

Paradigm shifts in energy: examining the impact of ideas on the implementation of
low-carbon policies in the EU and the US

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ABSTRACT

Climate change and the continuing changes that accompany it require society and its broader institutions to evolve continuously. Today's continual atmospheric damage requires a commitment to ecological considerations that show consistent and meaningful carbon reductions. The success of global carbon mitigation depends entirely on the capabilities of individual governing bodies agreeing and delivering upon their climate ambitions. However, delivering impactful progress on emissions is a considerable challenge. Although there has been significant research as to what climate mitigation goals should encompass, the policy path and resulting incremental changes needed to achieve them require additional scholarly attention.

This thesis analyses the role of institutions as they adapt to support societies addressing climate change. Adopting a historical institutional approach provides a pathway for understanding the coordination of information, individuals, institutional adjustments, and their role in the carbon policy process. By focusing on the impact of ecological modernisation ideas, this work addresses the ambiguity that lies between contradicting approaches to climate governance and instead, analyses the incremental changes needed to support societies as they address climate change. Systemically gathering policy tools from 1992-2012, this research empirically examines the nature, ambition, and achievements of mitigation policy in the EU and US as they transition to a low-carbon future.

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As they say, it truly takes a village.

-KMKP

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LIST OF ABBREVIATIONS

ARRA	American Recovery and Reinvestment Act
CAR	Climate Action Report
CECA	Comprehensive Electricity Competition Act
CEC	Commission of the European Communities
CEM	Clean Energy Ministerial
CEO	Chief Executive Officer
CEQ	Council for Environmental Quality
CFCs	Chlorofluorocarbons
CO ₂	Carbon dioxide
COP	Conference of the Parities
DOE	US Department of Energy
EEAN	European Environmental Action Network
EC	European Commission
ECCP	European Climate Change Programme
EEA	European Environmental Agency
EEB	European Environmental Bureau
EIA	Energy Information Administration
EPA	US Environmental Protection Agency
EU	European Union
EU ETS	European Union Emissions Trading Scheme
HR	US House of Representatives

INDC	Intended Nationally Determined Contributions
IPCC	International Panel on Climate Change
KP	Kyoto Protocol
NASA	National Aeronautics and Space Administration
NEPI	New Environmental Policy Tool
NOAA	National Oceanic and Atmospheric Agency
NO _x	Nitric Oxide
SO _x	Sulphur Oxide
UN	United Nations
	United Nations Conference on Environment and
UNCED	Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States of America
USCAP	United States Climate Action Program
WMO	World Meteorological Organisation
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

"I am not an advocate for frequent changes in laws and constitutions, but laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors."

-Thomas Jefferson, 1816

Chapter 1. Introduction

Climate change plays a significant role in increasing the earth's average surface temperature, fostering the phenomenon known as global warming. When at one time scientists were uncertain about the direct cause of climate change, today most agree the main cause of climate change is due to humans further expanding the "greenhouse effect", or the warming process that results from the atmosphere trapping in the heat that radiates from Earth towards space (Lockwood, 2009). Certain gases contribute towards heat getting trapped within the atmosphere. Some of these are naturally occurring, like water vapour, but others such as carbon dioxide (CO₂), methane, nitrous oxide, and chlorofluorocarbons (CFCs) are produced as a result of human activity (Lockwood, 2009). Thereby, controlling these gases can help to control the effects of global warming. The process of controlling the impacts of climate change by reducing the usage of these gases is known as carbon mitigation.

Carbon mitigation requires transitioning away from the consumption of fossil fuels, whose usage contributes mainly towards the amount of carbon present in the atmosphere (IPCC, 2014). Carbon policies are the specific actions and policy measures that nations must undertake in order to move towards a low-carbon future. As current industrial processes rely heavily on oil and coal, many countries, most specifically the US, have been reluctant to commit to these specific policies as they see climate mitigation as potentially limiting the opportunity for economic development. However, the EU has championed emissions reductions while still producing economic growth. Although the US has shown interest in committing, today's atmospheric damage requires immediate action. Countries must institutionally adjust to climate change in a manner that supports a societal transition towards a low-carbon economy.

This thesis seeks to analyse the role of institutions within climate mitigation governance. The crux of this research piece is understanding effective strategies for sustainable development, and how the ideas that are the centrepiece of them impact carbon policy success. By comparing the EU and the US, it seeks to show how different ideas impact institutional change and thus, climate mitigation policy outcomes. This work adopts a historical institutional approach to analyse specifically how sustainable development impact institutional change. Supported by a comparative analysis of policy tools from 1992-2012, this research empirically examines the effect that ideas have had on the nature, ambition, and achievements of mitigation policies in the EU and US.

1.1 Research background

Climate change policy was born directly out of the environment policy agenda area of sustainable development. Addressing climate change is therefore, an internationally recognised component of maintaining the stability between environment, economy, and broader civilian society (IPCC, 2014; Edenhofer, 2014; O'Neill et al, 2014; Lafferty, W.M. and Eckerberg, K., 2013; Neumeyer, 2012). The centrality of international climate mitigation policy today focuses on reducing CO₂. This is not because the other gases are not important; the reduction of CFCs for example, has long been a concern of scientists, and has been an area of international climate mitigation policy success. The Montreal Protocol, for instance, adopted in 1987 now is expected to return the ozone layer to a healthy level by the year 2037 (IPCC, 2014). However, the area of CO₂ reductions, or CO₂ policy, has not experienced as great of success as the area of CFCs, despite it being an absolutely crucial aspect of international climate mitigation success.

Today, international climate agreements focus on moving countries towards a low carbon future, one that is powered mainly by renewable energy. This is due to the fact that the burning of fossil fuels, specifically both coal and oil, increase the

concentration of CO₂ present in the world's atmosphere. This happens because the coal or oil burning process combines carbon with oxygen in the air to make CO₂. In addition, but to a much lesser extent, the clearing of land for agriculture, industry, and other human activities has also increased concentrations of greenhouse gases present in the atmosphere (IPCC, 2014). If current fossil-fuel consumption trends continue, the average surface temperatures of the earth could rise by as much as 6.4 degrees by 2100 (Stocker et al, 2014). Even under most the most optimistic scenario, temperatures will still rise by 1.1-2.9 degrees before this century's end (Stocker et al, 2014). Climate mitigation success therefore depends on the commitments of industrialized heavy emitters to move away from the usage of fossil fuels (IPCC, 2014).

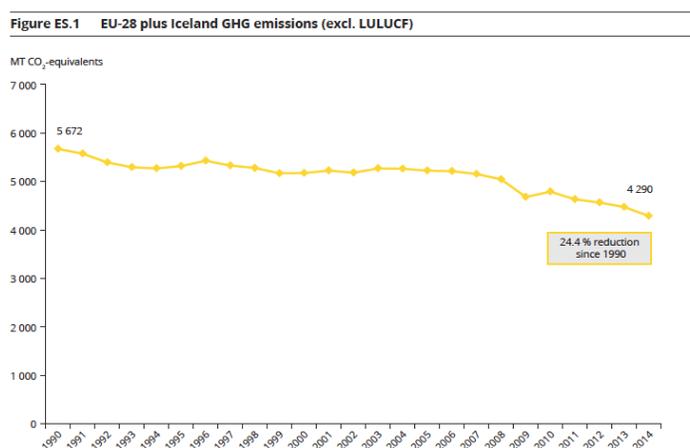
Addressing the consequences is an extensive process as nearly all current methods of economic consumption and production rely primarily on activities that produce carbon. These emissions are generally produced across six main categories including: electricity and heat production; industry and agriculture; transport; buildings; and energy (IPCC, 2014). Therefore, reducing CO₂ requires fundamentally creating change in production and consumption in each of these sectors.

To help foster global action on the issue, the United Nations Framework Convention on Climate Change (UNFCCC) originally developed an international treaty in 1997 which aimed to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference within the climate system," (Article 2, Secretariat, 2002). This binding treaty, the Kyoto Protocol (KP), requires signatory nations to adhere to certain emissions reduction levels within a specific time-period and a given base line for comparison. The KP recognizes that developed countries are primarily responsible for the current high levels of

greenhouse gas emissions in the atmosphere¹, and as such, places a heavier burden on these developed nations to commit to reductions under the principle of "common but differentiated responsibilities," (Protocol, 1997). It was (and remains) imperative that all large industrialized nations take part in officially committing to CO₂ reductions, specifically the top five largest emitters: China, the US, the EU, India, and Russia. Out of these five, the EU and the US both pledged to assume leadership in the realm of climate change, yet today they have ended up in very different places.

Today, quantitative reductions show that the US has achieved a decline in its emissions recently, yet its fluctuation in progress over the past years call into question the true authenticity of its ambitions (Friedlingstein et al, 2014, pp. 709-715). In 2013, the US greenhouse gas emissions totalled 6,673 million metric tons (14.7 trillion pounds) of CO₂ equivalents. This number represented a six per cent increase since 1990 levels; however, the US has seen a nine per cent decrease since 2005 (EPA, 2015). However, it could be argued that emissions reductions decreased during this period due to the economic recession, which resulted in decreased energy consumption during the time period 2007-2010 (Willow and Wylie, 2014. pp. 222-236). The US's capabilities of delivering upon their climate ambition become even more ambiguous when looking at the EU's 24.9% in reductions as of 2013, which show a constant decline in emissions, without many fluctuations, since the initial reporting period began in 2001.

¹ GHG emissions responsibilities are carried by developed nations as a result of more than 150 years of industrial activity; developed countries are seen as not heavily contributing current levels of carbon dioxide present in the atmosphere as they have not yet industrialised.

Figure 1: Annual European Union Greenhouse Gas Inventory, 1990-2013

Source: European Environment Agency, 2016

Although the EU is far from a perfect actor in climate mitigation success, today it has achieved considerable merit in the realms of climate mitigation success (Wurzel, Liefferink, and Connelly, 2016). Specifically, the EU is known for creating the world's largest emission trading scheme, the European Union Emissions Trading Scheme (EU ETS), whilst the US has yet to significantly show their capacity to increase carbon productivity. In terms of ambition, the EU has recently pledged to reduce its emissions by 40% by 2020, while the US only outlined its first ambition to support the global climate regime in the Paris Agreement this December (UNFCCC, 2015a). It has announced “an economy-wide target of reducing greenhouse gas emissions by 26-28% below its 2005 level in 2025,” (UNFCCC, 2015b). This Intended Nationally Determined Contribution (INDC) of the US shows that the government intends to begin to take action on CO₂ reductions; however, there is major uncertainty behind this commitment.

Instead of leadership, the US has been mainly labelled a “laggard” in climate mitigation policies (Kelly, 2015, pp. 685-687). This refers most usually to the lack

of official commitment to climate mitigation goals. It is therefore difficult to assess what the true nature of change has been in the US, especially when considering that it is still part of a “longer range, collective effort to transition to a low-carbon global economy as soon as possible,” (UNFCCC, 2015b). It is therefore, critically important for the success of global climate regimes, and current emissions reductions efforts, to understand the how the EU has been able to create a convincing case for climate mitigation, and what particular instances, or ideas, have donated towards the US failing to create such a convincing notion.

The EU’s ambition and success in climate policy provides a useful comparison for any large industrialized nation new to the climate challenge, and most specifically perhaps, the US. Although the two political systems differ institutionally and constitutionally² they still share important features, especially in terms of the variables that impact CO₂ most significantly: complex, multilevel, high-consumption, liberal democracies with significant impact on global change in emissions levels and the economic potential to address it. Both actors struggle with maintaining a balance between centralization and decentralization, and ensuring their structures retain legitimacy amongst their civilians (Schmidt, 2004, pp. 975-997). In addition, both political systems also struggle with retaining economic power, yet are faced with international pressure to reduce their carbon footprints.

Comparing the policy paths then from the first pledges of leadership to see how and why the EU and the US have ended up in such different places is empirically useful for analysing the incremental changes that institutions can undertake as they move society towards a low-carbon future. At the same time, this comparison is equally valuable for its theoretical contributions. The policy approaches that the EU and US have undertaken thus far are largely representative of the debate within climate

² The US is a sovereign federal state while the EU is a supranational organization

governance itself. What is the appropriate role of governance, and specifically governmental institutions, within CO₂ reductions? What types of actions are needed to spur change? The EU and US have both tried to achieve the same policy goal, yet have been drastically different in their approaches. The comparison of the EU and the US within this thesis will analyse the effectiveness of the contrasting approaches to emissions reductions.

1.1.1 Ecological modernisation as a mitigation strategy

The approaches of the EU and the US towards climate mitigation goals have been similar, yet different. Both areas have outwardly embraced the challenge of climate change, yet have attempted to address the issue in a manner that does not require the dismantling of their industrialist economies. Instead, both have declared their support for sustainable development, economic growth that contains both environmental and social considerations, as a means of mitigating the risks that stem from climate change. The specific idea of how to approach climate mitigation policies with an end goal of creating economic value for the environment can be described as “ecological modernisation” (Eckersley, 2004, p. 80). Ecological modernisation as a term refers to the transformative process of engraining environmental externalities within the traditional path of development (Eckersley, 2004; Mol, 1996; Christoff, 1996; Hajer, 1995; Mol and Spaargaren, 1993). Ecological modernisation can be described as a constructive approach for dealing with environmental problems, where the central role for solving these issues is “internalizing externalities (Mol and Spaargaren, 1993, pp. 431-459). This is based on a market-driven approach to sustainability, which focuses on creating a value for the environment, or including environmental costs as part of economic production processes.

In general, this theory refers to a more intricate aspect of development studies, and focuses specifically on the economic adjustments that institutions can take to benefit

from environmental management. Both Hajer (1995) and Harvey (1996) link ecological modernisation and sustainable development together in a manner where sustainable development acts as the “central story line” of the policy discourse of ecological modernisation (Gibbs, 2006, p.4) However, ecological modernisation acts as a stronger analytical tool when compared to sustainable development in that it “has a much sharper focus than does sustainable development on exactly what needs to be done with the capitalist political economy, especially within the confines of the developed nation state”, (Dryzek, 1997, p. 143).

The strategy of ecological modernisation is usually seen as a “win-win”, or a way that environmental considerations can be imposed upon economies in a manner that both reduces environmental degradation, yet also allows for economic growth (Jänicke 1985, 1983). It is worth noting that some theorists argue that true environmental, social, and economic balance cannot be achieved within the current constructions of economy and environment that are seen in mainly capitalist societies (Mol and Spaargaren, 1993). Instead, some schools of thought call for a drastic reconstruction of technology, economy, and the environment, in a manner where growth is limited. However, ecological modernisation should not be viewed in this manner, but should be seen as rather a political strategy for creating “systematic eco-innovation and diffusion,” (Jänicke, 2008, p. 9).

The most basic and fundamental assumption of ecological modernisation centres on the re-adaptation of industrial development and economic growth (Hajer, 1995). Taking an ecological modernist approach implies taking the notion that economic and ecological considerations can be positively aligned. Here, the productive use of natural resources and environmental aspects (like air, water, soil, trees) can be a source of future growth and development in the same way that labour and capital productivity are traditional sources of development (Hajer, 1995). Here, growth would mainly result from increases in energy and resource efficiency, as well as the technological and process innovations that result from the need for increased

environmental management, sustainable supply chain management, and clean energy resource technologies. Innovation, or eco-innovation more aptly put, would not only reduce the amount of carbon that results from the decreased direct dependence on fossil fuels in the energy system, but also indirectly from increased efficiency in industrial processing.

There are different understandings of the scope of ecological modernisation, which this thesis specifically seeks to address. Theorists within this space are largely divided as to what the appropriate role of government and policy-making is in supporting the path of ecological modernisation. On one side, theorists question whether ecological modernisation simply concerns techno-industrial progress, therefore requiring only a limited role for government in terms of solutions; the opposing school of thought argues that shifting towards an ecologically-engrained economy also requires an adjustment of cultural values, therefore requiring a larger role for government to help incentivize a shift in public values, attitudes, and lifestyle changes. At the centre of these disputes is whether ecological modernisation as a development strategy relies mainly on government, or markets and entrepreneurship, or civil society, or some sort of multi-level governance combining all three of the above. Therefore, the two divisions in ecological modernisation can be used to describe the two different strategies that the EU and the US use to approach carbon policy.

The literature to date usually describes the EU's approach to climate change mitigation policies as using strong ecological modernisation. This is described as the following: ecological, institutional, communicative, democratic, international, and unitary. (Christoff, 1996, p.490). In reality, what this translates into is the idea that climate change requires an overarching commitment, or a "top-down" strategy. This approach is based on the fundamental knowledge that addressing climate change requires a cross-institutional commitment to distribute the costs of the challenge evenly, and to form a uniform value for the environment that is

represented cohesively and consistently amongst all societal institutions. The basis of strong ecological modernisation ideas centres around the point that climate change requires a shared responsibility, but with considerable input from the variety of stakeholders it impacts, thereby becoming “democratic”, (Christoff, 1996, p.490). The international and ecological aspects of strong ecological modernisation are important. This means that the EU’s approach towards carbon policy begins with an approach that is informed by ecological science, and that institutions using this approach generally rely on external, international agencies to help inform the policy process. When discussing climate change in the EU, this infers that climate policy is informed by data collected at the UN-level, the UNFCCC, as opposed to data that would be collected on a domestic level.

Table 1: Weak and Strong Ecological Modernisation

Weak Ecological Modernisation	Strong Ecological Modernisation
Technological solutions to environmental problems	Broad changes to institutional structure of society
Technocratic/corporatist styles of policy making made by elite decision-makers	Open, democratic decision making with participation and involvement
Concerned with the domestic dimensions of the environment and development	Concerned with the international dimensions of the environment and development
Economically informed	Ecologically informed
Driven by local and regional levels of government	Driven by federal/supranational levels of government
“Bottom-up”	“Top-down”

Source: Derived from Gibbs, 1998 and Christoff, 1996

The US's strategy of managing climate change can be described as using a weak ecological modernist approach. This idea is described as using a "technocorporatist" approach, which relies on technology and corporations to produce the changes that are needed to spur institutional adaptation (Eckersley, 2004, p.80). Rather than seeing climate change as a challenge that requires environmental commands being set at a top-down level, the US generally can be described as viewing climate change as a "bottom-up" approach where the notion of the free-market will naturally drive a gradual and economic-based approach to climate mitigation policy. The strong approach sees institutional coordination and communication as the crux to mitigating climate challenges, yet the weak approach generally supports the notion that technology will create the solutions to climate change (Gibbs, 1998, pp. 1-15). In the instance policy-makers require information, the bottom-up notion would use domestically collected data, as opposed to the information used at the UNFCCC, to inform decision-making. Weak ecological modernisation tends to look at climate change as an environmental problem, yet is most informed by economic impacts (as opposed to ecological). This would mean that rather than looking at the environmental impacts associated with policy decisions, policy-makers instead are more likely to rely on economic impact analysis to make decisions. At the base of these differences is a fundamental division as to whether climate change is a societal problem as opposed to an environmental problem. I believe that climate change is a societal problem, not only an environmental challenge that requires drastically reconstructing the relationship between environment, economy, and energy.

When acting as an analytical framework, the concept of ecological modernisation can be used in two ways. First, it can be used as a theoretical concept to analyse the changes needed to support society deemed necessary to solve an environmental problem, which in this instance is CO₂ reductions. Second, ecological modernisation can be as an analytical tool for redirecting environmental policymaking. As with sustainable development, this theory can be used to qualitatively assess the degree to which both governing areas have been able to make progress on environmental

challenges, and can highlight which changes have been effective (Mol and Spaargaren, 1993). The concept can be used overall to examine the differences in policy tools and policy outcomes that each divergent approach has caused.

1.1.2 Analysing the impact of ecological modernist ideas

In political science there is a lack of attention between the connection of climate mitigation goals and what the development path of policy must encompass in order to achieve them. Although many scholars have described and explained differences in climate mitigation policies, fewer scholars have explained or analysed differences in mitigation policy outcomes. Changes in policy outcomes are quantitative and therefore easy to measure. Still, these changes can be hard to analyse as factors beyond the influence of policy-makers, like recessions and new technology developments, often result in emissions reductions. Yet, the differences in the climate mitigation policy outcomes in the EU and the US go beyond quantitative validation, and can perhaps be better captured by qualitatively analysing the differences in the climate mitigation policy outcomes. Specifically, in comparing the policy paths that the EU and the US took when seeking to move towards a low-carbon future.

The literature thus far has compared these two areas, yet the importance of ideas in relation to critical junctures has not been sufficiently developed. Although both the EU and the US have pledged commitment towards CO₂ reductions, the two have approached the goals with very different ideas as to how these goals should be obtained (Bäckstrand and Elgström, 2013; Harrison and Sundstrom, 2007; Schreurs and Tiberghien, 2007). Both the EU and the US have expressed a desire to take a market-based approach to climate change policies, one that includes both technology deployment and environmental market management (Clinton and Gore, 1993; COM, 1992). Although they both expressed this same desire in 1992, at the first conference on climate change, today, they both stand in significantly different

places. How is that today the EU is hailed a climate leader and the US still has failed to show significant progress on carbon emissions reductions? I believe that the argument to this is much larger than previously researched. I believe it is not only the influence of negative interest groups on the policy process in the US, but that the larger ideological understanding of climate change in the US requires a drastic reconstruction of current environmental values in the US. Addressing climate change today requires a policy strategy that contributes in a meaningful manner towards global reductions efforts, specifically in way that results in the furthered success of global emissions reductions efforts (IPCC, 2014; IPCC, 2007; Stern, 2007). The idea that a nation uses must be one that spurs the consideration of climate change into broader economic activities (Bulkeley and Newell, 2015). This idea must be strong, as opposed to weak, ecological modernisation.

Ideas are critically important to climate mitigation policy because of how they specifically influence the policy choices that actors make. An individual's ideology or personal set of values influences how that person considers broader policy decisions. Ideas are important within policy as they act as "institutional blueprints during periods of uncertainty, as weapons in distributional struggles, and as cognitive locks," (Blyth, 2001, p. 2). Investigating the core ideas that hold actors during times of change shows how, "ideas fundamentally alter people's conception of their own self-interests," and how they "impact how actors choose to structure their policy-goals and decisions," (Blyth, 2001, p 3). Specifically, ideas impact the ways in which policy actors perceive both their interests and the environment in which they mobilize them. In this way, ideas do not contradict the influence of interests on the policy process, but instead, act as a foundation from which interests derive.

Ideas are said to influence how a policy-maker is able to make judgements based upon facts (Blyth, 2001). For climate change, it is important to understand how pre-

existing notions in regards to the environment might influence policy-decisions relating to carbon emissions reductions. Climate change is a policy area where one can measure success; ambitious policy produces greater quantities of emissions reductions whereas ineffective policy produces no reductions. Therefore, climate change is a policy area where one is able to judge and compare effectiveness in a measured aspect. Therefore, one can say that there are some approaches to climate change that are better than others. Within my thesis, I argue that the ideas with which European actors approach climate change is a more effective lens for actors to adopt when compared to the set of ideas with which American actors approach climate change policies. The crux of my thesis is that there is no longer sufficient time to wait for the American's technology centric approach to carbon policy to produce effective results; instead, the world's second greatest emitter must begin to adopt an institutional approach towards climate change, one that shifts the US towards a more sustainable path of development immediately. Without adjusting the broader economic values of society in a manner that reflects a consideration for the environment, I hypothesize that carbon policy will continue to compete with policies that produce economic growth in the US. When taking this historical institutionalist perspective, analysing ideas during critical junctures and the incremental changes made after the junctures can help to provide a stronger understanding of how actors and agencies are influenced by the broader ideological background in both the EU and the US.

Although ideas impact the decisions that policy-makers make on a daily basis, they seem to do so even more during times of uncertainty. For climate change, these critical junctures can be considered the Conference of the Party (COP) meetings. These are the official international conventions held by the United Nations in order to monitor progress on carbon emissions reductions. During these critical junctures, "there is a substantially heightened probability that agents' choices will affect the policy outcome," (Capoccia and Keleman, 2007, p. 348). These moments allow ideas to spur "a series of trigger events that set the processes of institutional, or

policy, change in motion,” (Hogan and Doyle, p. 885). I hypothesize that it is critical for governing bodies to engage with the International Panel on Climate Change (IPCC) in a manner that allows them to make accurate deductions as to the appropriate next steps for carbon abatement. I further hypothesize that the manner in which the EU has engaged with both the UNFCCC and IPCC has been more effective when compared to the US’s approach. An effective carbon strategy should require monitoring, reporting, and revising a nations progress on climate change.

The concept of ecological modernisation as an idea can be used as part of a broader theoretical concept to analyse the changes needed for ingraining climate considerations in the broader economic activity of a governing body. These changes are deemed necessary for an institution to undergo in order for an ecological concept to turn into policy, and thereby, and can be used to evaluate the progress of a governing body on a path to a low-carbon future. Building on Eckersley’s (2004) theory of ecological change and Hall’s (1993) theories on paradigms and policy change, I argue that institutions must change at five different levels in response to international monitoring to show they are pursuing ecological modernisation or shifting towards an environmentally-valued society. This equates to changes within the following dimensions:

1. Change in policy ambition
2. Change in policy tools
3. Change in policy goals
4. Change in policy paradigm or the hierarchy of policy goals
5. Change in the role of the state

Eckersley’s work outlines how countries must adapt to address ecological issues, and uses weak and strong ecological modernisation to describe how countries may try to approach the above-listed levels of change. However, I use this concept to examine how these divergent notions impact institutional change; furthermore, I

hypothesize that weak ecological modernisation does not in fact produce the levels of change needed to achieve a mitigation paradigm shift. Comparing the changes made in the EU to the US helps to better understand the nature of adaptive capacity needed for successful climate mitigation policies in general.

The two different approaches are important to understand their effectiveness in producing the changes needed to support societies as they adjust to climate change. Although it is evident from quantitative reductions that the EU has achieved successful reductions, it is currently uncertain how and to what degree institutional change has occurred in the US. As the US has recently expressed the decision to support long-term mitigation goals, it is important to understand the degree to which existing norms of climate change policy stand to influence future climate policy-choices.

1.2 Main argument of the research

The central hypothesis of this thesis is that achieving CO₂ reductions requires an institutional approach to carbon policy, as seen in the EU, yet currently not exhibited by the US. Although the discussions on climate change first began as an environmental issue, it should be noted that climate mitigation policies today require strongly coordinated, multi-tiered governance. CO₂ reductions, although not requiring a drastic reconstruction of economy and environment, do require a fundamental shift in values across society. Economy and environment must be reconciled in a manner where the public, policy-makers, and the private-sector alike commit to valuing the environment. Doing so is a drastic change, one that requires strong institutional support and extensive coordination of information. This thesis mainly centres on the hypothesis that the EU has been able to use the idea of strong ecological modernisation to create successful carbon policy. This can be seen when comparing the effectiveness of the EU's institutional, economy-wide approach to climate mitigation against the US's technology and corporate centric approach to CO₂ reductions.

Although other areas of climate mitigation policy, like CFCs, have experienced success from a solely environmental perspective, I argue here that the complexity of carbon policy requires new institutions that are heavily economic in nature, and that are able to coordinate and disseminate the massive amount of information that is related to CO₂ reductions. I dispute the notion that CO₂ reductions can be achieved without new agencies, and that the US's current market approach to CO₂ reductions will be enough to signal the paradigm shift that is needed for effective carbon mitigation policy. I question the ability of the US in achieving lasting reductions with its current carbon mitigation approach.

This research therefore looks at the impact of two different ecological ideas of how to approach CO₂ reductions. Within this thesis I argue that different development strategies, and the ideas that form the basis of them, are responsible for the different carbon policy outcomes that are currently seen in the EU and US. Centring on the notion of ecological modernisation as a strategy for emissions reductions, this thesis examines how and why the EU compared to the US has been able to achieve successful carbon policy outcomes. Rather than focusing on the impact of interests in the policy-process (Brulle, 2014; Baumgartner and Jones, 2010; Keleman and Vogel, 2010; Van Asselt, Harro, and Brewer, 2010; Woll, 2004), this research focuses on ideas to provide an innovative perspective on how environmental norms influence the formation and outcomes of successful climate mitigation policies. It focuses on carbon policy, from the period 1992-2012, to compare how divergent approaches to CO₂ reductions have influenced the choice, implementation, and outcomes of carbon policy tools in both the EU and the US.

Within this research I focus on mitigation policy outcomes and more specifically, on the European Union Emissions Trading Scheme (EU ETS) as an example of a successful mitigation policy outcome. I do this for two main reasons: first, one of

the critical goals of global climate mitigation policies at this time is to create a social cost for carbon, or a tool that creates economic value for the reduction of CO₂ (Helm et al, 2003, pp. 438-450). Secondly, this tool can be used to broadly signal the EU's ability to embody a new notion, which is that the environment deserves economic value. As no such tool exists in the US at a federal level, I therefore assume that the US has not fully embodied a fundamental shift in regards to climate norms.

The effectiveness of the EU's ecological ideas can most be seen in the incremental changes that they have caused within domestic institutions. I argue that strong ecological ideas were brought into the policy arena at key international junctures, which then led the EU towards the revision of its domestic institutions. I focus on the impact of these ideas at four specific moments in time, which I argue were critical for the institutionalisation of strong ecological ideas: the 1992 first official UNFCCC meeting; the Kyoto Protocol in 1997; the Marrakesh Accords in 2001; and Copenhagen in 2009. I use a comparative design to examine the EU and US from 1992-2012 to holistically examine the degree of institutional change that occurred in the first twenty years of emissions trading discussions. I rely on interviews with key decisions makers that were present at these critical junctures, and who were present in the policy-arena prior to and after the junctures. Complemented by an analysis of documentary material, including the examination of speeches, interviews, and policy proposals, I am able to systemically analyse the impact that ideas had on policy-choices taken in relation to climate mitigation policy in both the EU and the US. Coupled with the empirical analysis of the policy-tools that resulted from critical junctures I am then able to conclude on the differences that each idea has on the diversity and ambition of each areas domestic policy-responses to the international policy demands at each point in time.

