An atomic adventure

A case study of the history of Swedish nuclear policy using the theories of historical institutionalism and advocacy coalition framework

author Martin Jansson
supervisor Elfar Loftsson
Master's thesis, 30 hp
spring 2015
Södertörns Högskola
Faculty of environmental sciences
Environment, communication & politics
Abstract

A case study of the first 35 years, 1945 to 1980, of the Swedish nuclear institution. The purpose is to discover which actors that have shaped the Swedish nuclear institution. By using the theories of historical institutionalism and advocacy coalition framework I have analyzed these 35 years in three separate parts. Historical institutionalism puts emphasis on the creation of an institution, and so have I. The creation phase goes from 1945 to 1972. The following two parts are critical junctures that spans the years 1973-1978 and 1978-1980. The first critical juncture deals with the Centre Party's reversal in their opinion on nuclear power, the 1976 election and the outcome of that election. The third juncture starts with the Harrisburg accident and ends after the 1980 referendum. Using the advocacy coalition framework to analyze the actions or actors and coalitions during these three phases, I have come to the conclusion that the industry actors, those that have built the reactors, have been the most successful in pushing their coalition's agendas, over the years. Their influence was considerable during the years of institutional creation, while the coalitions that opposed nuclear power were quite weak during this time frame, which is consistent with historical institutionalism's focus on the creation, and path dependence.

keywords: Nuclear power, coalitions, actors, historical institutionalism, path dependence, advocacy coalition framework, environmental movements
# 1 Introduction

1.1 Research problems & questions

---

# 2 Method

2.1 Research design & limitations
2.2 Sources & earlier research
2.3 Disclaimers

---

# 3 Theory

3.1 Historical institutionalism
3.1.1 Punctuated equilibria/critical junctures
3.1.2 Agency & change
3.1.3 Institutions
3.1.4 Criticisms
3.2 Advocacy coalition framework
3.2.1 Agency
3.2.2 Belief systems, individuals & the devil shift
3.2.3 Learning & change
3.2.4 Criticisms
3.3 The green dimension of politics
3.3.1 Where do the parties stand?

---

# 4. The creation of the Swedish Nuclear Institution: 1945-1972

4.1 Timeline
4.2 Actors & coalitions
4.3 A Swedish bomb, Swedish uranium and the Swedish line
4.3.1 The Swedish line
4.3.2 ASEA, Vattenfall and AB Atomenergi
4.3.3 ASEA-Atom
4.3.4 Atomic fuel
4.3.5 Different reactors
4.3.6 Ågesta and Marviken
4.3.7 Oskarshamn & light water reactors
4.4 The captains of industry
4.5 The Social democrats
4.5.1 Social democratic environmentalists
4.5.2 The relationship between S and the industry
4.5.3 Internal strife
4.6 The seeds of a green movement
4.7 Other critics
4.7.1 Criticism from within
### 4.7 Analysis

4.7.1 Mr. Alfvén ........................................................... 44
4.7.2 Mr. Alfvén ........................................................... 44
4.8 Analysis ........................................................................ 45

4.8.1 The advocacy coalition framework .................................. 45
4.8.2 Historical institutionalism & path dependence .................. 46
4.8.3 Historical institutionalism ............................................. 46
4.8.4 The pro-weapons coalition ............................................ 48
4.8.5 The Swedish line coalition ............................................. 48
4.8.6 The commercial reactor coalition .................................... 49
4.8.7 The environmental/critical coalition ................................ 49

### 5 Juncture 1: 1973-78, Fälldin & Alfvén

5.1 Timeline ............................................................................ 50
5.2 Actors & coalitions ............................................................. 50
5.3 The Centre Party .............................................................. 50
5.3.1 Hannes, Hambraeus and Fälldin .................................... 51
5.3.2 Hambraeus' parliamentary fight ..................................... 52
5.4 The other political parties .................................................. 53
5.5 The environmental movements ......................................... 54
5.6 The election of 1976 .......................................................... 55
5.7 After the election ............................................................. 56
5.7.1 The energy commission & a solution for nuclear waste .... 57
5.7.2 Fälldin in trouble .......................................................... 59
5.8 Analysis ............................................................................ 61
5.8.1 Historical institutionalism .............................................. 61
5.8.2 Path Dependence ......................................................... 61
5.8.3 The advocacy coalition framework .................................. 62
5.8.4 The advocacy coalition framework .................................. 65
5.8.5 The nuclear friendly coalition ......................................... 64
5.8.6 The environmental & nuclear critical coalitions ................ 65

### 6 Juncture 2: 1978-80, Three Mile Island and the referendum

6.1 timeline ........................................................................... 65
6.2 Actors & coalitions ............................................................ 65
6.3 The Ullsten government ..................................................... 66
6.4 The Harrisburg accident ................................................... 67
6.5 A crazy Wednesday ........................................................ 68
6.6 Referendum strategies ..................................................... 68
6.7 The referendum .............................................................. 70
6.8 The environmental movements ......................................... 70
6.9 Analysis ........................................................................... 71
6.9.1 Advocacy coalition framework ........................................ 71
6.9.2 Historical institutionalism ................................................................. 72

7 Epilogue: Referendum hangover, Chernobyl and the Green Party ................................. 73
   7.1 The Green Party .............................................................................. 73
   7.2 Who went green in the 1988 election? .......................................... 74
   7.3 Chernobyl ...................................................................................... 74

8 Closing discussion & conclusions ......................................................................................... 75
   8.1 The advocacy coalition framework ......................................................... 75
       8.1.1 Agency ..................................................................................... 76
   8.2 Historical institutionalism & the importance of the creation & path dependence ......... 76
   8.3 Research questions ............................................................................. 77

9 References ................................................................................................. 79
   9.1 Books ............................................................................................ 79
   9.2 Edited books ................................................................................... 80
   9.3 Articles ........................................................................................... 80
   9.4 Online sources ................................................................................ 81
   9.5 Other ............................................................................................. 82

Appendix A: Swedish governments 1945-1988 ................................................................. 83
Appendix B: Abbreviations and translations ......................................................................... 83
1 Introduction

Sweden has a population of some nine million, and for these people Sweden has three nuclear power plants, Forsmark, Oskarshamn and Ringhals, a total of 10 reactors. In 1999 and 2005 the Barsebäck nuclear power plant's two reactors were shut down. Even after the Barsebäck shutdown, Sweden has the most reactors in the world, per capita. This despite the fact that Sweden also has an extensive system of hydro power. Nuclear power has, since the 1990's, produced between 37-45% of Sweden's energy. Together with hydro power, nuclear power makes Sweden almost completely energy independent (Ekonomifakta.se). As an institution, Swedish nuclear has survived not only three international major nuclear accidents, technical difficulties both initially and more recent, but also a Prime Minister fiercely critical of nuclear power, a vocal non-parliamentary opposition, as well as a referendum that set an expiration date on reactors at 25 years.

The first large-scale commercial reactor in Sweden was Oskarshamn I, a light water reactor built by the Swedish company ASEA-Atom, fueled by American enriched uranium. Before that, Sweden had discussed the possibility of nuclear weapons, explored the possibility of using domestic uranium, not only for domestic civilian and military use, but also as an export and a chess piece in the cold war. Before Oskarshamn, Sweden had Ågesta, a smaller heavy water reactor that supplied Stockholm suburb Farsta, and Marviken, another heavy water reactor that was, because of safety concerns, never started. Sweden also built a few smaller research reactors.

Even though nuclear energy was a new technology, the Swedish nuclear institution could be viewed as a continuation of Swedish energy policy from the first half of the 20th century, when Sweden’s hydro power was built. The time period was characterized by a near unanimous consensus between the different power centers in Sweden. Industry, the growing unions as well as parliament were all in agreement on how to proceed. Two steps were needed for this project, legislation and public ownership. To this end, Vattenfall was created in 1909, and by 1920 Vattenfall produced ⅓ of the country’s power production. Vattenfall became the leading power producer in the country, and it started cooperating with ASEA, to develop better technologies. Thanks to this cooperation, ASEA became a world leader within the field (Radetzki, 2003).

In the 1960's, there were still plans for more hydro power in Sweden. Behind these plans were the Social democrats, together with the labor unions and industry leaders. The industry wanted more energy for their factories, while both S and labor wanted jobs and the regional
economical benefits hydro power brought. Against them were the burgeoning environmental movements, the Left Party, and somewhat surprisingly, the right wing parties of parliament. While the environmental movements saw more hydro power as a danger to small scale industries tied to rivers, such as fishing and reindeer keeping, as well as intrinsic values, their political allies felt that more hydro power was unnecessary, as nuclear power would satisfy the industries energy needs. This was most likely one of the first examples of how energy policy could break up the usual left-right divide of parliamentary politics, that would occur during the 1970's (Radetzki. p.48, Hedrén, 1994 & Anselm, 1995).

It was in the fight over the river Vindel that Prime Minister Palme admitted defeat, and Sweden scrapped the plans for further hydro power. The environmental discourse had not reached the stage where it made the environmental groups question the need for more energy, nor had they developed into a powerful enough force to affect policy, Sweden now would need either nuclear power or oil. What the decision makers at the time chose was nuclear power. In 1972 the CDL\(^1\) projected that by 1990, Sweden would have 24 reactors. They would take quite some time to build, however, and Sweden became very dependent on oil. Between 1965 and 1970, 66% of Swedish total energy usage was oil. The CDL's projection of 24 reactors were later, in 1975, revised down to 13 (Radetzki, 2004).

\subsection*{1.1 Research problems & questions}

A historical theoretical perspective views the evolution of institutions as a process where change happens during certain critical junctures. The change that occurs during these critical junctures is dependent on a dynamic interaction between stake-holders that act in coalitions.

The theory of historical institutionalism puts emphasis on path dependence; that the choices made during the creation of an institution are a major factor in explaining the development of said institutions, and that the outcomes of critical junctures can be explained by studying the creation of the institution. There are some weaknesses of historical institutionalism, mainly in how it deals with agency. To address this, I aim to use the advocacy coalition framework. It is not easy to chose which critical junctures to study, and if the chosen junctures truly are critical to the institution. I have chosen my junctures based on a

\footnote{Centrala Driftledningen, The Central Operating Management, created during world war 2 by power producers, such as Vattenfall and Sydkraft, to secure electricity availability.}
few single events that should be big enough to affect institutional change. My research questions are as follows

- When it comes to the Swedish nuclear institution, how valid is the main tenet of historical institutionalism, that the creation of the institution, and the path dependence that follows from it, decides the outcomes of the critical junctures?
- How have the chosen critical junctures chosen affected the Swedish nuclear institution?
- Which actors & coalitions have been involved in the Swedish nuclear institution, and how have they behaved?
- Which actors and variables have been the most influential during these critical junctures?

2 Method

In order to carry out the research, the chosen method will be a case study. The case study methodology is not a format in order to find out a particular solution. Rather it is used within a theoretical perspective. The implication is to achieve the goal of expanding and elaborating on available theories, to find causality amongst the information, and every case study rests on an implicit existence of a link between micro and macro, a cross-level inference of social behavior (Creswell, 2014 & Gerring, 2012).

Throughout the paper a qualitative approach will be applied, where the researcher will carry out a thorough in-depth analysis. To address every year and event, in detail from the creation of the Swedish Nuclear Institution in the 1940's and onwards would not be a feasible undertaking, and for this reason the theory of historical institutionalism is suitable, in its attention to the creation of an institution, and critical junctures in its history.

What, then, is a case study? Yin gives a definition of a case study that is split in two. The first part defines a case study as an in-depth empirical investigation of a contemporary real-world phenomenon in its contextual setting. In a case study, you do not remove the phenomenon from the context, as the line between phenomenon and context is often blurred and in doing so, you risk missing vital information. The second part of Yin's definition is derived from the first; A case study research often faces many variables (context and phenomena-based) and therefore it relies on multiple sources of evidence and data. These sources are used to triangulate "the truth", and this triangulation benefits from theoretical propositions, in both the gathering and analysis of data (Yin, p.16f).
What kind of phenomena, or case, can a researcher chose? According to Gerring, the only things that limit the choice is the ability to identify its boundaries and that it comprises the primary object of an inference. The boundaries are both spatial and temporal, and depending on the object, they can be of varying difficulty to identify (Gerring, p.19). In the case of the institution of Swedish nuclear energy, it is more difficult to identify what the institution is, than the where and when.

2.1 Research design & limitations

A research design that is executed properly is important in a case study, as it helps the researcher to answer the questions of what data to collect, from which sources, which questions to ask of the data, and how to analyze the results. As a case study focuses on one specific phenomena, or a case, it is vital that the definition and boundaries of the case are clear (Yin, p.28f). The Advocacy Coalition Framework is not only a theoretical model, but it is also a methodological tool, that helps with issues of delimitation. By adhering to this model, I will have an easier job of focusing my research, in search of answers to my research questions.

I have chosen to focus less on the media, and public opinion, and their effects on the Swedish nuclear institution (SNI). In a previous paper written by me and a fellow researcher on the same subject, we focused more on these. The public reacted quite a bit to events such as Chernobyl and Three Mile Island. and have in general had strong feelings regarding nuclear power, as soon as the issue became a part of the public debate. Media reporting followed a similar pattern, as it did, quite naturally, spend a lot of time on nuclear during accidents and other noteworthy events. These public and the media did most likely reinforce each other. Our conclusions was that the media have not had a significant impact on Swedish nuclear. Public opinion played a more significant role, as it influenced different actors, and spawned new actors. But the focus in this thesis will not be on the public itself, but if their opinions affected the policy process during the critical junctures, either directly or indirectly via more involved actors.

I have limited myself to two critical junctures and the creation of the institution, as my research topic. This is not only due to time constraints, but also a conscious choice to only cover what I consider to be the most exciting in the history of the SNI.
2.2 Sources & earlier research

A lot has been written about Swedish nuclear energy. This is both a blessing and a curse, as it can almost be overwhelming. Instead of struggling to find relevant sources, the struggle have been in the choice of which sources to exclude, and which to focus on.

Lindell, Johansson & Westerståhl, Anselm, Lohmann, Bergquist, Ohrlander and Leijonhufvud have all written about Swedish nuclear energy in a historical perspective. Their works are all thorough and have been a great help to me in my research, but they are not written with any kind of theoretical framework, nor is there a strict analysis of the facts presented\(^2\). By using all these authors, and by comparing their writing, I have been able to triangulate relevant information that I deem trustworthy.

Nohrstedt and Holmberg are some researchers who have contributed knowledge to the issue of political Swedish nuclear energy. Especially Nohrstedt have been of great interest to me as he has used the ACF to analyze both the referendum and Chernobyl as critical junctures in the life of the SNI (Nohrstedt, 2005 & 2008). Nohrstedt have not, however, fused the ACF with HI and its view on the creation of an institution. Nohrstedt have used these two junctures as a way to test the validity of the ACF. His article on the referendum have been of great use to me, as a comparative tool, to use with my own conclusions.

I have also used some autobiographies, which can be risky. Autobiographies are mostly written quite some time after the most important events have transpired. Not only will most people have forgotten several details after such a long time, it can also be tempting to omit certain facts, or paint yourself in a more favorable light. But autobiographies, if viewed with a critical eye, can be useful. They can point you in new directions, of which you were previously unaware. They can present a different point of view on events, give you a feel for the time period, and by triangulating with other sources, verify information.

I have, to the best of my ability, tried to follow Thurén's principles of source criticism; Genuineness, the time relation, independence, tendencies, and the distinction between a claim/story and an object as source. You judge your source's tendencies, is the source possibly biased in one way or another? Does your source have something to gain by distorting the facts? The time relation principle is important, as the further away from the actual event that

\(^2\) Anselm's works are more academic than the others, but there is a difference between his books and his articles on the subject, of which he has written several.
the source is, the more likely it is that some things are misremembered, or if new surrounding facts make it tempting to give less than truthful statements, as to be viewed in a more positive light (Thurén, 2013). Autobiographies is a good example of a source where the sanctity of these principles could be violated. I have only used one such source, Birgitta Hambraeus’ autobiography (Hambraeus, 2008), and the time relation in this case is almost four decades. Furthermore, as a outspoken opponent of nuclear power, I cannot, in good conscience, considered her an unbiased source. Neither can I say that about Lohmann or Ohrlander, as both their books are highly critical of the politics surrounding Swedish nuclear power. Both Lindell and Bergquist were part of the nuclear establishment in one way or another, and even though their work is written in a much more neutral language, it is not unreasonable to assume that they too, could be less than 100% objective and neutral. However, none of my stated research questions deal with whether or not any of the actors or coalitions acted maliciously. What I am looking for in my sources, is which actors were present, what they did, and what outcome did their actions lead to. Even if someone acted with a wicked intent, the result is what matters, and it is the result that I analyze.

I believe that my chosen theories, historical institutionalism and advocacy coalition framework, work well in complementing each other, and although none of them are perfect, I believe that they are well suited for me to be able to answer my research questions.

2.3 Disclaimers

While I have tried to keep events in chronological order and in their respective chapter, some events do not follow a strict linear time line, and some overlap between the chapters exists. Some of the political parties that are present in this thesis changed names during the time period, to simplify things, I have used their current day names during the entirety of this thesis. I have chosen not to source every paragraph in this thesis. Such a paragraph share the source of the paragraph following it. This is because I feel that it enhances the readability of this thesis, and suits the style of the thesis.

3 Her autobiography was released in 2008, and the events that interested me the most took place in the early 1970's.
4 Bondeförbundet became Centerpartiet (C) in 1957, Högerpartiet became Moderaterna (M) in 1969, Vänsterpartiet Kommunisterna (VPK) became Vänsterpartiet (V) in 1990.
3 Theory

To conduct a case study without a theory is a bit like building a house without a blue-print. It is possible, but it is harder, and the end result might end up as somewhat of a mess. In a case study, theoretical propositions act as guiding stars in how to collect and analyze data (Yin, p.38).

3.1 Historical institutionalism

The basic idea of historical institutionalism is that the choices made at the formation of an institution, or during a policy initiation, will be the main determinant of how the institution and/or policy will develop. This can also be described as path dependency; once decisions have been made, there is a tendency that inertial pressure will make it difficult to affect change. Although path dependency is often interpreted as a linear process, it is not necessarily so. An institution can attempt to remedy problems that is itself has caused. This allows for a more adoptive and fluid reading of path dependency. If the initial institutional setup is inadequate, the institution must initiate change, or perish. According to Peters, this is similar to evolutionary biology.

This view would imply that an institution is likely to stay on its initial path without interference, and if there is interference, the possibilities for change are limited by the initial, formative period of the institution. Even though historical institutionalism, as a theory, has a lot to say regarding the creation of an institution, the emphasis of historical institutionalism is on the persistence of the institution, not on the creation. This sounds paradoxical, but the question of creation is not so much a question of when and where, but rather why and how, and how the creation leads to the persistence, or lack of persistence. The study of the creation creates a reference point, from which to study change, or lack thereof. This reference point will, according to historical institutionalism, explain how the institution. This is why the creation matters.

It's quite easy to view historical institutionalism as a theory aimed only at explaining the persistence of initial choices, rather than how institutions change. But historical institutionalism, and the concept of path dependency, has evolved and changed. One of these more complex interpretations of path dependency says that institutionalization creates roles,
and that those roles create interests that help maintain the institution. Another view is that path dependency is positive feedback to the initial choices made, which reinforces them (Peters, 2012).

