would therefore do well to incorporate an attention to specificities of the institutional contexts in which the effect of ideas is analysed. At a simple level, this should be fostered to increase the nuance of the analysis in question. A more general point is that the specification of relevant institutional context for the policy area and ideas in question helps to limit the scope and set the parameters of generalizability of the findings of the study.

7.6 Implications of the thesis for future research

Following the findings of the analyses in this thesis focus of future research could usefully be directed towards a couple of axes of interest.

First, the often very politically-domestic dependent nature of these shifts, which means general predictions about reaction patterns are difficult to make, but also it necessitates a nuanced understanding of the different domestic political and economic contexts into which a given crisis is being understood. Second, the differences of where influence lies in terms of degree of political or bureaucratic control over the policy field will also make significant differences. In France, the ultimate decision of going with nuclear energy was political at the highest level, but the already existing expertise of national bureaucratic agencies within the field, as well as a political culture of state projects, made the outcome of a total reorganization of the energy supply and production towards a singular source – nuclear – the more conditioned by these contextually historical and institutional contexts. At the same time, the importance of tracing the ongoing back-and-forth of ideas and interests between these agencies is necessary to understand not just who, but how the policy shift took place as it developed over time. Third, the particular ideas that agents field to make sense of the problems that pertain to their policy area are of key importance in understanding these diachronic developments, not just their material interests as agencies, but the way in which material and ideational factors interact.

The choice of energy policy as the field of examination for the role of experts has wider appeal than the specifics of the choices and debates analysed in the period around and after the first oil crisis. Energy questions are perhaps even more relevant today than they were in the 1970s, because as the oil crisis represented a need to maintain energy supplies or shift to other sources as needed, the current debate on climate change is about more than just independence from oil in the Middle East. The climate agenda encompasses everything from CO2-reduction goals, phasing out of internal combustion vehicles by 2030s in some places (U.K., California, and France) to a greater attention to the underlying consumption-logic of modern capitalism and a reorientation towards recycling both on societal and individual levels. What all these interconnected concerns and goals have in common is that they are complex and will require effort and time. These questions cut across more dimensions than those covered in the present thesis, but nonetheless speak to the underlying relevance of some of the questions the thesis poses.

A tentative hypothetical application of the framework on bureaucratic structures could be the field of study relating to climate change. Here, the function of bureaucratic structures in the role of different policy ideas of how to transition (or not) to a less carbon-intensive society would potentially be useful. Such an application could highlight the different aspects of state or market involvement in producing the conditions for or explicit solutions to the climate crisis in which more state-controlled action promote faster adaption. The negotiation style of experts (or broader group of relevant actors) in defining the solutions could highlight how the inclusion or exclusion of especially state institutions alter the possibilities for policy ideas to become active solutions, with the findings of the study pointing to a more exclusionary negotiation-style in order to support new solutions.

Finally, the findings of this thesis hint at the varying dominance of different forms of epistemic authority would also be relevant in this field - with a focus on two pitfalls: one of generalists co-opting technical discussions and one of specialists dictating marginal discussions and developments. Thus, suggesting both the necessity of specialist for negotiation in specificities but also outside control that can prevent the continuation of marginal discussions that at best can hinder, or at works delay, outcomes. Although, potentially, this dimension should not be limited to educational backgrounds and disciplinary variation examined in this thesis, but broader examination of the role of climate scepticism versus scientific knowledge might be relevant dimensions to apply to the framework of a new area of study. The particularities of requirements for re-specification of

the broader framework to new policy contexts would of course need to take into account the theoretical and empirical concerns of the particular research questions that are being asked. The thesis did not specify theoretically how epistemic authority is achieved through the developmental history of the given episteme itself; rather it suggested that the institutional environment makes some constellations of knowledge, taking the form of ideas, more powerful than others and thus help explain why some ideas triumph over others. By extension, the thesis did not explore how the institutional factors (that allowed some ideas to prevail over others) provide experts with epistemic authority, nor how it travels across institutional contexts or policy fields.

This raises interesting questions for future research. For instance, is the epistemic authority of some experts (or broader actors) derived from educational background more decisive in energy policy than it is for social policy? Such analyses might take the research agenda further towards exploring how bureaucratic structures condition the power of ideas through epistemic authority. This also begs the question of the relative importance of the three factors in contributing to ideas granting epistemic authority in other policy contexts. This further application of the framework would go some way towards a more clear demarcation between the role of the different analytical aspects of the bureaucratic structure across policy fields and topics. For instance, is educational background more decisive than negotiation styles within specific ideational contexts? In this respect, the theoretical insights of the framework could be amended to contribute to other literatures on the role of information, knowledge and misinformation in understanding the policy dynamics of ideas (Hopkin and Rosamond 2018). Recent work on the politicization of expertise have shown how this has manifested in actions to discredit expertise of the more mainstream economic discipline by the Leave campaign surrounding Brexit (Rosamond 2020). This is an important new avenue in the study of the political advantage that expertise can bring which shifts the focus towards the origin and source of its authority.