1.3 Outline of the thesis

This thesis begins by exploring the current literature on climate change and its

connection to sustainable development. Beginning with a historical overview of environmental politics, this chapter then moves to explore the connection between ecological modernisation and climate mitigation policies. It then locates and discusses the role of the EU and the US in previous research investigations in a chronological manner. This keeps the investigation in line with the historical overview as recommended by the theoretical lens.

The third chapter outlines the conceptual framework for empirical analysis of climate mitigation policy change used in this study. This chapter identifies, defines, and structures the areas of investigation that are used in this thesis. This chapter helps to narrow the focus of this investigation, so that the reader has a clear comprehension of the importance of the empirical evidence analysed in the fifth and sixth chapters in this dissertation.

The fourth chapter outlines the theoretical lens used in this dissertation. This chapter explains the appropriateness of a historical institutional approach when seeking to understand change. It focuses on assessing the literature concerning historical institutionalism, and specifically explains its utility in exploring the connection between ideas and their role in the processes of change. This chapter then moves to outline the methodological approach used in this thesis. It concludes by presenting the methodology used for the cases of the EU and the US.

I structure the empirical and analytical chapters of this dissertation in a manner that clearly will show if, and to what extent, both the EU and the US have undergone ecological changes. Therefore, the fifth and sixth chapters contain the empirical substance analysed within this thesis. These chapters evaluate the climate mitigation policy tools of the EU and the US from 1992-2012. These chapters analyse changes in policy ambition and policy goals of each governing body, and then examine the

types of policy tools that were implemented to achieve them. This chapter also identifies the actors and location of the development and negotiation of the identified policy tools. This provides initial analysis on the two stages of change that are needed for ecological modernisation to occur: change in policy tools and change in policy goals.

In chapters seven and eight I trace the impact that strong ecological modernist ideas and weak ecological modernist ideas have had on the policy-tool choices identified in chapters 5 and 6. Specifically, I analyse more thoroughly the change in policy paradigms as well as the changes in the role of the state that both the EU and the US underwent in regards to recommendations made at the UNFCCC meetings. These chapters analyse the changes in the policy-processes, institutional structures, and the responsibilities of actors in order to understand the institutional adaptation of the EU and the US in regards to demands of international climate legislation.

This thesis finishes by examining the capabilities of the US and EU in delivering upon their climate policy ambitions. The conclusion examines how strong ecological modernism contributed to the institutional adaptation of the EU. This chapter also provides an equal assessment of how American climate mitigation policy could be made more effective, and points to the key institutional barriers that need to be addressed for the US to become a more ecologically responsible state. This chapter examines and outlines the differences in the capacities and capabilities of European and American actors in order to effectively describe the institutional capacities of the EU and the US in creating climate mitigation policy. In doing so, it provides insights on best climate governance practices, as well as outlining further research that is needed to help to increase success in global emissions reductions.

1.4 Main findings of the research

The research findings indicate that moving towards a low-carbon economy fundamentally requires society to embrace behaviours that reduce the human impact on the natural planet. Although someday it may be possible for a major technological breakthrough to occur that allows for carbon removal from the atmosphere, it still seems to be that the coordination of competing values demand a degree of structured governance. Climate mitigation policies are a complex issue, and the findings of this research indicate that institutions play a critical role in promoting the coordination between society, industry, and science that are needed to achieve climate mitigation goals. Governmental institutions are needed to promote and coordinate the achievements of broader societal institutions, and ensure that their societal structures are changing alongside in accordance with the scientific understanding of climate change and its impacts.

Within ecological strategies, it seems confusing how weak ecological modernisation could be expected to produce tangible change. As an already “weak” strategy of within sustainable development strategies, it seems indeed that weak ecological modernisation seems to describe instead, a zero commitment to sustainable development. If nations are indeed to make progress on sustainable development, and specifically CO₂ reductions as a critical component of development goals, then strong ecological modernisation seems the most appropriate and least radical idea with which to approach institutional adaptation. By looking at the EU’s path towards CO₂ reductions one can deduce that the idea of ecological modernisation often meets criticism from both strong environmentalists and political conservatives. However, one can also see that this strategy for change often is able to create an effective, and pragmatic approach to environmental management, one that produces “win-win’s” for both the economy and environment. Although the strong ideas of ecological modernisation are important, they often result in a compromise with non-environmental advocates. As such, it’s important that strong ideas exist within the political arena so that some degree of institutional change does occur.

The most important finding of this thesis is that institutional change, and the role of governmental institutions themselves, are a critical component of achieving climate mitigation goals. This is most evidently seen by looking at the creation and evolution of the agency Directorate General of Climate Change (DG Clima) in the EU. As a newly created institution, and specific climate focused institution, this new organisation removes competition amongst energy and environmental agencies to create cohesive goals for carbon mitigation across the EU. In addition, this agency is able to develop such a goal due to the unique capabilities that exist within such an agency. The agency helps to coordinate, collect, and translate statistical data from industry, science and the public alike. By channelling data and monitoring progress through the UNFCCC, DG Clima ensures relative consensus on statistics, which is needed for creating economic consensus across European institutions. The communicative process and greater involvement of experts in the EU's policy-making produces the additional intellectual capital needed to influence and motivate broader institutions to commit to carbon reductions.

Although the US has expressed an interest, and a recent commitment to climate change, surveying the impact of the US's weak ecological modernist approach to climate change policy will equally assess the institutional capabilities of the US in delivering upon its climate ambitions. This supports my counterhypothesis, which is that in the absence of the diffusion of strong ecological ideas, incremental changes will fail to take place institutionally, and carbon policy success and innovation will fail to occur.

1.5 Wider contributions of the research

This study attempts to connect multi-disciplinary research to form a stronger understanding of the incremental changes that are needed to support societies as they adjust to climate change. This area of investigation originally emerged from environmental policy studies, yet the area now has matured into warranting its own

separate area of policy investigation. Today, climate policy contains an intricate web of economic, energy, and environmental influences that must be understood in part, and as a whole, to fully grasp the complexity of addressing climate change. This thesis assesses both the change in tools, in structures, and in institutional powers, that contributed towards the EU's ability to ingrain environmental considerations within the economy. As such, this research provides insights on the relationship between energy, economy and environment and how decisions taken in climate governance stand to impact policies created in other areas.

As well as giving insight on the nature of incremental changes in climate policy, this thesis provides a better understanding of the nature of change within European and American institutions. Particularly insightful to scholars of the EU, this thesis displays the EU's effectiveness in a dynamic policy area, showing how the EU's competence in climate policy has increased with European integration itself. At a time when the EU is under increased scrutiny to produce short-term economic success, this thesis contributes to the understanding of the nature and operation of European institutions. For scholars of American politics, this work shows many restraints on the climate policy process within US institutions that may be more reflective of the difficulty in adjusting American institutions to broader modern policy challenges.

1.6 Limitations of the study

This thesis does offer an assessment of the EU and US's place in climate governance insofar as climate mitigation policy change is concerned, but also does not necessarily take into full account the impact that energy legislation has on the success of climate and mitigation policies. Despite the inclusion of energy legislation that would affect the reductions of CO₂ (such as efficiency measures) this work does not fully analyse the impact of policies in the fossil fuels which may inhibit or enhance the effectiveness of climate mitigation policies (Bauer et al, 2016;

Tavoni, M., 2015). However, further analysis could be made by using the conceptual structure developed in this thesis to understand how the ideas of ecological modernisation have influenced climate mitigation considerations within energy policy.

At the same time, this work is limited in cases and also, to some extent, the complete identification of all mitigation policy. This thesis focuses on the supranational and international efforts of the EU and the US, and therefore, does not investigate the impact of member states nor individual US states on CO₂ reductions. Member states in the EU are often credited with a role in influencing the leadership of the EU itself; however, this thesis seeks to capture that influence only within European institutions, but does not investigate how member states specifically supported or detracted from European CO₂ policies (Skjærseth, 2016; Berkhout et al, 2015; Jordan, 2012; Jänicke, 2011). At the same time, it may be useful to understand how these ideas have affected institutional change in nations outside of Europe, and whose place in global climate governance remains undefined. Particularly, energy-dense economies such as Canada and Australia would provide an interesting examination.

Additionally, despite the efforts of this research to collect all relevant policy information, there may in fact be policies that affect carbon levels that are not included within the specific dimensions investigated. Instead, efforts from other organizations, such as energy, foreign affairs, and defence, may occasionally impact climate policy. However, this thesis provides a useful understanding of the purposes, and historical origins, of the many agencies involved in the climate policy arena.

Chapter 2. A review of climate change and ecological modernisation in current literary investigations

Climate change presents a unique challenge for society. Producing ambitious policy that delivers effective reductions in global emissions becomes increasingly important as the negative effects of climate change increase. Achieving the long-term goals of carbon reduction requires better aligning environmental considerations within long-term growth, therefore adopting the notion of ecological modernisation. Although countries have approached carbon reductions with various conceptualisations of environment and economy, ambitious carbon reductions today require a strong commitment to change from both governments and citizens. However, the appropriate role of governance within environmental goals has been a consistent area of debate for scholars within the broader field of sustainable development. As a strategy for sustainable development, ecological modernisation has inherited many historical debates around the appropriate roles for technology, governments, and regulations. Weak and ecological modernist ideas have results over these exact debates, yet today's atmospheric damage no longer allows room for discussion. It's important for sustainable development goals that governments adopt effective strategies for change; within this thesis I argue that weak ecological modernisation is not an effective approach for doing so.

This chapter acts as a literature review and locates the aims and arguments of this research within broader sustainable development discussions. Specifically, this chapter is intended to provide the reader with a deeper understanding of the tension that exists between the divergent approaches to ecological modernisation. Surveying the assumptions of weak and strong ecological modernisation shows how today's atmospheric damage requires only a strong approach to ecological modernisation. Examining the existing literature on the US shows the lack of ecological modernist studies used at the US federal level, and clearly shows the need for Americans to revisit the conceptualization of technology, economy, and

environment within current governance. This relates to the need for better understanding how ideas, as opposed to interests, influence climate mitigation policies. Surveying the existing literates displays an additional gap in climate mitigation research, which is the need to understand the role of institutions in supporting society as they adjust to climate change.

2.1 A historical division within environmental policy studies

Climate change mitigation policies today are a complicated issue for policy-makers. They require coordination across multiple institutions to spur the changes that are needed for societies as they move towards a low carbon future. Ecological modernisation is one development strategy for spurring change, yet it is not the only one. The topic is closely related to the environmental movements that began in the late 1960's and early 1970's, and most closely to the topic of sustainable development that launched in the 1980's (Hajer, 1996, p. 243-266). Many of the problems that originate in climate change can be seen as inherited from the problems of the previous environmental movements.

In early environmental investigations social science scholars focused on analysing and examining environmental degradation. Their main concern was human behaviour, methods of production and consumption, industrial and technological developments, and the failure of governmental resource coordination, all of which were contributing to environmental deterioration (Hajer, 1996, p. 243-266). Many academic studies stemming from the post-WWII period had focused on rebuilding industries and promoting economic growth; as such, studies on the environment were neglected in favour of outlining how industry and the economy could better develop.

The environmental investigations that began in the 1970's therefore, focused on

understanding how governments could support environmental protection. These mainly analysed how to increase capacity building in laws and governments in a manner that would protect the environment better (Hajer, 1996, p. 243-266). However, this focus on capacity building meant that environmental studies were very internally directed. Environmental social scientists at this time became pre-occupied with analysing poor environmental records of societies and institutions.

In the 1980's environmental politics investigations started to widen, and scholars began conducting analysis on environmental improvements. These studies took a theoretical and empirical turn away from the causes of environmental deterioration, to focus instead on better understanding how societies could begin to address environmental problems. This resulted in an explosion of studies in sociology, political science, anthropology, psychology, and human geography. The majority of these studies focused on developing solutions to environmental problems that addressed the structural, institutional and behavioural traits that were previously identified in the 1970's. However, it's important to note that these studies still stemmed from an environmental policy standpoint.

By the 1990's environmental studies turned away from the domestic level to begin examining how international cooperation could best solve environmental problems. Here, scholars within environmental policy began investigating research at the international level and how to best address problems through global cooperation. Of these, issues like biodiversity, deforestation, ozone depletion, acid rain, and global climate change became the major topics of focus. As different subject areas emerged as a result of a specific area of investigate (such as biodiversity policy, deforestation and it's impacts on the environment, etc.) sustainable development became the overarching area of policy examination.

The definition and the ideas on sustainable development as a concept outlined the dependency of humans on the natural environment. It called for a re-envisioning of economics to ensure that growth provided for the needs and well-being of society in a much wider sense (WCED, 1987, p 43). The fundamental argument of sustainable development was that production and consumption levels should consist of more than the exploitation of resources for human success. Thus, the definition of sustainable development was defined as “growth that met the needs of the present without compromising the ability of future generations to meet their needs” (WCED, 1987, p 43).

The Brundtland Report had three main assumptions that changed the conceptualization of economy and environment. First, it acknowledged that there were biophysical limits that required serious environmental attention in order to minimize the damage that was occurring mainly as a result of industrial processes (WCED, 1987). Secondly, when recognising the negative that these processes were having, that the change needed to happen mainly within the industrialised Northern nations so that economic development could stay within the ecological boundaries (WCED, 1987). Lastly, and perhaps most importantly, the Brundtland report provided positive assurance to all countries that establishing ecological boundaries would be done in a manner that would not require the dismantling of capitalist structures, nor impede the development of future growth (WCED, 1987). Indeed, the Brundtland report actually called for the opposite, in that it called for an acceleration of the international economy via a means of enhanced scientific understanding, more innovative technology, and the internalisation of social and environmental costs the most effective means of avoiding future environmental and social degradation (WCED, 1987). Therefore, the main assumption of sustainable development would be that in growing more efficient and innovative, thereby modern, societies would be able to overcome major environmental obstacles.

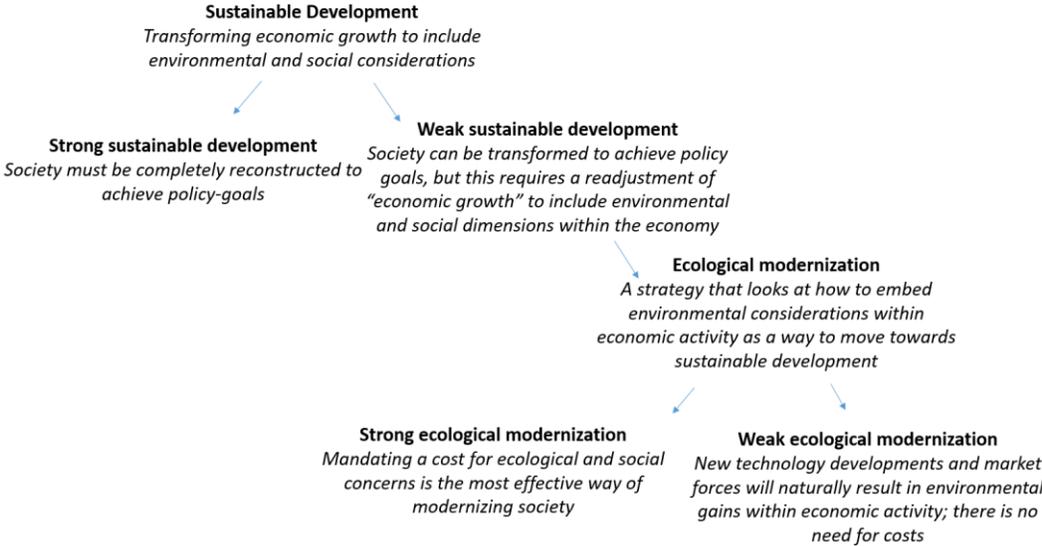
Moving towards sustainable development initiated debates on the link between the environment, economy, and the role of the state in coordinating and regulating these interests. Sustainable development goes beyond traditional environmental policies, in that it provides recommendations on how economy, environment, and society should function in unison. Although at the time of its origins both the EU and the US were united in support of globalisation, today one can see that the EU and the US have continued down very different paths in terms of what environmental stewardship entails. It is within this time period where the specific divisions in regards to environmental management first began to emerge, mainly between European and American scholars and politicians.

European social scientists became focused on empirical studies that supported ideological changes that would better promote environmental interest representation within politics, and thus, society (Buttel, Geisler, and Wiswall, 1984; Buttel and Newby, 1980;). These studies were dominated quite heavily by neo-Marxists debates critiquing environmental management. This research centred on the notion that current societal construction could not change enough to in order to adequately protect the environment. This had, and continues to hold, an important place within environmental social science investigations today (see Dobson, 2000; Schnaiberg, Watts, and Zimmerman, 1986). However, the movement for drastic environmental reform was far less popular amongst American social scientists. Instead, the rise of neoliberalism in the US at this time had many implications for scholars within environmental studies. First, the connection to *laissez-faire* economics meant that the role of the government and regulation was pushed back (Polanyi, 1944). Instead, deregulation, free trade, and market-based economics became the favoured solutions for addressing environmental problems. This meant that environmental studies that adopted a neoliberal approach were dominated by the notion of market-based solutions to environmental management. This is what I argue continues to impact the effectiveness and innovation of American mitigation policy today.

Within broader sustainable development studies scholars focused on how to adapt current societies with more ecological considerations with social movements, civil society and green public spheres (Dryzek et al, 2003; Torgersson, 1999); with environmental capacity-building (e.g. Jänicke, 1991); or by integrating ecological concerns into current economic thinking such as in green liberalism (Jagers, 2002; Wissenburg, 1998); and the role of democracy and ecology (Barry, 1999); the fundamental transformation of broader societies focused on describing an ecological state (Meadowcroft et al, 2005; Lundqvist, 2001), or green states (Barry and Eckersley et al, 2005; Eckersley, 2004). However, most of this literature resonated within European academic institutions, as in the US, this period was considered an era of environmental reform fatigue. Instead, American scholars outlined how environmental prosperity and social well-being could instead be driven through increased wealth gained in international trade and in industrial growth (Sachs, 1999; Moffet and Bregha, 1996). The American agenda centralized on the notion of technology, and looked at how new innovations, that arose out of increased industrial wealth, could better provide efficiency gains, and thereby, increase environmental protection.

This is where the division within sustainable development policies, and environmental policies as a subset of them, became apparent both in ideology and geography. On one side, the American agenda focused on how to use technology to gain efficiency, thereby protecting the environment; on the other side, European scholars began outlining the notion of environmental governance as a means of environmental reform. Scholars here began being referred to as strong and weak sustainability.

Figure 2: Ecological modernisation on the spectrum of sustainability



Source: derived from Hajer, 1993, Christoff, 1996, and Mol and Spaargaren, 1997

2.2 Ecological modernisation

The debates arguing for different approaches to sustainable development were therefore enriched with the contributions of the ecological modernisation theory (Mol, 1996; Christoff, 1996; Hajer, 1995). These theories moved the environmental policy movement towards a restructuring of environment and economy in a progressively modern manner (Mol and Spaargaren, 1993). Ecological modernisation theorists sought to heal this division in sustainable development, and instead create a theoretical movement where environmental protection could be framed in a manner that created incentives to move towards a more sustainable means of development.

It is important to consider that on the broader spectrum of sustainable development ecological modernisation is generally viewed as a “weak approach” (Mol, Spaargaren, and Sonnenfeld, 2009). Ecological modernisation is built on the idea

that environmental considerations can lead to a “win-win” within policy-making. This theory overall takes the standpoint that the economy benefits from environmental considerations. Therefore, it’s often seen as the main strategy for coupling the economy and environmental branches of sustainable development (Gouldson and Murphy, 1996, p. 11-21). These studies look at ingraining environmental concerns as an economic opportunity for further innovation to occur thereby taking a more economic approach to environmental management so that economies (Dietz and Neumayer, 2007, pp. 617-626).

Ecological modernisation emerged as a “social scientific interpretation of environmental reform processes at multiple scales in the contemporary world”, (Mol, Spaargaren, and Sonnenfeld, 2009, p. 3). Ecological modernisation’s main contribution to the literature of sustainable development has been to diversify the social science literature on how societies interact and deal with the natural world. These scholars developed, “a systemic theory of institutional environmental reform; the introduction of a variety of theoretical innovations on the reaction between society and environment; the creation of new research approaches in environmental policy and practice, and contribution to discussions on globalisation of general social theory,” (Mol, and Spaargaren, 2000, p. 20). Ecological modernisation emerged as a specific environmental and economic research agenda, a theoretical school which sought to specifically reconcile the environment and economy.

Ecological modernists begin by acknowledging the need to differentiate between those resources that are most limited and those that can be substituted to some degree (Barry, 2007, pp. 446-464). When a resource like the atmosphere or biodiversity cannot be created, replicated, nor reproduced by technology whatsoever it is referred to as “critical threshold” (Barry, 2007, pp. 446-464). Other natural resources, which can be reproduced, like coal or trees, are simply referred to as natural capital. This implies they should be valued, but still can be used for

economic production. This helps to identify which resources can and cannot be used for economic consumption. From this standpoint, climate change must be approached with a notion that recognises the atmosphere as a resource that cannot be reproduced.

At the micro-economic level, ecological modernists emphasize the importance in incentivizing the use and creation of new clean technologies to achieve environmental goals (Gouldson and Murphy, 1997, pp. 84-86). However, like sustainable development and the environmental movements it stems from, ecological modernisation scholars also vary as to what the appropriate role of governance and technology are when seeking to achieve environmental reform. Therefore, at the macro-economic level there is still extensive division as to what the appropriate role of governance is in spurring the changes that are needed for new technologies to come to market.

From a European perspective, ecological modernisation at a macro-economic level became centralized around three main story-lines: the need for governmental structures to incentivise energy efficiency, technology innovation, and a win-win scenario for the economy and environment. However, it is important to note that this highlights the shift from environmental policy approaches in a traditional sense (general stewards of environmental protection) towards an approach that is increasingly economically-driven. Authors like Weale (1992) and Jänicke (1991) originally focused outlining the role of the market in achieving ecological goals, yet studies moved quickly towards analysing the broader institutional and sociological dynamics of ecological modernisation that were needed to support these new environmental markets (Cohen, 1997; Hajer, 1995; Spaargaren and Mol, 1992). These studies methodologically took a comparative approach and shifted more towards analysing the role of the state in promoting industrial reform in Western European nations. However, these theories also moved positively towards a positive

perspective of environmental regulation, which authors found central as the driving force of innovation adoption, and also as a critical tool for incentivising behavioural change in the industrial sector (Hajer, 1996). These authors took a viewpoint of what I argue should inherently be considered the most effective approach to ecological modernisation.

Although in the EU this research area gained wide interest, it was not used extensively in the US (Mol, Spaargaren, Sonnenfeld, 2009, pp. 3-14). Instead, political scientists in the US continued to focus extensively on the micro-economic factors of ecological modernisation, thereby, mainly on the role of technology and innovation deployment as tools for environmental policy goals; however, in general the attempts to integrate the US into ecological studies in general were unsuccessful (Schlosberg and Rinfret, 2008, pp. 254-275). As a result, ecological modernists in the EU became equally as divided as the sustainable development scholars ahead of them, while scholars in the US moved to investigate the role of interest groups and their influence in American environmental policy.

2.2.1 Weak and strong ecological modernisation

Christoff (1996) was the first political scientist in this space to specifically contrast the divisions that he saw within ecological modernisation theory. Similar to how sustainable development was viewed as strong and weak, now ecological modernisation became equally divided as to how to best embed environmental considerations within the economy. It's important here to clearly differentiate the divisions within ecological modernisation from the divisions within sustainable development. Strong and weak sustainable development are separated over the construction or deconstruction of current economies. Weak and strong ecological modernisation are simply divided as to what the appropriate role of government and industry are in transitioning to a more environmentally-conscious economy. Strong ecological modernisation requires a mandated government-driven evolution to

produce environmental considerations within the economy, whereas weak ecological modernisation argues essentially that competition amongst firms will naturally lead to the production of more environmentally-efficient technologies, which results in increased environmental efficiency in production processes.

Authors like Hajer (1995) and Harvey (1996) outlined the importance of connecting ecological modernisation and sustainable development together so that sustainable development became “the central story line of the policy discourse of ecological modernisation,” (Gibbs, 2006, p.9). Here, these viewpoints should be seen as “strong ecological modernisation”. This research focused on, “exactly what needs to be done with the capitalist political economy, especially within the confines of the developed nation state”, (Dryzek, 1997, p.143). Arthur Mol and Gert Spaargaren worked to outline how development could take into account broader environmental reform, in a non-penalising manner, thereby creating “win-wins” for the environment by focusing on environmental programs in Germany, the Netherlands, and the UK that helped support economic growth. Within these studies, they found that structural change must occur at the macro-economic level in order to spur ecological considerations. This included specifically incentivising environmental shifts in industrial production and consumption at the macro-economic level.

Scholars within strong ecological modernisation research redirected sustainable development studies towards assessing the transformation of governments and societies towards greener states. Scholars focused on how to adapt current societies with more ecological considerations with social movements, civil society and green public spheres (Dryzek et al, 2003; Torgersson, 1999;); with environmental capacity-building (e.g. Jänicke and Weidner et al, 1997); or by integrating ecological concerns into current economic thinking such as in green liberalism (Wissenburg, 1998; Jagers, 2002); and the role of democracy and ecology (Barry,

1999; Doherty and de Geus et al, 1996; Dryzek, 1996). The fundamental transformation of broader societies focused on describing an ecological state (Lundqvist 2001a; Meadowcroft, 2005), or green states (Eckersley, 2004; Barry and Eckersley et al, 2005). These scholars outlined the institutional organisation required for governing environmentally. This required going beyond environmental recommendations to instead focusing on the social, environmental and economic impacts of proposed policies. At its core, the shift towards ecological modernisation resulted in the need for more systemic investigations of policies between economic, environmental and political impacts of proposed policies. However, this did not occur with equal proportion across the globe.

Hajer (1993) originally caused the emergence of the second approach to modernisation, which he labelled termed 'technocratist' modernisation, or what should be considered weak ecological modernisation. This notion still seeks to transform society with environmental considerations, yet argues that the economization of nature will occur naturally, rather than requiring strict costs for externalities. Rather than taking an institutionally coordinated approach that mandates the creation of an environmental cost to achieve environmental policy goals, theorists in this space argue that environmental considerations will naturally become part of the economy as competition forces firms to produce more environmentally effective goods (Hajer, 1995, p.40). For instance, whilst a strong ecological modernisation approach would mandate the movement towards carbon price as a way to direct firms, a technocratist approach would argue that firms will naturally try to reduce environmental inputs as a way to increase their own economic efficiency. Therefore, this approach does not argue that the economization of nature is necessarily needed through specific pricing structures. Instead, firms will have to increase their efficiency as a way to maintain their competition amongst firms.

Table 2: Weak and Strong Ecological Modernisation

Weak Ecological Modernisation	Strong Ecological Modernisation
Technological solutions to environmental problems	Broad changes to institutional structure of society
Technocratic/corporatist styles of policy making made by elite decision-makers	Open, democratic decision making with participation and involvement
Concerned with the domestic dimensions of the environment and development	Concerned with the international dimensions of the environment and development
Economically informed	Ecologically informed
Uses only voluntary and market-based policy tools to reduce carbon emissions	Uses regulatory, informational, voluntary, and market-based tools to reduce carbon emissions
Driven by local and regional levels of government	Driven by federal/supranational levels of government
“Bottom-up”	“Top-down”

Derived from Gibbs, 1998 and Christoff, 1996

Weak ecological modernists see technology as the main catalyst to change, and believe that corporations and private capital will provide the changes that are needed to completely reduce environmental impact or produce new environmental goods (Christoff, 1996, pp. 476-500). Here, these scholars believe that technological advances will be made, which will naturally help to address environmental problems, and will demand policy adjustments to be made. For change to occur from this technology-induced standpoint, market forces should be solely responsible for producing the change that is needed to signal the scarcity of a resource, yet without governmental intervention (Christoff, 1996, pp. 476-500). This viewpoint therefore assumes a neoclassical economic viewpoint that

regulation, and therefore, imposing environmental and social costs are not necessary for achieving a more “modern” economy.

Strong ecological modernists see technology as part of achieving a future balance between economics and the environment, but not as the whole picture of the changes needed to begin developing sustainably. Instead, scholars taking a strong ecological modernist approach focus on the broader picture and look at how to change institutions as a whole to better reflect and encourage the reframing of economic ideals. Strong ecological modernisation requires government intervention to ensure levels of environmental protection are maintained, and that change is initiated in a systemic manner. I argue in this thesis that this approach is more effective in driving the policy ambition, and institutional changes, that are needed to ingrain climate concerns within broader institutional arrangements.

At the same that ecological modernists were working to better understand how to produce the changes that are needed to make society more sustainable, climate change policy emerged as the “de facto” area used for the implementation of the sustainable development agenda (Drexhage and Murphy, 2010). Climate change was labelled the most urgent and pressing of the environmental concerns on the sustainable development agenda (Drexhage and Murphy, 2010). However, climate change policies also inherited the same division that sustainable development and ecological modernisation studies had: what is the most appropriate role for industry, government, and society in spurring environmental change?