### 3.1.1 Punctuated equilibria/critical junctures

Punctuated equilibria\(^5\) has been the concept of choice for historical institutionalism, when explaining change. Just as in economics, the equilibrium is the normal state, which is gravitated towards. The equilibrium is decided by the decisions made at the point of inception, or at the latest punctuation of a previous equilibrium. The problem with this view is the predictive powers, or lack thereof. After the occurred punctuation, it can be a very reasonable explanation, but to pin-point a punctuation in advance is not an easy thing to do. This view is focused on a sudden, or forceful, change that alters the institution significantly, but institutions are also capable of sliding from one equilibrium to another, without the need for a clear punctuation.

Criticism against punctuated equilibria forced HI to adopt concepts to explain gradual change, which is a common occurrence. These concepts assume that the basic policy structure will remain in place. The delivery of the policy might be affected by these changes, but it is also possible that the changes will be cosmetic, appearing to change while the status quo is maintained.

There are four concepts of gradual change, displacement is the most straightforward. It is related to incremental theory and conventional organizational theory. What Thelen and Streeck, who developed the four concepts, means with displacement is that the rules governing the institution transform over time.

The concept of layering focuses on new rules that are adopted, either on top of or alongside old rules. New political leadership often leads to layering. When the environment in which the organization is operating in changes, the rules might change as well. This environmental change often result in internal change, to which drift is the response. The explanation given to the concept of drift, in the literature, is not very clear, but I interpret it as an adaptation to smaller changes in subsystems\(^6\) that affect the institution.

---

\(^5\) Capoccia & Kelemen use the term critical juncture instead of punctuated equilibria, and that is also the term that I will use.

\(^6\) The advocacy coalition framework part of the theory chapter explains what a subsystem is.
*Conversion* is the final concept, and refers to the process of interpretation. By interpreting existing structures and rules in a different way, an institution may change. In the literature, this concept is often connected to institutions evolving to escape being made obsolete by outside forces (Peters, 2012).

### 3.1.2 Agency & change

The concept of agency is a weakness of historical institutionalism. In the agency concept, focus is often on internal issues, and how they affect change. Critical junctures, on the other hand, mostly explains change by external factors. There is a tendency to link internalities and agency to events outside of the institution, and the implicit view of historical institutionalism is that individuals become trapped by the institutions, thus accepting it's methods and constraints, removing agency from the picture.

This dismissal of the power of agency and individuals is not something that I agree with. To historical institutionalism, ideas are important, but I find that ideas and the power that they hold are closely connected to a person that espouses that idea. Therefore I feel that agency is much more relevant than historical institutionalism does. With this in mind, institutional change is closely related to the question on how to change ideas. The issue of agency, individuals and ideas will be more thoroughly written about in the section of advocacy coalition framework (Peters, 2012).

### 3.1.3 Institutions

There is no one definition of what constitutes an institution, in historical institutionalism. According to Peters, historical institutionalism separates itself from the crowd by being more vague than other institutionalist theories. One of the reasons for this vagueness, and separation from the rest, is the focus that historical institutionalists have put on ideas, and their role in the operational definitions of institutions (Peters, 2012).

Douglas North's definition of an institution is stricter than most, and definitely stricter than how Peters see historical institutionalism's definition. Although North is an economist\(^7\) Nobel Prize winning economist, his definition has merits in other fields. According to North, institutions are man-made structural constraints on political, economic and social activity.

---

\(^7\) A Nobel Prize winning economist, even.
These constraints are both implicit (customs, traditions, norms) and explicit (laws, codified rights). As an economist, North focuses on different economic institutions, and as such, one of the way an institution evolve, or change, is through a more efficient way to do business, and increase ones material gains. In one type of institution, what North calls a "primitive exchange"\(^8\), change is actively suppressed as it is viewed as a threat to survival (North, 1991).

While the actors involved are not quite the same, similarities can be drawn to the Swedish nuclear institution. Since the conditions at the start of the Swedish nuclear institution were favorable, it is likely that the institution would fight most changes, as they would be as a threat to survival.

An interesting example of an institution is Bretton Woods, the post-war economic system created by the western victors of World war 2. The operational structure of Bretton Woods were the IMF, the World Bank, and the GATT/WTO\(^9\). These building blocks evolved into institutions themselves. After years of struggles, the institution of Bretton Woods went under in 1973.

Why did Bretton Woods go down? Hall's work on economic policy and how ideas influence these policies might give us a clue for one of the reasons. The main influence on Bretton Woods was the ideas of economist John Maynard Keynes. These ideas were not only solutions to problems that arose, Bretton Woods was also built using his ideas. When Keynesianism was supplanted by other economic theories, the institution built on his ideas did not survive. By then, The IMF, the World Bank and the GATT/WTO had evolved and were not dependent on the idea of Keynesianism, and perhaps that is why they survived. Instead of being dependant on Keynesian ideas, these institutions seemed more like structural & procedural institutions (Peters, 2012).

There are many different ways to define an institution. A definition based on an idea might be compatible with a structural definition, or a procedural one. When once an idea would be the best way to define an institution, it might change into one where a procedural and/or structural definition would be more accurate. These changes would come to pass during critical junctures. But in historical institutionalism, change is not easy.

Hay & Wincott argue that historical institutionalism need to focus more on the relationship between structure and agency. The advocacy coalition framework, as it stands

\(^8\) North's examples are long-distance caravan trades, tribal societies and regional "bazaar economies".
\(^9\) The International Monetary Fund, General Agreement on Tariffs & Trade/World Trade Organization
today, accepts and incorporates agency as an important part of the policy process. I agree with the argument of Hay & Wincott, and by using the advocacy coalition framework, I add the ability to research the structure-agency relationship (Hay & Wincott, 1998).

### 3.1.4 Criticisms

Daniel Drezner, a professor of international politics, has pointed out some issues regarding the predictive powers of historical institutionalism. According to Drezner, feedback and sequencing either leads to reinforcement of prior institutional policies, resistance to them, or create effects that lead to new institutional systems. The lack of hypotheses on when institutional path dependence matters, and when it does not, leads to problems when it comes to falsification. What affected what? It can be difficult to avoid tautologies, as one could argue that predictive powers are inherently weak in the ontology and epistemology of historical institutionalism (Drezner, p.792-795).

Other authors have criticized not only the theory itself, but sloppiness in methodological execution as well. What happens during critical junctures, and their impacts are at times minimized, in favor of structural, antecedent conditions, when it comes to explaining institutional change. This is especially true when compared to concepts often used in institutional economics such as increasing returns. Because of the relative lack of methodological guidance when it comes to critical junctures, it is common that they are treated as a kind of deus ex machina. I hope that I, by using the ACF as a methodological tool, will be able to avoid the pitfalls that Capoccia & Kelemen points out (Capoccia & Kelemen, p.342f).

### 3.2 Advocacy coalition framework

In the late 1980's Sabatier and Jenkins-Smith developed the Advocacy Coalition Framework (ACF), in an attempt to deal with complicated issues involving multiple stake-holders, goal conflicts and substantive technical disputes, over a long time period. In the following decade the ACF broadened significantly from energy and environmental policy in the US, which was the field of expertise of both Sabatier and Jenkins-Smith, into other areas. Ten years after its development, over 30 ACF case studies had been conducted, since then, almost double that amount has been conducted, a majority of these in European policy settings (Sabatier, p.189f).
Early ACF stipulated that major policy change can only be initiated by an external shock to the subsystem. A significant development of the ACF is the addition of two more paths of policy change to the original hypothesis. The two paths that have been added are the possibilities of an internal shock path or a negotiated agreement path. Before this addition to the theory, I find there to be similarities to historical institutionalism and its unwillingness to consider agency and individuals as viable factors for major change within an institution (Sabatier, p.190).

Traditional political science has a tendency to view certain actors, for example journalists, researchers and agency officials as neutral, being above the political struggle. This tendency is challenged by the ACF, which urges us to think of these groups as potential participants in an advocacy coalition (Sabatier, p.127).

One could argue that clear evidence for agency as a viable factor for institutional change is Robert McNamara and the World Bank. In 1968 Robert McNamara, former defense secretary of both JFK and Lyndon Johnson, became president of the World Bank, which he remained for 13 years. During his tenure, the World Bank transformed. McNamara wanted the financial institution to become a development agency. A shift regarding development in academic circles had begun in the 1950's, and was now mature enough to go from theory to practice. There were already staff at the World Bank who wanted to move in this direction (Ruger, p.63).

Just as it is important not to dismiss agency, it is equally important that we do not overestimate the importance of agency. As Keynesianism grew weaker, the foundations of Bretton Woods and the World Bank also grew weaker. It is possible that McNamara would not have been able to transform the World Bank if the foundations of the institution had remained strong, even with his support in new research and World Bank staff. Agency is one of several possible avenues for change, not the only one.

In some ways, HI is a large, macro-theory. It does not go into detail on how things are supposed to change, or in what ways. Here the ACF comes in. In relation to HI, it is a "micro theory" and gives us a detailed account of policy outcomes in a system of several actors. The ACF will help me explain the outcome of the critical junctures as identified by HI. The fact that the ACF assumes that the beliefs of the policymaking groups are stable over a long period of time, and that this stability increased the difficulty in achieving major policy changes works well with the critical junctures of HI and the concept of path dependence.
The ACF assumes that modern policymaking is complex. If an actor hopes to be influential, it must specialize. This specialization occurs within subsystems that are composed of actors seeking to influence policy. These actors are not only the traditional legislators, agency officials and interest groups. Journalists and researchers can also be involved. Furthermore, the ACF assumes that the participating actors are highly motivated to see their beliefs be translated into policy, and that these beliefs are stable, in a long term perspective\(^{10}\) (Sabatier, p.192f).

Sabatier doesn't mention economic actors, businesses and such, as being participants of a subsystem. It is possible that Sabatier thinks of economic interests as interest groups, but I believe that it is important that economic actors are seen as a separate group of actors.

How the policy participants behave is affected by two sets of exogenous factors, stable and dynamic. The stable factors include the basic attributes of the issue and fundamental societal values. Policy decisions within other subsystems and changing socioeconomic conditions are examples of dynamic factors.\(^{11}\)

How does the ACF translate into analysis of sources? One of the most important aspects is to identify an appropriate subsystem scope, of which the two most important are geographic and substantive. This can be difficult because of overlapping subsystems, both vertical and horizontal (Sabatier, p.193).

### 3.2.1 Agency

Agency, as I've written, is not the focus of historical institutionalism, in fact, it is mostly dismissed as an explanation of change. In the ACF, with its more narrow scope, is agency considered a more important concept? Yes. The ACF explains the possibility for policy outcomes as a variable of, partly, the belief systems of the individuals that make up the coalitions. The closer the different actors are, in their belief systems, the easier it is for policy output. Or, I should say, compromised policy output, as it is entirely possible for one coalition to be a part of the process but to have no say in the output, depending on the relative strength of the coalition.

---

\(^{10}\) The long term perspective being a decade, or more.

\(^{11}\) Examples of stable factors could be nuclear waste disposal and security measures, while dynamic examples could be an accident, or a new political party entering parliament.
However, it is important not to over-estimate the importance of agency of specific individuals. The concept of institutional capture exists for a reason, and it can work in two ways. The first way being that an individual seeking to affect change will see his or hers attempts to be rebuffed by the institution and its power structure. The other being that the individual adopts the institution's views "turning" the individual away from its attempts to change the institution.

### 3.2.2 Belief systems, individuals & the devil shift

Rational choice assumes that actors are self-interested, and being rational entails that one pursue material interests. If altruism is a side-effect of rational self-interest, it might happen, but otherwise it will not. The ACF does not see altruistic behavior as only being a by-product of self-interest. The ACF includes two differing sets of models for the explanation of individual actions and belief systems. These are the logic of appropriateness and the logic of consequences. In the first logic, right behavior means following rules, and in the second, to maximize good consequences is the right behavior. When using the ACF, normative beliefs must be empirically ascertained, and to do this, one must be aware of pre-existing beliefs of actors. These beliefs act as perceptual filters that are difficult to break through. Information and facts, when seen through these filters, can be interpreted in different ways, by actors belonging to different coalitions. These filters do not only interpret information, they also tend to discard dissonant information, thus making the information you receive reaffirm previous convictions and beliefs (Sabatier, p.193f).

Just as a substitute teacher more easily remembers the names of kids who misbehave, individuals remember defeats more vividly than victories. According to prospect theory, this comes from the fact that most people are risk-averse, they value losses more than gains. Together, these two facts produce what is known as “the devil shift”, the tendency to view opponents as more powerful, more evil, and less trustworthy than they probably are. This can cause entrenched opinions to be even more difficult to change, and to entrench the existing coalitions even further. I suspect that this devil shift will be less evident where actors in competing coalitions cooperate in other subsystems or policy areas, as that cooperation is likely to foster good faith and knowledge regarding other actors.

---

12 Not as a manipulator of minds but more like an assimilation into the "culture" of the institution.
13 I could fill several pages arguing rational choice from different points of view, and the meaning of rationality. This I will not do, but use the widely accepted definition of rational choice that the authors use.
The belief system of actors is in the ACF conceptualized into a three-tiered hierarchical structure. Deep core beliefs is the broadest of these tiers, and they span most subsystems. The left/right scale of politics operates on this tier, as well as generalized normative and ontological conceptions of not only political ideals but also of human nature. The next tier, the policy core belief tier, is the application of the deep core beliefs, which span an entire policy subsystem. These beliefs include the perception of seriousness of the problem, its principal causes, which kind of government agency that should be responsible, how to balance economic development and environmental protection and which kind of policy instruments to use. According to the ACF, it is the policy core beliefs that is the glue of a coalition, as they represent empirical and normative commitments within the specialized domain of policy elites within the subsystem.

The third hierarchical tier is comprised of the secondary aspects of a coalition's belief systems. These secondary aspects are mostly more narrow than the beliefs that span the entire subsystem, and are focused on specific issues such as budgetary allocations, spatial causal factors, institution design, regulatory frameworks, how evaluations should be executed and the performance of actors (Sabatier, p.121f).

3.2.3 Learning & change

Change in these tiers is not uniform, it requires different occurrences. Policy-oriented learning is when new information and/or experiences leads to a change in the beliefs or one or several actors. If this new knowledge is related to secondary aspects, it can be assumed that it will be incorporated in an actor’s stance, but if the knowledge conflicts with beliefs from one or both of the core tiers, it is possible that the actor, or actors, will try to negate and disregard the new knowledge through various ways.

The ACF have over time generated a number of hypotheses concerning policy change, coalitions and cross-coalition learning. These will be a part of my methodological analysis following the creation chapter, as well as each critical juncture. The ACF and these hypotheses have been applied to several environmental and energy policy cases (Sabatier, p.123ff).
Coalition hypotheses  | Cross-coalition learning hypotheses  | Policy change hypotheses
--- | --- | ---
- During major policy core disputes within a subsystem, the opposing coalitions tend to be stable over a time period of a decade, give or take.  
- Consensus within a coalition will be on issues pertaining to the policy core. Issues pertaining to secondary aspects are more likely to be debated.  
- An actor or a coalition will give up secondary aspects of its belief system, rather than admit to weaknesses in its policy core.  
- There is a higher likelihood of policy-oriented learning across belief systems when two coalitions both have adequate technical resources and when the conflict is between either important secondary aspects or between a secondary aspect of one belief system versus core elements of the other.  
- Quantitative data and theory are more conducive to policy-oriented learning across belief systems than qualitative data and theory.  
- Purely social and political systems are less conducive to policy-oriented learning across belief systems than problems relating to natural systems, as coalition members in social and political systems tend to be active strategists, and that controlled experiments are easier to conduct in natural systems.  
- Policy-oriented learning across belief systems is more likely to occur when a prestigious and professional enough forum exists, that forces professionals from different coalitions to participate.  
- As long as the coalition that instituted the program remains in power within the subsystem, significant change in the policy core attributes will not occur unless imposed by an external jurisdiction of a superior hierarchy.  
- The policy core attributes of a governmental action program are unlikely to be changed in the absence of significant perturbations external to the subsystem; changes in socio-economic conditions, public opinion, system-wide governing coalitions, or policy outputs from other subsystems.

### 3.2.4 Criticisms

For many policy scholars, the ACF has become quite popular as it emphasizes falsification, causal drivers and testable hypotheses. But it has eschewed policy narratives, as narratives is something that exists outside the core principles of social sciences. Shanahan et al writes that the ACF could do better in some areas of policy explanations. The Narrative Policy Framework (NPF) constructed by the two co-authors of Shanahan, Jones and McBeth, seek to rectify the ACF deficits in the narratives department. According to the authors, the ACF is
lacking when it comes to images, symbols and rhetoric, which are critical to the study of policy processes (Shanahan et al, 2011). While an interesting concept, and not at all invalid claims, I will not focus too much on the NPF, but I will not completely discard the notions of the importance of narratives, which is a part of the nuclear power debate.

Bratt, in a conference, focused on the underdeveloped nature of the important policy brokers, in the ACF. Several questions regarding policy brokers have been asked; who are they? What are their belief systems? What are their interests? Why do they even exist? In Bratt's study of the Canadian nuclear sector, Bratt made two hypotheses. The first is that in an emerging subsystem, the brokers will use specific tools to try and mediate between the coalitions. The second is that a stable subsystem that displays a high degree of the devil shift phenomenon, brokers will instead make decisions that backs one of the coalitions (Bratt, 2013). Both Bratt and the study by Ingold and Verone that Bratt cites, tries to identify the brokers and how they influence the subsystems and their outputs. When analyzing Bratt's study, I find that focusing on policy brokers as a unique phenomenon is somewhat of a dead end. Policy brokers and coalition actors could be seen to be one and the same, and they can be analyzed using the same methodological tools and hypotheses. What one needs to keep in mind when doing so, is that an actor in a subsystem can act as a neutral policy broker in one instance, and in the next, actively seeking to promote a specific view or course of action (Bratt, 2013).

### 3.3 The green dimension of politics

The three tiered hierarchical structure of the ACF determines, according to me, what can be bargained with, and what is considered holy by coalition members. It also determines the coalitions themselves, who are allies, and who may cooperate on a certain issue. As Sabatier writes, the deep core beliefs, the first tier, operate on the fundamental views of politics, and on how ontological and normative views. But as I will show during the empirical part of this thesis, the old left-right divide of economics will have trouble with environmental issues. Bennulf has tried to operationalize and incorporate the green dimension into the regular, economic & social left-right scale.

On the green scale, one extreme is where the environmental issues are the most important, and where a good environment means the survival of humanity. This premise gives
considerable weight to issues that are meant to achieve ecological balance. Even if anti-nuclear and other purely environmental issues are important, they are combined with more philosophically social themes such decentralization and self-sufficiency. The other side is not the complete opposite, where the environment is seen as something negative. But environmental issues are not seen as the most important issues. Rather, it is most often economy that is seen as the most pressing issue. For this group, nuclear energy is often viewed as a smart environmental choice, and it is the positive view of a centralized, large scale industrial society that is the main opposing view of the most extreme, deep green environmental view. As Hedrén points out, there is one choice missing, that it seems that Bennulf had some difficulties with, and that was how to deal with the group that identifies environmental issues as the most important issues, and sees economic growth as necessary to right environmental wrongs... One where the environment is seen as the most important issue, but that the solution is a highly technical society that focuses on economic growth, what some scholars call ecological modernization (Hedrén, 1994).