The dynamics of policy ideas among experts in energy questions is relevant for a substantial part of climate debates, and even if they are not directly applicable in the form operationalised for this thesis, then the general concern with the role of expertise and its varied influence in different settings is. What is the currency of experts? Knowledge. How is knowledge transmitted? Through ideas that link problems and solutions. The rise and fall of ideas is affected by the institutional parameters of where they operate, and so, keeping a keen eye on them when attempting to transition societies to a greener and more sustainable path is absolutely essential for success.

There is an additional relevance of the focus on expertise beyond the climate agenda and transitioning societies to greater sustainability. Expertise is needed both in development of policy solutions themselves, but also to aid politicians and policymakers to navigate in and decide between different policy solutions. Higher complexity of problems and greater propensity for wicked problems makes expertise more invaluable to societies at large, and to politics in particular. Both in the substantive disciplinary form that expertise takes, but also in the institutional environment that it operates in. Greater complexity means many things, but one implication is that there is no a priori agreement on what relevant field of knowledge can speak authoritatively on different policy problems. The result is an increased risk of politicisation of expertise. This is specifically an aspect that this thesis has spoken to when examining the decision-making capability of different negotiation styles of a bureaucratic structure and trying to map the way educational basis of expertise or negotiation styles interact with creating conditions for coalitions around certain policy ideas. A relevant follow-up question, which this thesis did not tackle directly, is what happens when expert disagreements spill over into other fields than their own? This is perhaps even more evident in discussions over the veracity of climate change as a man-made phenomenon, but it is relevant in other spheres of society as well.

In recent years, we have seen a rise in the polarization of public discourse in particular in the United States, but also in debates over Brexit in Europe. In the context of these debates it has become clear that the role of expertise is a different one than modelled in classic understandings of knowledge as truth. Rather, these contentious political issues have shown that multiple truths seem to be in play and different groups pick and choose depending on ideological or political expediency. I will make no claim as to the causal sequence of these phenomena other than to state the seeming interconnectedness of things like the rise of the concept of fake-news, general mistrust of expertise and increasing populist tendencies among, at least some parts of, the political elites. In this context, a deeper appreciation for the institutional context that facilitates or dampens the support for particular ideas is crucial, not only in when understanding how particular policy ideas can lead to different economic policy, or energy policy choices, but also in understanding how ideas can support or maintain ideologies in the civil sphere. Alongside this increasing polarization of civil society, we have observed the formation of tribal logics that operate isolated from each other and connect and coordinate with the help of web-based technologies, social media and the like.

I should reiterate that while the framework suggested in this thesis may speak to dynamics in other spheres, I make no claim to its generalizability across the multitude of different actors, dynamics or spaces where non-state actors have a greater influence than energy policy in the 1970s. The world of yesterday is not the world of today. Clearly, the conceptualization of institutions as bureaucratic structures utilized in this thesis would probably not fit readily onto other areas of political life in a readymade fashion and despite similarities in the dynamics it attempts to capture would likely need conceptual and operational specification in these new contexts. Relevant institutional conditions in such examinations would have to include elements not present or defined in this thesis e.g. the role of different types of social media in the diffusion of information between polarized political groups, but also as places of power in themselves e.g. increasing visibility through algorithmic logics whose functioning is not transparent, or outright moderation in cases of "mis-information".

Thus, while the present analysis and analytical framework is not constructed to shed light on the role of populism, conspiracy theories, anti-waxing, climate-change denial or other discursive trends in modern politics, a more concerted effort to understand how ideas interact with institutional conditions in these areas would greatly improve our understanding of these phenomena. Hopefully, the examination of the role of different bureaucratic structures in the ability of policy ideas to gain influence among experts will have hinted at ways in which this might be done, and if not readily transferable to other similar fields, would point to the dynamics of coalition enforcing mechanisms that support winning policy ideas. If nothing else, then if this thesis has succeeded in showing how institutions matter for the variation in role of ideas, it will have been a success.

In closing, this thesis has emphasised the importance of keeping an eye on how institutional variation in administrative traditions can affect the influence of different experts and their ideas. Furthermore, it illustrates that politics and knowledge are linked even in highly technical policy-areas. Finally, in a world of increasingly complex and country-spanning problems – be they energy, climate, cybersecurity or otherwise - perhaps the more important point is for the thesis to act as a general reminder that even the most technical and complex of issues contain politics – and that politics is ultimately about collective choice, not necessity.

Chapter 8 Archive material

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