2.3 Ecological ideas and climate mitigation policies

The specific agenda to coordinate sustainable development and climate was formed in 1992, the UNFCCC. Originally, the conference brought together countries to discuss how to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”

(UNFCCC 1992, Article 2). This was based on two premises; first, that the problems caused by climate change were real and secondly, that man-made CO₂ had caused this problem (Ramakrishna, 2000, pp. 47-62). At this conference the parties agreed to begin to work on specific tools that could reduce the amount of CO₂ in the atmosphere. Thus, the KP was thus born in 1997, the first treaty that turned sustainable development into tangible policy goals. Thus, the climate conferences can be seen as the first example of legislative efforts towards integrating environment within economy, and can be used as policy goals to analyse the effectiveness of sustainable development strategies.

The aims of the KP were for each country to legally agree on its individual reductions, and then come together to create a global marketplace for CO₂ (Oberthür and Rabitz, 2014, pp. 39-57). Although The EU took the most ambitious goals, and agreed to legally binding measures, other countries did not agree on the legally binding agreements, or on the best way to achieve emissions reductions. Some disagreed on the role of finance and technology, and the specific provisions given to developing countries (Kawabe, Wang, and Yamashita, 2014, pp. 206-212). Others found fault with the countries that were considered developing, in particular China and India. No voice of discontent was louder than the US. Although The US signed the Protocol, it failed to reach majority agreement within its domestic legislative houses, thus negating the legality of American support. Rather than studies examining how the US could move to address Kyoto, academic literature instead has focused on extensively analysing the failures of the US. This has led to a failure to understand the institutional changes that are needed to support society as it moves to address environmental challenges, and instead, has moved the US towards a path that is unlikely to produce significant carbon emissions reductions.

2.3.1 The US's weak ecological modernist approach in climate mitigation

Although it's been nearly twenty years since the KP was first passed, the inability

of the US to legally ratify the KP has dominated a significant portion of climate investigations in America. Here, studies have focused on understanding the specific institutional mechanisms that resulted in the failure of the US to ratify the KP. Specifically, this research has looked extensively at the role of interests and their capabilities in disrupting the implementation of the KP. This research gives broader insight that support my hypothesis that American institutions are not changing adequately enough to protect society environmentally, and a new ideological change needs to occur to spur institutional change.

The ineffectiveness of the two-party system in the US has been brought to attention in regards to climate mitigation policies, such as during the 1997 Clinton-Gore administration with the KP. Here, the failure of the US to ratify was attributed to the Republican majority at the time, and due to the timing of an upcoming election year in 1998 (McCright and Dunlap, 2003, p. 348-373). However, the Republican party itself has been noted as a strong force for opposition, as it has been noted that the “democrats have become the environmental party, and the Republicans have become the anti-environmental party,” (Dunlap, Xiao, and McCright 2001, pp. 23-48). However, it has yet to be tested to what extent deeply rooted anti-climate ideals exist in this party or if instead, this is again a simply inherited opposition due to the disproportion of fossil-fuel funding that has most recently been part of Republican politics in the US.

The negative impact of interest groups in the policy process, such as the impact of fossil-fuel lobbying interference within the Bush administration, has been extensively noted as a major obstacle to the implementation of climate policy in the US (Brulle, 2014, p. 681-694). However, it has also been asserted that the reason lobbying groups have become so powerful has been due to the increasing influence of corporations, as opposed to citizens, within the American political arena (Baumgartner and Jones, 2010, pp. 190). These fossil fuel groups have been able to control media campaigns and create anti-climate campaigns have also been attributed as a major reason that the US failed to pass the KP or any climate

legislation since then (Speth, 2005). However, here, research was divided as to whether the ease with which this campaign was able to influence society was due to the lack of public support for environmental policy in general in the US. However, today these studies have shown there has been extensive change from the first climate investigations which pointed to the reluctance of the American people to support climate mitigation policy, to today showing a majority support for these types of policies (Brulle, Carmichael, and Jenkins, 2012, pp. 169-188; Borick, Lachapelle, and Rabe, 2010).

Overall, climate studies in the US for a long-time focused on the inability of the US to engage in the international climate arena. Rather than identifying how the US could perhaps better engage with the international arena, studies that sought to inform how the US could make progress on carbon emissions began to focus on state and city-level examinations. (Bulkeley et al 2011, Urpelainen, 2009; Matisoff, 2008; Betsill and Bulkeley, 2006). This is what is referred to as the “bottom-up” approach within US climate policy literature, which looks at the merits of state and local climate mitigation policy. Here, one is truly able to see the connection between the US’s approach to climate mitigation policies and the weak ecological modernisation strategy. The literature here has focused on identifying the benefits of using a decentralised approach to climate mitigation.

This research shifted the place of the US within international climate discussions towards being domestically focused. Although this is problematic for the international arena, taking a domestic approach has had merits for the US’s climate progress, which can be summarized into four main points. First, research has shown that using local-levels of governments within carbon mitigation policies are more likely to result in experimentation with new policy tool tools, and thus produce new types of tools (Lutsey and Sperling, 2008, pp. 673-685). Secondly, the local level also allows solutions to be more specifically tailored, and require less government

interference. Thirdly, these solutions are likely to be easier to test at a municipal or state level, which is likely due to the fourth main aspect, that local experts find an easier time passing climate policy (Lutsey and Sperling, 2008, pp. 673-685). Overall, the literature reviewing how the local level might be an effective strategy for change have yet to quantitatively show that these policies produce significant change.

Today, the pledges from cities and states only encompasses about ten percent of the US's greenhouse gas emissions (IPCC, 2014). California's climate programs, known for being the most aggressive in the US, only are responsible for about 6 percent of America's overall share. Although research has pointed to the need for bottom-up climate actions to eventually become intertwined with a "top-down" approach to legislation, there has been a lack of attention as to the types of institutional adjustments that are needed to amount to serious action on carbon emissions reductions. At the very minimum today, the US must move towards participation in an international cap-and-trade market regime or begin to regulate their emissions.

Although research has predicted that the lower-level "push" for sustainability will perhaps result in larger scale legislation (Bang, 2011; Selin and VanDeveer, 2007), I question the likelihood of this. I believe that the focus on state-level policy efforts, has not taken into account the ideological change that will need to happen in the US for this for significant decarbonisation to occur. Although federal level studies investigating the place of the climate change in the US initially focused on the difficulties in passing legislation due to the impact of interest groups, only focusing on interests thus far has ignored how "prior expectations and cognitive biases affect how they [actors] will work within [these] institutions and adopt them to their own circumstances", (Lewis and Steinmo 2012, p. 314). Focusing on the role of interests and the role of states as opposed to federal governments has ignored the ideological,

and perhaps institutional problem, that I believe is at the cause of climate change opposition in the US.

When reviewing the literature from both an international and domestic standpoint, it becomes apparent that the US needs to take responsibility and ownership for its carbon emissions reductions. Even if the literature reviewing the US state level efforts are positive, there still needs to be a stronger understanding of how the “push” to support climate mitigation policy happens. What are the steps that are needed to engage in international emissions trading schemes? What are the institutional adjustments that are needed to coordinate “bottom-up” legislation with international emissions reductions needs? Would it even be possible to evolve the state-level legislation towards a federal-level approach in the US? How have other countries managed to create such a convincing case for climate mitigation?

2.3.2 The EU’s top-down approach in climate mitigation

Whilst the US has remained a vague figure within climate studies, the EU and its place within the international climate arena has become a robust area of focus. Within the domestic level investigations of the EU, policy investigations featured heavily on the relations of power and influence of actors in influencing climate governance, which label the EU as a directional or power-based leader (Bäckstrand, 2008; Bulkeley and Moser, 2007; Betsill and Bulkeley, 2006; Betsill and Corell, 2001). Studies at the international-level typically feature qualitative case studies, and mainly focus on the diffusion of international tools and their diffusion across countries (Keohane and Victor, 2011; Ciocirland, 2008; Schreurs and Tiberghien, 2007; Schreurs, 1997; Stavin, 1997). Overall, research tends to focus on the strength of the EU’s ability to create an institution-wide approach to climate mitigation studies. In this way, one can see how the EU can be used as a representation of the “top-down” or strong ecological modernisation approach to climate mitigation policies.

The literature reviewing the place of the EU in global climate politics generally labels the EU as a “leader”. The concept of leadership is used in climate policy studies to help describe the role negotiating parties took when forming the international climate agreement (Knill and Liefferink, 2007; Skodvin and Andresen, 2006). Within climate change, leadership generally begins with “the ambition of nation-states to curb greenhouse emissions,” (Skodvin and Andresen, 2006, p. 14). The greater reductions usually indicate a higher degree of leadership (Skodvin and Andresen, 2006, pp.13-27). As such, studies have focused on assessing the leadership in carbon emission reductions quantitatively; focusing on meeting targets, and forecasting if the EU will meet future targets. Qualitative comparisons tended to focus on specific instances of the EU achieving leadership within the international CO₂ reductions (Oberthür and Rabitz, 2014; Uusi- Rauva, 2010; Urpelainen, 2009; Oberthür and Kelly, 2008; Schreurs and Tiberghien, 2007; Lightfoot and Burchell, 2005; Lightfoot and Burchell, 2004; Andresen and Agrawala, 2002).

Still, focusing on the leadership nature of the EU has stemmed from a domestic policy view that attributes the European leadership on climate change to one or more internal influences (Wurzel, Liefferink, and Connelly, 2016). These can be summarized into four main areas for investigation: the role of the EU within climate efforts; the institutional design features that help mitigate overcoming problems in the global effort; the factors that drive variation in climate policies at national and supranational levels; the driving forces of climate policy beyond state-civil society and public opinion; and the socio-political consequences of failing to avoid major climate change changes (Bernauer, 2013, pp. 421- 448). Doing so, has thus far explored the impact of the EU on its own internal member states, but has only recently translated into the impact of the EU beyond its borders. This has led to an examination of specific policy tools within domestic climate change policies, yet has moved scholars away from an understanding of the place of domestic

institutions within international climate governance.

Despite a thorough examination of new policy tools, the policy tool that has been neglected in political-science research is the EU ETS. The EU ETS was the first large greenhouse gas emissions trading scheme in the world and today is still the biggest (Ellerman and Buchner, 2007, pp. 66-87). Although the EU ETS is a central pillar of EU climate policy, the tools have been left mainly to economic discussions (Helm 2010, pp. 182-196). However, investigating the tool is useful, as it should be seen as a triumph for climate mitigation policies. The tool seeks to reduce greenhouse gas emissions, yet is in effect, the creation of an environmental market. The EU ETS is a prime example of the European attempt to integrate the environment into the economy, yet has been criticized extensively for the fluctuations the market had in its first phase (Helm, 2008, pp. 211-238). The tool was even used to showcase government failure, and called into question the broader capabilities of European institutions (Helm, 2010, pp. 182-196). However, the tool should be used instead to showcase the broader capabilities of European institutions.

Instead of focusing on specific instances of leadership, it would be more useful to understand how the EU has changed as a whole, in particular in providing the institutional capacity that leads to innovative climate tools. The area that still lacks academic investigation today are the institutional design features of the EU itself that help to drive climate policy. Looking at the policy factors that drive variation in climate policies would help to better explore a beyond the state analysis of climate mitigation norms in the EU.

2.3.3 Building on existing comparisons of the EU and the US

The EU and the US can thus be used as two useful cases for comparing two ideological divisions within environmental policy. Both the EU and the US

governmental bodies are similar, and therefore, useful for comparison. Both governments are noted for their vast economies, heavy industrialization, and large energy consumption, as well as their cultural similarities. With increasing international pressure to decarbonise, the emphasis on capacities and capabilities has become more pronounced, increasing the importance for an examination of the institutional natures of both governments on the path to a low-carbon economy. Surveying the previous comparisons below helps to highlight the areas of investigation that should be included as variables of analysis in this research piece. These comparisons highlight the utility in analysing more systemically why these differences or similarities are occurring.

Previous comparisons of the two have been used to show more general differences in environmental governance, yet still help to highlight the areas of investigation that should be included in an ideological investigation (Keleman and Vogel, 2010, pp. 427-456). Studies for comparison have mainly focused on the EU becoming more American-like, which calls into question the European commitment to sustainable development, but also the legitimacy of the climate policies of the EU (Van Asselt, Harro, and Brewer, 2010, pp. 42-51). On the opposite side, this could mean the US is becoming more like the EU, which signals a change in the American approach to environmental policy, and highlights an opportunity for climate policy innovation to occur.

The differences in the decision-making process of the two areas have been noted as a reason for the divergence in environmental policy. The EU joint-decision form of policy-process has been credited as sheltering policy-makers from interest group pressure (Woll, 2004, pp. 842-846). Policy makers in the EU are said to be kept distant from interest groups, and work in an environment that is heavy with direct confrontation and bargaining over policy proposals (Woll, 2004, pp. 842-846). In

the US instead, policy-makers are heavily exposed to lobbyists, who are very influential in the policy-process (Brulle, 2014, pp. 681-694).

The difference in the nature of energy industry influence is often noted as the sole cause of differences in lobbyist exposure in the EU and the US (Brulle, 2014, pp. 681-694). Industry influence is typically accredited as stronger in the US due to the strong presence of fossil fuel groups; for these firms, carbon reduction technologies are a constant threat to their daily business activities (Keleman and Vogel, 2010, pp. 427-456). Carbon reduction would mean implementing carbon strategies, developing sustainable business divisions, and potentially even switching their forms of energy usage (Keleman and Vogel, 2010, pp. 427-456). When looking at the establishment of CO₂ reductions, it has been argued that the US government has become so corporately focused that it is unable to produce any sort of environmental legislation that would damage the profitability of these firms.

The historical setting in which policy is developed has also been noted to effect the degree of pressure that citizens place on government officials to form environmental policy (Vogel, 2003, pp. 557-580). The backdrop of environmental policy in the EU has been very different when compared to the US. In the 1980's the EU experienced a series of crisis that increased public concern for the environment. Sickness related to contaminated beef and salmonella in eggs caused a public fear of the standards in chemicals and the environment to spread rapidly (Vogel, 2003, pp. 557-580). When the public pushed for further environmental regulations because of health concerns, the environment was seen as an imminent threat. EU public officials were then pushed to take actions on regulations for fear of negligence (Vogel, 2003, pp. 557-580). Therefore, the historical aspect of the setting also must be taken into consideration when comparing the policy outcomes of the EU and the US.

Differences in historical setting also points to the importance in understanding the differences in the cultural construction of environmental problems, which can result in differences in environmental policy outcomes (Vig and Faure 2004; Woll, 2004). However, variations in political cultures are often hard to understand the degree to which they influence the policy process. Understanding the influence of political culture is often "difficult to operationalize," meaning that it is difficult to identify variables that allow scholars to test for concretely for its influence. Proving that an idea has impacted change is incredibly difficult. In the past, researchers have had a difficult time analysing the norms and concretely showing that they have impacted change (Woll, 2004, p. 846). However, analysing the role in ideologies is extremely important for this study, as political culture has been connected heavily to climate change, which is a fundamentally environmental policy problem. By studying the outcomes of carbon policy, and connecting it with five dimensions of change, I am able to concretely test the influence of ideas on institutional change in the US and EU. However, this requires understanding clearly what types of change ecological modernisation ideas seek to cause.

2.3.4 The need for better understanding ecological change today

The divisions between weak and strong sustainable development and weak and strong ecological modernisation reflect an overall division as to how countries view the appropriate relationship between the government, people, and the planet. These concepts are all strategies for achieving the same policy-goals. Although ecological modernisation helped to more narrowly define the sustainable development strategy, it did not necessarily translate directly into the specific policy-dimensions that stemmed from the sustainable development movement. At the same time, the lack of studies that test the effectiveness of these different approaches has left a qualitative gap in understanding what the most effective strategies for driving change are.

Although the division in the approaches to sustainability in general can be seen as a geographical or perhaps cultural disagreement that stems mainly between American and European scholars, the division between strong and weak ecological modernisation actually reflects a division as to what constitutes natural capital. Scholars from a weak standpoint view environmental damages as replaceable by monetary units (Dietz and Neumayer, 2007, pp. 617-626). Countries on this spectrum would argue that natural capital could be replaced by man-made capital. Strong scholars of sustainable development find this a contradiction; sustainable development at its foundation seeks to create a balance between environmental, social and economic dimensions. Saying that the natural element can be replaced seems to diminish the need for sustainability at all (Dietz and Neumayer, 2007, pp. 617-626). In addition, “the easier it is to substitute the manufactured capital for depleting resources in a damaged world, therefore it is implied, that less attention is needed for the capacity of the environment to sustain human development,” (Victor, 1991, p. 194). Therefore, scholars of weak sustainable development hold the stance that “weak sustainability often leads to weak results, but to no reversal of basic principles,” (Pearce and Atkinson, 1993, p. 103).

At its foundations, the main divisions in sustainable development stem over what the appropriate role of government is in achieving environmental protection. On the strongest side of the sustainability spectrum, theorists would argue that society must be reconstructed so that capitalist structures become intentionally embedded with environmental and social values. On the weak side of the spectrum scholars instead argue that change can be driven so that existing capitalist structures can move towards a cleaner economy. The centre-point of sustainable development arguments stem over what the appropriate role of governance is in achieving environmental goals.

Today, it can be seen that society's current constructs of environmentalism have "failed to reduce, even remotely adequately, the impact of humans on the biosphere", (Foster, 2014). The paradigm change that has remained relatively vague and disconnected from the structural changes that are needed to achieve ecological goals. Instead, today's atmospheric damage requires a commitment to the environment that promotes, and effectively causes, changes of a more dramatic scale to occur. Yet, the lack of concrete understanding as to what how to best drive ecological change can be seen when reviewing existing studies on climate change literature. Nation-states, specifically like the EU and the US, can be used as an example as to the two opposing viewpoints in how to best drive ecological change. Looking at previous climate mitigation studies shows how today there is a clear need for understanding how these ideas translate into progress on ecological policy issues.

Today, the push for coordinated efforts on climate change at an international level has grown within recent literature (Bernauer 2013, pp. 421-448). There is significant worry that fragmented schemes without international coordination and consensus on needed reductions will instead lead to a "race-to-the-bottom", where firms would relocate to the regions with lower environmental standards (Newell, Pizer and Raimi, 2013, p. 123). This fear is founded on the notion that industries will relocate to cities, states, or countries that do not monetarily regulate environmentally, mainly so to avoid paying environmental fees (Newell, Pizer and Raimi, 2013, pp. 123-146). This fear is even more acute when it comes to emissions trading schemes, where bottom-up legislation has been a concern. Although bottom-up approaches have been effective in the initial launching phases of emissions schemes, without international consensus on the targets, it becomes difficult to ensure emissions trading schemes are meeting their environmental ambitions (Newell, Pizer and Raimi, 2013, pp. 123-146). Despite the positive progress on launching markets as displayed by the EU ETS, the Regional Greenhouse Gas Initiative, and New Zealand, the progress has been slow meeting ambitious

reductions (Newell, Pizer and Raimi, 2013, pp. 123-146). Although the bottom-up approach is useful and easier, nations still need to agree on the larger-scale contributions needed for climate change. Without doing so, “regulating states will bear a disproportionate share of the costs from such regulation with no guarantee of reaping proportionate benefits,” (Adler, 2005).

A more thorough understanding of the complete policy mechanisms and tools needed in the creation of an environmental market would be helpful for countries looking to implement a new emissions trading scheme (Aldy and Pizer, 2015, pp. 3-24). Specifically, it would be useful for policy-makers to investigate the determinants and implications of institutional design characteristics that are needed to support the deployment of environmental markets. Looking at international efforts is useful, but understanding the domestic policies have contributed to institutional change would help a country that is new to carbon mitigation policies understand how to implement a new, and effective, regime. Therefore, comparing the EU and the US will help showcase the institutional mechanisms that the EU has used in creating the EU ETS, which helps to identify the changes the US needs to make in order for international CO₂ reductions to be significantly successful.

2.4 Conclusion

When surveying the literature above we can find clear gaps in the research of both climate governance, and in comparative studies of the EU and the US. The literature was organised by both time and concept in order to show how the concepts have developed historically, and to examine how problems within earlier notions of environmental government still effect climate policy considerations today. Reviewing the literature in a historical manner also helps to show how important it is to take a strong approach to strong ecological modernisation in order for some societal change to occur.

The literature above also shows how divided approaches to climate management represent longstanding economic divisions between both the US and the EU represent. On one side, is the notion of a neoliberal approach to environmental management, and on the other side, is an ecological economic approach to climate goals. Although the above studies have contributed to the more narrowed analysis needed for understanding sustainable development, they do not address nor compare how two different approaches to carbon mitigation effect policy outcomes. COP21 has mandated all nations to address climate change, and effectively deliver on the CO₂ reductions; it therefore becomes increasingly important to understand how such different notions of ecological modernisation impact the institutional capacity needed for achieving long-term mitigation goals.

The path to the development of the EU EUTS and proposed emissions trading scheme in the US can be used to assess how- and to what degree- do different ideas impact institutional change in climate mitigation policies? Within this thesis, I argue that the current ideas with which the US approaches climate mitigations are currently not sufficient for developing competitive CO₂ reductions. I use ecological modernisation as an analytical tool for examining how different ideas of how to approach climate mitigation policies impact policy choices, tool innovation, and institutional adaptation. This provides a deeper analytical understanding of climate change mitigation strategies, specifically when considering the end goal of creating a carbon policy tool.

Chapter 3. Developing a theoretical lens for understanding incremental change in carbon policies

The conceptual framework in the previous chapter locates and defines the main areas of examination within this study. This framework provides the reader with an understanding of the origins of climate policy tools, and of the importance of institutional adaptation in supporting innovation in carbon policy. Now this thesis moves to provide the reader with an understanding of how historical institutionalism can be used as a theoretical lens to better examine the nature of change needed to support societies as they adjust to climate change. An institutional approach captures the interaction of agency, structures and context. This chapter first locates historical institutionalism within the broader realm of institutional studies. It then moves to examine change in institutions, as well as the relationship between ideas and institutional change.

The theoretical lens narrows into an environmental investigation to provide the reader with a systemic understanding of institutional adaptation in climate mitigation policy. Focusing on the impact of ecological ideas driving the evolution of structures and norms related to carbon policy, this chapter provides the reader with an understanding of the stages of change an environmental idea must undergo in order to cause institutional change. This explains how ecological modernisation as an idea can be used to examine the EU's path to intellectual leadership. This chapter then moves to outline the research methods used in this study so that the reader understands the potential impact of ecological ideas on institutions as they seek to achieve intellectual climate leadership.

3.1 New institutional theories

The study of political institutions and their effects on society has played a key role in political science investigations since the post-war period. Original versions of institutionalism mainly compared the formal structures of governments, but these

studies rarely produced anything more than basic general deductions on the differences of political systems (Hall and Taylor, 1996, pp. 936-957). In particular, the theory was criticized for neglecting the role of actors; the formal analysis of structures was not broad enough to include the consideration of preferences that were brought into the policy arena (Hall and Taylor, 1996, pp. 936-957). However, with the turn of the “behavioural revolution”, institutional studies turned away from structures towards instead focusing on actors.

During this time, interests were analysed as being the main source of influence on the choices of policy-makers (Pierson and Skocpol, 2002, pp. 693-721). Previously, this was an apt explanatory lens for many of the hegemonic decisions taking place in countries like the US and the UK, where the rise of neoliberalism encouraged isolationism and domestic governance regimes (Pierson and Skocpol, 2002, pp. 693-721). Here, institutional studies focused on the role of individual actors and how they were able to exercise power within the constraints or opportunities offered by institutions (Hall and Taylor, 1996, pp. 936-957). Although this theoretical perspective offered a more analytical understanding of the role of individuals within institutions, the movement did not capture the role of group behaviour, nor how it influenced domestic politics. Including the impact of non-state groups in policy analysis became mandatory as groups like industry associations, lobbyist networks, non-governmental organisations, and epistemic community members began to influence the policy-process.

Rational choice theory became further criticized as globalisation called into question the capabilities of single nation-states in effectively addressing global challenges (Giddens, 1990, pp. 64). With increasingly interconnected economies, countries began encountering obstacles and combatting problems that extended well beyond their own borders (Giddens, 1990, pp.64). The end of the Cold War, the

spread of terrorism, and global financial recessions all showed that cooperation was required to truly solve policy-problems.

With increasingly complex institutional arrangements, political scientists worked to create a theory that would provide a more dynamic understanding of the relationship between actors and institutional structures, but that could still be used for comparative studies (March and Olsen, 1984, pp. 734-749). Scholars in comparative politics, therefore, began to work on creating a theoretical and methodological guide for cross-country comparisons that would include the analysis of both political structures and the role of society, or governance (March and Olsen, 1984, pp. 734-749). New institutionalism emerged as an institutional theory that sought to develop a more sociological view of institutions, one that addressed the gap between individual and group studies.

This new institutional perspective sees institutions as the result of the interaction between social and structural dynamics (Hall and Taylor, 1996, pp. 936-957). New institutionalists see the structures of governments as largely influenced by the vast network of actors and groups that define the structures of the system itself, yet they also see existing structures as influential on actors themselves (Hall and Taylor, 1996, pp. 936-957). This group of political scientists takes the viewpoint that institutions affect both the objectives of political actors, and also affect the distribution of power amongst them (Hall and Taylor, 1996, pp. 936-957).

New institutional theory also seeks to accommodate the intricate nuances that come with language and culture. Previous institutional theories assumed that “class, geography, climate, ethnicity, language, culture, economic conditions, demography, technology, ideology, and religion all affect politics but are not significantly affected by politics,” (March and Olsen, 1984, p. 735). Instead, scholars in new

institutional theory moved to consider the cultural connotations that had emerged within the increasing complexity of policy-making in general, and looked at how to integrate them into a structural analysis.

New institutionalist theories also sought to develop a more analytical understanding of change than previously seen in institutional investigations. Adopting a new institutionalist approach as a theoretical lens therefore begins the research with an assumption that institutional change should be viewed as a critical component of achieving policy goals; here, institutions do not determine outcomes, but they do help to influence them (Capoccia and Ziblatt, 2010, pp. 931-968). Although rational choice theorists have argued that institutional theories often place too narrow a focus on governmental structures, today's new institutional theories provide an excellent theoretical lens for analysing change.

Analysing change has consistently been a difficult task for scholars of institutions (Hall, 1996, pp. 936-957). Understanding the degree to which general adjustments in the daily operating of institutions affect policy-outcomes can be more difficult than when analysing the impact that a crisis has had on an institution (Hall, 1996, pp. 936-957). However, what causes these general adjustments, or change, became an area of contention. Therefore, the merging of these various dynamics resulted in the construction of several new institutional strands, rather than one institutional theory.

Within the three separate strands of new institutionalism, all three of the theories retain the same emphasis of a mutual causal relationship between governmental structures and the actors within them (Hall and Taylor, 1996, pp. 936-957). Rational choice institutionalism, sociological institutionalism, and historical institutionalism all attempt to understand how policy-makers and their decisions

affect the policy-process and thus, society (March and Olsen, 2006, pp. 3-20). Rational choice institutionalists combine the assumptions of rational choice theory with a structural focus to examine how the rules and constraints of the system affect the decisions that actors make. This strand of scholars believes that institutions are used by actors to maximise their utility, and pays particular attention as to what actors may or may not be allowed to do within the policy-process (Hall and Taylor, 1996, pp. 936-957). What actors can and cannot do influences the choices actors make, and what causes institutional change to occur. However, this point of view focuses solely on rules and restrictions on actors and ignores how the broader setting may influence policy-decisions.

Sociological institutionalists take the idea that institutions are created in response to choices made by actors. Sociological institutionalism concerns “the way in which institutions create meaning for individuals, providing important theoretical building blocks for normative institutionalism within political science,” (Lowndes, 2010, p. 65). Sociological institutionalists therefore look at the broader policy norms as an explanatory variable for change. They describe change as something that happens alongside changing norms in society (Lowndes, 2010, p. 65). However, this point of view does not necessarily explain how change occurs, and negates the role of actors’ decisions in spurring on institutional change.

For scholars of historical institutionalism, both rational and sociological institutionalism provide a weak analysis of how influential formal structures are on the actors within the policy-arena. Instead, this school of thought believes that institutions give validity to certain rules of behaviour, but that decisions taken are a result of both sociological and ideological influences (Pierson and Skocpol, 2002, pp. 693-721). Scholars of historical institutionalism do not necessarily emphasize the sociological over the rational approach, but instead separate themselves from other forms of institutionalism by taking into account a focus also on the political

context and political structures of governments (Pierson and Skocpol, 2002, pp. 693-721). Historical institutionalists focus on the ways that political systems differ in their entirety exclusively, and then analyse how these differences influence overall governance when comparing political systems.

In this manner, historical institutionalism combines rational choice and sociological institutionalism to analyse the progression of behaviour and the interaction of actors, rules, and structure over time. By focusing on both structures and actors, historical institutionalism specifically seeks to take a holistic approach to understanding why and how change within a system occurs.