3.3.1 Where do the parties stand?

Where, on the left-right and green scale, do the parties end up? During the time frame of this thesis, the nuclear friendly S, FP and M are believers in new tech and it’s environmental benefits, but S is a left wing economic party, while M and FP are right wing. The Centre Party, on the other hand, is not that fond of the idea of new technology as an environmental benefit, while sharing most of the same economic views as M and FP.

While there was disagreement on the role of technology and science, generally, all the parties agreed that the lack of knowledge and consequences were a big part in the existing environmental problems. The Centre Party coupled ignorance with critique of international economic interests, how huge corporations and organizations acted with a large gap between the concern for profit and concern for the environment. FP and M claimed that the reason for environmental problems were related to a lack of economic incentives tied to environmentally sound practices, as well as poor management and inadequate resources to deal with environmental issues. The Social democrats and V added a class perspective to and shortsightedness to the FP and M claims (Hedrén, 1994).

Together with the green dimension, the view on citizen influence has differed between the parties. The Left Party and the Centre Party, and later the Green Party, were working
towards more citizen influence, going hand in hand with their view on a more small scale society. The difference here being that C having the individual as the focal point, while V worked at citizen influence through organizations. One reason for nuclear energy becoming such an hot button issue is the symbolism that people bestowed upon it. Both sides saw nuclear as the symbol for a future society, Hedrén calls those that were positive "industrial fatalists", and according to him, they saw nuclear as a way to safeguard the welfare society, and as a better alternative for the environment. "Civilization critics" were those that focused on the risks associated with nuclear power. This is compatible with the Sabatier's devil shift and deep core beliefs, as there would be hard to negotiate over nuclear power (Bäck & Möller, 2003, and Hedrén, 1994, p.86-88).

| The placement of the parties is not an exact science, but this shows that although two parties could have similar economic views, they could be far apart on other issues. This also shows why it was not surprising that V and C would later team up as the clearest no-alternative in the 1980 referendum, while S, FP and M were seen as nuclear positive. Citizen influence/centralization vs. decentralization is not plotted, but it corresponds quite well to the green dimension axis, while citizen influence done through organizations is more favored to the left of the economic spectrum, while individual influence is preferred at the right.

### Picture 1. Party placement on an economic left-right X-axis, and a green dimension on the Y-axis

In a study of the green dimension done in connection with the 1980 referendum, Holmberg found that the green dimension, among voters, was weak. The voter's opinions in green issues were not coherent. The exception to this being highly educated voters. "Large cognitive resources" and a "significant informational intake of politics" were also connected to a developed green attitude (Gilljam & Holmberg, 1990).
To be considered a "green" voter, one must consider a healthy environment to be a more important than economic growth, and for a "economy" voter, vice versa. Together with the left-right economic dimension, which is considerably more established, this dichotomy of environment vs. economy creates the incoherence in green issues, in my opinion. The reason is the lack of the "technology as environmental benefactor", which the authors say they omit as that line of reasoning would not measure the environment vs. economy dichotomy (Gilljam & Holmerg, 1990). When applied to the time period of my thesis, it is of little importance, as ecological modernization, as a concept, was not included in the discourse of either the environmental movements or the pro-nuclear advocates.

4. The creation of the Swedish Nuclear Institution: 1945-1972

As mentioned in the introduction, Sweden’s first reactor came online in 1972. But the institution, Swedish nuclear, started much earlier. While the time itself is not very important, the era certainly is. It starts at the end of World war 2, the US had dropped two atomic bombs on Japan. Nazi Germany was defeated, but there was a distinct possibility of more conflict in Europe, as tensions between the Soviet Union and the Western allies were rising. While there was no environmental movement to speak of, the prospect of oil scarcity was a real concern for the politicians. It was also an era of promises of technological progress, and that it could solve a lot of the world's problems. It is against this backdrop that the discussions, decisions and actors of the creation of the SNI must be seen.

4.1 Timeline

1945: The Swedish military becomes interested in nuclear weapons. The government establishes an Atomic Committee...
1947: ...and forms the company AB Atomenergi\textsuperscript{14}
1954: First parliamentary debate on the nuclear issue.
1956 & 1960: A law regarding responsibilities in the event of a reactor accident is passed.
1958: Protests against the plans for a nuclear plant in Västerås.
1961: The Marviken project begins.

\textsuperscript{14} AB Atomenergi was a jointly owned company, the government held 57% of the shares while the remaining 43% were owned by 24 private businesses.
1962: The book Silent Spring, by author Rachel Carson, is published, by many considered the igniting spark of the environmental movement.
1963: The Ågesta nuclear plant outside of Stockholm comes online
1965: Ranstad mining facility starts production of uranium
1972: The first reactor, Oskarshamn I, goes online.

### 4.2 Actors & coalitions

The first discussion about the possible nuclear options in Sweden were whether Sweden should have nuclear weapons or not. This was mainly a discussion that was had by military officials, politicians and high level bureaucrats. These men[^15] were all positive to the idea of nuclear power, and there was never any doubt that Sweden should invest in nuclear power. The dividing line was between nuclear power only, and nuclear power and nuclear weapons. The next conflict began before the weapons issue had been settled, and it was between what kind of nuclear power Sweden should invest in. At one side was the “Swedish line”, which meant that Sweden would be entirely nuclear energy independent. Those that opposed this wanted to buy American nuclear fuel. At this stage, industry leaders had become involved in the process, and scientists of various expertise were becoming more heavily featured.

In this early period in the creation, the coalitions were not set in stone, and because of the small number of actors, it is almost more accurate to just speak in terms of actors, rather than coalitions, and by using the ACF framework, I would say that these actors were rather similar in their deep core & policy core beliefs. These two ACF tiers are those that decide how coalitions will materialize, as they deal with an actor’s core beliefs, which the actor is unwilling to bargain with. Because the actors involved were mostly cut from the same cloth, the later heated and infected fights that would occur when more actors became involved, were not happening at this stage. The few environmental movements that existed were at the time not focused on nuclear power. In the halls of power, there was almost an universal acceptance of nuclear power. At the earliest stages of the creation of the SNI, there was no real anti-nuclear coalition.

[^15]: There were almost exclusively men involved, up until the 1970’s, when some females entered the scene.
In 1962 Rachel Carson released her book Silent spring. Many consider this the beginning of environmental movements all over the world. I won’t discuss the validity of that claim, but it does roughly coincide with the advent of Swedish environmental movements and their entrance into the debate. Nuclear power was not what the earliest environmental movements protested against. As I wrote in the introduction, they fought against hydro power. In the early stages of the nuclear age, it wasn’t even a foregone conclusion that the environmental movements would be against nuclear power. The Swedish Society for Nature Conservation (SSNC) was one environmental organization that was very positive towards nuclear energy (Radetzki, p.48).

Some of the more important organizations at the early stages of the SNI were as follows:
The Atomic Committee: Meant to research & organize the nuclear project, at the early stages.
The Atomic Delegation: A policy advisory board attached to the trade department
AB Atomenergi: Also known as Atombolaget, jointly owned by the government and private industry, created to help the Atomic Committee with operational issues.

4.3 A Swedish bomb, Swedish uranium and the Swedish line
In May of 1954, during the first parliamentary debate on nuclear weapons, Prime Minister Tage Erlander (S) acknowledged that Sweden was conducting research into nuclear weapons. Before 1954, nuclear policy discussions, both civilian and military, had been confined to a small group of politicians, military officers, scientists and civil servants. Erlander only mentioned preventive research, not that Sweden was actively researching its own nuclear weapons. While the political part of the Swedish nuclear program seemed to progress in a non-military fashion, the FOA continued to study the possibilities of Swedish nuclear weapons, under the guise of providing information for a political decision on nuclear weapons. During the same timeframe, in the mid-1950's, Sweden and the United States signed an agreement on civilian nuclear energy cooperation. The agreement explicitly forbade Sweden from developing nuclear weapons and was in line with President Eisenhower's Atoms for Peace program, promoting civilian nuclear energy (Jonter, p.67-73, Kågeson, 2014, & Orhlander, 1970).

16 FOA=Försvarets Forskningsanstalt, The Army Research Facility, which in 2000 was merged with FFA; the Flight Technical Research Institution, to create FOI; the Swedish Defence Research Agency
Erlander’s acknowledgement of the Swedish nuclear research came almost ten years after Sweden’s initial forays into the atomic age. According to Ohrlander, the first step towards a Swedish bomb was taken by Helge Jung, army chief of staff, who asked the newly formed FOA to investigate the possibility of atomic weaponry, which he did just a week after the bombings of Nagasaki and Hiroshima. It wasn’t until after this request that a meeting was held, where it was decided that Swedish research should focus on civilian use of the atom. This civilian focus came in the form of Atomkommittén. Its mission was to investigate and administer ways to harness the atom.

The AC was sorted under the Ecclesiastical department headed by Tage Erlander, who would take over as Prime Minister following the death of Per-Albin Hansson in 1946. The scientists on the ten man committee were staffed based on recommendations by Torsten Gustafson. Nobel prize winner Manne Siegbahn was one, future Nobel Prize winner Hannes Alfvén another. The scientists represented all the current Swedish knowledge in nuclear chemistry, physics and biology. On the committee were also representatives of FOA and the industry, one being former ASEA Chief Technical officer Ragnar Liljeblad. Five of the committee members also sat on the FOA board, which gave the military more access to the project than it seemed (Ohrlander, 1970, Leijonhufvud, 1994 & Lindell, 2003, & Kärrmarck, 2010).

The AC's first report was ready in spring of 1946. The report's conclusions were that Sweden should emulate the Manhattan-project, which was based on natural uranium with either heavy water or lead. It would also be beneficial to combine the military and civilian programs. According to Kärrmarck, the normal bureaucratic procedure would be for the AC to be disbanded after this report, and another committee formed, with expertise in technical issues, law, economy and organizational aspects. Instead, the AC maneuvered to remain as the main principal of the Swedish nuclear project. To achieve this, its members sought to create international cooperation and a domestic nuclear research platform (Kärrmarck, 2010).

Most of the nuclear research was being done at FOA, which was something the AC disliked. They were aware of the government's wishes of a focus on the civilian atom. Another point against FOA research was that US assistance was enticing, but not available unless the research was 100% civilian. The AC wanted to remove the research from FOA. At the same time as AC thought about how to proceed in removing FOA from the picture, the

---

17 The Atomic Committee; AC
trade department was secretly working with three private companies, to form a company for nuclear research.

In 1947, the AC comes to the realization that they are unequipped to manage the nuclear project, as it grows, and on suggestion from the AC, the government forms AB Atomenergi (ABA) for the purpose of handling the operational responsibilities, while the AC remains as an expert research council acting as a control apparatus. According to Leijonhufvud, the AC initiated talks with the industry regarding the formation of the ABA, behind the government's back. The industry was positive to these plans, because the financial responsibilities would be handled by the state. Of the initial funds of 3.5 million SEK, the state would cover 2 million SEK, and four of the seven board members would be state representatives. (Ohrlander, 1970, Leijonhufvud, 1994 & Lindell, 2003, & Kärrmarck, 2010).

A civilian focus did not mean that Sweden abandoned weapons research. In the late 1940's, FOA investigated costs and time schedules for the production of nuclear weapons. It came to the conclusion that a Swedish nuclear weapons program was economically viable. FOA were to perform a total of five studies on nuclear weapons manufacturing, between 1945 and 1965. During the same time period as the first of these studies, an agreement between ABA and FOA said that while FOA would be responsible for weapons research, ABA would take responsibility for the procurement of weapons grade nuclear material. Later, in 1955, FOA claimed that the technological advances were progressing in such a fashion that reactors built just for the production of weapons grade plutonium were not necessary. Civilian reactors could be built with capabilities to produce weapons grade plutonium, and if they were built, civilian and military nuclear should be merged (Jonter, p.64ff, & Lindell, 2003, & Leijonhufvud, 1994).

Although the FOA weapons research program was conducted separately from the civilian research program conducted by the AC and ABA, there was considerable overlap between the two programs, as both programs shared personnel. Despite this sharing of staff, the AC and ABA saw FOA's research as an impediment to their research into nuclear energy (Lindell, 2003).

4.3.1 The Swedish line

In 1956 the Swedish parliament decided on a large-scale nuclear energy investment. This investment was made on the basis of two official investigations, SOU 1956:11 and SOU
1956:46\textsuperscript{18}. The investment was the practical application of a grand vision, a Swedish line. By using the large supply of domestic uranium, Sweden would get a head start on both nuclear energy and nuclear weapons. The state would lead and finance the project, while the industry would be involved in research & development, and later to invest in the building of reactors that the State would own and operate. The perceived advantages were many, cutting edge weapons technology that would make Sweden into a regional power that could be the leader of a third way movement, with nuclear weapons technology not dependent on either the US or the Soviets. Energy independence that would ensure low energy prices for our industries that could maintain, secure and maintain the Swedish welfare. The industry would also have a new market in which it could compete. Nuclear power would also, as previously mentioned, make further hydro power development unnecessary (Jonter, p.67-73, Kågeson, 2014, Orhlander, 1970 & Kärrmarck, 2010).

4.3.2 ASEA, Vattenfall and AB Atomenergi

The operational layout of the Swedish line was organized so that ABA would conduct research & development. The industry, mainly industrial juggernaut ASEA, would construct and deliver reactors and other components, while Vattenfall and other power companies, both private and public, would build and run the nuclear power plants. According to Ohrlander, a part of the deal between the government and ASEA was that ASEA would receive substantial financial assistance, on the condition that they used Swedish companies as sub-contractors. (Ohrlander, 1970).

According to Leijonhufvud, was Ragnar Liljeblad trying to re-make the above mentioned operational layout, so that it would make ASEA, Vattenfall and Atombolaget a nuclear triumvirate, excluding other actors. After a trip to the US in the spring of 1954, he was convinced that heavy water reactors was the best choice for Sweden. After receiving a positive answer to a letter to Vattenfall general-director Åke Rusck, a meeting was held between Liljeblad, Rusck, ABA CEO Harry Brynielsson and Vattenfall executive Bo Rathsman. In the meeting, plans were mad for a 100 MW plant in Bohuslän. These plans were secret, but Liljeblad initiated ASEA CEO Åke Vrethem and and ASEA vice chairman Marcus Wallenberg by asking them to prepare for uranium import from Abyssinia\textsuperscript{19} where uranium

\textsuperscript{18} SOU is the abbreviation for Statens Offentliga Utredningar=Official Reports of the Swedish Government
\textsuperscript{19} Present day Ethiopia
had recently been discovered. Curt Nicolin, Chief Technical Officer of Stal\(^{20}\) was informed, on account of technical expertise. During an ASEA board meeting the same year, it was decided that ASEA would, together with ABA and Vattenfall, project to build a nuclear power plant within 10 years, and to investigate the possibilities to produce heavy water together with another company.

Vrethem knew that the Swedish demand for large hydro generators was coming to an end, and saw that nuclear reactors would be a fine replacement for ASEA. In a memo to his board, he claimed that nuclear power would be competitive, hardly more expensive than hydro power. Atomic Committee secretary Gösta Funke was not as positive as Vrethem\(^{21}\). In an interview he made the case for state owned plants. Because of the close connection between weaponized and regular plutonium, he was of the opinion that nuclear power plants should not be able to be built by the private industry. An alliance between ASEA and Vattenfall could be a good countermeasure, was Vrethem’s opinion. That Vattenfall was directly financed by the state budget saw Vrethem not as an obstacle, but rather as a positive, because of it, Vattenfall would manage the financial part easily. ASEA would invest heavily in research & development, to assure future earnings.

Vrethem’s thought of nuclear power as the future was shared by Vattenfall, but they were more ambivalent, because of hydro power, which was causing them some public relations troubles. Leijonhufvud writes that these troubles were mainly had with the nuclear friendly environmental movements, which shows once more that the environmental movements would go through quite a transformation, later on.

As the negotiations continued into 1955, the parties were not coming together. ASEA was hoping to use national resources while limiting governmental influence over nuclear development, through Vattenfall. AB Atomenergi wished to build the nuclear power plants, using ASEA as a contractor, and after the power plants were finished, turn them over for Vattenfall to operate. ABA saw themselves as the natural leaders of the nuclear project, as they were backed by the government, and had close connections to the academic world. ABA was also working to protect the government's interests, which meant not only commercial viability but also military, industrial and research policy, while ASEA and Vattenfall’s chief interest was to build competitive reactors. ABA was a joint venture, and ASEA was

\(^{20}\) Stal=Svenska Turbinfabriks AB Ljungström, an ASEA subsidiary.

\(^{21}\) Here it can be good to remember that ABA was formed on a suggestion from the AC, and that the two were still quite inter-connected.
represented on the ABA board, which further exacerbated the conflict, as both ASEA and ABA wanted to build the rectors, and both felt that they were the natural choice. It is worth to note that not all private industries were backing ASEA, the Johnson concern was a big proponent of ABA and their goals.

Despite agreed upon plans from the parliamentary session on 1956, the government turned down Vattenfall's request for funds to build a power producing reactor. With support from the Atomic Delegation, trade minister Lange instead pushed through a deal between Vattenfall and ABA, to co-develop the plant. Because of the deal, Vattenfall had better luck the following year, receiving funds to the reactor, as long as it was a heavy water reactor. The Atomic Delegation chairman Gustav Cederwall was pushing hard for the Swedish line. Regarding the fuel issue, both the delegation and ABA were in agreement.

The Swedish nuclear fuel was to be mined at Ranstad. While it was being built, it became financially obsolete. ABA tried to save the Ranstad facility, but did not succeed (Leijonhufvud, 1994).

4.3.3 ASEA-Atom

The struggle for advantages between ASEA, Vattenfall, ABA and the government continued during the second half of the 1960’s. In a shuffling of personnel within the government, Krister Wickman became the new “nuclear guy” in the government. Lange’s investigation released a memo in 1967, direct negotiations between the state and the nuclear industrial companies must be initiated.

This starts a carousel of different talks, offers, counter-offers, pride, and angry businessmen. The main argument was between the government and ASEA. Both were trying to get the other part to accept a deal that would put them in the driver’s seat. In the end ASEA-Atom was presented during the summer of 1968. The same day, Vattenfall held a press conference. They had ordered two large reactors, one from ASEA and one from Westinghouse. Vattenfall had decided this several months earlier, but kept it a secret from ASEA, as to not empower them during the negotiations. Even though ASEA-Atom was considered as a company within the ASEA concern, which meant that they would always have the post of chairman of the board, they did not like the deal. In an interview with (then)

---

22 The word “blackmail” is a part of the title of Leijonhufvud’s chapter dealing with the ASEA-ABA merger.
ASEA CEO Curt Nicolin in 1994, Nicolin states that they did not want to include ABA in the new company, and that it was forced upon them (Leijonhufvud, 1994).

4.3.4 Atomic fuel

During the first part of the 1940's, it was thought that Sweden was the sole country in Western Europe that possessed viable long term uranium deposits, and in the summer of 1945 the US and UK governments submitted a joint, secret proposal to buy and to decide over future export opportunities of Swedish uranium. Sweden dismissed this proposal, but made some guarantees regarding exports. Uranium became a delicate foreign policy issue for some time after world war 2, coming into contact with both the Swedish neutrality doctrine and our relationships with both the Soviets and the Western Powers. The Swedish uranium was the only major uranium deposit in the world that wasn’t under US or UK control. Up until that point, uranium had not been considered valuable enough to be of state interest, and it belonged to the land owner. After being urged on by Torsten Gustafson, Erlander made sure to change the law, making uranium the property of the state. In the 1950’s it turned out that the world had far greater uranium deposits than previously thought, enough to go around not only for the US and Great Britain but also for the Soviets as well as France (Skogmar, 1997 & Leijonhufvud, 1994).

In the early 1960’s, The US lowered prices on enriched uranium, which made it possible to build cheaper light water reactors. This created a rift between the government and private companies on how to proceed. The Government wanted to continue on the “Swedish line”, the already established path of a self-sufficient nuclear energy industry, which would allow for a continuation of the possibility of a Swedish nuclear weapon, while the industry was in favor of light water reactors. This rift was accompanied by a disintegration of the consensus in favor of nuclear weapons, which had earlier existed in the Swedish military. Not only had Sweden's uranium deposits been accompanied by large deposits abroad, the quality of Sweden's deposits was quite bad (Skogmar, 1997 & Jonter, p.74ff).

4.3.5 Different reactors

When it was time for the different actors to actually start building a reactor, three different kinds of reactors were seen as the most promising. One alternative was a reactor that

---

23 This type of reactor had not been used earlier.
produced both heating and plutonium, that was being projected by the American company General Electric. The plutonium was seen as a big advantage as it could be used in both power and heating reactors, and Vattenfall’s Rathman believed that the military would be very happy with this reactor. A big drawback was however the fact that this reactor type was not suitable for generation of electricity. The enriched uranium reactor had a big negative aspect, that the fuel would have to be imported, and that it would be scrutinized by international controls. The third reactor type was a heavy water reactor, which could be fueled by domestic uranium, here the drawback was the availability of heavy water, as ASEA’s attempts to jointly produce heavy water fell through. Talks between ASEA and Vattenfall were leading towards two heavy water reactors. This was a huge success for ASEA, as they would receive funding to build reactors that would increase their technical know-how. ABA was to deliver the fuel for the reactors, but ABA did not like their small role. Vattenfall was pressured to change their plans, instead doing the reactor work together with ABA. One part of the reason for this reversal was that Rathman had been recruited by the company KMW, which belonged to the Johnson-concern, an ASEA competitor. Rathman's successor at Vattenfall was the less ASEA-friendly Sture Ekfalk. To save the deal, ASEA managed to anger their friend Rusck, head of Vattenfall (Leijonhufvud, p.31).

At a joint Social democratic and LO\textsuperscript{24} conference held in Stockholm, Rusck was scheduled to speak. And his speech upstaged the other speakers. Vattenfall would build two reactors, Adam and Eva, he said. The decision on what kind of reactors was not yet taken, but they were leaning towards heavy water. Vattenfall was also engaged in talks with ASEA and ABA, for a more close cooperation. This was not cleared with the government, and they were not thrilled. Their response would be the Atomic energy investigation, which is handled in more detail in "4.5.2 The relationship between S and the industry".

Sweden’s first reactor was installed in 1954, at the KTH\textsuperscript{25} campus in Stockholm. Named R1, it was built by ABA and was a heavy water reactor built on uranium borrowed from France, as Sweden’s uranium mining was not yet operational. The first reactor built by ASEA was located in Studsvik, and just as R1 it was a research reactor and was operational in 1959.

\textsuperscript{24} LO=Landsorganisationen i Sverige, Sweden's largest labor union, by some seen as an extended arm of the Social democratic party. Others would say that it is the other way around.

\textsuperscript{25} KTH=Kungliga Tekniska Högskolan, Royal Institute of Technology
4.3.6 Ågesta and Marviken

The reactor in Ågesta, Adam (R3), was supposed to be ready in 1961, but it took three more years, and it cost a whole lot more than projected. In 1956 the Ågesta reactor was supposed to be built by Stockholms Elverk and ABA, as a heating reactor. ABA recommended that it be a heavy water reactor, a recommendation they would repeat with Marviken. Erik Grafström, new general-director of Vattenfall, had to meet with representatives of Västerås, where the Adam reactor was first planned to be built. He also had to meet with ASEA CEO Vrethem, and promise him to work for ASEA's inclusion in the Ågesta reactor, just as they were a part of the Västerås plans. In the end, it turned out that ABA and Stockholms elverk would be joined by Vattenfall and ASEA. Vattenfall would operate the plant from 1965 until 1974, when it was closed down. On the Ågesta project, Vattenfall, ASEA and ABA worked together with the company Stockholms Elverk (Leijonhufvud, 1994, p45ff).

In 1961 ABA requested funding from the state, to build a heavy water reactor in Marviken (R4). For ABA, the heavy water reactor was important. They had invested heavily in the heavy water technology, and not only financially, and as such, they were adamant in their support of the Swedish line. Vattenfall did not fight against ABA and Marviken, but at the same time they wanted to keep the door open to other technologies, in the future. They had plans for a light water reactor at Oskarshamn, together with private power companies. The Atomic delegation felt, however, that all resources should be put to use for the Swedish line, and Vattenfall, being a public company, left the Oskarshamn project. Torsten Gustafson, of the Atomic Delegation, was one of the few people involved in the Marviken project that protested. According to him and two experts, Marviken should be put on hold, awaiting further technological advances, while the constructions of the Oskarshamn light water reactor should proceed. ASEA, the final big industrial player, had some doubts about the viability of the project, but they were eager for Marviken to be built, as ASEA would gain both profits and technical experience (Anselm, 2000, p. 75ff & Ohrlander, 1970).

The next year, ASEA proposed doubling the capacity at Marviken, to 200 MWe, by building a boiling water reactor with internal nuclear over-heating. This was quite an ambitious proposal, as the technology was very advanced, ABA went along with the proposal. Vattenfall did not oppose these plans, but as they were considerably more advanced, and thus added more risk, Vattenfall refused to take on any technical or financial responsibility. In

---

26 One of the companies involved in AKK
27 Anselm does not name the two experts
1963, the parliament approved the changes to Marviken, while Vattenfall were becoming increasingly skeptical to Marviken, and to heavy water technology in general. ASEA was in all likelihood affected by Vattenfall's skepticism, and they began using language that would cover them somewhat, if Marviken would turn out to be a failure. In 1964, the agreement between the involved parties now stated that ASEA, despite being the main supplier, would be free from responsibility relating to the construction. Vattenfall, as the owner, got the same deal. The government and ABA took on full technical and financial responsibility. ASEA, Vattenfall and ABA would continue to argue about the Marviken plant. At one point it was even decided that it would be built as a light water reactor. In 1970, as Marviken was finally completed, the government cited security concerns, and refused to start it. In the end, it was rebuilt using oil as fuel (Anselm, 2000, p. 75ff & Ohrlander, 1970, & Kärrmarck, 2010).

Concurrently with Vattenfall’s distancing from heavy water, the opposition to the Swedish line was beginning to pick up steam. In the US, electricity from light water reactors were showing signs of being able to compete with oil, which was cheap at the time. For the light water reactor proponents in parliament, media and the science community, this was good news, both in the fight against the Swedish line and those doubting all nuclear power (Anselm, 2000, p. 75ff & Ohrlander, 1970)

### 4.3.7 Oskarshamn & light water reactors

AKK, who wanted to use American products, were made to reconsider as their conceived supplier stopped producing the turbines that AKK wanted. AKK then turned to ASEA. Curt Mileikowsky at ASEA was not sure that ASEA could deliver. Because of low oil prices, ASEA's nuclear division had been shrinking, and Mileikowsky had deliberately held light water enthusiastic engineers back. ASEA and AKK started working on different kinds of solutions for light water reactors. It turned out that they needed General Electric as a licensing partner. Because of the negotiations, ASEA was not able to deliver an in-voice until September of 1964. But meanwhile, Curt Nicolin had other plans, after the in-voice, he went to AKK and asked them about their interest in pure ASEA reactors. AKK’s interest was piqued, with the condition that they would not have to subsidize the plant. Nicolin convinced the other bosses at ASEA. The two Curt’s now had to sell the idea to the private power companies, which they managed to do. ASEA signed a deal with the newly formed OKG\(^{28}\), and now the only remaining issue was financing. Representatives of ASEA and OKG went to

---

\(^{28}\) Oskarshamns Kraftgrupp AB, Oskarhamns Power Consortium, created by AKK to manage the Oskarshamn plant.
the trade department to announce the deal. There was some trepidation, as the plant was not in sync with the Swedish line, despite this, in March of 1966 the Atomic Delegation recommended approval of the plant (Leijonhufvud, 1994).

4.4 The captains of industry

AB Atomenergi was formed to better perform organizational tasks and similar issues, but according to Ohrlander, that was not the only reason, and perhaps not even the most important. As a private company, it would be easier to evade oversight and transparency. It would also be beneficial to allow other companies to buy stocks, and thus gaining their support. And for those that lead these companies, having the government as a partner meant stability and safety. With this arrangement, the government also took on the financial burden and risks associated with the new technology (Ohrlander, 1970).

Sweden's industry leaders saw profit potential in this new market. The CEO of Sydkraft AB, Göran Ekberg was one of them, and he pushed hard for Sydkraft AB to enter the nuclear market. Why did Ekberg push hard? The issues were related to money. Sydkraf was worried about competition from Vattenfall. In the south of Sweden, hydro power capability was fully developed. Middle Eastern instability was worrisome, as instability affected oil prices.

Sydkraft had projections for Swedish oil dependence at over 70% at the end of the 1960’s. If oil prices rose considerably, the price of Sydkraft-generated electricity would rise with it, while Vattenfall could fall back on its northern hydro power. With this background, it is not surprising that nuclear power was seen as something very interesting to Sydkraft executives. The ASEA, ABA, Vattenfall triumvirate made other Swedish power companies nervous, fearing being shut out of the new nuclear market altogether. Something had to be done, and it was done just in the nick of time. In 1955, just a few days before trade minister Lange gave directives to the 1955 Atomic energy investigation; Atomic energy endeavors would be handled by the government and that Vattenfall and ABA would run and supply these endeavors. Sydkraft and other power companies formed AKK. This consortium was not only created to better be able to monitor atomic developments and to educate personnel for future atomic endeavors, but also to try and stop a governmental monopoly (Bergquist, 1985 & Leijonhufvud).

29 These projections proved quite accurate, as 66% of Sweden's energy was generated by oil between 1965-1970 (Radetzki, p.48).
30 Atomkraftskonsortiet, Krångede AB & Co, the Atomic Power Consortium, Krångede AB & Co.
At the end of the 1960’s, as the phase of creation was nearing its end, the industry was, despite some setbacks, optimistic regarding the future of nuclear power in Sweden. Vattenfall technical director put this optimism into words, when he predicted that nuclear power would not be restricted and attacked the same way that oil fuelled power plants were being, and that nuclear would not suffer the same fate at hydro power. The industry, through CDL, continued with the plans for 24 reactors (Anselm, 2000).

At the beginning of the nuclear project, ASEA had been positive to the Swedish line, even if at least some of that positive attitude came from the fact that a negative attitude towards it would have made it difficult for ASEA to earn money. The other power companies were not as positive. They wanted safe power plants that would produce cheap electricity, imported or exported. Vattenfall's new general director Erik Grafström\(^{31}\) wanted to go ahead with imported light water technology. This was somewhat sensational, when considering his close ties to the Swedish line.

AKK, the power consortium, where moving ahead with its light water plans. Both ASEA and Vattenfall tried to get AKK onboard with their reactor plans, but AKK liked what they saw in the US company Westinghouse's Boiling Water Reactor. AKK received heavy criticism for their decision to abandon the Swedish line. A small country such as Sweden can't afford to split neither financial nor informational resources, the Swedish line proponents claimed. (Leijonhufvud, 1994).

### 4.5 The Social democrats

The Social democrats were a party of optimism. Their faith was in technology and science, large infrastructure projects, industry and economical growth. Rolf Edberg, author and former MP for the party, released his book *Spillran av ett moln*\(^{32}\) in 1966, by some called the Swedish Silent spring. This book was not compatible with the official party line, in it Edberg wrote that there were signs that human civilization was moving towards an ecological collapse, thanks to our technological advances. Neither science nor technology was the solution. This heresy was embraced by some of the more radical elements of the party\(^{33}\). (Anselm, 1995)

---

\(^{31}\) He came most recently from trade minister Lange's office, and was also on the ABA board.

\(^{32}\) The fragment of a cloud

\(^{33}\) I have not been able to find out names of these radicals, but it is likely that at least some of them were the ones that opposed the party in the hydro power fight, and would later become those that formed the anti-nuclear wing of the party.
Hans Palmstierna released a book the year after, *Plundring, svält, förgiftning*[^34]. It is more trusting in the political ability to handle problems, in fact, politics the only way to stop industrial carefree looting of environmental resources. Economic growth, according to Palmstierna, would help deal with environmental issues. Palmstierna was an important ideologue Social democratic environmental politics. In 1968 the party released an environmental program, focused in fixing environmental problems in a modern, progressive society. Science, legislation & rationality was needed, and the party could deliver, said minister of agriculture Eric Holmqvist. The ideas for this policy area was similar to other policy areas, and the Social democratic solution to environmental problems were easily integrated into the Social democratic world view, where they and their ideology could solve basically everything (Anselm, 1995).

### 4.5.1 Social democratic environmentalists

In the 1970's, as the nuclear debate was raging, the Social democrats were divided, a large part of their party was against nuclear. But it was not only nuclear power that was dividing the party. During the Vindel river fight, many Social democratic MPs, most of them from the north of Sweden, joined the right wing parties in voting against hydro power, defeating it in parliament (Anselm, 1995).

### 4.5.2 The relationship between S and the industry

The Social democrats and the industry leaders had together formed the core for the Swedish nuclear project, and the Swedish line. The main tool had been ABA, but also Vattenfall and ASEA had prominent parts to play. The order of light water reactors by OKG made the government worried, especially Gunnar Lange, as it was his department that ASEA and OKG had turned to for financing. In 1966 he commissioned an investigation, with the main task to look at the organizing and financing of the research & development that was being performed, mainly at ABA. It was expensive for the government, but for the government and ABA, there seemed to be few benefits. And now it seemed as if they were being betrayed by their industrial partners, as they were abandoning heavy water (Leijonhufvud, 1994).

The Social democrats and by extension the nation's government felt that the issue was slipping out of their grasp, with private industry taking the lead. Erlander's secretary Olof

[^34]: Plundering, starvation, poisoning
Palme wrote a memo on the issue; Organizationally, there is chaos, he wrote, Vattenfall and ABA are fighting in the media, other private companies are using this to their advantage, and we are doing nothing. Palme weighed the pros and cons of a socialized power industry. Finally, he suggested that the state would have a monopoly on reactor construction. The state would order reactors, and the industry would deliver. Palme reasoned that a small country such as Sweden needed a concentrated effort, for which the government would be the only one capable of financing. True to the roots of the party, Palme felt that such an important sector as energy could not be left to the interests of market actors. According to Lindell, the memo has been circulated in several versions, most of them not dated, but most likely they were written as a reaction to Vattenfall's speech at the S & LO conference (Leijonhufvud, 1994 & Lindell, 2003).

Further suggestions from Palme was a full nationalization of ABA. One of the reasons can be found in another Palme memo, that if Sweden would later decide to produce nuclear weapons, state run reactors could easily deliver fuel (Leijonhufvud, 1994).

4.5.3 Internal strife

From the beginning, during the discussions in the 1940's, there were disagreements whether or not Sweden should have nuclear weapons, but there was a general agreement regarding nuclear power, that was something that Sweden should have. The weapons issue was active in the party up until it was finally dismissed in 1968, as Sweden signed a non-proliferation treaty. On one side, there were those that wanted nuclear weapons. From the military, army Chief of staff Nils Swedlund was active in trying to get Sweden a bomb, and with him he had several high level officers, mainly from the air force but also the army. FOA was also a supporter of the weapons project. Within the government, Minister of defense Torsten Nilsson was very enthusiastic about a Swedish bomb. Others that were positive to the bomb were Per Edvin Sköld, and Minister of trade Gunnar Lange and Sven Andersson, Minister of communication The two latter wanted reactors to be built so as to be able to produce weapons grade plutonium. Gunnar Sträng, Minister of finance, and Undén were on the opposing side, together with Ulla Lindström. While not saying that Sweden should build a bomb, Erlander choose to give the task of organizing Sweden's nuclear organization to Lange and Andersson,

35 We being the government.
36 She was a part of the government, but was not head of any department, she would later go on to be one of the driving forces of the no campaign during the referendum.
and the plans for a Swedish bomb would not have developed so far as they did without the support of Prime Minister Erlander, be it quiet or out in the open (Leijonhufvud, 1994, & Kärrmarck, 2010).

The main argument from Swedlund was that Sweden's neutrality policy would not be credible without a Swedish bomb, as it would be understood that Sweden was in fact not neutral, but was expecting protection by the US nuclear umbrella, in case of a coming bullet rain. This was, according to Kärrmarck, the same argument that Erlander used on dissenting members of his cabinet.

Even if several of the ministers in Erlander's cabinet were positive to a Swedish bomb, civilian use of the atom was still the number one priority. In the memoirs of cabinet secretary Sverker Åström, we learn that Östen Undén (S)\(^\text{37}\) was adamant in maintaining Swedish sovereignty, and opposed a Swedish bomb, during the 1945 discussions. These discussions were part of the evolution of Undén's “third way”, the Swedish neutrality doctrine. While Swedlund argued that Sweden's neutrality needed a bomb, Undén felt that a bomb would jeopardize Sweden's neutral. How Undén handled himself would have ramifications later, when Sweden had to balance neutrality and economical interests. But it was not only money and economy that was to be affected. During the discussions, the Americans dropped a bomb over Hiroshima, and this put the discussions in a new context of geo-strategy and safety. In the late 1950's Undén would publicly work against nuclear weapons both at home and abroad, and he would be a part of energizing the public opinion against nuclear weapons. Doubts about earlier cost projections regarding nuclear weapons surfaced in the second part of the 1950's. Sweden made inquiries to the Americans regarding nuclear weapons assistance. The US did not see the necessity of helping Sweden, as NATO felt that it had sufficient nuclear capabilities in the rest of Europe, and in 1960 they gave a definitive no as an answer to these inquiries. The increasing costs, public and parliamentary opposition and international pressure had changed the views of many S leaders, including Erlander (Skogmar, 1997, Jonter, p.73&p.80ff & Lindell, 2003).

4.6 The seeds of a green movement

Sweden's environmentalists have often been regarded as more forceful than many other country's environmentalists, and one of the main reasons could be that Sweden's autonomous

\(^{37}\) Foreign minister, 1945-1962.
environmental movements had to fight for independence against Sweden's strong traditions of governmental interference and its willingness to incorporate new issues and problems into its big bureaucracy. This ability of the government and state could have lead to the fact that Sweden's environmental battles have often been fought by a briefly mobilized, intense one-issue popular campaign. As the battle was done, so was the campaign. Sweden was also the first European country to experience nuclear power as a hot topic political issue. (HWB, 1977 & Rüdig, 1990).