3.2 The assumptions of historical institutionalism

Institutions in historical institutional theory are defined as the “the formal or informal procedures, routines, norms, and conventions embedded in the organizational structure of the polity or political economy,” (Hall and Taylor, 1996, p. 6). Historical institutionalists believe that institutions provide the context in which political actors define their strategies and pursue their own policy interests (March and Olsen, 2006, pp. 734-749). The theory “takes a broad view of how institutions influence individual actors’ behaviours, and include normative and cultural dimensions which go beyond rationalist calculations,” to give a sound understanding of how institutions, actors, and ideas interact (Bulmer, 1998, p. 370). From this perspective, institutions are not just structures, but act as the physical and ideological boundaries that shape the strategies, goals, and decisions of policy-makers.

Historical institutionalists look specifically at how states structure their response to new challenges within the global political economy (Hall and Taylor, 1996, pp. 936-957). Achieving policy goals requires cooperation and often times results in

political conflict; institutions thus, define political situations and stand as both a cause and effect of political outcomes (Steinmo, Thelen, and Longstreth, 1992, pp. 27). Historical institutionalists therefore begin with the assumption that policy is the product of the interactions among various groups, interests, ideas, and institutional structures (March and Olsen, 1984, pp. 734-749). They reject the notion that political behaviour can be analysed as a whole, but instead seek to understand why decisions have been made as opposed to other policy options available to policy-makers (Capoccia and Kelemen, 2007; Pierson, 2000; Steinmo and Thelen, 1995; Hall, 1986).

Scholars within this field are separated from the other schools of new institutionalism as they alone take into consideration the historical context within which policy decisions are made. Although war and economic crisis are often analysed for their sudden impact on institutions, taking into account the broader historical context and the development of institutions during times of non-crisis is often neglected when compared to the other explanatory variables of change (Pierson, 2000, pp. 251-267). Historical institutionalists thus, place great importance in understanding the context in which institutions develop as this often acts, at least partially, as an explanatory factor for policy-choices (Pierson, 2000, pp. 251-267). The environment that surrounds influences the perception of actors and how they view the structures around them. Historical institutionalists therefore investigate how the overarching policy background may influence actors' policy-decisions.

Historical institutionalist scholars analyse policy by assuming that policy develops in a continual path. Defining this as "path dependency", historical institutionalists believe that when a program or an organisation starts on a path, there is a tendency for the policy path to continue (Hall and Taylor, 1996, pp. 936-957). It is possible for policy-makers to change the course of an institution, and thus alter the policy

pathway, but it is difficult. This is partly due to the fact that historical institutionalism sees, to a certain extent, that pre-existing policy powers tend to be entrenched in already present institutions (Streeck and Thelen, 2005, pp. 1-39). These arrangements give “actors and interests greater powers of influence over others whenever it comes to creating new institutions,” (Hall and Taylor, 1996, p. 954). Although people act according to rules and traditions already in place, they can change the institutional path in some way if any of these factors is altered (March and Olsen, 1984, pp. 734-749). Historical institutionalism thus, places strict emphasis on understanding how institutional paths are altered.

In order to clearly identify change historical institutionalists differentiate the status of institutional systems as being either changing or static. The state of the institution infers a certain set of assumptions about the nature of the institution under examination. When institutions are static they are referred to as being in “dynamic equilibrium”; in this instance, none of the actors in the arena has an incentive to defect from existing arrangements or strategies (Thelen, 1999, pp. 369-404). These equilibria are seen as effective arrangements of institutions, which contain practices, norms, and values (Thelen, 1999, pp. 369-404). When systems are in such a state of equilibrium, actors and existing arrangements reproduce within the system and further embed themselves within existing political systems (Thelen, 1999, pp. 369-404). Therefore, existing strategies become difficult to overturn, specifically as actors who benefit from these arrangements will seek to maximize their gains.

In a negated aspect disequilibrium can also occur, which is a continued state of actors’ defecting from the arrangement of the system (Thelen, 1999, pp. 369-404). Disequilibrium is a state of unresolved strategies or preferences. Disequilibrium can be adjusted when actors successfully put in place strategies that address defection, but can also result in a crisis if the overall values and norms of the system come into question (Thelen, 1999, pp. 369-404). These are referred to as crises, or an event or

action that threatens the existence or generation of the governmental body under investigation (Thelen, 1999, pp. 369-404). Crises often result in institutions changing drastically.

3.2.1 Critical junctures and incremental change

It can be a problem predicting when institutions will move from a period of equilibrium to disequilibrium, but historical institutionalists have traditionally tended to credit diplomatic and economic crises as the main stimulators for institutional change, or as major critical junctures (Hall and Taylor, 1996, pp. 936-957). When an actor, or group of actors, is able to change the developmental path of a policy, this is referred to as a critical juncture; the periods of stability in between are referred to as a period of continuity (Capoccia and Keleman, 2007, pp. 341-369). Critical junctures are the point in time when an event, or series of events, provides an opportunity for the institution and actors within in it to pursue alternative methods (Steinmo, Thelen, and Longstreth, 1992).

During these critical junctures, “there is a substantially heightened probability that agents’ choices will affect the policy outcome” (Capoccia and Keleman, 2007, p. 348). These moments force institutions to respond to shocks; therefore, the change made is likely to be abrupt (Hall and Taylor, 1996; Cortell and Petersen, 1999, Steeck and Thelen, 2005). The consequences of actors’ actions during these periods will typically lead to one of two situations: actors and their power will be able to expand noticeably, or actors’ power will diminish and most likely be replaced by that of another actor (Capoccia and Keleman, 2007). The choices made at these critical junctures generally, “close off alternative policy options and lead to the development of institutions that generate self-enforcing path-dependent processes,” (Capoccia and Keleman, 2007, p. 348). Therefore, critical junctures normally indicate that institutional change will occur.

Critical junctures force institutions to respond to shocks; therefore, the change made is likely to be abrupt (Streeck and Thelen, 2005; Cortell and Petersen, 1999; Hall and Taylor, 1996). However, it can be difficult to judge if an event is critical, thereby being disruptive on a large-scale, as opposed to being simply an event in the institutions path of development (Steinmo, Thelen, and Longstreth, 1992). Yet, historical institutionalists also recognise that change can occur without crisis; however, this change is different in the nature and magnitude to which it affects a system. These are referred to as incremental changes, which are smaller and less noticeable (Streeck and Thelen, 2005, pp. 1-39). Still, these changes can be difficult to assess the degree to which they affect a system (Streeck and Thelen, 2005, pp. 1-39). However, incremental changes are interesting as they are the most common type of change to occur within institutions.

Incremental changes generally infer that the structure of institutions remain intact, but imply that some form of change is still occurring within the system to alter the rules of the political game (Mahoney and Thelen, 2010). Generally, incremental change is seen as positive change; governmental bodies themselves are created to represent the interests of the constituents they represent. Therefore, incremental changes can mean that the institutions under analysis are changing in accordance with the changing values of society (Streeck and Thelen, 2009, pp. 1-39). Although not all policy demands warrant change, “the problems of the public still demand attention on most bases,” (Streeck and Thelen, 2009, pp. 1-39). Therefore, these gradual changes can be useful for analysing how governments respond to challenges on a daily basis, or how governments are responding to the demands and needs of its citizens. This can also imply that if governments are not making changes on a constant basis, then there may be a failure of institutional capabilities in responding to citizens’ demands.

Previous studies using historical institutionalism found incremental changes

difficult to identify and judge. Instead, scholars moved to develop an evolutionary explanation of institutions in response to external stimuli which offers a likely explanation of the way in which a system must literally adapt to address new policy issues (Lewis and Steinmo, 2012, pp.314-339). Rather than the types of changes being different and separate as previous historical institutionalists outlined, change from this perspective is likely to act in a cyclical approach. Exploring change through this evolutionary lens gives greater insights into the increasing complexity of political patterns across time, and gives an explanation of change occurring in more of a cyclical manner (Lewis and Steinmo, 2012, pp.314-339).

From this point of view, incremental changes are fundamentally related to achieving policy goals. Resembling the notion of evolution in Darwinian Theory, these theorists outline how institutions must evolve similarly to how species adapt in biological evolution (Lewis and Steinmo, 2012, pp.314-339). Arguing that the relationship between adaptation and survival has been investigated previously across science, economics, sociology, anthropology, and psychology, institutional scholars now adopt the notion that institutional evolution must occur in order for an institution to survive (Lewis and Steinmo, 2012, pp. 314-339). This notion sees incremental changes as a mandatory and important part of institutional survival (Lewis and Steinmo, 2012, pp.314-339).

In these evolutionary terms, change must occur on a constant and regular basis. Institutions, therefore, must respond to external stimuli as species do in biology. Here, "human's creative capabilities and problem-solving abilities are important mechanisms for generating continued variation in human social systems" (Lewis and Steinmo, 2012, p. 316). The knowledge capacity of policy actors is directly responsible for influencing the "complexity of political institutions themselves, the opportunities for new variation to emerge, and likely the rates of institutional change," (Lewis and Steinmo, 2012, p. 317). From this Darwinian aspect, actors

must respond to a policy-demand appropriately to cause institutional change. This means that if actors are able to correctly address issues, they will improve institutional arrangements through trial and error methods (Lewis and Steinmo, 2012, pp. 317). When the correct policy answer is put in place, innovation within policy will occur, which can then replicate itself in further policy measures (Lewis and Steinmo, 2010, pp.314-339). Actors, therefore, become important in this investigation, and this theory, as they become the vehicles for change. They must have the capacity to address issues correctly, and to formulate appropriate policy-responses. Therefore, in order to truly understand the influence of actors in the policy process, one must first acquire an understanding of the external sources that may influence actors as they make policy-decisions.

3.2.2 Ideas and institutional change

When seeking to understand what external sources effect actors' choices, historical institutionalists tend to favour either interests or ideas as the main source of influence on policy decision-makers (Hall, 1997, pp. 174-207). On one side, scholars see interests as the main cause of influence on actors involved in the policy process. In climate change, this notion has been much explored, specifically the impact of corporate interests in the policy-process (Lewandowsky et al, 2015; Dunlap and McCright, 2011; Helm, 2010; Anderson, 2009; Bryner, 2008; Rabe, 2004; Dunlap and McCright, 2003; Betsill and Correll, 2001). These "materialist theories" take the notion that interests infiltrate the policy-arena and shape actors' opinions, thus, forming actors' ideas. However, if this approach is embraced, there is still ambiguity over why agents perceive interests the way they do.

Scholars in comparative studies faced limitations when using interests as a tool for describing how actor's made decisions during times of uncertainty. This approach ignored the prior cognitive biases that actors brought with them into the policy-

arena (Pierson and Skocpol, 2002, pp. 693-721). Instead, taking an ideational approach became a useful tool for understanding how external and internal sources of bias influence actors in the policy-making process. This perspective investigates how actors interact with a set of existing “prior expectations and cognitive biases that affect how they will work within [these] institutions and adopt them to their own circumstances,” (Steinmo and Lewis, 2012, p. 314). These prior expectations and existing biases can be referred to as ideas.

When taking an idealist approach, ideas, rather than interests, become the key external stimuli that spur institutions to change. Ideas are seen as responsible for the new formation of new structures after a period of equilibrium becomes unstable (Blyth, 2001, p. 2). They act as “institutional blueprints during periods of uncertainty, as weapons in distributional struggles, and as ‘cognitive locks’”, (Blyth, 2001, p. 2). Ideas are important as they define how institutions evolve. Investigating the core ideas that hold actors during times of change shows how “ideas fundamentally alter people’s conception of their own self-interests,” and how they “impact how actors choose to structure their policy-goals and decisions,” (Blyth, 2001, p 3). Ideas are said to be successful, or influential, when they diffuse the policy arena and creating lasting, effective results.

For an idea to cause change, or alter the path of policy development, it normally goes through three phases: formation, negotiation, and operation (Young, 1999). In the formation phase, actors often act as policy-entrepreneurs to conceptualise the idea. They are influenced by both personal ideas as well as external interests’. During this phase, actors gather inputs from various sources to form an understanding of how to best approach a policy-problem (Young, 1999). Here, information is informally present in policy-discussions, and combines with the overall setting at the time to influence an actor, or actors, response to a policy-demand. This response, or idea, is then brought into the public policy-arena during

the negotiation phase (Young, 1999). Finally, ideas then influence policy-choices in the operation stage. Here, the fundamental concepts of the idea manifest themselves in tangible policy evidence (Young, 1999). This stage is where an idea results in structural and organisational responses to the policy-problem (Young, 1999). If changes are made organisationally, then an idea is credited as being successful. If no changes are made, then one can assume that the idea that was used, or formulated, was an inappropriate policy response. These stages therefore, display how an idea can and should influence change.

3.3 Outlining the mechanism for institutional change

The concept of ecological modernisation as an idea can be used as part of a broader theoretical concept to analyse the incremental changes that are needed to ingrain climate considerations in the broader political economy. Therefore, we can conclude, if an idea such as strong ecological modernisation is formed, and present in the policy area, then one would expect institutional change in relation to the five aspects developed in the previous section; change in information coordination, change in policy tools, change in policy goals, change in policy paradigms or the hierarchy of policy goals, and change in the role of the state.

Change must occur within all of these dimensions in order for an economy to accommodate ecological considerations (Eckersley, 2004, pp. 180-208). Therefore, although there are two different approaches to ecological modernisation, or towards engraining environmental considerations within the political economy, we can use these five dimensions of change to analyse the impact that each notion has on institutional change. This will allow me to understand not only to what degree the EU and the US have institutionally adjusted to address climate change, but will also allow me to concretely analyse the authenticity of both of their individual approaches towards CO₂ goals.

Although carbon policy goals have quantitative outcomes, this thesis seeks to more specifically understand the qualitative outcomes of this policy. Carbon emissions reductions require a fundamental paradigm shift. As such, policy-makers within this policy area therefore have two main goals within carbon policy: to quantitatively produce reductions but to also choose policy tools that produce behavioural or systemic change. Success here can also be seen as, “the ambition or stipulation of ambitious objectives that produce real change in behaviour, and compliance, to the extent to which implementers, including target groups, work to follow the stipulated requirements,” (Bressers, Bruijn, Lulofs, and O’Toole, 2011, pp.187-208). However, these changes can be hard to measure. It will be important therefore in this research to define how to measure this qualitative change.

The EU ETS as a specific carbon policy also supports the initial hypothesis within this thesis. The EU ETS represents the price of carbon, which shows that the environment has been given some inherent value. This therefore helps support the thesis which is that if in fact the goal for climate mitigation policies is to support a carbon policy (or to create a fundamental value for the environment), then the EU has undertaken an approach that is effective. The alternative would be to either create a regulatory regime that mandates reductions of carbon. There is no third scenario with climate change mitigation goals. Therefore, assuming then that the EU/US have mutual economic ambitions and carbon footprints (or the most similar economic ambitions as possible within comparative studies) then the EU becomes an apt investigation for examining what incremental changes the EU undertook to create such an economic value for the environment.

This research piece therefore will gather, examine, and analyse the five dimensions of change that are required to create an ecological paradigm shift. This helps to provide better qualitative goals for evaluating the EU and US’s capabilities that are needed to create long-lasting emissions reductions. This also helps to define a rational ambition for climate policy in the US. The US is unlikely to embark down

a policy-path that is damaging to US economic interests, so this time of framework helps to direct American climate policy studies towards a complementary pathway for emissions reductions.

3.4 Conclusion

Taking ideas as the initial cause of catalytic change does not dispute the influence of interests nor individual agents in the political process. Instead, focusing on ideas allows one to differentiate between the creative capabilities of individuals versus the vested corporate interests that oftentimes arise in the climate policy process. An ideational approach expands climate research beyond the typical interest investigations that exist in political science, and brings a new positive contribution to the analysis of how institutions must change in response to the challenge of climate change. Taking an idealistic approach provides a deeper understanding on the framing of climate change policy, as well as the nature of the human capacities that are needed for increasing the capability of institutions when seeking to adapt to the challenge of climate change.

When using a historical institutional lens from this ideational perspective, ideas then become a critical area of investigation as they are what influence actors to make the choices they do. As this thesis investigates climate change, the conceptualisation of how actors view climate change becomes increasingly important. Paraphrasing Blyth, these ideas must define both how climate change affects, “what the economy is, how it operates, and the place of the individual or collectivist within the economy,” (Blyth, 2001, p.3). This research therefore specifically seeks to examine the impact that climate change ideas have had on the process of institutional adaptation.

Chapter 4. Constructing the conceptual framework and research methodology

When seeking to conduct a comparative investigation that tests the impact of ideas on policy outcomes, it is imperative to develop a framework that will allow the researcher to identify meaningful differences within institutional change. The theory provides a strong lens for understanding why the importance of ideas and change are important, yet there still needs to be a strong framework for the empirical analysis of this research piece. As such, a critical component of this work is developing a framework for the comparison of carbon policies in the EU and the US.

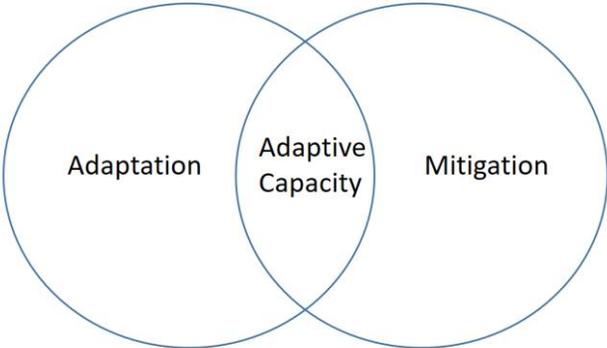
This chapter seeks to both develop and more clearly define the areas of investigation that will be used within this research piece. It acts as the conceptual design of the broader research piece, and organizes the areas of investigation to be used in the comparative analysis of carbon policy in the EU and the US. The framework shows how carbon policy reflects a systemic investigation of climate mitigation policies. With a clear understanding of what specifically defines carbon policy, this thesis then moves to outline the research methods that can be used to better understand how institutions are adapting to climate change. By the end of this chapter the reader will have a strong understanding of how tool choice, design, and goals can be compared to better understand the paradigm shift that has occurred in the EU but not US.

4.1 Defining the area of investigation

As shown by the literature review, climate change research today contains an intricate coordination between various dimensions of academic research. Despite the subject being new, political scientists have produced a high quantity of research that touches upon the various dimensions of climate policy, which points to the need to revisit how these studies are approached. Today, these research investigations are

most generally separated into two main areas of investigation: climate adaptation and climate mitigation studies (IPCC, 2007, p.141). These two subfields of climate change policy complement each other, but are generally separated due to their different time dimensions, and thus, differences in policy design (Klein, Schipper, Dessai, 2005, pp. 579-588). Adaptation policies are “initiatives and measures [undertaken] to reduce the vulnerability of natural and human systems against actual or expected climate change effects" (IPCC, 2007, p.86). These measures are likely to be considered short-term, focusing on what nations are doing now to reduce the impacts of climate change effects in the next one to four years. Adaptation policy investigations focus on the immediate damage that result from climate change and as such, focus heavily on procedures, such as vulnerability studies, risk assessments and strategies, or infrastructure protection policies (Wellstead and Stedman, 2014, pp. 999-1010). Contrarily, mitigation measures consist of actions to limit the magnitude or rate of long-term climate change (IPCC, 2007, p.225). These policies tend to have twenty year outlooks, but can be shorter. The fundamental differences of the areas are that mitigation studies look to see how to reduce the causes of climate change whereas adaptation studies seek to understand how to reduce the impact of climate change. This research piece focuses on mitigation policy, in that it looks at the tools that are taken to help move the two areas towards low-carbon economies (therefore looking at how to transition away from the use of fossil fuels, the cause of climate change).

Figure 3: Adaptation, mitigation, and adaptive capacity



Source: Derived from UNFCCC, 2016

Although the two areas of adaptation and mitigation are traditionally separated there is now significant interest in exploring the inter-connectivity that lies within adaptation and mitigation techniques. This is referred to as the “adaptive capacity” of nations (Wellstead and Stedman, 2014, pp. 999-1010). The adaptive capacity of a government, or policy-area, connects mitigation and adaptation measures by looking at the nature of change institutions have gone through. Adaptive capacity is the “ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies, (IPCC, 2007a, Section 17.13.1). These adjustments must “enable sectors and institutions to take advantage of opportunities or benefits from climate change” (IPCC, 2007a, Section 17.13.1). Here, governmental rules and structures specifically are needed to “promote the adaptive capacity of society and allow society to modify its institutions at a rate commensurate with the rate of environmental change” (Gupta et al, 2009, p. 457). Although this study focuses on mitigation, understanding the likelihood of policy mitigation goals being achieved depends heavily on the role of institutions and how they change. Therefore, this study looks at mitigation goals but also provides an analysis on the adaptive capacity of the EU and US governments.

Mitigation studies, although separate from adaptation studies, still contain a wide variety of research aims that are rarely divided amongst themselves. However, for the purpose of this study it is important to strictly clarify the area of investigation. Mitigation studies as a whole focus on addressing the causes of climate change, and therefore focus on a few main actions that institutions can take to help incentivise the societal shift towards a low-carbon future. These include shifting towards renewable energy policies, increasing the capacity of storing carbon (carbon sequestration), and actions that can counteract carbon emissions such as deforestation (carbon off-setting). Still, each of these areas are specific and can be seen as different because they require different types of policy actions. For example,

deforestation is a heavily environmental issue, whereas shifting towards renewable energy sources are clearly an energy issue. Therefore, identifying the types of tools that are used for moving society as a whole together requires using tools from environmental policy, economic policy, but also energy policies.

Rather than focusing on individual aspects of policy- energy, environmental, or economic-this thesis seeks to analyse all three dimensions. The combination of all of these policies is what this thesis refers to as carbon policy, or the inclusive measures that are used to shift society towards a low-carbon future. It is important to note the all-encompassing focus on low-carbon legislation because it impacts the outcomes, or goals, of the policies investigated within this dissertation. Although mitigation goals broadly look at how to remove greenhouse gases from the atmosphere, this specific research stream looks instead at how to shift society towards a low-carbon future and what institutional changes need to be made across energy, environment, and economy to do so.

4.2 Developing a carbon policy taxonomy

This thesis seeks to test the impacts of ideas on policy-choices, mainly to show that strong ecological modernisation is impactful in driving the changes that are needed to support societies as they adjust to climate change. However, in order to understand how ideas can impact policy-choices it is first imperative to define and understand the range tools that policy-makers are able to choose from when seeking to achieve carbon policy success.

Carbon policy itself is a relatively new topic, and is evolving rapidly. With increasing interest in addressing climate change, nation-states and non-governmental actors are heavily focused on achieving success in carbon policy. Governments are now facing many policy options, which are intricate in design and

function, and also in how they interact with existing policy designs. Although carbon policy is typically investigated from an economic perspective, the policy dimensions involved make it an attractive area of investigation for studies that are more policy oriented (Helm, 2008, pp. 211-238). The IEA now defines carbon policy as the different climate policies used in putting countries on a low-carbon growth path (Helm et al, 2003, pp. 438-450).

When choosing to create mechanisms for passing policy, policy-makers are usually faced with a range of options they can use when hoping to solve a public problem. Political scientists and economists alike, specifically those involved in policy studies, seek to understand what tools are available to policy-makers, and why policy-makers favour choosing the tools they do (Majone, 1989). Both political scientists and economists believe that there are particular ways to categorize tool tools, and believe that in doing so, they can better understand more about the choices behind these tools themselves, but also in the effectiveness of these choices. By forming a stronger understanding of how policy tools function, political scientists hope to be able to understand the errors in policy-making in the past.

In order to judge the effectiveness of policy, political scientists generally begin organising tools into what are referred as “tool taxonomies”. Earliest forms of policy taxonomy approaches began by researchers looking to best understand how governments could manipulate policy processes through symbols, signs, etc. By the early 1980's, taxonomy approaches had transformed into becoming a critical aspect of sound research methodologies (Howlett, 2005, pp. 31-50). Lester Salamon led the efforts to more narrowly define the categories of tools that governments could choose from. With extensive input from economists, he looked specifically at organizing how to group tools together in a manner which allowed researchers to reflect upon the “type, quantity, price, or other characteristics of goods and services being produced in society,” (Howlett, 2005, pp. 35). This was important for

establishing more rigorous methodologies within political science investigations.

These main types of tools used in climate mitigation studies generally fall into the informational (or persuasive) category, cooperative means, economic tools, or regulatory policy tools (Schmitt and Schulze, 2011, pp.1- 27). These main types of tools are the means through which governments how to achieve climate mitigation goals. Regulatory tools, which are often referred to as command and control tools in environmental policy, directly limit the actions of polluter. In this instance, the state sets the exact limits that industry members are forced to comply with and then sets penalties or fines for non-compliance. Economic, or market-based, tools use markets, price, and other economic variables to provide incentives for polluters to reduce or eliminate negative environmental externalities. Cooperative tools are negotiated agreements between the private and public sector in which firms can volunteer to participate. Informational tools are mainly used to spur behavioural change by providing information to industry members or citizens. The assumption behind informational tools is that the more aware society members are of their impact on the environment, they will naturally be incentivised to change their behaviour.

The different tools themselves require a different amount of participation, i.e., on the part of the state (Bressers, de Bruijn, Lulofs and O'Toole, 2011, pp. 187-208). Regulatory tools require the largest amount of state influence in that the state is required to set the rules for playing for industry members. Economic incentives require less, in that they generally rely heavily on the private sector (or market forces) to create change, as opposed to governmental "rule-setting", yet a certain degree of governmental guidance is needed to define the goals of these policies (Bruijn, Lulofs and O'Toole, 2011, pp. 187-208). When looking at voluntary or cooperative agreements, there is generally the same out of state intervention required as in economic instruments. Traditionally, informational tools require

the least amount of government intervention; when using persuasive measures very rarely is the state called upon to help spread information (Hall and Taylor, 1996, pp. 936-957). However, it is important to note that these conclusions have been made in regards to environmental policy and are not specific to climate change.

4.2.1 A carbon policy taxonomy

This typology provides the general framework for understanding the basic types of tools that governments are able to use for developing environmental policy in general. Within these four dimensions governments then create more specific tools that address specific environmental concerns. Often, several tools are combined in a tool mix formulated to address a certain environmental problem. Since environmental issues often have many different aspects, several policy tools may be needed to adequately address each one. Tool mixes must be carefully formulated so that the individual measures within them do not undermine each other or create a rigid or cost-ineffective compliance framework (Jordan et al, 2003, pp. 355-574). Overlapping tools lead to unnecessary administrative costs, making implementation of environmental policies costlier than necessary (Howlett, 2009, pp. 73-89).

We can examine the four main measures of environmental policy, regulatory, economic, cooperative, and voluntary measures, to gain a better understanding of the basic means that policy-makers may use to address a policy problem. By gaining a better understanding of the sources with which government agents can draw upon, one can better understand the presumptions that lie behind individual policy tools. For instance, while a carbon tax is a specific tool, it can also be considered part of a larger “toolbox” of economic or market-based tools. By moving to investigate the main sources that environmental policy tools originate from, we can also better understand some of the assumptions that lie more broadly behind specific policy tools.

Informational (persuasive) tools refer to any type of knowledge data information that is used for decision-making processes. Informational, or persuasive, tools attempt to influence the public's actions by giving information to the citizens. The presumption that lies behind informational tools is that citizens will change their collective behaviour if they are given facts about the environment (Schmitt and Schulze, 2011). For instance, these may include specific quantitative targets on emissions reductions, or more broad information, like informing citizens. For carbon policy, public disclosure agreements are recommended as useful examples of informational tools (Gupta et al, 2007). However, what specific or necessary information points have proven to be effective are less well-researched. Therefore, this thesis will pay particular attention to the more granular types of information that the EU has used to inform its citizens on the importance of a low-carbon future.

Cooperative tools seek to address the gap that exists between actors and the state when trying to reach policy goals. These types of tools often work between government and industry, and act as mechanisms to support industry achieving government mandated goals (Bressers, de Bruijn, Lulofs and O'Toole, 2011, pp. 187-208). Cooperative tools often aim to create arrangements that are economically beneficial for the private sector, yet incentivise behaviour towards government standards. These tools are generally attractive, and have a history of moving industry towards new technological improvements. It is worth noting that within carbon policy, the UNFCCC recommends that any mutually-agreed arrangements include targets that consist of a baseline scenario and a formal monitoring provision (Gupta et al, 2007). This work will investigate the stringency and ambition of cooperative tools to judge their effectiveness. (Gupta et al, 2007, pp. 459-471). Without such, the tool will lack the substance needed to spur the change in technology.

Regulatory tools seek to create limitations on actors' behaviours. They have a high degree of government involvement, and are generally used to give specific measures of behaviour- what people can and cannot do. Regulations and standards provide a certainty of emissions levels, but "their environmental effectiveness depends on their stringency" (Gupta et al, 2007, pp. 461). In carbon policy, taxes and charges are normally the two most common types of tools used. They are generally used to force behaviour change by requiring industry to collectively pay a tax on carbon emissions. For example, a 2% carbon tax would work in the same way that an income tax normally does. Anyone who is producing carbon emissions would pay 2% as part of their profit-sharing tax.

Taxes and charges are generally viewed as being very effective in terms of cost (little cost to implement, possible to generate high revenue) but cannot necessarily guarantee a particular lowering of emissions (Gupta et al, 2007, pp. 459-471). It must be noted that these taxes have been found politically difficult to implement, and also to make any type of further adjustments to. This is associated with the amount of access anti-tax groups have on the environmental policy process (Gupta et al, 2007, pp. 459-471). It is also noteworthy that these taxes are found to be effective only when there is a high amount of stringency, or a large regulating body (Helm et al, 2003, pp. 438-450).