Anselm writes that the scientific discourse during the 1950’s was homogenous, and in favor of nuclear, and that the nuclear opposition did not really come together until the 1970’s. There were dissenting voices, but they were few, and none of them were opposed to nuclear power, their objections were limited to certain aspects of nuclear power. As the project and information was kept to a small group, the negative aspects of nuclear was also kept within that small group. One of those in that small group was Professor Rolf Sievert, the foremost Swedish expert on radiation. He admitted that harmful radiation would be the price to pay for nuclear power, but his opinion seemed to be that it was a price worth paying (Anselm, 2000, & Funke, 1956).

Jamison and other environmental scholars have divided the first 30 years of the Swedish environmentalists movement (SEM) into three phases. The first one starts in 1962, well after the decision to go for nuclear power had been made. The first phase is characterized by an initial debate within the science community, followed by an “awakening” of the public, fueled by popular science such as Carson’s previously mentioned Silent Spring (Rüdig, 1990).

At the beginning of the first phase, the public was largely unaware of any negative side-effects, as the public discourse was focused solely on nuclear power as the solution to a wide variety of economic, social, and political problems. In general, nuclear radiation was compared to other modern societal risks such as electrical wiring and traffic. At the time, the scope of the Swedish nuclear project was not known, and as the public became aware of it, opposition grew. Later on, one of the main arguments of the nuclear opposition would be the question of nuclear waste, but in the very beginning, the dangers of nuclear was more linked to hazards in the workplace, fearing mutation due to radiation (Anselm, 2000, p.45f).

During the 1950’s and 60’s, the Swedish environmental movements did not consider, or question, the modern industrial society, nor its development. The environmentalists discussed and protested, but did so within the frames of modern life. The Vindel river fight, concluded in 1970, was one of the first signs of the evolution of the environmental movements, into
organizations that were more activist, more vocal, that acted more and were protesting more loudly. The fact that they had won, also worked to increase their fervor. In the 1970's, this would continue, but at the time it was not guaranteed that it would be directed against nuclear. The SSNC for example, was even more optimistic about nuclear power than the industry (Radetzki, 2004 & Anselm, 1995 & 2000).

While perhaps not technically an environmental group, Aktionsgruppen mot svenskt atomvapen\(^\text{38}\) (AMSA) was involved in the birth of the new movements that would appear in the 1970's. They were active while the nuclear weapons debate was still ongoing, and they focused on radiation and its consequences. Consequences that, according to AMSA, were unavoidable and would spell disaster for health and genetics. AMSA was one of the first organized groups opposed to nuclear, as far as I’ve been able to ascertain, and according to Anselm, their continuing action might not have influenced scientists, engineers or politicians, but their work affected the public. The fears that AMSA generated were met by experts who said that the concerns were blown out of proportion. It seems as if the public were swayed more by AMSA, than by the nuclear friendly community (Anselm, 2000, 47f).

In 1958 a local committee was formed in Västerås, protesting the plans to put the nuclear heating plant “Adam” there. The committee published a text by psychologist Egil Rönne-Petersen. His criticism would later be adopted and repeated by the 1970’s environmental movements\(^\text{39}\). In Ågesta, outside of Stockholm, there were also protests, when it became known that a plant would be located there. The Adam plant was moved, to be installed in Ågesta instead. The official reason was increasing costs. When the plans for Ågesta became known, there were protests there as well (Anselm, 2000, 50f).

### 4.7 Other critics

Most criticism of nuclear power was related to radiation and waste storage, but not all. In the shift from the 1950's to the 60's, MP Ragnhild Sandström (FP) was accusing ABA of deliberately obfuscating public insight into the nuclear program, and of too easily ignoring those outside of their own circle of experts. This criticism was echoed by Göran Hultqvist of

---

\(^\text{38}\) Action group against Swedish nuclear weapons

\(^\text{39}\) The criticism went along the lines of engineers were drinking the atomic Kool-Aid and in cahoots with big business, claims that nuclear was completely safe, the connection between nuclear weapons and nuclear energy, lack of democratic oversight, and more.
FOA. He also added concerns over the poor organizational layout, as construction, safety and the operating of the reactors were in the hands of the same people (Anselm, 2000, p.55f).

In the beginning of the 1960's, other Liberal Party parliamentarians criticized the organizational layout of the SNI, as ABA officials were a part of the Reactor placement committee\(^{40}\), which was a case of conducting oversight over yourself (Anselm, 2000, p.55).

In an interview, Krister Wickman (S)\(^{41}\) says that the government was being kept in the dark regarding many of the technical risks associated with nuclear power. Especially the issue of nuclear waste. Safety was a part of the discussion, but it was not regarded as a problematic issue. Aside from not getting all the information, the politicians were also fed with disingenuous energy need projections. Wickman says that the overall feeling at the time was unbridled optimism. Wickman is critical of himself and others, for not questioning the assumptions regarding oil scarcity and price. Wickman and the government were not the only ones that were woefully uneducated in the area of nuclear power. According to an unnamed MP, he was not at informed about the decisions he were to vote on, and at least 30 of his colleagues felt the same. He felt that too much of his information came from experts and technicians, and that they mainly came from the industry (Lohmann, 1985).

When Vattenfall bought land and applied for permissions in the mid 1960's, Dagens Nyheter began criticizing their behavior, accusing them of "anti-planning"; by extensive investment and planning before notifying the government, it was presented with a fait accompli, and had no real choice but to approve the plans.

Manne Ståhl (FP) was another parliamentary critic, attacking the Marviken specifically. He had information from ABA employees. The information he received was, while not technically classified, hard to come by. Ohrlander wrote his book *Blågul atom* on the premise that his sources, mostly nuclear technicians at ABA, were afraid to speak up about mismanagement and poor decision-making for fear of reprisals. According to Ohrlander, the outward unity that is presented by those that were in charge of the Swedish nuclear project, in its early stages, was accompanied by an inward culture of censorship and oppression of dissidents. Ståhl attacked the Marviken project from the political right. Claiming that it was a financial disaster aimed at helping companies that were close to the S leadership. Ståhl recommended buying American reactors. Social democrats in parliament defended the

\(^{40}\) Reaktorsförläggningskommittén. Despite the name, it was more involved in overseeing radiation issues.

Swedish line, asking what was to become of Swedish industry if Marviken, and by association ASEA, were to be stopped. Lange successfully managed to stop any kind of parliamentary investigation into the matter (Ohrlander, 1970 & Lohmann, 1985).

4.7.1 Criticism from within

Technicians from the Ågesta project, after reviewing the reactor at Marviken, wrote a scathing report on the deficiencies of the Marviken project. This report was not well received by the people at the top, and efforts were made to bury the report. They were somewhat successful, the report did not reach the public, but some outside critics were informed. One was Ohrlander, whose book Blågul atom is based on information received by staff working on the Marviken project (Ohrlander, 1970, & Leijonhufvud, 1994).

Every month, ABA sent status updates to the Atomic delegation, but that came to an abrupt stop as the safety team at ABA criticized Marviken in an update, the criticism never reached the Atomic delegation (Ohrlander, 1970).

4.7.2 Mr. Alfvén

Alfvén was one of the members of the Atomic Committee, so he was very much a part of the SNI right from the start. He was also part of the Atomic Delegation, and sat on the board of ABA (Ohrlander, 1970, & Lindell, 2003).

As a member of the ABA board, Hannes Alfvén raised concerns regarding Marviken. The punishment he received for this was harsh. He received funding for his research from ABA, which was swiftly decimated. The following years he fought for funding and against what he considered political harassment. Alfvén moved to California to teach, and there he came in contact with anti-nuclear activists. In California, he was chairman of "Pugwash" from 1970 to 1974. The main objective of Pugwash was to stop the nuclear arms race, but they have become more and more involved in the opposition to civilian nuclear energy. (Ohrlander, 1970, Alfvén, 1975, & Leijonhufvud, 1994).

---

42 The Pugwash Conferences on Science and Public Affairs
4.8 Analysis

4.8.1 The advocacy coalition framework

The deep core beliefs of a majority of the actor's during the creation phase seems to be quite similar to each other. Most are older, powerful men, and they all operate within the Swedish corporatist system. There are a few exceptions, however, and they relate to the weapons issue. The most vocal supporters of a Swedish bomb seem to have had views that included the need for nuclear weapons, as a tool for Sweden's desired political course. The question here would be if these desires were a part of their deep core belief, or not. I do not believe that I have found enough evidence to support a definitive answer, and must be satisfied to say that they lost the fight for their views, in the policy process. As their coalition was failing, the majority of the coalition's actors did not move on to another coalition, rather, they disappeared from the SNI. This is different from other actors that chose to either switch coalition, or stayed, trying to bring success to its coalition's goals. That could be seen as evidence that nuclear weapons was a deep core issue for them, as they did not feel the need to continue to participate in the process, after that point. But I do not see it as conclusive evidence.

The policy core beliefs are where we can see some differences emerge. Most of the actors agree on the big issues; energy generation and oil dependence, but after that we see disagreement. One very interesting hypotheses of policy change is that the policy core attributes of a governmental action program\(^{43}\) are unlikely to change without a significant enough external event. Policy output from another subsystem is one of the changes listed. A subsystem is not strictly defined in the literature on the ACF, but in general they seem to be thought of as different institutions and policy areas. When one institution is large, such as the institution of Swedish nuclear, I believe that it can have several subsystems within itself, that can affect other subsystems, both within and without the institution, as well as the institution as a whole, and the rapid advances in reactor technology is a policy output from a (sub)system\(^{44}\) that isn't the main, or whole, institution of Swedish nuclear.

These technological advances was a big blow to the Swedish line coalition. Because of them, one might say that the Swedish line coalition lost, but it isn't that simple, as that

\(^{43}\) In this case, the Swedish nuclear project

\(^{44}\) This subsystem is partly internal, and partly external, as research was being done in many countries, with the US as probably the most successful in nuclear research.
coalition, alongside the pro-weapons and commercial reactor coalitions were very much intertwined, through various agencies, committees, politicians, scientists and industry leaders, as evidenced by the empirical text in the creation chapter. The actors were at times working against the Swedish line, and at times they worked against it, and sometimes some actors did both at the same time, some of ASEA's actions during the Marviken project, for example. There was a Swedish line coalition, but when it lost, it didn't mean that all of its actors lost, most of them just moved on and adapted to the new conditions within the SNI. ASEA, for example, would go on to build many of the reactors currently in use in Sweden. Vattenfall, while never seeming to be 100% for the Swedish line, was definitely involved in that coalition, and they are also active today.

To place a big decision such as choosing between heavy and light water for reactor construction, in one of the three tiers of the ACF's belief systems, it is in the tier of secondary aspects. With the way that the evolution of the SNI was progressing, it was simply not worth it to continue being in the Swedish line coalition, to the actors involved. As I've written, most of the actors in the creation phase were older, powerful men. But another thing that connected them were their pragmatism, and this pragmatism, is in my view, a deep core belief. Often, actors do not switch coalitions, as their deep core beliefs differ significantly, and the devil shift concept is working its magic, causing the competing coalitions to become entrenched. Why this is possible, in this case, is, in my opinion, that the creation phase is not really a critical juncture. Everything is new, there are no real entrenched positions to take, and the different coalitions were similar, as a real opposition had not had time to form, yet.

For the devil shift to take hold, the opposite actors & coalitions must also have differing deep core & deep policy beliefs, and a long enough time frame for distrust to build up.

4.8.2 Historical institutionalism & path dependence
It can be somewhat difficult to analyze an institution at its conception by using the ACF, so by using the historical institutionalism theory, it is interesting to trace the subject of Swedish nuclear power policy & politics to other areas. Energy policy in Sweden had been dominated by larger corporations such as Vattenfall, for the last fifty years. In regards to path dependence, it is not at all surprising that the state would turn to Vattenfall when it came to a new area in energy generation, as Vattenfall had been formed specifically to deal with energy and the policies that the government had decided upon, regarding energy generation. And in
following traditional Social democratic policy, new agencies were created to deal with new issues

While there was not yet any real path dependence within the SNI, its creation was shaped by the path dependence of Sweden, with its strong corporativistic tradition where the government worked closely with the industry and labor. The Swedish state was also used to be very active in all kinds of policy areas, so there is no surprise that it did so in this policy area as well.

Path dependence did not yet exist within the SNI, but one can make the claim that the Atomic Committee was the first step on that path. It was the first tangible institution that was created for the explicit purpose of creating Swedish nuclear power. It was under the command of the ecclesiastical department, which was in charge of research & science, higher education and church issues. In 1968 the department turned into the department of education. Both the AC and the department under which it was sorted were research-focused. After the initial phase, the nuclear project should have been handed over to others, with expertise in other areas, but this did not happen.

Radetzki, in his book Svensk energipolitik under tre decennier (Radetzki, 2004) makes the claim that a nation's energy policy should not be burdened with tasks that are not directly related to correcting market failures. If energy policy is tasked with issues relating to other policy areas, like national safety or redistribution of wealth, there is a very real chance of unintended consequences. Radetzki is an economist, and his argument is mostly concerned with economy, and whether or not you agree with it, it is interesting to keep it in mind while reading about the grand plans of the Swedish line. Furthermore, Radetzki writes about the haphazard and sloppy nature of the governmental nuclear propositions, especially those from the 1960’s and ‘70's. The economical consequences of the propositions have in some cases been near impossible to grasp, as vast sums of money have been mixed with smaller amounts, and appropriations are mixed with loans and guarantees of loans. In doing so, he validates Lohmann's claims, but does so in a more neutral and objective language, adding credibility.

By criticizing both the handling of financial matters during the creation phase of the SNI, as well as the wide policy aims of the SNI, Radetzki gives credence to historical institutionalism's path dependence, as he, without using those words, is warning of (a

---

45 As the Social democrats held government power for so long, one can talk about either one and mean both, up until 1976.
46 AB Atomenergi, the Atomic Committee, the Atomic Delegation.
negative) path dependence, if a policy area deals with issues that are not its core issue, in this case energy & electricity.

4.8.4 The pro-weapons coalition

The military, while represented at most levels of the Swedish nuclear project, was not a very strong actor. It did not manage to force a classification of the majority of the Atomic committee’s work, for example (Leijonhufvud, 1994). Neither did anyone build the reactor that Vattenfall's Rathsman believe that the military would prefer. More information pointing to the weakening of the pro-weapons coalition was that Vattenfall was moving away from the reactors and fuel that would allow for a Swedish bomb, despite the fact that Sven Andersson 47 was their governmental overseer. The pro-weapons coalition faced considerable pressure from outside forces as well, both international & domestic factors.

4.8.5 The Swedish line coalition

The Swedish line coalition was strong in the beginning of the creation phase, as it was not only a coalition wanting to build reactors with heavy governmental involvement, but also included in the goals of the Swedish line was considerations of other policy areas such as defense and industrial-political and economic. The pro-weapons coalition was in what one could call an alliance, with the Swedish line coalition, as the reactor technology that was pushed by the Swedish line coalition was suitable for them, but the alliance was more a one way street than a real alliance, as the Swedish line coalition was more focused on civilian nuclear. When it became clear that the heavy water technology was losing, many of the coalition's actors, especially the industrial leaders, switched to the commercial reactor coalition, as they represented interests that first and foremost wanted government contracts to build reactors. Many outside factors worked together to weaken the Swedish line and its smaller alliance partner, the weapons coalition. A low oil price made it harder to justify expensive investments into energy that could not compete with energy generated by oil. The foreign policy of the US to restrict nuclear fuel and technology to civilian use, and their decisions to lower the price of enriched uranium also helped to create difficulties for the Swedish line.

47 One of the ministers in Erlander's cabinet that wanted reactors to be built for possible weaponized plutonium
4.8.6 The commercial reactor coalition

The commercial reactor coalition was connected to the Swedish line in many ways. As that coalition was weakening, the commercial coalition was getting stronger. But many of the actors were fluid in which coalition they were part of. It is in the interplay between mainly the Swedish line and the commercial reactor coalition, with the pro-weapons coalition involved, but less so, that most of the early criticism against nuclear came from. This criticism, as I've shown, was not mainly aimed at nuclear power, but rather at how the actors involved in the SNI behaved. While the Swedish line was negatively affected by external events, the commercial coalition benefitted. It seems that those in power at key places, such as Vattenfall executives, were more interested in going in the direction of light water, and went against the wishes of the government.

4.8.7 The environmental/critical coalition

At the creation of the SNI, the environmental coalition was not an active participant in the policy process, either as an inside actor or an outside pressure on the actors on the inside. It was not either very similar to the environmental coalition that would become such an active coalition in the 1970's. The environmental coalition was not even 100% unified as an anti-nuclear coalition, as evidenced by the hydro power debate. The environmental coalition could also be described as the critical coalition, with different actors than future environmental coalitions. As the critical coalition, it did achieve some success, even if it is possible to claim that their successes had less to do with them other factors. During the 1950's and 1960's, the oil price was low, which meant that the private power companies were not very interested in investing huge sums of money on an energy project that was more expensive than oil, especially the initial costs. Much of the criticism from politicians was aimed at inefficient use of resources and poor oversight. Despite the criticism, this did not seem to improve during the later stages of the creation phase. Similar criticism came from people closer to ASEA and ABA. Alfvén's criticism lead to him being pushed out completely. This would have significant ramifications later, but at the time, it was not a win for the critics.

Sweden does not possess an arsenal of nuclear weapons. This fact is probably due to the biggest success that the environmental/critical coalition had during the phase of creation. In its campaign against nuclear weapons they had important allies in the form of international
pressure & agreements, and costs that seemed to be considerably higher than projected, but the vocal opposition posed by this coalition should not be discounted.

5 Juncture 1: 1973-78, Fälldin & Alfvén

5.1 Timeline
1972: UN environmental conference in Stockholm. Alternative conferences are held by various environmental groups. Reactor Oskarshamn 1 comes online.
1975: Reactors Oskarshamn 2, Ringhals 2 and Barsebäck 1 comes online.
1976: Election, C, M and FP forms a coalition government with Fälldin as Prime Minister. Reactor Ringhals 1 comes online
1977: Reactor Barsebäck 2 comes online
1978: In October, Fälldin resigns, Ullsten (FP) forms minority government

5.2 Actors & coalitions
At this stage, the nuclear weapons coalition was dissolved, and with Oskarshamn I up and running, the industry's line of imported enriched uranium had won over the Swedish line. The different nuclear friendly coalitions had merged into one, and it now faced an anti-nuclear coalition, both within and outside of parliament. Anti-nuclear sentiment and actors existed prior to 1973, but it wasn't until Thorbjörn Fälldin and the Centre Party joined the Left Party as the parliamentary nuclear opposition, the anti-nuclear coalition could pose a real threat to the nuclear friendly coalition, as it now could attack on two fronts.

5.3 The Centre Party
The Centre Party's doubled its votes from 1958 to 1976, to some 25%, on its transformation from a rather narrow farmer’s interests party to one that also focused on “quality of life”

---

48 Stop nuclear power!
issues, attracting urban voters as well. The electorate identified C with environmental concerns and an anti-nuclear agenda (Rüdig, 1990, p.41), which in the years around 1970, was a good thing for C.

Fälldin’s anti-nuclear stance was fueled in part by the youthful and activist Centre Party youth organization, where environmental activists gathered. To many, C was the natural choice by those that had been swept along the green wave of the 70’s. According to Hambraeus, doctor Lennart Levi, 49 was responsible for turning the Centre Party onto environmental issues as he, in the 1960’s talked about workplace environment and stress. The Party initiated a task force, which prepared them for the nuclear fight ahead. In the party program of 1971 it was stated that the Centre Party was against nuclear weapons, "Nuclear power may only be used for peaceful endeavors" and chairperson of the Centre Party Women's Organization, Gunilla André, managed to insert an important clause; "if it can be done without endangering humans and the environment.” In 1971, André was already involved in the nuclear opposition, and now the Party asked Hambraeus to investigate any potential dangers relating to nuclear power. (Hambraeus, 2008, and Bäck & Möller, 2003).

Hambraeus says that she was somewhat reassured that nuclear energy seemed to be better than the alternatives, and that it wasn't until she came to the issue of the waste that she became a critic. Hambraeus came into contact with the scientists at the Centre for Environment and Sustainability at Chalmers University of Technology. This was mutually beneficial, as the scientists got a way into the political world, and Hambraeus had access to knowledge necessary for her investigation, as well as inspiration to fight against the nuclear friendly coalition (Hambraeus, 2008).

5.3.1 Hannes, Hambraeus and Fälldin

As previously mentioned, Sweden hosted the first UN environmental conference, in 1972. The Swedish environmental movements organized their own alternative conference, lead by Lennart Daléus 50, founder of the Swedish chapter of Friends of the Earth. Swedish newspaper Aftonbladet published an article that said that Palme had denied Hannes Alfvén to speak at the conference. Hambraeus writes that because of this, she wrote Alfvén, telling him about her investigation into nuclear power. Alfvén was not a nuclear physicist or theoretician, but as a

49 Levi was a professor in psychosocial environmental medicine, and would represent C in the parliament between 2006-2010.
50 Daléus would go on to become the leader of the Centre Party, and was at the time secretary of the Royal Swedish Academy of Sciences, and not party affiliated.
Nobel prize winner, he knew enough, and convinced Hambraeus of the dangers not only of nuclear waste, but also of the techniques of splitting the atom itself. In her memoirs, Hambraeus recollects only meeting with Fälldin once, to inform him of the mission assigned to her, and her feelings on nuclear energy.

In connection with Alfvén's appearance at the industry committee, he had lunch with Fälldin, where Hambraeus felt that the two men developed a rapport. Later, Alfvén spoke at a Centre Party meeting, repudiating nuclear power. The speech was well received, and one could say that because of it, the Centre Party was now firmly against nuclear power (Hambraeus, 2008).

5.3.2 Hambraeus' parliamentary fight

Hambraeus had come to distrust Vattenfall's projections for energy consumption, as she felt that they were exaggerated to suit the 24 reactor program that, at the time, was still alive. These projections said that energy consumption would increase with 8% per year, effectively doubling consumption in nine years. The new general-director of Vattenfall, Jonas Norrby, said that 20 reactors from 1977 until 1990 would cover this. One of Hambraeus' party colleagues had sent a motion to the industry committee, requesting a separation of Vattenfall and other energy producers, and the task of projecting energy needs. This fell on deaf ears but Hambraeus' own motion, in 1973, asking parliament to stop the building of nuclear reactors if the industry committee investigation supported her claim's of the dangers of nuclear power. Hambraeus writes that she managed to get the industry committee to hold hearings with a wide variety of experts, and not only from Vattenfall and other energy producers, but also Alfvén and other friends of Hambraeus (Hambraeus, 2008, & Anselm, 2000).

In earlier years, these projections had been accepted without any criticism, but now Hambraeus and C had company in the criticism, editorials in Dagens Nyheter, the leading Swedish newspaper, criticized these projections. In 1973 the parliament decided to revise their stance on the 24 reactor program, on recommendation by the industry committee (Hambraeus, 2008, & Anselm, 2000).

51 The remaining four out of the twenty four reactors would be built before 1977.
52 Näringsutskottet
53 The Daily News, self-proclaimed non-partisan liberal.
5.4 The other political parties

During the beginning of the 70's, the S government said that it was time to inform the Swedish public about nuclear power, its possibilities and what was happening. This information came in the form of brochures from the CDL. The main point of the brochures was that energy consumption would rise considerably in the future. The CDL also said that nuclear was an environmentally friendly way to produce electricity, and that waste management was a technical problem easily solved, mainly because of the small physical size of the waste.

The government gave the responsibility to educate the citizenry to various adult educational associations (AEA)\(^{54}\). These AEA were underfunded and did not get a lot of time to disseminate the materials received, that spanned some 1000 pages. Environmentalist Björn Gillberg attacked this and made references to Nazi-Germany, where the citizenry forgot their civic duties. Gillberg and other critical voices were not appreciated by the leading men of the pro-nuclear coalition. Valfrid Persson, general-director of the EPA, was especially critical of the opposition. Lohmann mentions that there was one individual member of the opposition that was appreciated. Per Kågeson, author of the book “Stoppa kärnkraften!” At the time he was a known sympathizer of the Left Party, which made it easier to paint the entire nuclear opposition as hardcore socialists (Lohmann, 1958).

What was the outcome of this citizen education? In the beginning of 1975, Olof Palme spoke, both in public and in parliament, about how his government would await the results of the public debate, before proceeding with nuclear policy. Palme interpreted the outcome as a majority being nuclear positive, but that more caution should be applied. According to Palme and minister of industry Rune Johansson, this majority view was compatible with government policy. In March 1975 the government proposed two more reactors, and parliament voted yes. According to a survey, some 50% thought that the existing five reactors were sufficient. The same survey said that 80% of S voters wanted fewer reactors than the party leaders. The same number for M was 76% (Lohmann, p.68f).

Palme's government's proposed decision to build more reactors was received positively by Gösta Bohman, party leader of the Moderates, as he complemented S on the decision. Some people prophesized that S would have a hard time come election season, because of their outspoken nuclear friendliness. These people would be correct, as it turned out. Nuclear

\(^{54}\) Studieförbund
would become an even hotter issue than before. During election campaign, both FP and M would treat nuclear as a strictly political issue, as to exploit the mistakes of S. Carl Tham, party secretary of FP, said that the 1975 nuclear decision as a clear commitment to nuclear. In the public’s mind, Carl Tham was seen as perhaps the foremost energy expert in FP, and a critic of nuclear power. In 1974 he had said that a policy of energy savings, mass transit, and alternative fuels could be beneficial, as an alternative to more nuclear. In 1975 he continued to talk against nuclear, he questioned the assumption that energy usage would increase, but he spoke not only of energy but also of social, ethical and moral consequences. The party leaders of FP, Gunnar Helén and Per Ahlmark followed Tham, publicly criticizing S for their nuclear-friendly decisions. While criticizing Palme, they did not talk about their own opinions regarding nuclear power (Lohmann, 1985).

5.5 The environmental movements

The second phase of the Swedish environmental movements covers the years 1969 to 1973. In the 1970’s, the environmentalists had evolved. Their organizational schemes had changed, most often initiated by young scientists. They were adapting the discourse of Carson and her peers, criticizing modern society and its ills, protesting against specific issues. One can spot similarities to the anti-Vietnam demonstrations, and there was a definitive influence from the new left wing political movements. This phase stressed participatory strategies, trying to form a normative ecological worldview, to replace the dominant view of the times. This was somewhat of a renaissance, which it shared with the peace movement. These new critics of modern society became the dominant part of non-parliamentary environmental movements (Radetzki, 2004 & Anselm, 1995, & Rüdig, 1990).

Svenska Naturskyddsföreningen (SSNC), formed in 1909, had less than 20,000 members in 1961. Both it and its youth organization Fältbiologerna enjoyed the renaissance, experiencing growing membership numbers and in 1981, the SSNC could boast, having more than 70,000 members. Some of the new organizations founded during the renaissance were Miljöförbundet Jordens vänner (1976), Folkkampanjen mot kärnkraft-kärnvapen (1980), and Framtiden i Våra Händer (1976). Most of these were those that criticized how society was

55 Ahlmark replaced Helén in late 1975
56 Svenska Naturskyddsföreningen=Swedish Society for Nature Conservation (SSNC)
  Fältbiologerna=The Field Biologists
  Miljöförbundet Jordens Vänner=The Environmental Association Friends of the Earth. Merger of Miljöförbundet
progressing. They presented an ecological critique against the entrenched political organizations and the faith they placed in large scale solutions, whether they were technological or administrative in nature. A radical reorientation of society had to be conducted, if ecological disaster was to be averted. While many of the founding dates of these organizations postdate Jamison's second phase, they share the same criticism driven discourse.

The groups started to organize into larger umbrella units. They organized alternative environmental conferences, in contrast to the United Nations environmental conference in 1972, that was held in Stockholm. The environmental movements, now strengthened, managed to affect the public debate, inserting issues important to them, into it. Issues such as limits to growth, inequitable resource allocation, population levels and nuclear, both power and weapons (Bäck & Möller, 2003, Anselm, 1995, & naturskyddsföreningen.se).

5.6 The election of 1976

The nuclear issue was not the only one that was working in favor of C and their political allies. In general, people felt tired of the Social democrats long reign, the wage earners fund fight was working in the right’s advantage, and the Social democrats were hurt by an anti-socialist backlash, displeased with the left-ward shift that S had been forced to make by new, more radical, leftish movements. Another negative aspect of the oil crisis was that the Social democratic way to solve environmental problems became problematic. The economic downturn that was a result of the oil crisis made it harder for the Social democratic government to spend money on environmental problems.

The environmental movements were going full steam ahead. The nuclear issue was, naturally, also a big one. A central theme in the nuclear debate was energy, growth and welfare. Critics of material growth questioned the need for more energy production (Radetzki, 2004, Rüdig, 1990, & Anselm, 1995).

Shortly before the ‘76 election, FP leader Ahlmark stated that the Sweden should try to initiate an energy savings program. Nuclear should only be built if these savings turned out to be inadequate. He also said that Fälldin was more optimistic regarding the possibilities of …

and Jordens Vänner
Folkampanjen mot Kärnkraft-Kärnvapen=The People's Campaign Against Nuclear Power and Weapons
Framtiden i Våra Händer=The Future in our Hands
energy savings, but that he (Ahlmark) would be very pleased if nuclear power was not needed.

Neither FP nor M wanted to be seen as nuclear friendly, during the election. They preferred to let Fälldin and C talk about nuclear, and attack the Social democrats on their nuclear stance, while they could remain somewhat vague on the subject. And talk nuclear Fälldin did, In a radio interview in March of 1976, he said that he would not participate in a government that would start more nuclear reactors. No cabinet posts could be so desirable that he would compromise his position. This worked, as the three right wing parties defeated S on election night in September of 1976. Fälldin became Prime Minister of the C-M-FP coalition (Lohmann, 1985).

5.7 After the election
Fälldin and energy minister Olof Johansson were not as positive to nuclear as the previous governing regime. The pragmatic realists saw it as politicians wanting to interfere, and close down a revenue stream of a private company. M and FP were still nuclear friendly, and to make sure that the new energy minister, Olof Johansson (C) would not go too far, they placed Anders Wijkman (M), Carl Bildt (M), and Carl Tham (FP) at the Energy department, to keep Johansson in check, and to stay in touch with the nuclear industry (Lohmann, 1985).

Reactors number two at Barsebäck was about to be started, and with Fälldin as Prime Minister, Sydkraft was worried, as Fälldin had wowed that Barsebäck 2 would not start under his watch. Two top level Sydkraft executives contacted Bohman, Ahlmark and Curt Nicolin the day after the election. Nicolin, chairman of both SAF and ASEA-ATOM, was of the same opinion as Sydkraft as ASEA-ATOM, that had built the Barsebäck reactors. Fälldin was forced to back away from his previous statement. He now put forth two demands that had to be met, if Barsebäck 2 would get the go ahead.

1. A contract for the reprocessing of spent fuel from Barsebäck 2 had to be complete.
2. The problem of final storage for nuclear waste had to be solved.

Meanwhile, SKI chairman Gösta Netzèn had reassured Sydkraft CEO Göran Ekberg that SKI would give permission to load Barsebäck 2. A week after the election, Curt Nicolin,

57 Svenska arbetsgivarföreningen, the Swedish employer’s association
Bohman, Anders Wijkman, Göran Ekberg and M party secretary Lars Tobisson met at the offices of ASEA. Their mood was sour, as it seemed as if the coalition government would fall right as it came out the gates, because of Fälldin’s view on nuclear. Industrial Sweden was worried, ASEA had some 10 billion SEK worth of nuclear contracts, Karlskrona company Uddcomb was also heavily dependent on nuclear, as was Stal-Laval in Finspång, to a tune of some 80% of their income. The opinion of the meeting was that a nuclear free Sweden would be quite expensive.

Later that day Sydkraft representatives met with Carl Tham and other FP members. They were sympathetic to Sydkraft’s view, just as M had been. One more meeting was needed. Vattenfall and Sydkraft executives dined together. Barsebäck 2 was a deal breaker, the government negotiations were endangered by Barsebäck 2, and Barsebäck 2 was in danger because of the government negotiations. M was on the side of Sydkraft, and FP went even further, saying that they would not participate in a coalition government if C kept their demands. According to Lohmann, Fälldin was put under considerable pressure by his coalition partners. If he hadn’t negotiated on nuclear, M and FP would have dealt with S instead, continuing on their nuclear policy. Fälldin accepted that Barsebäck 2 came online, but under a limited license. The Centre Party tried to regain control of the situation, and launched an Energy Commission, and they wanted rigorous conditional rules for reactors six to thirteen.\textsuperscript{58} What these rules boiled down to, was the issue of the waste. Fälldin saw this a de facto ban, that it would not be possible for the nuclear industry to manage the storage conditions (Lohmann, 1985, Leijonhufvud, 1994, Vedung, 1979).

\subsection*{5.7.1 The energy commission & a solution for nuclear waste}

The Energy Commission’s (EC) mission was to gather and evaluate materials necessary for the next round of political energy decisions. The EC was to work out several alternatives, of which at least one would be that nuclear would be discontinued by the mid 1980’s. The EC worked for all of 1977 up until the end of February of 1978. In the commission we find representatives of the political parties, government agencies SKI and SSI, other organizations such as labor unions, as well as one representative from the nuclear opposition. Chairman was Ove Rainer. Lars Hjort became the secretary of the EC, he who previously had been heavily

\footnotesize{\textsuperscript{58} Somewhat different rules would be applied for reactors 6 and 7.}
involved in the nuclear expansion, when he was at the department of industry. The EC got its material from five expert groups.

Commission members Birgitta Dahl (S) and Lars Engkvist (S) accused the chairman of the safety & environment expert group Björn Kjellström of being in league with the Centre party, by focusing on the risks of nuclear, instead of risks related to oil, as was the wishes of Dahl and Engkvist. In 1975 the government had decided on 13 reactors. Dahl and Engkvist would refuse anything the EC presented if it was less than 13 reactors, and this they told Tham. Birgitta Dahl would also dismiss the findings of American experts that had investigated Barsebäck.

In another of the expert groups we find Anders Björgerd, deputy CEO of Sydkraft. His group, the supply group, would be the dominant one, and on which the EC would base much of its recommendations. Vattenfall experts staffed the supply group. Olle Lindström, professor at KTH, says that he was not a part of this Vattenfall group and that he and other non-Vattenfall experts became more and more marginalized, as they did not share the views of the Vattenfall group, led by Carl-Erik Lind. Finally, Lindström left the supply group. Carl-Erik Lind’s group changed quite a bit of numbers, to suit the nuclear friendly agenda, according to Sven Anér’s book Urladdning.

It is not really a stretch to say that the environment surrounding the EC was nuclear friendly. Lohmann cites several parts of the EC release (SOU 1978:17) and not a few of these citations are quite damning for nuclear. The end result, however, is more in line with the nuclear friendly environment of the EC; the majority recommendation of the EC is that nuclear power should not be stopped

What then of the conditional rules? Fälldin saw them as the proverbial final nail in the nuclear coffin. The power industry had more than a year to prove that they could solve the storage issue. Not only did had they time, they also had money. They spent 25 million SEK on a nuclear waste crash course, courtesy of the Nuclear Industry Project for Nuclear Fuel Safety (NIP). The NIP was headed by Vattenfall technical director Ingvar Wivstad, head engineer Per-Erik Ahlström and from OKG, Lars Bertil Nilsson. They oversaw the production of some 50 000 pages worth of reports. It was not easy to disseminate this information, and it turned out that those that did review the published reports were the same experts that had written them. The experts that were not involved with the power industry were somewhat more negative in their reports. One of these reports were written by Thomas B Johansson and Peter Steen, tied to energy minister Olof Johansson. It was titled The radioactive waste of
nuclear power, and was not at all popular at the M and FP secretariats. The inquiry material was presented to a group consisting of Fälldin, Bohman, Ahlmark, energy minister Johansson, his secretary Tham, and M coordinating manager Carl Bildt. This presentation was kept behind closed doors, and criticism about the short time span for inquiries was answered by Lars Bertil Nilsson, he said that there was no need to change one single digit in their proposals. (Lohmann, 1985)

The conditional rules also stipulated that Sweden had to have a reprocessing agreement. Erik Svenke, head of the Swedish Nuclear Fuel Provision (SNFP) took care of that. He travelled to France and struck a deal with the French. Svenke framed the issue of Barsebäck 2 as important not only for Sweden but also for Europe, and France. The French wanted the deal kept secret, so as to not interfere with the current French election. The deal was classified, but not only because of the election but also because of financial considerations. Details surrounding the deal where somewhat unclear. As Bo Lindell, head of SSI, claimed that the deal did not fulfill the conditional rules, things did not become any clearer. Finally, the minister of justice, Sven Romanus, overruled Lindell. Fälldin went with Romanus’ view, and accepted the agreement.

5.7.2 Fälldin in trouble

In the 1975 energy proposition, Palme had declared that there needed to be a wide berth for different ideas and solutions, in Swedish energy policy, for it to remain flexible. What this meant was far from clear, and both sides on the nuclear debate chose to interpret it favorably. The recently launched energy commission felt that it was very important the 1975 energy proposition would remain in force, so as to remain flexible in the future. The nuclear proponents said that it was time to charge the newly built reactors, while the opponents of nuclear said that it was important that we not load the reactors, as to ensure future flexibility. Erik Grafström of Vattenfall was one of those that expressed support for the opposition, and was somewhat of a spokesperson for the many environmentally conscious Social democrats.

ASEA-Atom’s CEO Lars Halle said that his company would go down in flames if it wasn’t permitted to build the twelve reactors from the 1975 proposition. As the time for decisions surrounding the recently and soon to be built reactors neared, the entire nuclear
industry echoed Halle’s word. Halle added that ASEA-Atom would seek reparations in the amount of several hundred million SEK, from the state, if they stopped the Oskarshamn 3 reactor. High level union officials supported the industry. What ASEA-Atom didn’t say, was that they would need orders for more reactors, after the first twelve were built, to ensure its survival. This was something that the opposition realized, and mentioned often.