Economic based tools, or market-based tools, use markets, price, and economic variables to provide incentives for actors to reduce or eliminate negative environmental externalities. Unambiguously, economic tools use the market-based coordination of environmental values to influence an actor's behaviour in both the private and public markets (Jordan et al, 2003, pp. 355-574). Although economic tools appear to be private sector-oriented, the state itself actually is very important

for economic tools. By setting economic incentives as price signals, the state acts as the initial cause when promoting behavioural changes.

Table 3: Carbon tool typology

Tool typology	Specific tool type
Informational	Public disclosure information
Regulatory	“Command and control” techniques- directly limiting carbon emissions
	Pricing mechanisms (price floors or ceilings)
Economic (Market-based)	Flexible pricing (non-governmental intervention)
	Subsidies (direct/indirect)
	Phase-out subsidies (of renewable energies)
	Taxes and charges
	Tradable emissions quotas
	Negotiated agreements
Cooperative (Voluntary)	Tradable emissions quotas
	Public-private partnerships (for efficiency increases)
	Targets for emissions

Within economic or market-based tools, the IPCC details five main types of tools that may be used within carbon policy: taxes, full-cost pricing, subsidies, phase-out of subsidies, and tradable emissions quotas (Gupta et al, 2007, pp. 459-471). Tradable permits are the most popular and politicized method of carbon policy. These tools work by effectively creating a commodity out of carbon by giving value to the carbon that has been emitted into the atmosphere (Helm et al, 2003, pp. 438-450). These permits work to establish a carbon price, which is based on a specifically allotted amount of emissions, which in hand determines the environmental effectiveness of the permits (Gupta et al, 2007, pp. 459-471). However, there is considerable debate as to what is the most effective strategy for pricing carbon emissions. On one side, some argue that the most effective way for

reducing emissions to set a clear price on the cost of emissions. This type of strategy would require the government to set an unfluctuating cost of carbon, or at the minimum to set a clear floor or ceiling as to how high or low the price could fluctuate. Industry tends to argue this point, saying that this is more closely related to the concept of a regulation and the market set should be left to its own devices. Here, the invisible hand of the market would be the best device for causing price changes to occur.

There are two forms of subsidies (direct and indirect) that are provisions given by the government in exchange for use or non-use of a good (Gupta et al, 2007, pp. 459-471). These funds are given directly by the government to either private individuals or, more likely, private industries or firms. However, the definition of subsidies can vary depending on which industry they are allotted towards. A subsidy in general is defined as “money granted by state, public bodies, or governments to help decrease prices of commodities (Helm et al, 2003, pp. 442). For environmental policies, these moneys are cash stimulants used by governments in order to encourage the development of new technologies that are typically less carbon-heavy (Helm et al, 2003, pp. 438-450). Most commonly subsidies are issues for lowering the use of fossil fuel, or for agriculture (Gupta et al, 2007). Subsidies work by giving monetary assistance to a specific sector or producers to prevent the decline of the industry. For instance, in agriculture, an industry that is suffering due to the increased effects of weather, subsidies are given to farmers to maintain price during non-growing season. When discussing fossil fuels, subsidies generally refer to governmental funding that is given to industries to encourage to encourage research for alternative energy developments.

Although the initial costs are likely high for subsidization, these financial incentives have been noted as a key tool in helping overcome the obstacles that

act stand in the way of new technology being dispersed in the global political economy (Jordan, Wurzel, and Bruckner, 2003, pp-179-200). Providing tax breaks and other benefits for firms helps them to save financial resources and encourages them towards increasing efficiency in production, thereby reducing CO₂. Increasing the technology that can help to reduce existing carbon within the atmosphere is an important part of mitigation strategies. Although technology may not exist now, developing further technologies that can help to reduce existing carbon in the atmosphere is a key way to increase further ambition within carbon policy. Energy resources also require technical development, specifically renewable energies. Although the technology exists to produce the energy, storing the energy itself is currently a problem.

All of the tools discussed above positively impact carbon levels, but many other policies can actually result in the increase of carbon levels. Trade and Development Assistance, or non-climate policies, are indirect policies that will effect climate change. Trade policies are the largest of impactful policies on climate change as often times these are formed between nations, and will push for an increase in transportation needed for the increased production of goods. These policies may not be specifically directed at emissions reductions, but may have significant climate-related effects (Gupta et al, 2007, pp. 459-471). Trade policy often seeks to increase productivity, which requires an increase in energy production and thus, higher carbon levels. These policies can also include negative effects, such a trade agreement that does not provide strong enough environmental stipulations.

Exploring tool taxonomies from a generic standpoint to the more specific climate taxonomies identifies the resources a government has at its disposal. At the same time, this taxonomy shows the nature of how tools are intended to achieve policy goals. Grouping them together in a concise manner therefore helps to clearly show

what types of choices generally face policy-makers in the carbon policy arena. However, as this thesis focuses on policy outcomes, and how choices influence the success of policy outcomes, it is now important to define exactly what these instrument tools are used to achieve.

4.2.2 Carbon policy targets, ambitions, and goals

The carbon policy taxonomy as explained above shows how individual policies can be gathered together in order to form deductions about the general means that governments use to create carbon policy. Whilst policy-makers in general attempt to create successful policy, meaning that their policy recommendations will cause lasting change, carbon policies have a much more specific end goal. Strong and weak ecological modernisation are specific strategies used to influence policy outcomes that are related to carbon. Yet what these specific outcomes are tend to be disjointed when looking amongst the various fields of economic, environmental, and political science literature. Instead, connecting these fields to form an encompassing understanding of what carbon policies should seek to achieve will also help to form a more solid understanding of the impacts that governments should be seeking to create today.

When discussing targets in climate mitigation policy, a target generally refers to the emissions reductions levels that states look to achieve by a specific point in time (C2ES, 2016). A target can refer to the specific volume of emissions reductions needed (thereby representing a percentage of reduction), or it can indicate a volumetric level of carbon that is indicated by a year. For example, a country may look to reduce their emissions to 1997 levels by 2030. This could also be expressed in terms of percentage reductions, i.e. reducing the amount of carbon emitted by 20%. The year to which the country intends to return is generally referred to as the baseline (Stern, 2007). The higher the goal, or further back the year in baseline, the more ambitious the target is. The combination of the baseline and target can be seen

as a governing bodies overall climate ambition, i.e. how by which year and by how many tonnes of carbon does an area seek to reduce? The higher the year or more intensive the carbon, the more ambitious the policy is likely to be. Although these quantitative goals should be used as a beginner indicator of monitoring progress on carbon mitigation, it would be also helpful to have qualitative goals to add alongside these am. However, this requires better understanding existing viewpoints that are currently used to define carbon policy success.

From an economic perspective, the end goal of carbon policy can be considered a low-carbon economy. This end point was originally derived from a natural science perspective which states that human-induced climate change is happening and the only way to avoid the impacts is to move towards an economy that relies on a minimum amount of fossil fuel usage for economic production and consumption (Stern, 2007). From this perspective, the goals of a low-carbon policy are two-fold: first, to create market-based schemes that internalise the costs of greenhouse gas pollution, generally through a carbon emissions trading scheme or through a carbon tax (Stern, 2007). This is based on the assumption that polluters should pay a price for the costs of their polluting activities. Secondly, the goals of a low-carbon policy have traditionally called for a dramatic increase in public spending on research into technologies and practices to mitigate pollution (Stern, 2007). We can see how these definitions of success can match to specific policy tool dimensions, i.e. the economic perspective. However, this negates to include what the broader goals for society will be. Although deploying new markets and technology seem to be a useful aspect of society, this standpoint is not useful if the correct people are not in place to know how to operate environmental markets, nor know which technologies are critical to the future. Therefore, success of a low-carbon economy should go beyond this to include a broader societal notion.

Combining the economic viewpoint with the existing literature from a political science perspective helps to more holistically define carbon policy goals. Here, the definition for success tends to refer to “strong internationally-agreed reduction targets which lead to a significant increase in the price of polluting activities,” (Martin, 2006, p. 8). This perspective builds slightly on the economic dimension as defined above by adding in the stipulation for international policy agreements, therefore indicating that both a carbon trading scheme and/or tax are needed for success, yet so are international agreements on carbon emissions. However, this definition still leaves out the role of the individual. This perspective points to the role of both technology and institutions, yet leaves out what the role of general society should be when working towards a low-carbon future. Instead, one can look towards a more sociological perspective in order to holistically understand what carbon policy success needs to more holistically entail.

From the point of a sociologist, transitioning to a low-carbon society also requires “understanding [of] community practices and their resultant emissions, as well as the technologies, infrastructures, and institutions” that are associated with the transition to a low-carbon economy (Moloney, Horne, Fien, 2010, pp. 7615). Furthermore, a sociological perspective emphasizes understanding the connections between these components and emphasizes the importance in understanding the behavioural change that is necessary to influence a reduction in citizens’ environmental footprints. This perspective champions the notion that success in carbon policy should include a society that is supportive and concerned with mitigating the risks that stem from climate change (Moloney, Horne, Fien, 2010, pp. 7614-7623).

Therefore, when considering strong and weak ecological modernisation as strategies for change, one can conceptualize the end goal of ecological modernisation as more specific outcomes of success in carbon policy. One here can

see that economic instruments must be deployed. It is also evident that international agreements need to be considered a critical part of low-carbon policy success. Yet lastly, having a more informed and aware citizen base is also a critical success of carbon policy. Therefore, rather than thinking in fragmented terms, it would be better to view success of low-carbon policies in a manner that aggregates all three of these viewpoints. Success for a low-carbon economy should be defined as a society who has overall shifted towards an environmentally-conscious economy, where the cost of the carbon is accounted for either in a voluntary or regulated manner; where progress on emissions is monitored, reported, and revised in accordance with international demands; and where general citizens have the knowledge and capability to make decisions that will reduce their carbon impact on the environment. This thesis therefore adopts this notion and looks to see what type of strategy has been more effective in driving the institutional evolution of broader societies towards a more carbon-considerate economy.

4.3 Research Design and Methods

Locating and defining carbon policy within broader mitigation studies helps to differentiate the area of examination from adaptation studies. Yet doing so also shows how this research investigation provides insights useful to adaptation studies. However, better defining and narrowing the focus of carbon studies within broader climate studies helps to form a more accurate base for comparison. The conceptual framework outlined above provides an analysis of the tools, or tools, that governments are able to use to address carbon policy. By gathering and examining the tools between the US and EU between 1992-2012, I can more clearly analyse if change in policy tools and a change in policy goals has occurred. This empirical analysis identifies where the location of the policy is proposed, (i.e., at what level and on behalf of which specific agency) and also the degree of ambition in the policy goals. This allows me to analyse if change has indeed occurred at the first two-levels needed to show that governing bodies are adapting to address climate change. The framework defined above organizes and locates

the carbon policy research area so I can identify if change has occurred in regards to the type of policy tools proposed and implemented, and also in regards to the degree of ambition for policy goals. Paying particular attention to the diversity and innovation of the tools will allow me comment on how different ecological strategies impact these two types of changes.

In order to fully understand the institutional changes that are needed to support societies as they move to address climate change, it is necessary also to compare the change in policy paradigms and changes in the role of the state. The empirical analysis of this dissertation will also give an indication of the change in actors and agencies that were responsible for implementing carbon policy. This will allow me to identify if there has been a change in actors and responsibilities. By then moving to trace the evolution of these particular agencies, I can better understand the institutional changes that are needed to support increasingly innovative policies (as displayed by the EU). At the same time, doing so also helps to identify where institutional barriers may have blocked innovative policy from being proposed in the US. However, in order to comment accurately on the paradigm shift needed to support climate mitigation goals, it is first imperative to get a clear understanding of how the ideas of ecological modernisation are able to impact change.

4.4 Hypothesis

There are several hypotheses that I will test within this thesis, but central to them all is the argument that climate change ideas have been a fundamental factor in driving the evolution of European institutional structures and norms. Knowing that leadership is a critical component of achieving climate mitigation goals, and therefore, creating carbon policy, this thesis therefore proposes that the set of ideas that the EU has adopted to use in carbon policy has been more fitting to the policy-demands of climate mitigation policy in general. This thesis therefore focuses on

the EU as an intellectual leader and seeks to understand how the EU's ideological approach to climate change has caused institutional changes. I therefore, also propose that the US's ideological approach to climate change has been insufficient for spurring domestic institutional change.

I begin with the proposition that if strong ecological modernist ideas are prominent in the carbon policy arena, then one would expect these ideas to influence decisions taken at critical junctures to reflect an institutional, democratic, and communicative approach to climate change policy. As such, we can hypothesize that if a set of ideas that comprise strong ecological modernisation are present, and remain so, one would expect to see changes in the ambition of carbon policy goals. This would be due mainly to the assumption that strongly coordinated responsibilities for climate change reductions are more likely to result in meaningful changes than a bottom-up approach to carbon policy. My hypothesis mainly centres around the fact that having a coordinated and overarching commitment to carbon emissions reductions that is informed by international dimensions is more likely to result in ambitious policy simply due to the ease in coordination that I believe interacting with the UNFCCC causes. Carbon policy is a new topic, one that requires intensive monitoring to ensure institutions are adjusting at a rate that is sufficient for avoiding the negative impacts of climate change. The difficulties in ensuring individual progress meets global standards is simply too taxing for individual governments to coordinate themselves. Instead, I suggest here that engaging with the UNFCCC has been critical in helping the EU to coordinate, monitor, and revise their reductions targets, which has led to its ensuing incremental changes. This "top-down" approach, where the EU gets its information from the UN to form recommendations that are then given to its key stakeholders is a better approach for causing institutional adaptation than the weak approach.

Contrarily, I hypothesize that the bottom-up approach is simply too difficult for an individual nation to effectively address on their own. Here, I predict that the lack of coordination with the UNFCCC has resulted in a lack of understanding of climate change and its impacts as a whole in the US (mainly due to the lack of scientific engagement). I estimate that taking a bottom-up approach means that climate change remains an environmental issue, not a societal issue, and instead, climate change then has to compete with other critical agenda items. Furthermore, I hypothesize that the weak approach the US has used has failed to cause organizational changes in the US government.

Overall, the main hypothesis that I test refers to the coordination of information. My main hypothesis is that strong ecological modernisation is a much more effective set of ideas for tackling the complexity of climate change than a weak ecological modernist set of ideas is. I assume here that a strong approach leads countries to engage in the international arena, monitor their progress, and revise their institutions accordingly. With a weak idea my estimation is that countries engage in the international arena with little to no consistency in terms of their representation, fail to monitor progress, and instead, institutions remain stagnant as there is no convincing numerical case shown to broader governmental institutions. This is because without a clear agency to coordinate the data, different agencies will compete to manipulate data in a way that presents the best benefit for themselves. For instance, an environmental agency is likely to forecast that harsher reductions are needed whereas an energy agency may be more likely to recommend weaker targets and recommend instead, focusing on funding a new low-carbon technology. Part of my hypothesis rests on the suggestion that the US government is increasingly fractured in its decision-making and the need for a non-biased source to independently report on progress in the US. I surmise that US institutions are increasingly unable to form consensus on issues, and are less likely to do so on an environmental topic. I believe that the increasing partisanship of the US has made it difficult to address climate change, and a new set of ideas are needed to create a

convincing case as to why it is important for governments to immediately address climate change.

My main hypothesis is that the EU has been able to create tangible, material evidence of its commitment to climate change due to the presence of strong ecological modernist ideas. I identify key actors that further moulded and promoted this idea, and examine how they framed policies so that all stakeholder groups saw some sort of economic benefit that could be derived from the environment. I specifically propose that the EU's internal platform of support for strong ecological ideals helped the EU to demonstrate value for compliance with industry members, increase public support, and maintain engagement with scientific community members. I anticipate as a result of this extensive stakeholder interaction, the EU was able to propose an increasingly diverse array of tools for climate mitigation, and thus, change in the system occurred to support its goals. I hypothesize that the changing role of the state in the EU has led directly to the emergence of its institutional capabilities.

Table 4: Predictions of the hypothesis

Changes that countries must display to show an ecological paradigm shift	<i>Strong Ecological Modernisation</i>	<i>Weak Ecological Modernisation</i>
Change in policy ambition and goals	Uses international-levels of governance to inform decision-making; more ambitious policy results	Continues to use fragmented domestic data to coordinate targets; clear targets for reductions do not form; ambition remains the same
Change in policy tools	Causes change in policy tools to occur: shows increasingly diverse array of tools or introduces new policy tools	Does not incentivise change in policy tools: policy tool type remains the same, no new policy tools are introduced
Change in policy goals	Causes a change in policy goals (more ambitious goals and targets)	Does not cause a change in policy goals (no change in ambition nor targets)

Change in the hierarchy of policy goals (moving from environmental to overarching strategy for development)	Causes climate change to become a central story in economic development	Climate change remains an environmental policy issue; competes with economic issues
Changes in the role of the state (power/responsibility in decision-making allocated in regards to climate mitigation goals)	Causes a change in the power allocation of climate change decision-making capabilities	Does not cause a change in regards to power allocation for decision-making, failure to produce climate change policies and/or display effective carbon emissions reductions

Contrarily, considering the US's uncertainty in global emissions reductions efforts, one can also expect that the idea of weak ecological modernisation will fail to spur institutional adaptation and the achievement of climate goals in the US. Considering that this approach focuses on a technocratic and unitary approach to carbon policy, we can hypothesize that if this idea is present at critical junctures, it may be able to influence negotiations during the junctures, but it will not result in institutional changes. I expect that this idea fails to result in a change in the ambition of policy goals, which therefore, fails to spur the need for innovative policy tools. As a result, I expect that this idea will not lead to institutional structural changes, nor in the climate policy-paradigm in the US. I therefore test the notion that when such an idea is present, actors and governmental structures remain unchallenged, unimproved, and static. Instead, I hypothesize that this approach fails to produce institutional adaptation.

Throughout the dissertation I also test specific sub-notions that all relate to the impact of the ideas of strong and weak ecological modernisation on the carbon policy process. In the US, I speculate that there are specific governmental structures, and policy may block climate policy from becoming an agenda item in the US. Overall, this research seeks to understand the differences in institutional changes that strong versus weak ecological modernist ideas have had on climate mitigation policy. This dissertation specifically seeks to understand and compare

the incremental changes in the US and the EU in order to understand the capabilities of American and European institutions in supporting societies as they adapt to address climate change. By focusing on the demands of international science as outlined at critical climate junctures, this thesis will also focus on analysing the large and incremental changes that are needed for institutional adaptation.

Overall, this research will show the differences in institutional changes that strong versus weak ecological modernist ideas have had on climate mitigation policy. This dissertation specifically seeks to understand and compare the incremental changes in the US and the EU in order to understand the capabilities of American and European institutions in supporting societies as they adapt to address climate change. By focusing on the demands of international science as outlined at critical climate junctures, this thesis will also focus on analysing the large and incremental changes that are needed for institutional adaptation.

4.5 Methodology

Historical institutionalism provides a useful theoretical lens for understanding change in climate mitigation policy. This section outlines the research design and method used in this thesis. The hypothesis proposed requires a concrete analysis of institutional development over time. This will require both comparing and analysing empirical evidence related to carbon policy tools. Therefore, this thesis adopts comparative historical analysis as a method for understanding the substantive differences in the nature of carbon policy in the EU and the US.

Comparative historical analysis, combined with an institutional lens, allows me to systemically examine the formation and influence of climate change ideas in the EU and US. In doing so, I can examine the causal affect that relates to the ideas, ambition, and goal levels put in place, compared to the actual outcomes of policy

achievement. This lens mandates the analysis of actors' capabilities as compared to policy-demands. Understanding the historical setting at the time lets me comment on how pre-existing notions and the overall economy can impact actors in the policy-arena. This methodological lens directs the investigation towards policy-choices to understand how pre-existing bias influenced policy-decisions. Assessing the organisational changes and structural adjustments made to support the policy allows me to understand the degree to which ideas impacted change. However, this requires a concrete methodology to provide the reader with confidence in the conclusions drawn here.

Combining the comparative historical analysis with most similar systems designs methods is useful for analysing two jurisdictions that exhibit such strong similarities, yet have ended up in such different places. Although the EU and the US are united in discussions within the UN, one has implemented a trading scheme, while the other has not developed a scheme or a tax. This method lets me focus on controlled variables of different ideas and examine how these influenced institutional path developments in relation to climate mitigation leadership pledges. Commencing with the investigations of the discussions that stemmed from the Earth Summit in 1992, and finalising with the expiration of the first carbon emission deadlines in 2012, this thesis will examine how divergent ecological modernist approaches contributed to specific instances of policy change. This will provide a more accurate understanding of how each of the systems responded to the new policy challenge of climate change. This will address the lack of qualitative understanding between climate change goals, carbon policy tools, and institutional design, as needed for effective carbon mitigation policies.

Understanding the impact of ideas on policy-choices requires having an accurate analysis of how actors thought at specific times in history. I therefore, also use process tracing, and specifically the interview process, to better understand the

impact of ideas on policy-choices. By investigating the role of governmental structures, the influence of epistemic community members, and the role of non-governmental organisations, I am able to understand both the influence of ideas and interests (or of individual actors and groups) on the policy-process. This allows me to gather a more in-depth analysis of how the pressure for change affects governmental systems differently, and also allows me to compare the capacities and capabilities of policy-makers in the US and EU in carbon policy.

Analysing the notion of change through ecological modernisation points to specific dimensions that must be analysed in order to understand how a country is embedding environmental considerations into its development path; policy tools, policy goals, policy paradigms, and changing responsibilities of the state. The methods outlined below will provide the reader with a concrete understanding of how to locate, identify, and understand the degree to which ecological modernist ideas contributed to the institutional adaptation of the EU and the US.

4.5.1 Comparative historical analysis

The centrality of this research piece is the comparison of the EU and US. At the beginning of a comparative investigation it is necessary to “develop a set of guidelines in which one is able to form a plausible deduction of the similarities and differences between societies,” (Gerring, 2011, p. 3). Focusing on macro-societal aspects of social analysis, comparative politics are a useful method for evaluating transnational relationships (Gerring, 2004). Despite not being a specific method of measurement, the deductions that result from comparative politics have often formed the basis for initial commentary needed for in-depth empirical research (Gerring, 2011). Often focusing on cross-societal, institutional, or macro aspects of politics, comparative politics have a methodological base ingrained in its very essence (Gerring, 2011). This analysis naturally requires at least two areas to

compare in order deduce on the similarities or differences between two governing areas.

Comparative analysis is a method of social science that when combined with a strong theoretical lens is able to produce hypotheses on the relationships that exist between nations, and on the internal dynamics that affect these relationships (Gerring, 2011). Historical institutionalism naturally asserts variables that should be examined for their impact on the policy-process. Specifically, the theory mandates the analysis of actors, structures, and the historical context as initial variables for investigation. This creates a holistic examination of how governmental structures react to mechanisms both internal and external to the policy-process.

This analytical approach demands that this research takes into account the role of alternative options in the system to analyse the full landscape of decisions made by policy-makers (Lewis and Steinmo, 2012, pp.314-339). By examining all of the decisions made in one policy area, one is then able to deduct hypothesis on the relationships that these factors have both on the policy process and on each other. In essence, one is then able to have a firm understanding of the functioning of a political system in its entirety. In focusing on only one of these aspects, one would have an isolated understanding of a policy catalyst, but lack an understanding on the fully functioning of the system itself. By applying the theoretical lens of comparative historical analysis to the comparison of the EU and the US, the differences in institutional structures, in tool type, and in tool goals, are all included within my policy-analysis investigation.

The comparative method I adopt therefore is comparative historical analysis. Comparative historical analysis is a specific method that should be used to focus on small number of areas for comparison, in order to allow the researcher to focus on specific differences between nations or states. Using this approach is most

useful when analysing areas that are, “unified in space and/or time” (Stark and Bruszt, 1998, as seen in Thelen, 1999, p. 95). Therefore, the choices of the EU and US are important as these cases are connected in a way that will allow me to draw deductions as to how the two areas have ended up in such dramatically different places in relation to carbon management.

4.5.2 Embedded case studies

For case studies to be most effective, they must offer a specific proposition, but must be linkable to a large context for the method to work the most effectively (George and Bennett, 2005, pp. 136-138). At the same time, it is most useful to look at cases that are structurally different, specifically when organisational differences may be the leading factor in the causal differences in path investigations (George and Bennett, 2005, pp. 136-138). The outcome of this project is to understand what mechanisms have been effective in implementing carbon policy, and what mechanisms have acted as a hindrance when attempting to implement CO₂ reductions policy. However, I would also like to be able to draw broader conclusions on the nature of adaptive capacity in the EU and the US. To do so, I need to compare a governmental body that has implemented a formal low-carbon policy to a body that has not yet development a formal policy. The economic and societal construction of the areas must be similar, yet different enough that political culture differences can be investigated as a potential catalyst to change. I therefore, chose the US and the EU as they are both politically and culturally similar, but most, importantly, are similar as highly industrialized economies.

The thesis therefore begins with an assumption that is asserted from historical institutionalism, which is that ideas matter. Particularity, I defend the notion that ideas are critically important to institutional change. I specifically analyse the impact that strong and weak ecological modernisation have had on the climate policy-processes in the EU and the US. I argue that the EU’s success in achieving

and implementing ambitious climate legislation is a result of the revision of development ideals in an aggressive manner, which has resulted in an overall institutional change in the notion of economic growth. Now, the EU has transitioned to fully embody strong ecological modernisation. The diffusion of this idea in the policy-arena has led directly to the success of legislation such as a CO₂ trading scheme. Conversely, I aim to show how the stagnation of economic ideas, particularly the narrow approach to sustainable development as outlined in weak ecological modernisation, has failed to produce institutional change in the US. This has directly impacted the ability of the US to develop carbon goals at the federal level. In this thesis therefore, I will trace and compare the impact that weak and strong ecological modernism has had on the path to developing an emissions trading scheme from 1992, the first international conference on climate change, to the first evaluation of the EU ETS in 2012. Both 1992 and 2012 are observed, pivotal moments in both the international and domestic climate regimes of both the EU and the US. These twenty years give a clearly defined pathway for investigation through which I can clearly trace how divergent notions of ecological modernisation influence climate policy outcomes. Investigating the development of this particular policy tool over this time period allows me to understand how prior, existing, and changing notions of environment and economy impact the success of climate policy. This effectively allows me to understand how the concept of strong ecological modernisation translates into policy tools, and also allows me to analyse how institutions respond to the demand for change.

I use the Method of Most Similar System's Design as the major comparative strategy of my research. This method is useful because it allows for the comparison of similar areas, yet also helps to eliminate other factors that may be confusing or contradictory to the research design. This method is generally used when comparing very similar cases that only seem to differ in dependent variables (George and Bennett, 2005, pp. 136-138). This allows the researcher to identify and examine which independent variables have directly influenced the dependent

variable. As the dependent variable in this investigation is the reduction of CO₂, or the committal to a top-down climate policy, I use the structures identified in historical institutionalism as the independent variables in my investigation. At this point in the research, I then am able to initially deduct as to what may have caused differences in climate mitigation policy in the EU and US.

4.5.3 Process-tracing in case-study comparisons

Although the case study is useful in its application, it works the best when combined with qualitative, ethnographic, or process-tracing methods to draw truly innovative insights (Gerring 2004). I will therefore use the process-tracing method to ensure that the historical comparison leads to an in-depth analysis, and allows me to concretely give evidence on my proposed hypotheses. Seeking to understand the nature of change in regards to carbon policy in the US compared to the EU will let me make broad deductions on the entirety of the governing systems themselves, but process-tracing lets me draw more intricate conclusions as to the external sources that influence, and hinder, the development of effective climate mitigation policy.

Process tracing was first developed in the 1980's in accordance with the case-study method to ensure that accurate findings on processes were being determined when drawing qualitative conclusions within political science (George and Bennett, 2005). It is a method that is specifically tailored to support and investigate the process of decision-making by addressing gaps in existing historical accounts (George and Bennett, 2005). Process tracing has been noted for its advantage in exploring the causal processes; in this instance, it is useful for exploring the impact of ideas on broader climate policy ambitions. This method "attempts to trace the links between possible cases and observed outcomes", so that specific deductions can be made as to what caused the variation in outcomes to occur (Bennett and George, 2005, p. 6). The goal of process tracing is to analyse information about specific events and processes.

Process tracing works by extracting all of the observable implications of a hypothesis, instead of only the observable outcomes that can be drawn from the dependent variable, and verifying them through elite data or interviews (George and Bennett, 2005). The method "frequently involves the analysis of political developments at the highest level of government; elite actors will thus often be used for critical sources of information about the political process under interest," (Tansey, 2007, p. 4). Process tracing works best when the key political actors within the policy-process are identified through these initial empirical documents so that their involvement in the process can be verified through tracing methods (George and Bennett, 2005). These actors interact with the policy-process through formal institutions. Therefore, a critical component of this methodology is identifying actors who are involved in the policy-process and examining recorded interviews and personal documents from these various sources. As such, this thesis will investigate the role of actors from the epistemic community, nongovernmental organisations, and industry organisations, in order to understand how weak and strong ecological modernism contributed or impeded policy success at specific instances in time.

Weak and strong ecological modernisation are to a certain extent, ideas that are more often described rather than specifically referred to in the carbon policy arena. Therefore, finding existing material that relates to both topics is difficult. Instead, developing relationships with the actors identified in the empirical research will help to further substantiate my hypotheses on the impact of ideas in the American and European policy arenas.

4.6 Research Methods to Generate and Analyse Data

To begin identifying how independent variables affected the construction of policy changes, it was first necessary to formulate a clear understanding of the dependent

variable, or the degree of change made thus far within carbon emissions reductions. The empirical data collection in my research helped me to validate my initial hypothesis by comparing when specific quantitative reductions occurred, against when the specific policy tools, or events, occurred over time. This allowed me to test and compare the first two dimensions of change that are required for ecological modernisation: change in policy goals, and change in policy tools. From there, I used process tracing to better understand how specific instances hindered or helped broader ecological modernisation adaptation.

4.6.1 Documentary data analysis

I initially gathered empirical evidence from the EU first. I collected green papers, or policy discussion proposals, which helped to identify the actors who initially propose policy. These documents, which are produced for specific policy actions, list which specific actors propose policy and what the policy objectives are. This gave me a clear understanding of why policy is proposed, and also by whom. Therefore, this phase initially helped to identify specific actors that I was later able to interview and trace. At the same time, this also helped to clearly show which policy pieces were proposed so that I was then able to see if they were implemented. This was useful for identifying which motions were denied, so that I could focus on identifying the concrete legislative items that were successful in passing.

When actual legislation is passed in the EU, there are two types of legislation that may result: directives and regulations. Directives must be incorporated in Member State law, whereas regulations are immediately legally binding in all member states (Weale, 1992 pp. 594-611). The US has a similar process; policy is proposed in bills, and policy that is implemented becomes law. However, the U's process is complicated, with many specific caveats and rules that can be used for blocking and passing policy. The intricacies that specifically affect carbon policy will be discussed later in this thesis.

Therefore, by comparing policy proposals to policy that was actually implemented, I am able to see how suggested policies were able to gain authority and credibly turn into actual law. In doing so, I also can also see which proposals were not turned into legislation, and thus, identify key problematic moments along the policy pathway. I then analyse the impact of ideas at these specific moments with a variety of stakeholders. Here, I specifically sought to understand how broader events, ideas on ecological modernisation, and rules and structures have changed over time.

In order to break down the collected material, I divide the amount of material collected into two decades. From here, I then divide the tools according to tool typology as outlined in the conceptual framework. Combined with historical institutionalism's natural methodological framework, I was able to identify specific moments where I believed these ideas influenced decisions-taken in the policy process.

Table 5: example empirical data collection

Type of tool	Tool aims and ambition	Location of Tool Proposed	Action taken
Regulatory	<i>Motor Vehicle Reductions Rates Directive No 661/2009</i> Reducing target rates for industries producing outside the EU, with a focus on motor vehicles. CO ₂ emissions of vehicles produced in 2012 to be no more than 130 g/km.	Commissioner for the Environment 2009 (Margot Wallström)	Implemented

The original identification of these moments, or critical junctures, depended very much on the thoroughness of my empirical research. By surveying archival records during the time period of investigation, I could better locate and understand the viewpoints of key groups, and to identify specific individuals within them. News sources, such as press releases and archived broadcasts, were surveyed to understand the existing tensions between domestic actors, and in their interaction in the international climate arena. This helped me better formulate an initial understanding as to why certain instances may have been important along the pathway, or to question why a specific event led to a policy-failure for instance.

This dissertation therefore focuses on examining the domestic responses to international climate proposals at four different critical junctures; the 1992 UNCED conference on sustainable development; the Kyoto Protocol in 1997; the 2001 Marrakesh Accords; and the 2009 Copenhagen Conference. Each of these time periods mark instances in which I believe the EU's ideas of strong ecological modernisation helped European policy-makers choose effective carbon policy tools. I believe that these instances also show how similar proposals in the US show how a weak approach to ecological modernism was ineffective in creating the incentive to address climate change, and thus, failed to produce policy innovation. These specific moments highlight the obstacles that climate mitigation policies face in existing American institutions, but also highlight how the critical organisational adjustments made within European institutions were influenced directly by ecological ideas.

4.6.2 Interview Methods

Personally engaging with experts in the policy-process adds to the uniqueness of the insights that are drawn in this conclusion. Developing relationships with the actors identified in the empirical research helps to further substantiate my hypotheses on the impact of ideas in the American and European policy arenas.

However, drawing accurate conclusions requires interviewing policy actors in a manner that ensures the information drawn from them is both accurate and plausible.

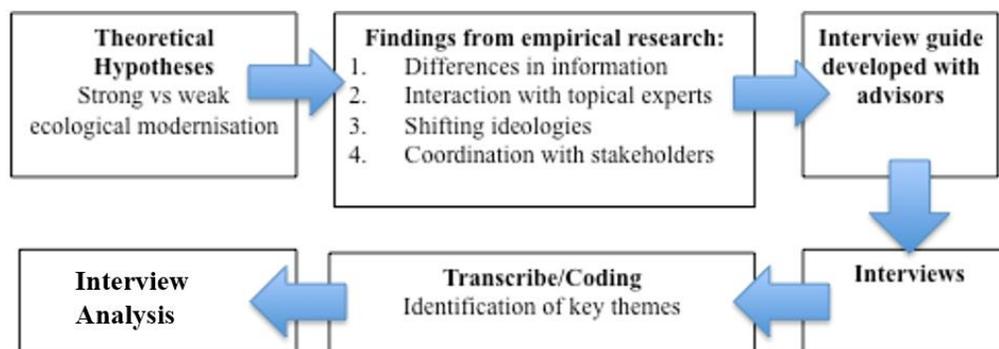
Interviewing can be defined as a conversation between two people in which one person tries to direct the conversation to get information for a specific purpose (Bryman, 1984, pp. 75-92). Different interview types have different strengths and purposes in research. Bryman (1984) divides interviews into three main types: structured, semi-structured and unstructured analysis. Semi-structured interviews are said to be the most appropriate method when it is the aim of a researcher to understand the concepts that the interviewees use as a basis for their opinions and beliefs about a particular matter or situation (Bryman, Lewis-Beck, and Liao, 2004). As such, I use semi-structured interviews for the primary data collection purpose of this dissertation. I chose this technique as it allows the researcher to probe deeper into a specific instance if necessary, yet it is noted for keeping the responses of interviewees comparable.

One aim of semi-structured interviews is to develop an understanding of a respondents 'world' so that the researcher can make effective deductions on research, but also then contribute to the field of knowledge itself. A major part of my research has been keeping "close to this world", and maintaining professional engagement with these policy-makers. At the same time, maintaining my academic research has forced me to retain knowledge of the literary and policy developments in this field. I have developed an extensive understanding of the existing gaps in the understanding of change within both European and American institutions. Therefore, I direct interview conversations in a manner that ensures that the conclusions that I am drawing are presenting new contributions to the field of knowledge. Although much is known about the EU achieving climate leadership, how they have done so is not known.

I structure the interviews with the aim to conduct analysis with a variety of stakeholders. This helps me to build a holistic understanding of how ideas have impacted how experts made policy decisions in both the EU and the US. At the same time, my professional engagement in the policy world allows me to comfortably test the actors' responses to notions that I know go against their personally held notions of either a strong or weak ecological modernist mentality; this allows me to counter-test any findings that I develop as I go through the interview process.

To ensure that the information I collect is accurate, comparable, and analysed effectively, I have adopted Grounded Theory (GT) as a specific tool for the analysis of the qualitative data gathered in the interview process. Grounded theory uses theoretical sampling, where participants are selected according to criteria specified by the researcher. I began this research project with theoretical hypotheses, which meant that I already had key factors to test in my interview process- mainly, that institutions in the EU were driven by the idea of strong ecological modernisation. The theoretical testing however, is substantiated by early empirical evidence in order to clearly identify specific individuals, locations, and instances where strong and weak ecological modernisation impacted institutional change.

Data collection and analysis in this thesis takes place in alternating sequences. This process can also be described as an interactive cycle of inductive and deductive data collection, in that it continuously compares results with new findings (Strauss and Corbin, 1994, pp. 273-285). Although I conduct the interview processes together, some are conducted earlier than others, which means that I am able to update my questions and then revisit certain interviewees with information collected in earlier interviews.

Table 6: interview methods

The early empirical and theoretical evidence therefore indicated that the following types of individuals are influential on carbon policy. This includes actors from:

1. Academia, specifically ecological economists
2. Intergovernmental organisations
3. Nongovernmental organisations
4. Lobbyists
5. Industry representatives

Within each of these dimensions, I identified key expert members that participated in the creation of carbon policy. This was facilitated through my personal professional experience in the carbon policy arena, in both the EU and the US. I worked to make sure the interviewees I worked with represented a diverse range of participants. These interviews represent academic, policy, industry, and scientific expertise on the topic of ecological modernisation, sustainable development, and emissions trading schemes. This helped me to form a well-balanced understanding of the various sources of influence on the policy-process in the EU and US, and helped to develop a wide-variety of original information (The full list of interviewees can be found in Appendix 3 of this thesis).

My questions are added to and amended while conducting the interviews, in order to ensure that more sophisticated and specific findings are tested along the way. Highlights of this process include conversations with noted climate economists and policy-makers such as Dr. Dirk Forrister, CEO of the International Emissions Trading Association and Kyoto Protocol negotiator for the US government, former DG Energy Joan MacNaughton, Senior Climate Fellow of the Brookings Institute Dr. Tim Boersma, and a leading academic economist on carbon markets, Dr. Robert Stowe of Harvard Economics, amongst others.

The questions I pose seek to understand the primary conceptualisation of European and American carbon policy, and to concretely identify what acted as a practical policy driver for carbon policy in the EU compared to the US. The interviews also help to verify the specific junctures that I use for comparing specific instances of institutional change.

In order to ask questions that shed light on the concept of ecological modernisation, it is first necessary to confirm the familiarity of the notion of the concept with the interview participant. I began the interview process by first attempting to locate carbon policy within a specific “policy sphere” of sustainable development. This meant understanding and verifying differences in the conceptualisation of the concept in the EU and the US. For instance, with European actors I began by questioning if the approach to sustainable development was limited to a sole institution or broader European institutions. Contrarily, in the US I began my questions by asking if regulatory structures or the free-market were more likely to result in ecological considerations in the economy. Following this, I kept the interview rather open ended but focused the questions on analysing the role of various institutional structures in creating carbon policy.

Conducting the interviews in this manner served three main purposes for my research. First, this allowed me to eliminate the distortion of only one variable on institutional adaptation. Secondly, this allowed me to test each of the notions associated with strong and weak ecological modernisation, to truly verify if strong and weak modernisation were in fact the ideas at the time, even if the interviewee was not familiar with this specific terminology. Thirdly, this allowed me to connect various sources of influence to particular instances in time across various interviewees. I concluded my interview process by asking interviewees to identify specific junctures in which they saw progress or hindrance in the policy process. This allowed me to then diver further analytically into specific instances with other interviewees.

Bias is always an issue in research, but as the interviews in this thesis are conducted in order to understand how an idea impacted either the EU or the US, a fair amount of bias is removed in that my questions seek to understand ‘how’ not ‘why’. In addition, each interviewee was selected based on their renowned expertise in the field and therefore, was chosen for their unique capabilities and for the lack of political bias they exhibit in the field. Finally, as this topic is political, it is nearly impossible to remove all traces of bias, yet by specifically seeking to interview people who were from the international climate arena, and external from the EU and the US, I am able to collect the thoughts of people who naturally would not be interested in shedding biased light on the EU or the US. These external interviewees are chosen for their expertise in ecological modernisation, but also for their interaction in the formal and informal decision-making processes in the international carbon policy arena.

4.6.3 Participant observation

Elite actors can be difficult to develop relationships with, and the interview process very much depends on these relationships, it was necessary for me at times to

instead attend lectures, where my questions could be addressed in an open forum. I was able to attend three conferences by invitation-only which allowed me to collect the viewpoints of three ultra-elite experts in the field. The first, Energy Day in Germany September 2015, featured a two-hour discussion on the EU ETS and featured only German economists, who are noted for their place in European climate policy; these included Martin Jänicke for instance, as well as industry members from BASF, Siemens, and RWE, EU Energy Commission Günther Oettinger, State Secretary Rainer Baake from the Federal Economics Ministry, and also Dr. Jos Delbeke, who was a key actor in my dissertation. I was able to informally ask questions, as I was an audience member, and was also able to speak with many of them briefly in regards to the EU ETS afterwards.

Prior to COP2015, I was invited to attend the LSE Pre-COP Conference where I heard panel discussions from many of the key authors that were noted in the empirical evidence as influential on EU carbon policies. Specifically, Lord Nicholas Stern was present in addition to Dr. Dieter Helm, Dr. Cameron Hepburn, and Dr. Giles Atkinson. All three of these ecological economists featured in the policy-documents analysed. The panel provided a useful discussion on the key changes made in the EU, as well as providing insights as to how the EU's climate mitigation can better be strengthened in the future.

In December 2015, I attended COP as a representative acting as an official "blue badged" governmental representative. Here, I was able to attend the confidential governmental meetings that discussed carbon markets, and the obstacles in creating global mitigation policies. I was able to discuss the incremental steps in developing climate mitigation policy with governmental officials, and was given restricted access to conversations that would have otherwise been difficult to collect information from. Here, Dr. Dirk Forrister lectured in the US tent on the need for an emissions trading scheme in the US, and the complications in passing a carbon

tax, with Dr. Robert Stowe and Dr. Joseph Aldy. This gave me a better understanding of the key obstacles in the US, but also provided me with first-hand accounts on the relationship between climate, environment, and economic policy in the US.

4.7 Conclusion

Historical institutionalism provides a solid theoretical lens for understanding the dynamic interaction between structures, norms, and society that is needed for institutional change. Taking weak vs. strong ecological modernisation as two central ideas allows me to compare and analyse the differences in impact that ideas have on climate mitigation goals. Historical institutionalism also provides a more dynamic understanding of how the various factors that influence climate mitigation policy interact with each other. The setting and norms of society are a difficult aspect of climate mitigation policy to analyse, yet they are a critical component in understanding the success and failure of policy proposals and tool implementations. By using this lens, I can better systemically analyse the changing role of institutions in promoting the coordination needed for achieving ambitious climate goals.

Applying this institutional lens to the methodological framework outlined above provides a better understanding of the interaction between many of these variables, and also in their interaction over time, thereby providing a more thorough analysis of the nature of incremental change in the EU and the US. Through the conceptual framework I was able to identify the types of policy-tools that can be implemented within carbon policy; the methods outlined above give an understanding of how these aspects are analysed in this thesis. These processes allow me to test my hypothesis in ways which otherwise would have been impossible to substantiate. The empirical evidence collected will defend the notion that the EU has had more success in making the incremental changes that are needed to support the development of climate mitigation policy; however, the interview process will

provide unique evidence as to how a weaker version of ecological modernisation actually impacts the institutional evolution of the US. Now, this research piece moves to provide the empirical substance of this dissertation, and to analyse the impact that divergent notions of ecological modernisation have had on carbon policy tool type, ambitions, and success.

Chapter 5: Examining change in policy ambitions, tools, and goals in European carbon policy from 1992-2012

This dissertation as a whole seeks to analyse the impact of divergent notions of ecological modernisation on the transition towards a low-carbon economy. As shown by the theoretical framework of this thesis, a governing area must display five dimensions of change in order to show they are adequately supporting societies as they adjust to climate change: change in policy ambitions, change in policy tools, change in policy goals, change in the role of the state, and also change in the hierarchy of policy goals. The next two chapters of this dissertation focus on analysing the impact that both strong and weak ecological modernisation have had on spurring the first three types of change, or change in policy ambitions, tools, and goals. This chapter specifically focuses on the EU and its set of strong ecological modernist ideas to show how taking an institutional and top-down approach to climate change policies has positively benefited the evolution of European carbon policy.

This chapter begins with an analysis of the carbon policy ambition and goals in 1992. It then moves to organise and group the policy tools proposed and implemented over the next twenty years into the four main categories of tools as described in the carbon policy taxonomy: economic, voluntary, cooperative, and regulatory. The analysis is divided into two time periods to help break up the density of policy tools analysed. These periods are divided by decade, from 1992-2000 and from 2001-2012, to clearly show how change has occurred. In doing so, this chapter shows how the set of ideas that the EU has approached carbon policy with resulted in continuously more diverse and ambitious policy tools. This chapter identifies not only the types of legislation that was proposed, but also those that were struck down. In doing so, this part of the thesis helps to identify the critical actors and institutional structures that may have helped or hindered the implementation of carbon policy in the EU. By the end of this chapter, the reader will have a firm understanding of

how the ideas of strong ecological modernisation impacted change in the type, nature, and ambition of carbon policy in the EU from 1992-2012.

5.1 European climate mitigation policies from 1992-2000

The time period from 1992-2000 is where one can first concretely identify the impact of the EU's strong ecological modernist ideas on its carbon policy. Looking at this time period shows the EU moving away from traditional command and control approaches used previously, towards the creation of a shared environmental responsibility amongst member states, governments, industry and European citizens alike (CEC, 1998). It is during this time period where the EU first recognised that "a possible way to meet climate targets would be to develop cost-effective policies and measures across all sectors and gases," to achieve its part of responsibilities as required by the KP (CEC, 1998, p.4). When looking at this time period one can see how the EU's strong ecological modernist approach led the EU towards the implementation of policy tools that addressed the social, environmental, and economic dimensions of climate mitigation. This was the first time period where the EU set out clear objectives, targets, and time frames for European climate mitigation policy. The EU first used targets for a variety of sectors, to "help define the responsibility for a sector and thereby provide a useful yardstick to monitor progress and to mobilise political action," (COM. 1998, p.1). Although the EU did not officially launch numerical targets until later in this period, it was during this time period where the EU first committed towards the development of official carbon reductions.

5.1.1 Ambitions and goals of carbon policies from 1992-2000

The major goals of the EU at this time were to create a strong mitigation policy, one that met the recommendations of international standards at the time. Building upon international discussions, the intentions of the EU at this time were to address CO₂ through an economic tool (CEC, 1998). Although the specific tool was not yet

decided, the EU recognised that addressing climate change would require engraining economic value within environmental considerations (CEC, 1998). A critical component of the EU's commitment to the UNFCCC was ensuring that the EU developed its policies alongside the scientific recommendations as outlined in the KP, which were -8% reductions with a baseline year of 1990 (Protocol,1997). Therefore, the EU's first major goal was to shift climate change policies from being solely an environmental concern, to become a community-wide policy issue. The idea of strong ecological modernisation emphasised taking an integrated approach to carbon policy formation amongst all European institutions. Therefore, during this time period, the EU looked to provide European decision-makers with a firm understanding of the risks and opportunities associated with forming a carbon policy in the EU. As such, the EU's first internal goal during this time was to create a level playing field where all European member states were equal in environmental standards. As such, a major part of this period focused on addressing ways to remove differences in environmental compliance amongst both member states and industry groups (Jordan, 2005, pp. 142-184).

The EU's institutional approach towards carbon policies emphasized taking an aggressive stance on the need for carbon emissions reductions across all European member states. Reflecting the EU's democratic decision-making approach of strong ecological modernisation, this time period used many types of policy tools to help create a dialogue amongst both industry members and private citizens in order to identify how the most cost-effective, yet impactful, emissions reductions policy tools (CEC, 1998). In this manner, the EU's approach to carbon policy began with intensive stakeholder engagement that encouraged broader behavioural awareness of carbon impacts.

5.1.1.1 Informational tools from 1992-2000

When looking at the informational tools that the EU used during this time period, one is able to see the impact that strong ecological modernisation had on the diversity of policy tools that were implemented at this time. The heavy emphasis on informational tools as seen below is very different to the solely economic and cooperative approach than was used US at this time. Communication was at the centre point of the EU's approach, and as such, many of the tools that were put in place were used to inform the broader community of the benefits of carbon compliance (COM, 2005a). These tools targeted specific aspects of daily life for civilians and industry members. Informational measures at this time reflected a strong ecological approach in that they sought to broaden citizen awareness, create a dialogue amongst industry members and society, and to also disseminate incorrect information in relation to climate change. By combining these measures with economic tools, the EU was able to create a civilian knowledge base that was aware of, and later supportive of, climate change mitigation and its adverse effects on the natural environment. These tools provided information on the energy footprint of goods, appliances, and automobiles.

Informational tools can be seen as a complimentary crux to many of the economic instruments that were put in place during this time period. Tools like the JOULE Programme, Thermie, SAVE and the Altener Programme are examples of joint informational and economics measures that the EU took to promote the development of non-polluting, alternative energy sources and to improve energy efficiency (COM, 2005a). These were specially created to increase efficiency measures across heavy industrial emitters, and to promote the benefits of environment-friendly transport and other green transport infrastructures (COM, 2005a). The EU used these specific tools to show how clear economic savings could be gained through energy efficiency increases, thereby reiterating the “win-win” approach of strong ecological modernisation.

The SAVE programme II is exceptionally noteworthy as an example of an informational tool that worked to increase the broader societal support of CO₂ reductions. The SAVE Programme was originally the primary focus of the EU's non-technical tools used to increase energy efficiency, but during this time period it became a central pillar through which the EU was able to construct solid industrial and societal support for adhering to more efficient energy practices (Council Decision 91/565/CEE.) The second phase of the programme, built to last five years with a 150-million-euro budget, combined the Electricity End Use Programme (PACE) and the Regional and Urban Management Programme (PERU) into one combined umbrella. SAVE II was created to promote energy efficiency and encourage energy-saving behaviour in industry, commerce, transport and the broader European public through labelling and standardisation, as well as dissemination measures (COM, 1996, 737). Reflecting the strong ecological approach again, this measure helped to shift data collection responsibilities amongst agencies to report on energy consumption directly to the DG Enviro.

The ALTENER programme contained informational measures that promoted the market for renewable energy sources and their integration into the internal energy market (COM, 2000, 87). This programme is an example of the truly democratic approach to strong ecological modernisation that the EU undertook. This tool helped to prepare Central and Eastern European member states begin cooperating on the development of a European carbon policy. The programme was intended to help create the necessary, "legal, socio-economic and administrative conditions for the implementation of a Community plan for renewables and furthermore, to encourage private and public investments in the production and use of energy from renewable sources," (COM, 2000, 87, p. 1) This programme created various projects to teach citizens the importance of environmental considerations in daily life in Central and Eastern European member states. Measures for dissemination in regards to incorrect climate information were a critical component of this

programme, and helped to keep European carbon discussions on track with international expectations at the time. This set of tools encouraged the exchange of experience and practises amongst member states, and moved the EU towards the “establishment of a centralised system for collecting, prioritising, and circulating information,” relating to carbon (COM, 2000).

5.1.1.2 Regulatory tools from 1992-2000

Regulatory tools made up a strong component of the EUs initial climate mitigation strategy, although the nature of these tools is slightly less regulatory than one would expect. Although strong ecological modernisation generally falls on the spectrum of weak sustainability, one can see here a major difference between American and European carbon policies. Whilst the US was encouraging the cooperative participation of industries at this time, the EU took a firm standpoint that environmental regulations were to be imposed across all European member states, and used this time period to create a legal foundation that would later allow the EU to penalise member states who did not comply with CO₂ reductions. Regulatory goals were put in place to ensure industry compliance with climate targets early on, yet this initial time period did not feature any monetary penalties that were levied against individual member states nor firms. Instead, this time period used regulation as a warning signal towards the rest of European industries and citizens would become accustomed to carbon mitigation penalties. Although informational instruments sought to create a win-win dialogue between broader European stakeholders, the strong ecological approach still took a firm stance that central coordination and regulation was needed to achieve ambitious climate goals.

The development of numerical targets for emissions reductions themselves should be considered as regulatory tools at this time. Although the EU only committed to developing carbon goals in 1992, by 1997 the EU had committed its members to reducing greenhouse gas emissions by 8% by 2012 compared to levels in 1990

(Protocol, 1997). The EU then moved to set targets according to each member state's relative wealth at the time. The reductions ranged from an emissions reduction of 28% for Luxembourg to an increase of 27% for Portugal, showing how emission rates would vary depending on various stages of development (CEC, 2006). This included giving Eastern European countries room for increasing emissions, whilst creating ambitious targets for those member states that were more economically developed. Countries that needed to decrease their emissions immediately were given guidelines for industry energy usage, and were asked to increase the usage of energy efficient technologies within industrial operations (CEC, 2006). Countries that were allowed to emissions rates were instead given guidelines for transitioning their industries to cleaner methods of productions (CEC, 2006). These targets thus also acted as guidelines for industries by providing them with a direct correlation of information on energy consumption within industrial and economic growth.

Imposing basic targets for regulations on the amount of energy used in economic growth helped the EU to create a strong base where it could later move towards a stricter regulatory nature within future climate mitigation efforts. During this time period, the EU transitioned away from being a solely regulatory body and moved towards creating a more collaborative atmosphere between the private and public sectors. The EU recognised that regulatory tools could be seen as burdensome and recommended that their use going forward should be used in conjunction with economic policy tools.

5.1.1.3 Cooperative tools from 1992-2000

Taking an institutional wide approach to climate change policies during this period meant that carbon policy tools included not just environmental policy instruments, but also a significant amount of energy policy instruments. As such, renewable energy integration became a main area of cooperation between government and industry members. Reflecting the democratic approach of strong ecological

modernisation, cooperative agreements made up a strong component of policy tools in the EU from 1992-2000. These tools are policy mechanisms that work between government and industry members to develop policies that both maintain environmental protection, but also to help support economic growth (Howlett, 2005, pp. 31-50). During this time period, cooperative tools were put in place to help provide financial support and economic incentives to transition industries towards more efficient production methods (Lenschow, 2005, pp. 305-327). The EU recognised that to develop sustainably, it would need to address “the operation of the energy market via more efficient use of existing tools, and by an overall balance of fuels on the market,” (COM 1998, p .23). To do this, the EU created subsidies and tax breaks which would incentivise the broader usage of renewable energy sources (COM, 1993). This included supporting industry in increasing the usage of renewable energy resources, but also in increasing funding in research and development.

The most apparent use of cooperative tools between industry and government can be seen in the transportation industry (Jordan et al, 2007, pp. 283-298). The EU realised that a majority of its goods were imported, which required long transportation routes, and as such, automobiles contributed towards a large portion of emissions rates. The EU therefore worked to identify how to best incentive the production of more efficient vehicles (Jordan et al, 2007, pp. 283-298). Voluntary commitments were made with automobile producers to reduce CO₂ by 25%, therefore requiring the efficiency of automobiles in general to be increased (Jordan et al, 2007, pp. 283-298). This increase was possible as the automobile industry had failed to come up with it had promised in the voluntary agreements made in preceding years (Jordan et al, 2007, pp. 238-298). In addition, the EU deployed economic tools alongside cooperative agreements to help support industry members in producing the next generation of technologies that were needed to increase efficiency in automobiles and thus, transition the overall transport network that was at the centre of economic activity in the EU.

European enlargement during this time period required even further collaboration between industry and governmental members to ensure the EU was creating a European-wide approach to carbon management (Hicks, 2004, pp. 216-233). With discussions leading to the introduction of more countries into the European community, the EU recognised industries in new member states would need support in adhering to the new regulatory guidelines on emissions rates (Hicks, 2004, pp. 216-233). In addition to the informational tools that the EU used amongst member states, it also worked to deploy cooperative agreements that acted as technology transfers between various European nations (Hicks, 2004, pp. 216-233). Here, the EU specifically used these agreements in a strategic manner that identified and recommended specific areas of collaboration that would help to address gaps in technology standards across the EU (Hicks, 2004, pp. 216-233). These measures helped to financially compensate countries that needed to research or deploy more innovative measures than were previously existing in Eastern Europe. By working between member states to broker technology transfer agreements, the EU was able to help further the idea of a level playing field amongst European member states, regardless of the year of entry into the EU.

5.1.1.4 Economic tools from 1992-2000

The economic tools put in place during this period show how the EU's strong ecological approach still emphasized a sound economic base to carbon management. The economic tools put in place from 1992-2000 were used to address inefficiencies created by pollution by incorporating the external cost of pollution onto business-as-usual activities (Jordan et al, 2007, pp. 283-298). These tools worked by placing direct costs on production processes, or on the actual end product cost itself (Jordan et al, 2007, pp. 283-298). In this way, the EU began to create value for firms in both pollution abatement and pollution prevention processes. These tools also helped transition industry members into using renewable energy, but also in encouraging power plants to produce more renewable energy for the

general public (Directive, 2001/77). The EU at this stage provided direct funds, tax breaks and technology standards to large producers of power to help increase overall efficiency in both production and in the private lives of EU citizens. In this way, the economic tools put into place at the time period helped to also support the more robust deployment of cooperative tools put in place.

As the strong ecological modernist approach reflected a community-wide approach to carbon policy in the EU, it had to guarantee that the tools they were using at the time were the most efficient and useful for overall governance for the EU (Kosonen and Nicodème, 2009, pp. 1-33). At the same time, creating a broader value for society seemed to require much more than the traditional economic instruments like taxes or subsidies. Instead, the economic instruments during this time period showed the EU shifting towards a more ecologically-driven society. Economic instruments like the Cost-Benefit Analysis Mechanism (CBAM) mandated that projects and policies in the EU should include both environmental and economic factors in traditional cost-benefit analysis (Kosonen and Nicodème, 2009, pp. 1-33). Now, policy-makers were required to include a price for the environment to weigh against the economic benefits proposed by all policy decisions (Kosonen and Nicodème, 2009, pp. 1-33).