The government is under siege from all the different opinions expressed by the press, labor unions, industry officials and the public. Soon, Sweden will have four reactors waiting for someone to press the on button. The demands for a referendum to solve the issue are raised, with more force now than in 1975 when only the Left Party spoke about it. The other parties did not like the idea, but as a final solution for their coalition, C, M and FP inserted language about a possible referendum in their governmental declaration. The situation is only getting worse, and in 1977 Fälldin and Johansson started dropping hints, maybe a referendum wasn’t such a bad idea after all? Right wing magazines such as Svenska Dagbladet attacks C, saying that it is foolish, that the hints are only coming from political tactical considerations, and that a bipartisan parliamentary solution must be found.

In late 1977, Vattenfall applies for permission to start the Ringhals 3 reactor. They presented a report that showed how the waste would be safely managed. Soon after that another application came in, this time for Forsmark 1, from the Forsmarks kraftgrupp. Fälldin and Johansson wanted to deny the applications, Bohman and Ullsten wanted to approve. A compromise was reached, the applications were denied, but just on one account, that no suitable place for the storage had been identified. If such a place could be found, the reactors could be turned on. The joy in the compromise was short lived, as everyone soon realized that this compromise was, in reality, a win for the pro-nuclear side. Soon two more reactors would be approved, and Sweden would have ten reactors. Fälldin realized that he had lost, and tried to regain ground by adding to the compromise agreement, that an eleventh reactor would not be built. Bohman and Ullsten refused. Fälldin’s counter was to demand a referendum. His party was also beginning to distance themselves from the compromise. It was not inevitable that the government would fall. On the 5th of October, Fälldin resigned (Anselm, 2000).
5.8 Analysis

5.8.1 Historical institutionalism

Despite winning the election on an anti-nuclear platform, Fälldin and his party had a hard time to really achieve their goals of stopping, and later dismantle, the SNI. At a glance, Fälldin had a strong starting position as a lot of the Centre Party's electorate support was due to their anti-nuclear stance. For the first time ever, the SNI did not enjoy the support of the Prime Minister, there had been serious attacks on the SNI by members of parliament, and public opinion was more hostile than in the 1950's and 60's. Although these factors seem to be, and were, quite formidable, the allies of nuclear were far from beaten.

Not much had changed in the executive offices of Vattenfall, ASEA and other industry actors, and in the various governmental agencies that oversaw the SNI, nuclear friends were still plentiful, and powerful. Within Fälldin's government, he had to co-exist with nuclear-friendly M and FP, who made sure to have key players in the energy department.

5.8.2 Path Dependence

By the time that Fälldin came to power, the SNI had been going for 31 years, and it was big. Huge sums of money had been invested, a lot of people were working within the institution, and it affected many regions of Sweden. While the critical environmental movements were gaining strength, they were still trying to catch up with the nuclear friendly coalition, which had been dominant during the creation. One aspect of path dependence that Peters writes about (Peters, 2012) is that path dependence in practice can mean that attempts to rectify previous mistakes lead to new mistakes, thus strengthening the path dependence tendencies. This can be said to have happened here, as Fälldin tried to use the tools at his disposal, government commissions, investigations, rules. These had been present at the beginning of the institution, and were partly to blame for the somewhat unclear situation that was the creation.
5.8.3 The advocacy coalition framework

What managed to make the nuclear issue so divisive was also the fact that both the pro- and anti-nuclear people took on the role of environmentalists. Both sides claimed that their position was the best for the environment (Rootes, 2004). This divisiveness, both sides claiming to "own" the truth, is fertile soil for the devil shift concept to grow. Together with the growing schism between the new green dimension, where most of the environmental coalition's actors were, and the established norms of modern society, which was represented by the pro-nuclear coalition.

In 1973, at the start of this critical juncture, the world experienced an oil crisis, where prices rose as a result of an oil embargo initiated by several oil exporting countries. This drastic price increase worked in favor of nuclear power. I wrote in the section "4.3.7 Oskarshamn & light water reactors" that ASEA had cut back on its nuclear division, partly because of the low oil prices at the time. The high oil prices that followed 1973 were very much in line with the oil scarcity argument that had been brought forth in the 1940's, as a reason why Sweden should explore the atom. And now it became relevant again. While the actions of the Centre Party were an internal shock to the subsystem, in favor of the nuclear-critical coalition, the oil crisis was an external shock that was positive for the nuclear-friendly coalition.

The oil prices continued to rise during the 1970's, and at the year of the referendum, it was at $37.42 per barrel, after a second oil crisis in 1979 that saw prices spike to $25.1 per barrel (inflationdata.com). It is my belief that these two shocks, the Centre Party versus oil prices, acted as counterweights to each other. Even though Fälldin took a hard stance, and his party worked hard to break the nuclear friendly coalition, he was constantly forced to accept compromises. If the oil prices had stayed around the 5$ per barrel mark from 1973, it is not at all unlikely that Fälldin's coalition could have managed to stop many more reactors from being built.

---

60 The yearly average 1953-1972 was $2.9 per barrel. In 1976, it was $13.1 per barrel (inflationdata.com)
### 5.8.4 Agency

Most of my sources say that Fälldin took a lot of heat for his compromises during this time period. Several of them, most notably Birgitta Hambraeus, also say that it was undeserved. He said that he would not trade his nuclear stance for a cabinet post, which he then did. Why did he? If we turn to the three tiers of the ACF, we know that actors act upon either their deep core beliefs, their policy core beliefs, or on secondary aspects. As the leader of a party that he had moved to the political right, I think it is safe to assume that he was firmly on the right on the political scale, which is one of the deep core beliefs. Fälldin's opposition to nuclear power, was it a deep core belief or a policy core belief? The policy core is an application of the deep core beliefs; a problem that is identified is viewed through a person's deep core beliefs, and then the policy core applies to that problem questions such as "how serious is the problem?", "what are the causes?", "how should we solve it? And who should be responsible?".

My sources points to Fälldin being a true believer; nuclear power is bad. But it is rare for a high level politician to be naive, and I do not think that Fälldin was naive, in all likelihood, he was pragmatic. He knew that his coalition partners were pro-nuclear. But he also knew that their coalition was the only chance to remove the socialists from power, which they had possessed since the Second World War.

Perhaps Fälldin was like former US president Lyndon B Johnson. In Robert A Caro's masterful suite of biographies, we learn that Johnson was a man with deep compassion, but also extremely ambitious and with an insatiable hunger for power. When his compassion and ambition could be satisfied at the same time, he was compassionate. But when the two clashed, Johnson was not compassionate, he grabbed power. You don't become the leader of a parliamentary party without ambition, a certain ego, and a belief in your abilities. I believe that Fälldin thought that he could, through the energy commission and his conditional rules regarding fuel, stop nuclear power, while still keeping a right wing coalition together. But aside from that fact, it is possible that Fälldin's deep core right wing beliefs were more important to him, than his opposition to nuclear power. It is hard, if not impossible, to know 100% if that were the case, but the way I interpret the events of that time, I believe that

---

61 Four books starting with *The path to power* in 1982, to *The passage of power* in 2012, with a fifth planned. In these books Caro manages to paint an extremely vivid and interesting portrait of the orchestrator of "The Great Society".
nuclear opposition was secondary to a right wing government. But not so secondary that he completely gave up on his opposition, as evidenced by his resignation in 1978.

Did Fälldin become an institutional captive, as historical institutionalism claim that most actors become? Both yes and no. He was certainly not acting as a captive when he became critical of nuclear power, and it seems as if he made his best to turn the ideas of the nuclear critical coalition into action. But in the end, I believe that Fälldin's agenda fell captive to the institution, and the factors that were working for it, such as the oil price, and the nuclear positive leaders of both his coalition partners and his main political opponent, Olof Palme. His resignation was perhaps a reaction, he felt that he had become a captive, and did not wish to remain in chains.

Of course, agency is not just one individual, and that individual alone. One individual is an agent, and tries to influence the process, but this is not done in a vacuum. Fälldin's opposition to nuclear power, and his actions, are the result of a transformation of his party, executed by other agents, and formed by events over which he had no control. But agency is how one individual deals with this, and uses this to his or her advantage. This Fälldin tried to do, with mixed results. Another individual walking in Fälldin's shoes might have lead to a different outcome, and this is why I believe that Fälldin, despite being one actor among many in one coalition, was an important individual in the shaping of the Swedish nuclear opposition and the SNI in general.

5.8.5 The nuclear friendly coalition
The nuclear friendly coalition caught a lucky break with the oil crisis in 1973, as it helped their cause. Even though they experienced some setbacks in the years prior to the election, it feels, when looking at the events, that Swedish nuclear was not in any real danger, politically. If Palme and S had won the election, things would have continued pretty much as before. If the right wing parties were to win and form a government coalition, the critical Centre Party would have been joined by M and FP who where both part of the friendly coalition.

Even if Fälldin's critical coalition did its best to stop nuclear power, in the form of commissions and rules, nuclear friends in the agencies of the SNI were not helping Fälldin, one example being SKI chairman Gösta Netzén. If they could obstruct and wait for Fälldin to wear himself out, their future did not look to bleak.
By the time that 1973 came around, the few heavy water proponents that existed were marginalized, and had no impact on policy.

5.8.6 The environmental & nuclear critical coalitions

A not insignificant part of the environmental coalition had, during the early years, been pro-nuclear, and Anselm says that it is ironic that nuclear was a big part of the creation of a organized environmental movement that had received support within parliament, in governmental investigations and with members of the media (Anselm, 2000). But now, most of the environmental coalition were now adamantly anti-nuclear.

Mostly thanks to the Centre Party, the nuclear critical coalition won a couple of significant victories during this critical juncture. Just the fact that a large, well-established parliamentary party was openly opposed to nuclear was a mark in the win column. They were a big part of the decision to abandon the plans to build 24 reactors. When it came to their time in the government, C did not manage to live up to the expectations, however.

6 Juncture 2: 1978-80, Three Mile Island and the referendum

6.1 timeline

1978: In October, Fälldin resigns, Ullsten (FP) forms minority government
1979: On March 28th, an accident occurs at the Three Mile Island nuclear plant.
1980: Nuclear referendum on the 23rd of March. Reactor Forsmark 1 comes online

6.2 Actors & coalitions

During this time frame, there was two clear coalitions, the nuclear friendly, and the nuclear critical. The Social democrats were still in the friendly coalition, although a large number of their voters were critical of nuclear power. The industry was (of course) still in the nuclear coalition. Both the Moderates and the Liberal Party were pro nuclear, but they were more or less in an alliance with the Centre Party, which was the leading voice of the critical coalition. Together with C in the critical coalition were the Left Party and the environmental movements. Thanks to the referendum, both sides were more organized than before (and after), especially the critical coalition.
6.3 The Ullsten government

In October of 1978, Fälldin resigned, because of increasing differences regarding nuclear, between C and coalition partners M and FP. During the government coalition negotiations, language had been written about a referendum, in case of parliamentary difficulties. After Fälldin resigned, C started pushing for a referendum, joining V. None of the other parties were enthusiastic about the idea. (Lohmann, p.93) In a somewhat unusual chain of events, Ola Ullsten became Prime Minister of a pure FP government, and Carl Tham became minister of energy. Ullsten and Tham were more receptive to the nuclear industry than Fälldin and Johansson had been. The outgoing government’s decision to hand over the decision making of waste storage to the technical agency SKI was kept by the new FP government. The Moderates and the Social democrats were in agreement with the government, and there seemed to be peace in the SNI.

Ullsten’s government appointed two large enquiries, the consequence enquiry, and the reactor safety enquiry, according to Lohmann, the only people participating in these enquiries that were not part of the nuclear friendly coalition were the MPs from C and V, and the chairman of one of the environmental organizations. Heading up the consequence enquiry was former S state secretary Lennart Sundgren,. The consequence enquiry focused how oil prices would affect the nation, choosing not to investigate costs related to nuclear power. The result of the enquiry was presented in the media. Sydkraft’s Anders Björgerd attacked it hard, in the media. The numbers that the enquiry had come to were too small, Björgerd claimed. According to him, the high oil price would cost between 70 and 180 billion SEK. Nuclear critical voices claimed that a more realistic number was 25 billion SEK. Who was correct? It is perhaps not easy to say, at this date, but it is interesting to note that the consequence enquiry had predicted a rise in energy consumption from 1979 to 1980 by 6%, while the consumption did not rise at all. A calculating error of a large amount of electricity (Lohmann, 1985).

The reactor safety enquiry (RSE) was staffed by SKI chief Arne Hedgran, former AB Atomenergi employee Evelyn Sokolowski, KTH professor Torbjörn Westermark and SSI head Bo Lindell. Mostly nuclear friendly people, according to Lohmann. An alternative safety enquiry had been denied by official sources, creating further speculation of a rigged game. In November of 1979, the RSE had done its job, and the verdict? Sweden did not need to change its considerations of reactor safety, light of the Three Mile Island accident. In their report, one can find that a severe (and not very probable) accident could lead to thousands of deaths and
radiation poisoning, thousands of cancer cases over the next decades, as well as some thousand square kilometers worth of radioactive damage to soil.

SKI, as the agency in charge, felt that it lacked sufficient in-house geological expertise. They brought in eight geologists to address this. Out of these eight, only one gave approval to the boreholes. Despite this, chairman Gösta Netzén managed to get the SKI board to approve the boreholes, during a “marathon session”. One of Sweden’s most prominent experts of post-glacial bedrock, Nils-Axel Mörner, was more or less thrown out of the borehole investigation, and Netzén’s forced approval gave more credibility to one of the seven dissenting geologists, who said that he got the impression that the decision to give the go ahead to the new reactors had already been taken. The “marathon session” took place on March 27, 1979. The next day, something happened outside of Harrisburg, Pennsylvania in the US (Lohmann, p.94f)

6.4 The Harrisburg accident

The accident at Harrisburg created a new political atmosphere for Swedish nuclear power. The debate had for a couple of years centered on nuclear waste, but as there was a partial meltdown in Harrisburg, everyone was reminded of other nuclear dangers. The government did not want to review their decision to charge the new reactors Forsmark 1 and Ringhals 3. Neither did the SKI, but SKI decided that reactors 2 and 3 at Ringhals had to be rebuilt, for reactor safety concerns. In this, the Ullsten government gave SKI its support, trying to satisfy the nuclear opposition.

Olof Palme (S) spoke out after the Three Mile Island incident, he was now not sure if he had been correct regarding nuclear power. It is one thing to know, in theory and with a low probability, that accidents can happen, he said. It is a whole different thing, altogether, to see families with Geiger counters in hand, packing their car and running away. He referenced earlier statements, where he said that if new developments in nuclear safety were to occur, then S was willing to review their position. Palme now promised to do that. (Lohmann, 1985, Johansson & Westerståhl, 1998).

Palme consulted his former boss, Erlander. Even if Erlander never said it, he seemed to be positive to the idea of a referendum. The same day, Palme dined with some high level LO officials. They to discussed a referendum, but no decisions were made. After another meeting,
this time with the executive committee of the party, Palme met with Prime Minister Ullsten and energy minister Tham. Since the parties had made a deal regarding energy, Palme wanted to inform FP about their decision before they went public. Ingvar Carlsson, Palme’s right hand man, said that he felt that this talk about flip-flopping was unfair, as it was a whole new situation. Ullsten also had plans to meet with Palme, and prior to him inviting Palme, he had rejected the plans for a referendum, in talks with his party, against the wishes of many present at the talk. Palme rejected the notion of a joint statement, saying that it was not possible, for political reasons, as he was already under heavy fire from his party for not stopping the FP from forming a government. Ullsten had to face the music, he felt, and the next day he recommended that the party would join S in calling for a referendum (Leijonhufvud, 1994).

6.5 A crazy Wednesday

Both Prime Minister Ullsten (FP) and Bohman (M) criticized Palme, saying that Palme was playing politics, and that the actual words that Palme spoke did not mean that S backed away from the previously made energy policy decisions. A few weeks after Harrisburg, during what became known as the "Crazy Wednesday", Palme now wanted to hold a referendum. Why did Palme really change, and why did his decision also make the decision for the other parties? The Social democrats felt that the nuclear issue had been the reason for their defeat in ‘76, and they were worried about the ‘79 election. It was thought that a referendum, set after the election, would move nuclear off the agenda. Internally, S was a party divided, with women and the youth at the forefront of the anti-nuclear wing of the party. The referendum would keep this wing from open rebellion, Palme thought. Fälldin was now joined by both Palme and Ullsten. Bohman had no choice but to join as well. (Lohmann, 1985, Johansson & Westerståhl, 1998).

6.6 Referendum strategies

Previous referendums had two choices, yes and no. Future referendums would have two choices, yes and no. The referendum on nuclear had three choices, no, no, and no. The third choice, "line three", was the line of C and V, it meant no more reactors, a ten year phase out

---

62 Verkställande Utskottet, VU.
63 He also managed to throw a punch at Fälldin and C, saying that you couldn’t have a referendum on whether to have ten or twelve reactors.
64 Under Parliamentary rules, a government can pass through Parliament as long as a majority not votes against the proposed government. S lay down their votes, thus enabling FP to form a minority government on 39 yes votes, out of a total of 349.
of existing reactors, focus on energy conservation and the development of renewable energy sources. The two first options were in fact nuclear positive, despite the language it contained. A classic case of Orwellian newspeak, Lohmann called it. Even though the party leadership of M, FP and S were in agreement on the necessity of nuclear, they could not agree on a joint line, and it is quite possible that there were benefits to this disagreement (Lohmann, 1985).

LO did not wish to be seen as being too friendly with the right wing Moderate party and their industry allies, by extension, neither did the Social democrats. The Social democrats wanted to insert language about full nationalization of the nuclear industry, which was unacceptable to the Moderates. Both the first line (the Moderates' line) and the second line (of S and FP) had the same main text, that the phase-out shall be conducted with consideration for employment and welfare, as well as lessening the dependence on foreign oil. Up to 12 reactors both under construction and planned, were to be put to use. Even though these two lines were, technically, choices against nuclear power, in the public's mind, a vote for either were a vote for nuclear power. Beside the purely party political wishes to be seen as two separate options, two "yes- lines" also meant more exposure in the public debate, at the expense of the third line. The Liberal Party decided to join S on option two. Hans Blix (FP), campaign general for the second line, said that the two different lines were a tactical move, not only a result of distrust between labor unions and the Moderates & industry leaders (Lohmann, 1985, Johansson & Westerståhl, 1998).

According to Ingvar Carlsson, there should have been four lines. The ten year window, line three, was a tactical choice. In their hearts, most of the nuclear critical people wanted to shut down nuclear immediately, but that such a choice would have scared away too many voters (Leijonhufvud, 1994).

The polling institution SIFO did a quick poll after the news of three alternatives, which 66% of the asked found to be negative. SIFO said that two different “yes” lines would favor the yes side. After the Harrisburg accident, SSI had gotten the mission to investigate readiness in the case of an accident. It was set to be published November 30th, 1979. Some members of the SSI board did not like that, as the board did not want to influence the decision of either S or FP. On December 12th the parties decided on their official stance, and the report was released on the 21st of December. LO, TCO65, SKI and S went against SSI head Bo Lindell and civil defense officials from the four nuclear counties, who had come to the conclusion that plans for evacuations between 60 and 80 km around the plants were necessary. The

65 TCO is a large labor union.
disagreement meant that the report was sent to a committee that was going to investigate further, effectively burying it. It was finally released just three weeks before the referendum (Lohmann, 1985).