The CBAM helped the EU to ensure the environment was being considered in all project developments, both in the present and future. However, again reflecting a strong ecological approach, the EU moved to further institutionalise the value of the environment through climate mitigation policies in the EU. The Competiveness Effects of Environmental Tax Reforms Programme (COMETR) COMETR helped to stabilise the broader market by making sure that firms and countries that included environmental costs in project and policy proposals were rewarded in broader financial compliance (Andersen et al, 2007). The measures included in this initiative focused on evolving normal accounting measures from standard financial

considerations into including all factors related to environmental impact; specifically, towards including a carbon price (Andersen et al, 2007). Before the initiative was created, accounting measures simply included measures related to financial numbers, and did not include a cost for environmental consumption (Andersen et al, 2007). This set of tools required European firms to include non-financial information about economic performance, and specifically to disclose their environmental impact as part of traditional financial disclosure practices (Andersen et al, 2007). In doing so, the EU moved towards green accounting standards, therefore moving away from traditional accounting measures towards standards that reflected a value for the environment.

Including environmental impacts in financial analysis created a strain on certain industries that were carbon intensive, and therefore, certain member states that had strong industrial backgrounds and the extraction sectors, such as Spain and Italy (Lenschow, 2002, pp. 219-233). In order to reduce the financial strain on those economies the EU authorized funds to be used in the form of a Cohesion fund to help cushion the losses of industries and member states against the new objectives of the EU; mainly, against the new objective of balancing CO₂ costs against industrial development (Lenschow, 2002, pp. 219-233). In addition, subsidies were given as monetary assistances to businesses specifically in agriculture, as the industry was impacted directly by an immediate need to reduce CO₂.

These economic measures were put in place to help lay a thorough foundation for Europe's future regulations on CO₂. By offering incentives to firms, and by helping fund research and technology, the EU championed the transition to a more sustainable means of development. This time period focused heavily on making both sustainable development, and carbon management, an attractive means of compliance for industries. Rather than simply penalizing industry members, the EU worked to ensure that transition to a low-carbon economy was appealing, rather than

straining on economic performance. In doing so, the EU was able to create a positive economic relationship with the private sector. This helped to create a strong and democratic support for future legislation on CO₂ reductions.

It is important, and interesting to note, that it was during this time period, specifically in 1992, that the EU proposed its first official carbon policy tool. Carlos Ripppa di Meana, at the time, acted as European Commissioner for the Environment, and proposed a European wide carbon tax. However, even though the EU was highly successful in implementing several economic tools for carbon policy, the carbon tax proposal failed. Instead, the proposals for an emissions trading scheme seemed to grow by the end of this period. By 1997 the EU had officially agreed to participate in an emissions trading scheme, yet why the EU moved from a carbon tax towards an emissions trading scheme will be investigated within the tracing chapters of this dissertation.

Overall, the period from 1992-2000 reflected the strong ecological modernist approach by using a democratic, top-down, and internationally-compliant approach towards the development of carbon policy. This period shows that the EU looked to create a strong internal base of support for a future carbon market to launch by creating support for the reduction of CO₂ in general. Informational tools were put in place to help show citizens the benefits of behaving more sustainably. Regulatory tools were used to help firms and individuals become accustomed to the idea that CO₂ should be regulated. Cooperative tools were implemented to ensure regulatory actions taken in regards to limiting energy usage would be done in a manner that did not harm industry competitiveness. Economic tools addressed the financial gaps needed to show the benefits of complying with carbon mitigation objectives. Together, these measures were put in place to ensure that CO₂ reductions created opportunities across all European stakeholders. Combined with the institutional adaptation that increased the competence behind the deployment of these tools, the

EU was able to create a strong framework for the launch of the European carbon market that would take place in the next decade.

5.2 European climate mitigation policies from 2001-2012

By 2001 the EU had officially ratified the KP, meaning that the EU was legally required to begin monitoring and reporting its progress on carbon emissions reductions (CEC, 1996). This shows a marked change in the policy goals of the EU. However, it is also during this time period where one can see a change in the hierarchy of policy goals as well. It was during this time when carbon policy became a central pillar of European policy. This time period focused on building on the foundation of support created in the previous decade, towards the launching of an official carbon policy.

It is during this time period where one can clearly see the change in ambition and tools used in the EU. Reflecting the strong approach of ecological modernisation, the EU recognised that in order to address reductions effectively, it would need to go beyond the cooperative approach to using a more formal approach for carbon management (CEC, 1996). The time period of 2001-2010 was thus highly focused on developing strict targets, deadlines, and pricing mechanisms for specific CO₂ reductions (CEC, 1996). Again showing the impact of a strong ecological modernist approach, tools at this time targeted an increasingly diverse range of stakeholders. At the same time, one can also see the shift of the EU towards an increasingly centralised position on climate change. Here, one can see the integration of climate considerations in broader community legislation.

5.2.1 Ambitions and goals of carbon policies from 2001-2012

The objective of climate mitigation policy at this time was to shift to a more sophisticated market-driven approach that developed economic solutions for carbon mitigation. Yet, the EU's climate ambitions during this time period were very specific. Not only did European emissions reductions require the development and

revision of specific goals, but overarching qualitative goals were also used to transition the European economy towards the long-term objectives for environmental actions. Climate mitigation policies were created to specifically increase the sustainable use of resources, and to integrate climate change objectives into different Community policies (COM, 2001a). In this way, the EU placed carbon policy at the centre of European climate strategies, and also in the broader economic development of European institutions.

The tools the EU put in place during this period were mainly economic and regulatory. However, information sharing and dissemination of negative climate information remained a critical component of the climate programmes in the EU. These were specifically used to maintain a positive relationship with industry by supporting regulatory tools, and alerting industry of progress made. These tools therefore focused on spreading information related to emissions reductions helping to decrease energy dependence in the EU; developing national industries in the EU; and creating jobs for European citizens (Hey, 2005, pp. 18-30.). These were joint economic and climate objectives that were not seen as conflicting, but rather as a beneficial means to further economic development.

Recognising again that climate change was the main challenge facing the EU, the EU worked to move towards the ambitions outlined in the Kyoto Protocol in 1997, which were to reduce emissions reductions by 8% by 2012, when compared to the baseline year of 1990 (Protocol, 1997). Although the EU firmly had committed previously to achieving their CO₂ reductions level, the EU used this time period to firmly commit to legally binding legislation. However, the EU wanted to set targets that exceeded the Kyoto's ambition. Although the EU was supportive of the Kyoto ambitions, European actors had problems with the baseline as outlined in discussions over the years. Therefore, the EU government moved to create more ambitious legislation than was required internationally.

In March 2007, the European heads of state and government made a commitment for the EU to reduce its overall emissions by 20% by the year 2020, compared to 1990 industrial levels (Oberthür and Kelly, 2008, pp. 35-50). At the same time, the EU expressed its intention to commit to a 30% reduction in the instance those other comparable countries also made confirmed commitments (Oberthür and Kelly, 2008, pp. 35-50). In order to make this ambition happen, the EU recommended putting specific goals in place that would increase the share of renewable energy sources in the EU energy supply to 20%, and also increase the contribution of biofuels to transport by 10% by 2020 (Oberthür and Kelly, 2008, pp. 35-50). Therefore, this time period focused on the EU increasing the diversity of its tools in order to strengthen previously developed tools. This required both enhancing the regulatory and legal basis behind existing tools, as well as identifying where new tools were needed to support an institution-wide commitment to climate change.

5.2.1.1 Informational tools from 2001-2012

Informational tools during this time period worked to streamline the citizen knowledge needed to understand how and why it was important to reduce CO₂ reductions. Fundamentally, these tools were used to empower citizens to again increase the understanding of the importance of efficiency (Löber, 2010, pp. 33-51). More importantly, the EU worked to ensure that the public and industry members were well informed of the benefits of carbon-free economy. As the previous time period had focused on using eco-labels and generalised information for consumer information, the EU transitioned now to informing citizens on the dangers and impacts of climate change specifically. Citizens' understanding of the state of the environment was a key aspect of European climate policy at this time, and statistical information was made easily accessible to the public (Decision 1600/2002/EC). As such, carbon data became an integral aspect of all informational tools, and the EU worked to deploy specific statistical information that kept citizens and industry members informed on the progress needed to achieve Kyoto targets.

Member states were seen as a key aspect to the overall development of the EU's climate mitigation policy, and many of the informational tools put in place were meant to enhance communication among member states. Member states were required to designate one or more bodies that would be responsible for creating energy labels that laid out standard product information in regards to the consumption of energy and other resources by energy-related products (Decision 1600/2002/EC). Member states were required to monitor false advertisement of goods that were not sustainable, and prohibit the use of inaccurate information from being relayed to European citizens (Decision 1600/2002/EC). By doing so, the EU ensured that member states were contributing in a bottom-up approach to European environmental policy.

The EU also used statistical information to produce newly updated targets, which were seen as crucial informational tools for both industries members and for member states. These targets gave a firm level of CO₂ reductions to aim for and also a firm timeline for when these emissions should be achieved by (Helm, 2008, pp. 211-238). The EU constantly released data updating the EU-level emissions rates so that member states could understand their role in reducing emissions more firmly (Helm, 2008, pp. 211-238). This also helped civilians and industry members remain aware of forthcoming legislative measures, as they could anticipate where further reductions would be needed.

5.2.1.2 Regulatory tools from 2001-2012

Although this time period is typically referred to as anti-regulatory in environmental studies, regulatory tools actually emerged with greater precedence than used in the previous decade when examining specific carbon policies (Jänicke, 2005, pp. 129-142). Initially, the EU was adamant that the regulatory tools put in place should be a method of guidance for other tools, specifically those that were market-based.

However, regulatory tools were still needed to make sure CO₂ reductions were being met. In order to do so, the EU needed to limit the amount of carbon that firms could emit in six main industries: energy, steel, cement, glass, brick-making and cardboard production (Decision 1600/2002/EC). These industries were noted as the highest contributors to CO₂ mainly due to the large amount of energy they consumed in product manufacturing (Decision 1600/2002/EC). These industries became targeted to ensure that their production became more streamlined with the sustainable development goals of the EU.

Reduction target rates were also set for industries that produced outside the EU to help ensure trade remained less carbon-dense in the EU. This included extensive legislative plans for motor vehicles (Decision, 1600/2002/EC). This legislation required the average CO₂ emissions of vehicles produced in 2012 to be no more than 130 g/km (Decision, 1600/2002/EC). These standards became a common feature in climate mitigation policy in the EU and moved the EU away from voluntary measures towards specific regulatory measures. This was due to the lack of compliance with the voluntary measures that the EU had put in place during the previous time period.

Beyond this, the EU began to place similar standards and restrictions on industrial development amongst member states to ensure national participation levels in emissions reductions schemes. Again, this reflected the strong emphasis that the EU placed on taking a democratic approach to emissions reductions. Targets were put in place to help limit the amount of energy each economy was allowed to consume. Although targets can be informational tools, they also can be regulatory when used to legally restrict the amount of carbon emitted per European nation (Helm, 2008, pp. 211-238).

Originally, the EU ensured that reductions were European-wide, but by the end of this time period, international differentiations would also be translated into binding targets for member states. In 2008, the EU emissions strategy was amended in the European Energy and Climate Plan. This strategy included specific directions for how member states should combine effort in sharing the burden related to European-wide CO₂ reductions. Directions were given to achieve an agreed goal of reducing emissions 20% by 2020 from 1990 levels, beyond the goal that was outlined in the Kyoto Protocol. Member states were allowed to apply for additional EU-level assistance if they found that these strategies were going to be overly taxing on economic development (Decision, 1600/2002/EC). This kept the EU involved in member-state level emissions strategies, making it easier to understand where the leaders and laggards were in the EU-level emissions targets rates.

5.2.1.3 Cooperative Tools from 2001-2012

During this time period, the EU provided incentives for changing business-as-usual, and thus, worked to understand what would make industry members likely to decrease their carbon footprint (Lévêque, 2013 pp. 17-26). The cooperative tools put in place during this time helped the EU to spur innovation in technology that was needed to help increase efficiency in European industrial activity (Lévêque, 2013 pp. 17-26). Many of the tools put into place reflected the need to transition all industries in the EU into cleaner methods of production. Key to this was ingraining more sustainable energy forms for the production itself. The EU focused on deploying wind, solar, and biofuel energy to further encourage the overall usage of cleaner energies.

The European Wind Initiative was launched to deploy large-scale wind turbines (COM, 2001a). Likewise, the Solar Europe Initiative focused on developing a research, development, and demonstration roadmap to set the EU on a path for photovoltaic development (COM, 2001a). This joint initiative worked between the

member states and the European Photovoltaic industry to increase the usage of renewables in power production. Likewise, the Bioenergy Europe Initiative was focused on deploying the next generation of biofuels within the overall energy mix (COM, 2001a). The Sustainable Nuclear Fission Initiative helped to increase funding behind technology related to nuclear energy production by focusing on the future production of fission technologies (COM, 2001a). With these key initiatives the EU hoped to help encourage the transition away from fossil-based fuels to greener energy supplies.

The efficiency of existing energy infrastructures also represented a carbon-dense pathway for development that needed to be changed. The EU put in place several initiatives that focused on the requirements necessary to increase existing efficiency standards (COM, 2001a). The European Electric Grid Initiative focused on the whole system requirements necessary to transition electricity production in the EU away from fossil fuel plants at the industrial level (Com, 2001a). This helped to enforce the integration of renewables into the grid, by increasing the efficiency goals of industrial sectors.

The cooperative tools during this time reflected the EU's transition to take an ecological, or strong, approach towards climate mitigation policy. The cooperative tools at this time took on a much more sophisticated approach to support the integration of more sustainable economic performance into the European market. However, what can also be seen in the cooperative tools during this time the degree to which industry was targeted in climate regulations in the EU.

5.2.1.4 Economic Tools from 2001-2012

The economic tools put in place during the 6EAP heavily reflected the introduction of “new environmental policy tools” (Jordan et al, 2007, pp. 283-298). The main tools put in place during this time were created to support the initial deployment of

the EU ETS. These measures ranged from direct funding to indirect support needed to increase the behavioural change of citizens into becoming more energy efficient. All of the tools worked in a much more sophisticated manner when compared to previously used economic tools.

Many of the financial measures put in place came in the form of subsidies (Gupta and Ringius, 2001, pp. 281-299). Although these can be costly for governments, directly contributing funds to technology research is usually an integral part of overcoming the barriers to the penetration of new technologies (Kosone and Nicodème, 2009). Financial tools transitioned from broad means of encouragement for research and development as seen in 1992-2001, into specifically sector-targeted funds for research and development (Decision, 1600/2002/EC). Mainly, funding was now given to countries and firms in order to create new power plants. These funds specifically were allocated towards the use of small-medium enterprises that could be launched much more quickly than traditional large-scale power plants (Decision, 1600/2002/EC). In this way, the EU created jobs, providing a positive stimulation towards cleaner energy.

To further increase the share of renewables in European energy supplies, the EU deployed green tariffs. These were specific subsidies used to develop renewable energy industries within certain member states (Couture and Gagnon, 2010, pp. 955-965). These subsidies were used to provide upfront capital to member states to help further integrate renewable energies into their existing energy generation portfolio. At the same time, these subsidies also worked to help engrain environmental considerations within electricity pricing structures. These market-based tools contained guidelines on the price that was to be paid to electricity producers if they produced power from renewable sources (COM, 2001a). This price was set to be equal to the cost of avoided standard electricity use that was based on fossil-fuel supplies, and also included a, “premium reflecting the

renewable, social and environmental benefits” of using a cleaner energy (COM, 2001a). In this way, the price of electricity moved from standard consumption to including the positive allotments of consuming green energy. This shows the EU’s ability to also embed environmental considerations within its energy markets, therefore indicating a broader societal shift was occurring.

A hugely impactful cooperative tool put in place during this time was the Community's Eco-Management and Audit Scheme (EMAS), which encourages private companies and public bodies to improve their environmental performance within areas of economic activity (Decision, 1600/2002/EC). EMAS first requires organisations to conduct an environmental review of all of the aspects of their business; then, organisations must work to establish and implement environmental management systems based on results of the review (Decision, 1600/2002/EC). An evaluation of these processes then produces results that are exchanged between the public and other interested parties affected by the organisation (Decision, 1600/2002/EC). If organisations can display steps towards improved environmental performance, mainly through showing reduced emissions rates or environmental impacts, the EU then will work with them to improve the costs the organisation takes on for improving their environmental performance. This tool helped provide regulations for compliance, but also incentivised private-sector members in emissions reductions.

By far, the most predominant tool feature in this time period, and in the entirety of climate mitigation policy in the EU, is the EU ETS, which was launched during this time period. This tool works to financially link energy consumption to industrial production. Industry members are provided with targets limiting their CO₂, or a cap, on the total amount of greenhouse that can be emitted by all participating installations. Allowances for emissions are then auctioned off, or are allocated for free, but can then be traded amongst industry members (Helm et al, 2003, pp. 438-450). Industry installations are required to monitor and report their CO₂, mainly to

ensure that they provide enough allowances to the EU in order to cover their emissions targets (Helm et al, 2003, pp. 438-450). If an emission from an industry installation exceeds the amount CO₂ it's been allocated, it must purchase additional allowances (Helm et al, 2003, pp. 438-450). Alternatively, if an installation increases its efficiency, and therefore, reduces its emissions, it can sell remaining credits to other industry members (Helm et al, 2003, pp. 438-450). This is intended to provide European industries for a market-based and cost-effective method of reducing emissions, without necessarily calling for the intervention of a government.

The overall emissions scheme has been divided into a number of trading periods, both of which were located during this time period. The EU ETS's initial launch in 2005-2007 was the first period, and covered approximately 12,000 installations, representing 40% of European CO₂ overall (Caney and Hepburn, 2011, pp. 201-234). This period covered energy activities, production and processing of ferrous metals, mineral industry (such as glass and cement) and also the monitoring of pulp and paper production (Caney and Hepburn, 2011, pp. 201-234). This phase covered all 27 EU member states with the exclusion of Romania, Bulgaria, and Malta.

In 2008, the EU began the second phase of monitoring, which ended in 2012. This expanded the tool significantly. In 2007, three non-EU members joined, and the Linking Directive introduced the Clean Development Mechanism and Joint Implementation mechanisms, which allowed countries to invest in emissions reductions projects to also contribute towards lowered emissions reductions. The EU used four main platforms for technological development support: low-carbon adaption technologies, low carbon-capture technologies, renewable energies, and bio-fuels (COM, 2007a). In this way, the EU broadened the interaction with industry members to create further economic incentives for complying with CO₂ reductions. However, this tool was heavily criticized when the price of carbon dropped

dramatically. As later analysis will show, this was due to the influence of weak ecological modernisation.

2020 is the next date of expiration for judging emissions rates at EU level. The EU has stated that their new target is to be a 20% of emissions by the year 2020 (COM, 2011). The EU has also volunteered to lower European emissions by 30% if the rest of global leaders would sign on a climate agreement (COM, 2011). If the EU does attempt to lower European emissions by 30% then an aggressive action plan, one that expands the EU ETS's current industrial coverage, must be implemented (COM, 2011). Coverage must expand to include buildings, agriculture, and waste management and transport schemes (COM, 2011). With the EU's expansion to include the air transport industry in 2012 it is feasible that they will be able to do so. Member states have accepted this area of expansion, and have created their own corresponding national emissions targets.

5.3 Conclusion: analysing change in policy ambitions, tools and goals in the EU from 1992-2012

When surveying the tools used by the EU during this time period, it is evident that the EU has clearly undergone the first three types of change required for ecological modernisation: change in policy tools, change in policy ambitions, and change in policy goals. Both the goals and the ambitions of the EU have progressed drastically from 1992-2012. Originally, the EU began with an overall qualitative ambition to simply reduce CO₂ reductions, yet within a short period of time the EU had moved to identify 1990 as an apt baseline-year for reductions. Although the ambition of the goals may have wavered at times, the EU's aggressive nature on the targets shows the commitment of the EU towards making noticeable, institutionally-wide changes.

When simply looking at the quantitative commitment of the EU on CO₂ reductions, one could argue that fluctuations in the baseline year of ambition could call into question the sincerity of the EU. However, looking at the diversity and evolution of the EU's carbon policy tools clearly indicates that this is simply not the case. The first era, 1992-2001, created a broad base for the support of future emissions reductions. Informational tools were used to create an undisputed understanding of the need for climate mitigation within the EU by providing both industry members and civilians with statistical information. Regulatory tools were not penalized, but rather served as guidelines to help industry members' transition into a time where they would need to pay for emitting carbon. Direct-economic and indirect economic tools worked in tandem to create incentives for transitioning into a low-carbon economy, and worked to ensure economic growth and stability of energy markets in accordance to the principals of European sustainable development.

The second time period of European carbon policy saw the cementing of climate mitigation policy in the EU that displayed the commitment towards ingraining environmental concerns into the economy, and clearly showed the impacts of a strong ecological modernist approach. Informational tools worked to address the integration of member states, and to increase the availability of statistical information needed to increase carbon policy efforts, thereby reflecting both international standards, but also an increasingly democratic process of target development. Direct economic tools were used to specifically drive the development of renewable energy projects, and to enhance technological innovation needed to transition the EU's industries into a low-carbon economy. Surrounding all of these tool choices was the transition of the overall economy itself; the EU used indirect economic tools, such as accounting measures, to complete the legalities and economic measures needed for a balanced economy. By shifting the taxes from welfare-negative taxes to welfare-positive taxes, the EU was able to make sure that European firms did not lose competitiveness by operating within a low-carbon economy. In this way, it is evident that the EU's commitment to climate change

goes much farther than the creation of new economic tools. Instead, the empirical data analysed in this chapter indicates that the EU has clearly moved towards an ecological paradigm shift.

Chapter 6. Examining change in policy ambitions, tools, and goals in American carbon policy from 1992-2012

American climate mitigation policy has a complicated history, one that at times seems impressive, yet at others relatively stagnant. This thesis now moves to examine the change in policy tools, goals, and ambitions in the US in order to evaluate the first three degrees of ecological change that occurred between 1992-2012. This chapter will thus, seek to assess to what degree weak ecological modernisation has had an impact on the evolution of carbon tools. In doing so, this chapter will empirically examine and identify the nature, diversity, and ambition of carbon policy in the US, in order to later analyse how the central idea of a weak approach to ecological modernisation impacted the policy-choices, and innovation, of American carbon policy.

Beginning with the first discussion of carbon policy tools in 1992 and finishing in 2012, this chapter shows how the US's set of ecological ideas failed to produce an increase in the policy ambition and goals of carbon policy. At the same time, when reviewing the tools proposed and implemented in the US, this chapter shows the static nature of policy tool type in the US. Divided into the same two time periods as the analysis in the EU empirical chapter, this chapter will identify both the policy tools implemented, and also the tools that were proposed but did not lead to implementation. In doing so, this chapter will examine when and where policy innovation failed to occur in the American carbon policy-process.

6.1 American climate mitigation policies from 1992-2000

Like the EU, the US has distinct periods in its environmental legislative history. The initial time period under examination (1992-2000) encompasses two different administrations, the George H.W. Bush Administration and the Clinton Administration, but mainly focuses on the efforts of the Clinton administration, as

this was the first administration that sought to implement climate policies at the federal level. President Clinton and Vice-President Al Gore commenced their term in office with a vehement promise to enhance the image of America, specifically within global environmental discussions. This administration sought to reinvent environmental policy and laid out specific goals and ambition for US carbon policy that were intended to span a time period of 25 years (Clinton and Gore, 1995). The administration created “principles” for reinventing environmental protection, which were intended to create a balance between economic, environmental and social goals (Clinton and Gore, 1995). Like the EU, climate change in the US was emphasized as a critical point for action. Unlike the EU, this time period shows how using weak ecological modernist ideas failed to result in change in policy tools nor ambition. Instead, this chapter examines the negative impact that weak ecological modernist ideas had on the diversity and maturity of carbon policy instrument in the US from 1992-2000.

The overarching objective of the Clinton-Gore administration began by committing the US to protecting public health and the environment as a national goal that required individuals, businesses, and government to take responsibility for the impact of their actions (Clinton and Gore, 1995). This administration sought to design regulation to achieve environmental goals in a manner that minimizes costs for firms. To do so, the administration outlined a series of specific measures with which environmental policy must be formed. First, environmental regulations were to be performance-based, providing maximum flexibility in the means of achieving environmental goals, but also by requiring accountability for the results (Clinton and Gore, 1995). Preventative pollution actions were to be taken where possible (Clinton and Gore, 1995). Market incentives were to be used to achieve environmental goals, whenever appropriate and possible (Clinton and Gore, 1995). This reflected a weak ecological modernist approach, which would clearly impact the policy-choices presented to policy-makers at this time. Both economic and cooperative tools would dominate the administration’s policy tools at this time, yet

surveying the proposals below shows how the ideas of weak ecological modernisation limit the tool options available to policy-makers.

6.1.1 Ambitions and goals of carbon policies from 1992-2000

Although the US today may perhaps be more well known for its fluctuations in climate change policies, it is often forgotten that the US was once a leader on environmental issues. In addition, many often dismiss the fact that the US was once committed to climate change. Yet it was during this Presidential administration where official targets for CO₂ reductions were recommended so that performance in climate abatement could be measured statistically (Clinton and Gore, 1995). However, it is here where the European carbon policy begins to differ drastically from the US. After the 1997 Kyoto agreement, the EU committed its members to reducing greenhouse gas emissions by 8% by 2012 compared to levels in 1990 (Protocol, 1997). The US's first proposal for lowering CO₂ was to 1990 levels by the year 2000 (Park, 2005, p. 165). Although the EU was clear that this time period would be used for moving towards a regulated industry, the US administration used a weak ecological modernist set of ideas which recommended using targets in a non-binding manner, thereby, allowing industry to choose if they would meet the ambitions or not.

The administration led by President Bill Clinton pledged the first emissions reductions during this period, which were to reduce emissions levels in the states to 1990 levels by the year 2000 (Park, 2005, p. 165). However, it's important to note here that these targets did not include a target for percentages of reductions, but instead were loose guidelines for emissions reductions. The US here showed that although it had the ambition to achieve a baseline year in reduction, it did not have the specific targets that were needed to turn these ambitions into results.

6.1.1.1 Informational tools from 1992-2000

Perhaps due to the lack of regulatory authority, informational tools clearly did not make up as critical of a component of the American policy portfolio as they did in the EU at this time. The economic approach that the US was intent on using required using a carbon market, yet did not emphasize the creation of a broader civilian base that would be supportive of carbon emissions reductions. Rather than focusing on how to build an informational base for target emissions reductions, this time period focused on simply informing stakeholders that the US was beginning to engage in carbon reductions. These tools focused on making government regulations understandable to those that were affected by them (Clinton and Gore, 1995). The US communicated that regulation was to be “based on the best science and economics, and would be subject to the scrutiny of the epistemic community and the public,” (Clinton and Gore, 1995, p. 8). This is interesting, as this did not clearly translate into specific targets. Instead, federal, state, tribal, and local governments were recommended to work with the EPA as partners in order how to identify the best and most common environmental goals, so that future targets could perhaps be formed (Clinton and Gore, 1995). Looking at the instruments below show how problematic and increasingly administratively difficult a bottom-up approach to carbon policy can be.

In these initial informational measures, one can see the intent of the US to begin developing climate mitigation policy, yet its inability to do so. Informational tools during this time period did not correlate with the developments in international standards at this time, and instead, show the problems that come alongside the domestic collection of carbon data. Although extensive information needed to be collected, the EPA had difficulties in asserting the authority to collect information, mainly based on the lack of true regulatory authority to do so (Selin and VanDeveer, 2009, pp. 111-136). Although the EPA had the authority to enforce regulations in other areas, in the area of greenhouse gases they did not possess regulatory authority. As such, collecting information posed a large task to the agency, and verifying

economic progress on emissions reductions became difficult. Instead, industry members were asked to release information in relation to their emissions data so the EPA would be able to understand who were the leaders and laggards in environmental compliance amongst industry members. Environmental audits were enacted to understand how various industry sectors contributed to emissions reductions. In doing so, the US hoped to understand how energy was being used so that future regulations could be developed to monitor consumption.

During this time, the EPA was ordered to periodically prepare and also make publically available reports on the state of the environment (Clinton and Gore, 1995). However, before collecting information the EPA needed more streamlined methods for risk assessment to ensure independent views of science were being conducted within their methodologies. As such, the first informational tools put in place were environmental impact assessments. There were no specific times designated for these assessments, but still the administration instead created general guidelines to determine the impact of new economic actions on the environment. The EPA also began developing guidelines for record-keeping and reporting measures. More vaguely, the federal government ordered the EPA to use licenses and permits as they saw fit for environmental consumption. The EPA was ordered to ensure that any governmental funding of a project would take in a certain degree of consideration for the environment (Clinton and Gore, 1995). The EPA was also asked to develop a specific centre for environmental information and statistics, which would establish a central point for quantitative information (Clinton and Gore, 1995). In this way, the goals of the administration reflected strong sustainable development, while the tool choices did not.

From here, informational tools declined in comparison to the implementation of cooperative tools. In 1999, President Clinton issued a presidential directive titled

“Presidential Directive on Carbon Dioxide Emissions” to confirm the administration’s commitment to pursuing economic growth and environmental progress simultaneously (Buzelli and Lash, 1997). This directive required a full report to be conducted to fill in the missing informational gaps that had been identified as problematic in the energy policy of the US. The report emphasised how information collected would promote retail competition in the electric power industry, and thus would deliver efficiency increases, and a reduction of greenhouse gas emissions (DOE, 2000). The information was to be collected on an annual basis and would deliver the data from the previous years, from both utility and non-utility sectors that produced power (DOE, 2000). The data included both national and regional information divided into fuel type, or energy resource (DOE, 2000). The report was intended to thus provide the amount of carbon reduced in the previous year. However, the involvement of firms producing information was still collected on a voluntary basis.