The pro-nuclear coalition did not talk about the dangers of nuclear power. They talked about the dangers of a society without nuclear power, and the possibilities of nuclear power. The CEO of one of the largest pension funds said that a no vote was a vote against pensions (Lohmann, 1985).

6.7 The referendum

In the referendum, 18.9% voted for the first line, 39.1% for the second line and the third line got 38.7%. Together, the two “yes” options got 58% of the vote. The campaign had been quite fierce, with accusations of media manipulation coming from both sides. (Leijonhufvud, 1994, Anselm, 2000, Johansson & Westerståhl, 1998, Lohmann, 1985).

6.8 The environmental movements

The third phase ends in 1980, and is noted by the specialization of the issues, and the attention that they brought, commanding attention from government, industry, and mass media. As the organizations grew, they experienced internal struggles, both political and ideological. The fourth phase runs from 1980, and the end date is not set, as the book was released in 1990, and according to the editor, while the fourth phase was still going strong (Rüdig, 1990, p.9ff).

Even though the government was lead by Fälldin, the nuclear issue was reduced to a question of technical, scientific & judicial problems, as that was the only way to ensure the survival of the right wing coalition. Moral, existential, ecological and emotional dimensions had to be put away, in the face of realpolitik. This put the environmental movements in a bind, should it attack the government that was trying to achieve the same goals, or accept that Fälldin was doing what he could? After a series of decisions, the SEM felt that Fälldin would not be able to accomplish much. This coincided with the renewed talks of a referendum, following the events of Harrisburg.

The environmental discourse of the early 1970’s, the modernity criticizing, decentralization-driven deep green discourse came back, in full swing. People like Per Gahrton and Maria-Bergom Larsson attacked the nuclear industry from all possible angles.
The people’s campaign No to nuclear\textsuperscript{66} acted as an umbrella organization. The Centre Party, The Left Party, the newly formed Christian democrats were involved, as was the Social democratic nuclear opposition SAFE and its FP counterpart LIFE. Many other organizations joined, from the peace movement, Christian movements and socialistic organizations. Their focus was on the society of the future, quality of life, solidarity, etc. (Anselm, 2000).

\textbf{6.9 Analysis}

\textbf{6.9.1 Advocacy coalition framework}

The relative strength of the different actors within the coalitions had changed, after Fälldin's resignation, and as a result, the strength of the two coalitions had also changed. With Ullsten as Prime Minister, the nuclear-friendly FP were more powerful than earlier, and since they and S had compromised over energy policy, S were also a bit stronger, since they were now more involved in energy policy, than under Fälldin. But it was a precarious strength, as the party at large were not very happy at Palme's decision to let Ullsten form a government in the first place. Fälldin and C, now in opposition, could talk a harder talk, but the support of the environmentalist groups were not as strong now as before 1976, because of the compromises that were made.

Harrisburg was an external shock to the system, and as such, it had the potential to initiate a change in the SNI. While things did change, they did not change a whole lot. As Palme and his Social democrats changed their opinion regarding a referendum, they internalized the external shock through a negotiated path agreement. It was the desire of S to "hide" the nuclear issue until after the 1979 election that made the referendum happen, a referendum that Fälldin and C had wanted for several years.

Another agreement that would turn out to be beneficial for the pro-coalition was the referendum choices themselves. The nuclear opposition did not dare to go forth with two lines, one being an "immediate shutdown" line, and the other a 10 year phase-out. They combined in a 10 year phase-out line. The pro-nuclear coalition did the opposite, they made their "shut down later, when its possible" into two separate "shut down later, when its possible", one with language about the government running the plants. Officially, this was because labor and industry could not be on the same side, and by extension, their parties S and

\textsuperscript{66} Folkkampanjen Nej till kärnkraft.
M could not either. This was also tactically smart, as Hans Blix said. In my opinion, it is not at all impossible that the tactical desire to have two "yes lines" was the real reason, and the disagreement between labor & S, and industry & M was a smokescreen. Good politicking, plain and simple.

Even though S lost the election, and Palme's plan had failed, in the short term, as Fälldin once again became head of a coalition government, it would turn out to be a big win for the pro-nuclear coalition, in the long run. Nohrstedt's view on this critical juncture is interesting, but I believe that he misses one vital aspect. In the conclusion, he writes that "political actors may sell out policy core beliefs in order to escape temporary strategic problems and safeguard short-term political interests." A few paragraphs later, he clarifies that the learning process that the ACF describes is of less importance to the outcome than how the leaders viewed the political consequences of different courses of action, and that the learning involved is more in line with a new order of preference of priorities, instead of a totally new view (Nohrstedt, 2005).

Nohrstedt does not, however, make the connection that the policy core beliefs that are being jettisoned for short-term political interests are in fact very much in line with the deep core beliefs of these politicians, and that these deep core beliefs are centered around power. If you do not have power, you cannot transform your policy core beliefs into actual policy.

### 6.9.2 Historical institutionalism

A referendum could of course go either way, it could be a win for the pro-nuclear side, or for the anti-nuclear coalition. Technically, the public had voted to shut down nuclear power, but "everyone knew" that a vote for either line one or two was a vote to keep nuclear, and as those two options combined for 58% of the vote, it became a big win for the pro-nuclear coalition.

The issue was now "decided", it was out of the politician's hands. 67

As 58% had voted for the choice to shut down nuclear power in a somewhat vague and indeterminate future, Sweden's SNI would be shut down, in a somewhat vague and indeterminate future. As it was no longer an issue for the politicians, it was an issue for the bureaucracy. The bureaucracy of the SNI which, quite naturally, did not want to dismantle itself, and that was, also quite understandably, pro-nuclear.

67 And by extension, out of the hands of the voting populace.
This is, I think, evidence of path dependence at work. Strong, entrenched interests that, for almost 30 years, did not face a strong opposition, managed to turn a serious external event into the referendum and its "rigged" choices, which would lead us to where we are today.

7 Epilogue: Referendum hangover, Chernobyl and the Green Party

The first few years of the 1980’s, were for the environmental groups, not pretty. They were still reeling from the referendum defeat, failing to display the same energy and vigor that they had before the referendum. In the middle of the decade, the environmental movements had begun to shed skin. There were now not as many people involved, but those that did participate were more professionalized (Rüdig, 1990, p.56). People had become disillusioned after the disappointing defeat in the referendum, where many felt that the yes-side had cheated.

7.1 The Green Party

The Green Party was formed in 1981, mainly because of the disappointment surrounding the referendum. For many people, S, M and FP were seen as manipulators of the referendum, as the three choices which were all, in theory, a choice against nuclear power. For these people, the result of the three "no to nuclear" choices made it more difficult to dismantle nuclear. The Centre Party, the pre-referendum choice for environmentalists, were seen as not trustworthy in nuclear issues, due to their actions since the 1976 election.

The environmental ideologies are not like traditional left right divide. The nuclear friendly S, FP and M are believers in new technology and the environmental benefits that it brings. The Centre Party had moved to the right since Fälldin became their leader, but they disagreed with the aforementioned parties regarding nuclear, and were in general more skeptical towards technology in general, and as the solution for environmental issues, in particular. Environmental issues were not really on the agenda, for fights about ideology and party politics, until nuclear energy became a burning topic. Therefore, C, M and FP worked well together until nuclear energy became politics (Bäck & Möller, 2003).

Once again "Nuclear" was to take on a symbolic role. For MP, nuclear was the symbol that they could rail against, as the symbol of society's fixation with material possessions and economic growth. The overarching idea that unites all the various parts of MP is their

---

68 Where nuclear energy is one.
thoughts about the correlation between human “goods” and economic growth, MP goes against the grain, and sees this as a negative connection (Gahrton, 1988).

**7.2 Who went green in the 1988 election?**

In 1988 the Green Party got 5.5% of the vote, thus earning seats in parliament. As previously established, many of the opposition to nuclear power were young people and women. It would therefore be logical that those groups would vote for the Green Party, at a higher rate than the total voting population. Among first time voters however, MP got 5.9%, a meager 0.4 percentage points more than their overall result (Gilljam & Holmberg, 1990).

As a new party, MP took voters from the established parties. These voters came from both the left and right wing parties, at roughly the same rate. The other parties that were viewed as green lost more voters, proportionally, to MP than those that were viewed as less green. This supports the green dimension concept. The voters who voted for the perceived green parties before, could now choose an even greener party, that was openly critical of modern society and its ills. The question can be asked, why didn't more people vote for MP, as they probably had a much larger potential voter base, based on the '76 election and the referendum campaigns. As Bennulf admits, there is no representation of a third preference group, those that consider the environment to be important, but also views modernity and technological advances as being positive for the environment. It is possible that it is these voters that were against nuclear power, but not a high technological society at large (Gilljam & Holmberg, 1990, Hedrén, 1994).

**7.3 Chernobyl**

After Chernobyl, Prime Minister Palme (S) said that the shutdown of the first two reactors would be pushed forward, to 1995 and 1997. This did not happen. In 1999 the first Barsebäck reactor was shut down, and it would be another 6 years before the second, and final, Barsebäck reactor was shut down, and their shutdown was more the result of negotiations with the Danish over the Östersund-region than because of pressure from environmental groups.

At first, the opinion polls showed that the public had become quite critical of nuclear power, just after Chernobyl. But the negative opinions did not last long, and soon the public

---

\[69\] Aged 18-21

\[70\] Roughly 50/50 from the left and right wing parties.
opinion looked similar to what it had been prior to the accident (Johansson & Westerståhl, 1998)

8 Closing discussion & conclusions

8.1 The advocacy coalition framework

Some of the hypotheses of the ACF are, in my opinion, not totally applicable to this large scale institution that I have worked on. These are mostly the hypotheses concerning cross-coalition learning. I believe that this is so because of the significant devil shift apparent in the SNI, that appeared soon after the creation phase. But on those that are applicable, the coalition and policy change hypotheses, I find that as the SNI became more established and entrenched, the hypotheses of the ACF mostly seem to be correct. Changes to the institution were only instigated on account of shocks either internal or external, or though negotiated agreements by the relevant actors within the institution. The three coalition hypotheses described in the theory part of this thesis seem to hold quite well. The biggest coalition shake-up was the break between the Centre Party and the pro-nuclear coalition, which it had been a part of for some 25 years. When the break occurred, the result was a critical juncture that put considerable pressure on the SNI.

The coalition-internal consensus hypothesis and it's "follow up hypothesis" that says that secondary aspects are more likely to be jettisoned than an admission of policy core weakness, are both good explanations for the creation period. The consensus was on the policy core; "we will have nuclear". The secondary aspects, light or heavy water, was heavily debated. There were non-secondary aspects that the actors disagreed on, the Swedish line and nuclear weapons, despite a consensus on other issues. I believe that it was so because these issues were external from energy policy, they came from other subsystems\(^71\), trying to use the energy policy area/the SNI to further their own goals. This might be why these two hypotheses are both true and false. It might also be interesting to investigate this further, it is possible that more external subsystem interference causes disagreement within coalitions.

The three tiers seem to correspond quite well to the information that I've gathered, and the changes to the system has been, related to these tiers, either at the "acceptable" levels of

\(^{71}\) Other policy areas, security, military, industrial.
policy core or secondary aspects, and when the deep core beliefs were affected, either the actors disappeared or lost.

8.1.1 Agency

The Agency aspect of the SNI is difficult. It is clear that many of the actors involved have been very influential in the institution, but would other persons at the same position have made a difference? I still firmly believe that agency is an important aspect of all institutionalism, and historical institutionalism is no exception, and the ACF have been helpful in the agency part of this thesis. It just seems that the weight of the institution have crushed those that tried to oppose it, except for certain, small victories. One can talk about institutional capture. Were the party leaders of S, FP and M captives of the SNI? Or were they just believers in the technology, and acted accordingly?

8.2 Historical institutionalism & the importance of the creation & path dependence

One can perhaps argue that my choosing to have the creation phase last until 1972, for 27 years, is excessive, but as Peters write, and what I paraphrase in the theory section; the date of the creation is not important. Neither do I think that the time spent on creating an institution must be an arbitrary amount. When the institution is functional, "up and running", so to speak, the phase of creation is done. And the creation of the SNI took quite a bit of time, and while that time could probably have been shortened if other decisions had been made, that did not happen.

As evidenced by the first five to ten years of the creation phase, the different actors were not, despite most of them being more or less associated with the government and the state, acting as a coherent group working towards a common goal. Instead, the actors seem to have worked mainly to achieve their own goals. If these goals coincided with the "greater good" of the Swedish nuclear project, all the better. To me, these goals were not surprising, when paired with each actor. The industry actors, for example, sought advantages for their companies, they wanted to take advantage of advantageous funding provided by the state, and they sought to be the ones that would build the infrastructure of this new field in energy generation.
State organizations, such as the Atomic Committee, sought to guard their territory, not giving up the command that it had over nuclear knowledge. Vattenfall, a public company, did not always communicate their decisions to the government, and made many independent moves, for the benefit of the company, but perhaps not always for the institution of nuclear power.

In the analysis in "4.8.2 Historical institutionalism & path dependence", I write of Radetzki's views, that it is inefficient economics to use a policy area to further goals in other policy areas. The thinking is interesting to apply to non-economic aspects. The path dependence of the SNI has been very strong, as the way that the institution was created, with many different actors involved, and in attempting to use the institutions policy area to supplement other policy areas, and to solve their problems, have lead to a somewhat dysfunctional institution. That it still exists is also proof for a strong path dependence, as there were practically no critics of the institution involved in it, during its creation.

8.3 Research questions

- When it comes to the Swedish nuclear institution, how valid is the main tenet of historical institutionalism, that the creation of the institution, and the path dependence that follows, decides the outcomes of the critical junctures?

I believe that I have shown that path dependence have been a big factor in explaining the evolution of the SNI, from its start in 1945 up until 1980. The dramatis personae during the creation phase was almost exclusively made up of nuclear-friendly individuals and actors, which gave them a head start compared to the nuclear opposition. As the opposition was not a part of the creation, it was not involved in the design of the institution. With this advantage, the nuclear-friendly coalition have managed to limit the success of the opposition. The actors that were prominent during the creation phase would continue to play big parts in the shaping of the SNI, and if the individual actor left, he or she would be replaced by another actor that would fill the same role.

- How have the chosen critical junctures chosen affected the Swedish nuclear institution?

They have affected the SNI quite a bit, but the change could have been much greater. I believe that, if the "institutional head-start" had not existed, it is possible that C and Fälldin could have been more successful in the 1970's, in their attempts to reduce the Swedish
investment in nuclear power. As it were, they managed to reduce the number of proposed reactors significantly, but as their goal was no reactors at all, they were not completely successful.

If the nuclear opposition would have had more "institutional weight" in the years prior to the referendum, it is possible that the referendum options would have looked different, and that this would have lead to another outcome. It is my belief that the end results of this "what if-outcome" would not have been completely different from the actual outcome. Many in Sweden were nuclear positive, and voted as such.

Not only had the pro-nuclear coalition a head-start in the SNI, but the same kind of organization and actors that were dominant in the SNI were already active prior to the SNI, adding further obstacles for significant change.

- Which actors & coalitions have been involved in the Swedish nuclear institution, and how have they behaved?

The actors involved are the same type of actors that Sabatier described. Politicians, researchers, bureaucrats and journalists. Sabatier did not mention economic leaders specifically, but they have played a big part, and those with influence have been on the side of nuclear power, from 1945 to 1980. The behavior of the actors have been quite rational, considering the knowledge that I have presented in this thesis. The industrial leaders were relatively quick to abandon the Swedish line when it seemed as if the light water reactors would be more economically viable, which is rational for business leaders. Meanwhile, the politicians were working harder to keep the Swedish line alive, as it was better for their goals in other policy areas.

During the creation phase there were more coalitions that were active at the same time, and they were more intertwined than later coalitions. In the beginning, the coalitions were all under the nuclear friendly umbrella. The policy process from 1945 to 1972 destroyed some coalitions, and merged the remaining actors into the nuclear friendly coalition that would face the anti-nuclear coalition that was beginning to form during the later years of the creation, and these two coalitions would remain until 1980, with more or less the same actors.

- Which actors and variables have been the most influential during these critical junctures?
I believe that I have shown that the actors that have had the most influence during the SNI have been the industrial leaders that have been in charge of building and running the plants. They managed to turn Sweden on to the light water road despite heavy resistance from the government and their partners, often while being those partners! Their access to politicians and the willingness of those politicians to use public funds in ways that actively worked against the wishes of the politicians shows us that they have held the true power in the SNI. Not 100% of the power 100% of the time, but enough to keep the SNI alive.

9 References

9.1 Books


Bergquist, S. (1985) *De heta åren* Malmö: Timbro


Vedung, E. (1979) *Kärnkraften och regeringen Fälldins fall* Stockholm: Rabén & Sjögren


### 9.2 Edited books


### 9.3 Articles


### 9.4 Online sources


Regeringen.se <http://www.regeringen.se/sb/d/4393> retrieved 2015-05-03

9.5 Other


Appendix A: Swedish governments 1945-1988

Dec 1936 – July 1945 War-time coalition government, S*, C, FP and M
July 1945 – Oct 1951 Social democrats
Oct 1951 – Oct 1957 Coalition government, S* and C
Oct 1957 – Oct 1976 Social democrats
Oct 1978 – Oct 1979 The Liberal Party
May 1981 - Oct 1982 Coalition government, C* and FP

*signifies the party of the Prime Minister (regeringen.se)
S=Social democrats, C=The Centre Party, FP=Folkpartiet, M=Moderaterna, V=Vänsterpartiet

Appendix B: Abbreviations and translations

Some abbreviations and translations are my own, and some are official and/or widely accepted
SNI=Swedish Nuclear Institution
SEM=Swedish Environmental Movements
MP=Member of Parliament
HI=Historical Institutionalism
ACF=Advocacy Coalition Framework
FOA=Försvarets Forskningsanstalt, The Army Research Facility
SOU = Statens Offentliga Utredningar=Official Reports of the Swedish Government
AEA=Adult Educational Associations, Studieförbund
AMSA=Aktionsgruppen mot svenskt atomvapen, Action group against Swedish nuclear weapons
CDL= Centrala Driftsledningen, The Central Operating Management
ABA=AB Atomenergi, aka Atombolaget. Atomic Energy INC., aka The Atomic Company
AKK=Atomkraftkonsortiet, the Atomic Power Consortium
OKG= Oskarshamns Kraftgrupp AB, Oskarhamns Power Consortium
SSNC=Swedish Society for Nature Conservation, Svenska Naturskyddsföreningen
LO=Landsorganisationen i Sverige, Sweden's largest labor union
KTH=Kungliga Tekniska Högskolan, Royal Institute of Technology
The AC= The Atomic Committee, Atomkommitten
The EC=The Energy Commission, Energikommissionen
RSE=The Reactor Safety enquiry
NIP=Nuclear Industry Project for Nuclear Fuel Safety
SNFP Swedish Nuclear Fuel Provision, Svensk kärnbränslehantering AB (SKB)
SKI=Statens Kärnkraftsinspektion, The Government Nuclear Power Inspection
SSI= Strålsäkerhetsmyndigheten. The Radiation Safety Agency