6.1.1.2 Regulatory tools from 1992-2000

Although there were no regulatory tools put in place during this time, it’s important to show the complete lack of category of carbon policy tools in the US. The weak ecological modernist approach championed by the George H.W. Bush administration took the stance that regulatory tools for the environment were overly protective, and would result in American industries becoming uncompetitive (Cropper and Oates, 1992, pp. 675-740). As such, regulatory tools did not play a key role during this time period. Instead, regulatory power was even stripped from the Environmental Protection Agency and temporarily limited the role of environmental regulations in various policy realms (Hahn and Stavins, 1991, pp. 1-42). Here, it is evident that an institutional approach to emissions reductions was not favoured, but instead, was limited to the responsibility of the EPA.

6.1.1.3 Cooperative tools from 1992-2000

As the weak ecological modernist approach to climate change championed the notion of a techno-corporatist approach to climate change, the administration during this time worked in tandem with corporations to create programs that would enhance the role of industry in environmental cooperation. These programs were created for two main objectives. First, to enhance industry incentives to increase innovation within technology, and secondly, to increase efficiency standards to indirectly lead towards lowered emissions reductions (Clinton and Gore, 1995, pp. 5-9). These tools were created to specifically develop emissions reductions techniques that would not harm economic development.

The first measures passed were automobile fuel efficiency standards. Recognizing the link between fuel usage and CO₂, mileage standards were introduced as a way of reducing CO₂. Automobile industries saw this as an opportunity to apply technology standards to existing industries (Lutsey and Sperling, 2008, pp. 673-685). Although fuels standards help reduce emissions, they also helped to increase gas mileage. With increasing gas prices consumers would find standards easily acceptable. Therefore, the industry worked to develop standards as a way to ensure all automobile producers were manufacturing along the same guidelines.

The 1993 President Climate Change Action Plan deployed several cooperative tools. These tools were created to reduce domestic greenhouse gas emissions in a number of sectors across the economy through a range of partnership efforts. The voluntary Department of Energy (DOE) Climate Change program was formed in cooperation with the electricity sector (DOE, 2000). This tool sought to encourage utility firms to voluntarily reduce their carbon footprint. Rather than mandating reductions, this program sought to understand the economic benefits that came alongside increasing efficiency standards in production (DOE, 2000). By working with utility firms, the government hoped that other sectors would then recognize the benefits, and choose

to comply with increasing emissions standards. This very much reflects the economic approach of ecological modernisation in the US.

The Energy STAR Program, jointly deployed by the EPA and DOE, was put in place to reduce energy consumption in homes and office buildings across the Nation (DOE, 1995). The EPA deployed the Energy Star Building and Green Lights Partnership to encourage increased efficiency within the built environment (DOE, 1995). This program worked to provide funding for buildings to undergo efficiency upgrades, which resulted in emissions reductions of more than 16 million metric tons of CO₂, covering more than 15% of the built environment (DOE, 1995). This program set specific standards for energy-efficiency in office equipment, heating and cooling systems, residential appliances and new homes (EPA, 2006).

The Energy Star label was developed to give owners a method for evaluating the efficiency of their buildings in comparison to others, thereby encouraging the competition of efficiency standards (DOE, 1995). In this way, the tools were put in place to encourage and display commitment to the increasing efficiency standards within the built environment.

The cooperative tools at this time also worked to enhance cooperation between federal levels of environmental management and local and state level organizations. These local partnership initiatives worked mainly to create a better level of policy cooperation between various levels of environmental organizations (DOE, 1995). Sustainable development challenge grants were provided to increase the formation of local environmental organizations needed to promote the concept of sustainable economic development (DOE, 1995). Performance partnership grants were also put in place to target funds given to fit the specific needs within these programs (EPA, 2006).

Overall, cooperative tools were representative of the viewpoint that Clinton and Gore sought to change in the viewpoint of American environmental policy. The administration worked to move away from the regulatory and, thus, associated burdensome image that environmental policy had and instead worked to create a positive relationship between government and industry in relations to emissions reductions.

6.1.1.4 Economic tools from 1992-2000

In 1994 the signing of the North American Agreement on Environmental Cooperation (NAAEC) showed the administration's desire to move forward on environmental legislation, and specifically included the mandatory "promotion of the use of economic tools for the efficient achievement of environmental goals," again reflecting the weak ecological modernist approach of the US (Clinton and Gore, 1995). The Clinton administration thus used economic tools to stimulate the benefits for participating in energy efficiency. These measures were included creating tax incentives for industries involved in the renewable energy industry and hybrid vehicles sectors.

During this time, individuals in Congress produced over 30 bills, resolutions and amendments that proposed economic tools in climate change. Initially, the tools proposed worked on three main categories of climate legislation: climate credits, subsidies, and direct technology funding (Selin and VanDeveer, 2007, pp. 1-27). The first category of tools gave credit for early action on reducing greenhouse gas emissions. Funding and subsidies created to help reduce upfront costs that firms may incur when switching to renewable technologies (Clinton and Gore, 1995). Measures were also proposed for funding research in technologies that could be used for reducing greenhouse gas emissions, specifically those that may lead to the future utility of carbon (Clinton and Gore, 1995). At the same time, Congress also worked to propose tax incentives for investing in new technologies that would produce able

to make use out of carbon, such as carbon-capture-and-storage (Clinton and Gore, 1995). Unfortunately, many of the tools were not implemented.

The main item the administration submitted to Congress was the Comprehensive Electricity Competition Act (CECA) bill to restructure the US electric industry and increase competition to drive down increasing electricity costs. Increased competition would force firms to “improve their own efficiencies and to create new markets for green power and end-use efficiency services” (DOE, 1999, p. vi). The CECA was specifically designed to restructure the electricity market in a direction that included environmental provisions within the electricity markets (DOE, 1999). This bill included the development of renewable portfolio standards, tax incentives for renewables, and also created a public benefits fund (DOE, 1999). The administration also recommended funding for education for those who were studying towards environmental degrees, and would thus be able to participate in increasing technology standards.

To support the encouragement of the restructuring program, the DOE issued a supporting analysis to quantify the economic and environmental benefits of the plan (DOE, 1999). The analysis focused on displaying the impacts of restructuring program on CO₂ and found that the policy proposal would reduce up to 216 million metric tons of carbon by 2010 (DOE, 1999). However, the Environmental Information Administration (EIA) conducted the same study and conversely found that the proposal would reduce CO₂ from energy usage anywhere between 147 to 220 million metric tons annually by 2010 (DOE, 1999). Congress found that the policy did not include key provisions that supported the effective functioning of competitive electricity markets and energy diversity while at the same time providing reductions in CO₂ levels, and as such, struck down the proposal (DOE, 1999). This shows a discrepancy in statistical data relating to tool success.

Instead, Congress introduced and passed several policy initiatives that led to deregulation on the electricity sector (McCright and Dunlap, 2003, pp. 348-373). These measures led to power companies being able to avoid any monitoring of CO₂. This deregulation also prohibited the administration from deploying integrated resource planning programs, which provided subsidies for renewable energy programs and also for energy efficiency programs (McCright and Dunlap, 2003, pp. 348-373).

The Clinton administration deployed economic tools in many land-use policies that would also affect carbon legislation. Positively, the administration was successful in preventing legislation that would have allowed drilling for oil and natural gas to take place on federal lands. Negatively, the administration also passed many policies that would hinder progress on carbon legislation such as tax and royalty relief for many oil and gas wells (McCright and Dunlap, 2003, pp. 348-373). This administration specifically passed a series of policy initiatives that would encourage oil and gas drilling in the Gulf of Mexico (McCright and Dunlap, 2003, pp. 348-373). While they refused to pass policy allowing drilling, the tools they put in place allowed federal land to be drilled in Alaska (McCright and Dunlap, 2003, pp. 348-373). This administration also allowed for federal uranium programs to become privatized, leading to an increase in mining and nuclear programs (McCright and Dunlap, 2003, pp. 348-373).

By proposing energy efficiency measures and the use of alternative fuel vehicles, the administration hoped to help develop a green fuel-based economy that would act as a catalyst for greening other sectors. Although the administration clearly proposed many tools that would have lead toward the increased production of renewable technologies, and also the restructuring of electricity markets at that time, the government was unable to show the economic benefits that came from complying.

The tools put in place during this period therefore display the American preference for cooperative-based policy-tools. The empirical evidence gathered also shows the significant attention that the US gives to the electricity sector when seeking to produce CO₂ reductions tools. Although the variety of policy tools was not immensely diverse, it is evident that significant strides were taken in regards to implementing a path to a cleaner form of economy. Although many individual tools were put in place, problems began to emerge and were concretely identified by the end of 1998. The EPA and DOE both issued statements requesting informational deficiencies as a source of problem within the success of their monitoring accuracy (Bruner and Klein, 1999, pp. 133-161).

Although the Clinton administration put in place the first targets for emissions reduction, by the time the administration left office, emissions stood at roughly 15% above that target (Park, 2005, p. 165). Therefore, it's evident when analysing the first period of tools that neither the policy tools nor the policy goals changed in the US during this time.

6.2 American climate mitigation policies from 2001-2012

The time period from 2001-2010 in Europe focused heavily on creating tools that would help the EU achieve its KP targets. Although the US was initially committed to working on climate change at this time period, this same period shows how important it is to take an institutional approach towards climate change, instead of approaching it as solely an environmental policy. Although this time period featured aggressive measures taken to combat CO₂ in the EU, this same time period began under the leadership of President George W. Bush in the US. Not only did President Bush champion the notion of using technological solutions to solve environmental problems, he also opposed international standards for carbon compliance. One of his first actions in regards to the broader realm of climate change

policy was to remove the US from the KP and instead push towards a domestically focused climate administration. Despite Bush being considered as a key antagonist to international climate regime, Congress was democratically led at the time, and strongly supported both increasing international support of CO₂ reductions, and the concept of sustainable development. With increasing public support of climate change during this period, the US still should have been able to implement a tool that addressed CO₂ reductions. However, even Congressionally proposed measures were struck down. The evidence gathered below helps to identify the specific instances in which climate mitigation policy encountered obstacles in the US specifically due to impact of ideas stemming from weak ecological modernisation.

6.2.1 Ambitions and goals of carbon policies from 2001-2012

President Bush released specific goals in regards to carbon policy at the beginning of his term in 2002, which was the first official target that included a percentage for emissions reductions in the US (Bush, 2002a). While targets in Europe contained specific time periods and baseline years to set deadlines for emissions reductions, the target Bush released contained no baseline. Instead, the target focused on tons of carbon reductions as a way to eliminate emissions from the atmosphere. President Bush's first target was to reduce 500 million tons of carbon from the atmosphere, the equivalent of reducing 18% over ten years, which would imply the baseline year of 2002 as opposed to the Kyoto's recommended baseline of 1990 (Rabe, 2004, p. 115). Overall, climate change was not a critical component of Bush's overall agenda.

The change in Presidential leadership at the end of this period led to a drastic change in the interaction of the US in international climate legislation. President Barack Obama took office in January 2008, and for the first time, formed the basic ambitions of carbon policy in the US. His campaign specifically included a commitment to address climate change, and a dedication to putting the US on track with international climate legislation (Obama, 2009a). Therefore, in 2009, the US

went to the Copenhagen conference in order to firmly commit itself to CO₂ reductions. Although the US did not agree to formally ratify any legislation at the conference itself, the US did pledge to develop federal climate mitigation policy that would put the US on track with other developed nations.

In 2009, the US ratified international legislation relating to climate change through the Copenhagen accord. Obama agreed to limit the US emission levels from 4% below 1990 levels by 2020. This was the first time the US agreed to limit the US to levels at 1990. However, unlike the KP, the Accord was not a legally binding treaty. Instead, the US was required to develop its own climate mitigation policy that would achieve these levels. By 2010, the US announced government-wide CO₂ reduction targets for 2020 for all federal agencies to take a leadership role in emissions. Agencies were to reduce twenty-eight per cent of direct emissions³ compared to the baseline year of 2008 (Sutley, 2010). The US also added a target of thirteen per cent for indirect emissions, such as those from employee commuting and business travel (Sutley, 2010). Showing the US' government's commitment to long-term emissions reductions was an initial step towards creating a federal carbon policy, yet unfortunately, the limitations of using only voluntary or economic-based instruments meant that the US was consistently unable to deploy ambitious or innovative carbon legislation.

6.2.1.1 Informational tools from 2001-2012

Informational tools played a limited role during the Bush administration. Instead, many members of the American epistemic community worked to increase the American public awareness of climate change and to further the understanding of the urgent need for the US to increase their climate ambition. Although the time period displays many innovative proposals, the majority of policy failed to reach implementation.

³ Direct emissions are those released from fuel and building energy usage.

The tools put in place by the administration itself were used to inform the public of the administration's negative stance on climate change. While in the EU these tools were used to broadcast the dangers of climate change, and to spur the necessary public support for carbon legislation, in the US these tools served a dual purpose. First, to provide the public with information on climate change, but also to dissuade the public that CO₂ reduction was a necessary policy priority (McIntosh, 2008). Specifically, deployed from the executive branch of the administration, these tools were used to show that CO₂ reductions would impede economic development in the US.

Nevertheless, several federal organizations attempted to increase the public support of climate mitigation during this time period. The main informational tool at this time was a 2003 report that combined information from all existing federal agencies on CO₂ reductions. Authored by Peter Schwarz and Doug Randall, the report "An Abrupt Climate Change Scenario and its Implications for United States National Security", outlined the risks that climate change would impose on the American public and economy (Schwartz and Randall, 2004). The report found that the risk of climate change would impose "potentially dire consequences" on the US citizens and public economy (Schwartz and Randall, 2004, p. 1). Although they found the risk "uncertain and quite possibly small" they still suggested that climate change should be elevated beyond the debate status it retained at the time to become a national security concern (Schwartz and Randall, 2004, p. 2). This informational report should have acted as an initial tool for spurring carbon legislation, but instead was met with strong opposition from the Bush administration.

Still, the EPA was able to develop smaller measures for developing climate mitigation policy. The Climate Leaders Offset Methodologies developed a standardized approach to determine the eligibility of projects proposed for carbon

reductions (EPA, 2008). Working similarly to the measures that the EU created, the methodology was developed to ensure that greenhouse gas emission reductions from projects met key accounting principles. The methods required projects to be determined if they were authentic, permanent, and verifiable (EPA, 2007). These measures changed accounting standards to have more of an environmental aspect by including a specific baseline that identified the exact quantification of reductions a new energy project would help to emit (EPA, 2007). The methodology was developed internally, and only applied to projects that required EPA funding. Again, this shows a large difference when compared to the European institutional approach shown at this time.

6.2.1.2 Regulatory tools from 2001- 2012

This time period saw very few regulatory tools implemented on a federal level. The 108th Congress (2003-2004) attempted to pass 96 bills, resolutions, and amendments relating to climate change, yet few of them were implemented (Rabe, 2004, pp. 105-128). This congress for the first time sought to impose CO₂ reductions on a national basis, and even attempted to target specific industries that were identified as carbon dense. However, mostly all of these tools were simply proposed and died in Congress.

The Climate Stewardship and Innovation Act of 2007 sought to impose a gradual reduction of emissions levels (the Climate Stewardship Act S.139). This act proposed to reduce emissions levels to the 2004 levels by 2012, 1990 emissions levels by 2020, and 60% of US reductions overall below the 1990 level by 2050 (the Climate Stewardship Act S.139). Not noted as aggressive measures by the international community (as most nations used 1990 as the baseline starting year for all emissions reductions) even these basic regulations towards carbon reductions died in committee with a 55-43 vote in the Senate (Senate, 2007). This bill's

earmarked proposal to establish a National Academy of Sciences for studying climatology also failed (the Climate Stewardship Act H.R. 4067).

The 2007 Global Warming Pollution Reduction Act was proposed mainly to increase emissions efficiency standards (Senate, 2007). The act would provide funding as well as research and development into furthering the understanding behind the sequestration of CO₂, which would increase carbon capture and storage capacities in the US (Senate, 2007). The bill also sought to set emissions standards for new vehicles and gasoline beginning in 2016 (Senate, 2007). Energy efficiency and renewable portfolio standards were also proposed for 2008, as were low-carbon electric generations standards (Senate, 2007). The bill also called for a review by the NSA (interestingly, not the EPA) to see if the targets in emissions rates were adequate. The bill died in committee.

The US continued to attempt to pass similar legislative measures in the next sessions of Congress. By the 110th Congress, the US had introduced almost two hundred types of legislation that mentioned climate change. Although CO₂ reductions targets remained weak, every policy proposal relating to climate mitigation measures were struck down.

The change in administration perhaps affected the importance placed on climate mitigation policies. To create a clear pathway for CO₂ reductions, the administration created tools that would force federal agencies to take on a leadership role in the promotion of sustainability (Obama, 2007). Obama issued an executive order at this time that mandated that government agencies comply with his regulations on emissions. The “Federal Leadership in Environmental, Energy, and Economic Performance” issued targets and emissions requirements for all federal agencies that were resisting the target submission (Obama, 2009b). This order required a 30%

reduction in vehicle use by 2020; 26% improvement in water efficiency by 2020 and 50% increase in recycling and waste diversion by 2015. The order also required 95% of government contracts to meet sustainability requirements (Obama, 2009b). Federal agencies were also required to submit a 2020 greenhouse gas pollution reduction target within 90 days of the President taking office (Obama, 2007). In this way, the administration hoped that showing American leadership within government would increase bipartisan support for climate mitigation goals.

The EPA was also given regulatory power during this time in order to help push forward regulation and monitoring on emissions (Obama, 2009b). The same executive order requested that the EPA begin collecting information on existing emissions so that a cap-and-trade scheme could be implemented in the future. Unfortunately, before the bill passed a bill was proposed that prohibited the EPA from regulating CO₂ reductions or pollutants, saying the EPA did not have the authority to regulate this specific gas.

6.2.1.3 Cooperative tools from 2001-2012

Cooperative measures were used widely within this time period to increase the connection between domestic and international climate regimes, and also between domestic organizations. Mainly all of these tools worked to push forward cleaner technologies, and energy efficiency, such as the administrations allocation of funds to the DOE for the increased deployment of smart-grids (Levy and Rothenberg, 2002, pp. 173-193). Federally, cooperative measures put in place at this time showed the eagerness the industries to move forward on carbon legislation. Specifically, the automobile industry was incredibly cooperative in recognizing its role in emissions reductions (Levy and Rothenberg, 2002, pp. 173-193). This industry worked with congress to help transition to more efficient modes of transportation.

The cooperative tools put in place for the automobile industry worked to increase standards in fuel efficiency and increased mileage requirements for newly produced vehicles (Levy and Rothenberg, 2002, pp. 173-193). The state of California even went beyond federal cooperative measures, to create more ambitious policy measures. When working with the automobile industry in 2002, California introduced and passed AB1493, a bill requiring automobile makers to begin developing standards for vehicles (Schreurs, 2008, pp. 343-355). The bill passed and California moved forward to require automobile manufactures to reduce emissions by 30% by 2016 (Schreurs, 2008, pp. 343-355).

In 2009, the administration funded the DOE's Advanced Research Project Agency-Energy (ARPA-E). This program focused on "out-of-the-box" transformational energy research that brought together scientists, engineers, and entrepreneurs in the hope that further innovation would be created within cleaner technologies (Senate, 2007b, sec. 16538). The program also provided the creation of clean energy innovation hubs, which were to bring together researchers and engineers in the US to address the most critical domestic energy challenges (Senate, 2007b). These hubs focused on improving battery and energy storage in renewable energies, and also in helping fund developing fuels that can be produced directly from solar power (Senate, 2007b). This tool was proposed to develop a more aggressive approach to renewable energy deployment.

As the administration allocated smaller budget amounts to federal environmental departments, Congress chose to use earmarking tactics on small appropriations for climate change mitigation policy (Richards and Richards, 2009, pp. 3-31). Most of these items sought to promote energy conservation and energy efficiency. Congress introduced a small resolution to attempt to introduce more clean technologies as well. Nuclear energy was offered as a solution, as was electricity created through renewable sources (Senate, 2007b). All resolutions containing even earmarking

appropriations or funding on energy management were denied. Equally difficult to pass were legislative measures needed to increase carbon-sequestration activities. These funding proposals were put in place to develop carbon-capture and storage technologies that would remove carbon from the atmosphere, yet still let industry actions continue as usual.

In 2011, the Operational Energy Strategy Implementation Plan was launched in coordination with the Department of Defence (DOD). This was a significant measure in American CO₂ reductions as the DOD had the largest carbon footprint when compared to any other organization in the world (Pew, 2011). Although the American military is known for their vast size, the military also uses excessive amounts of fossil fuels within its operations. Instead, funding was allocated from the defence budget to increase “energy efficiency and new energy technologies to give (our) troops better energy options on the battlefield, at sea, in the air, and at home” (Pew, 2011). The executive administration worked directly in tandem with the DOD to invest in more efficient aircraft engines, hybrid electric drives for ships, improved power for patrol bases in Afghanistan, and higher building efficiency at facilities worldwide (Pew, 2011). Overall, the organisation committed to deploying three gigawatts of renewable energy on military installations, including solar, wind, biomass, and geothermal energies, by 2025 (Pew, 2011). The plan was developed to address military actions now, but also included long-term targets to serve as a roadmap for transforming the way the Department uses energy in military operations.

6.2.1.4 Economic tools from 2001-2012

Although the Bush administration recommended using direct economic mechanisms to target climate change and carbon emission reductions, even market-based tools failed to reach policy implementation. Still, as Congress supported the need to reduce CO₂ reductions, there many policy proposals at this time that sought to use

economic policy tools on a federal level. During this time, many tools were proposed that suggested that the US would begin developing an ambitious climate mitigation policy. However, despite having an executive administration that seemed to support the proposals, and a liberal congress, all cap-and-trade proposals died in Senate. This is interesting as this type of tools seems as if it would match well with the US's economic and technology-focused vision on sustainable development.

The 108th Congress was able to develop incentives for industries to reduce CO₂ by passing extensions of tax credit for electricity producers who used renewable energy supplies (DeCicco and An, 2002). They also were able to provide tax incentives for the use of lower carbon-dense fuels, specifically for biodiesel and the use of electric vehicles.

The US instead sought to launch The Climate Change Credit Corporation, which was attached to the Climate Stewardship and Innovation Act, and was proposed to provide funding for industry and consumers to create new technologies and businesses that would help lead the US towards emissions reductions (Lieberman et al, 2007). This institution would have been constructed as a private and public company, and would have also provided credits to industries that needed assistance in transitioning to less carbon-dense activities. Unfortunately, the bill died in the Senate.

Still, the US passed the New Energy for America Act in 2008 (White House, 2012). This plan was created to help America transition away from an oil-dependent economy to a new cleaner, more efficient, energy economy by giving increased funding to renewable energy research (White House, 2012). The New Energy Plan for America sought to create five million jobs by investing \$150 billion over the next ten years to encourage the transition to clean energy sources (White House,

2012). This would save more oil than the US imports from both the Middle East and Venezuela. The plan also sought to implement a cap-and-trade system and to implement the first carbon target for the US, which was to reduce CO₂ by 80% by 2050 (White House, 2012). Although the plan did not immediately lead to the development of the CO₂ reductions scheme as originally hoped, the plan was able to transfer a significant portion of funds to climate mitigation related activities, and actually marked the first time the US was able to pass federal legislation related to climate change.

The McCain and Lieberman Climate Stewardship Act was the closest instance in which the US passed policy that would lead to the development of a CO₂ trading scheme. This proposal called for the federal government to play a leading role in transitioning to less carbon-intensive operations (Skodvin and Andresen, 2009, pp. 263-280). The agreement called on the government to fund research and commercialize efforts involved in producing new energy technologies (Skodvin and Andresen, 2009, pp. 263-280). The proposal also included a proposal for developing trading emission allowances and reductions to be given as climate credits (Skodvin and Andresen, 2009, pp. 263-280). Proposed by Senators McCain and Lieberman, who were respectively republican and independent, the act failed to pass, despite being proposed with bipartisan support.

Despite the failure of implementation on many bills, significant funding as was allocated towards carbon policy through the American Recovery and Reinvestment Act (ARRA) in 2009. Attached to the bill were several pieces of legislation that would help to push forward climate mitigation policy, including many of the proposals that had been listed in the McCain-Lieberman bill. Congress granted over 39 billion USD to the DOE in order to issue loan guarantees to projects that would “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases” and “employ new or significantly improved technologies as compared to

technologies in service in the US,” (ARRA, 2009, sec 2). Although the legislation was not a direct act related to CO₂ reduction, the heavy promotion of technologies for low-carbon abatement measures was significant.

Congress was also able to pass the Programmatic Environment Impact Statement (PEIS), which streamlined the funding from various pieces of legislation into key energy projects (NEPA, 2011). The tool identifies energy corridors in the West that will help distribute renewable energy. (NEPA, 2011) In this way, the funding put forward for renewable energy was put into projects that would have the most significant impact on transitioning away from fossil fuels.

With the failure of the US to begin developing a cap-and-trade scheme, Obama moved to redevelop a piece of administration that would directly implement such a scheme. Unfortunately, the American Clean Energy and Security Act of 2009 marked a slight setback for the Obama administration. The bill was defeated as it was not approved in the House, but marked “the first time either house of Congress approved a bill meant to curb the heat-trapping gases scientists have linked to climate change” (Broder, 2009). The bill would have established an emissions trading plan similar to the EU ETS and proposed the first coverage period for 2012-2050 (Waxman and Markey, 2009) The scheme was well developed; electric utilities were posed to reduce emissions by 20% by 2020 (Waxman and Markey, 2009). The legislation also included \$90 billion in subsidization for clean energy technologies and energy efficiency for renewables to be dispersed by 2025 (Waxman and Markey, 2009). Carbon-capture and storage was allocated \$60 billion, electric vehicles were given \$20 billion, and \$20 billion was reserved for research and development (Waxman and Markey, 2009). The bill also included provisions to help protect American citizens from rises in energy costs that utility firms could pass onto consumers in order to finance efficiency measures. This piece of legislation included specific order for utility firms to hold energy prices consistent

and to invest in energy. Although the bill proposed 17% of emission to be reduced to 2005 levels by 2020, Obama went ahead and pushed further to have the US reduce 83% by 2050 (Waxman and Markey, 2009).

Although the legislation did not pass, the Senate did agree to later, “establish a market for the United States when international negotiations on a new climate change treaty begin later”, (Broder, 2009, p. 1). The US thus, agreed to review the failure of provisions in order to understand how to later address the implementation of an American CO₂ trading scheme.

6.3 Conclusion: analysing change in policy ambitions, tools and goals in the US from 1992-2012

From surveying the above tools, it is clear that American climate mitigation policy was negatively impacted by the ideas of weak ecological modernisation during this time period. The tools proposed and implemented during this time period show no change in the ambition, type, or nature of policy goals in the US during these two time periods. Although there were continual proposals to begin implementing carbon policy during this time period, the lack of informational instruments and general data made available to the US caused all policy proposals to be denied. By looking at the difficulties that both states and agencies encountered in terms of data collection, it is apparent that a bottom-up approach to climate change policies are much more difficult than previously presumed.

When comparing the diversity of carbon tools in American mitigation policy to that of the EU, it seems that the weak approach to ecological modernisation greatly impacted the type of tools that were available to policy-makers in the US. Although the US often describes a “market-based” approach to CO₂, it may instead be more accurate to describe the US’s approach as “financial” or monetary. Emissions

markets are certainly not favoured in the US, and the sole tools that seem to be proposed are financial or cooperative in nature. Informational tools are largely missing from the US's climate plans, while they seem to form the centrepiece of European climate policy. Instead, it is evident that the US has favoured using economic tools such as those that stimulate funding for research, or that provide financial compensation for efficiency upgrades. In addition, the tool choices of the US seem to shy away from regulating industry, and favour instead cooperative agreements such as tax incentives or standards for buildings and automobiles.

From surveying the tools above, it becomes clear that the US has actually attempted to make significant contributions to climate governance, yet institutionally seems to encounter problems when proposing climate mitigation policy. While the EU implemented aggressive measures that would reduce emissions globally, the US was unable to form a consensus on targets for reductions, despite heavy support for an emissions trading scheme in multiple institutional locations. Analysing the differences in the nature and ambition of the carbon tools proposed in the US points to the specific types of tools that are proposed, yet fail to reach implementation. Emissions trading schemes consistently encounter problems, despite being proposed from many different agencies and from different actors. However, it seems that decisions proposed have been more successful when they have come from the DOE instead of the EPA. Although proposals come from different committees, they seem to be continuously proposed by the same senators, from either Western or North-eastern states. Despite an emissions trading scheme being an economic tool and suited towards the US preference, no actor has been able to successfully create the policy unity necessary to pass an emissions trading scheme on a national level. Overall, when surveying the last two chapters we can clearly see that the ideas that the EU has used to approach carbon policy have resulted in a change in policy goals, ambitions, and tools. However, we can also clearly deduct that the US's weak ecological modernist approach has failed to create a convincing case for climate

change, and shows that US has not changed in regards to policy goals, ambitions, or tools.

Chapter 7. Comparing the impact of ideas on changes in policy paradigms and the role of the state in the EU and the US between 1992-2000

The empirical analysis collected in chapters five and six of this dissertation indicate that the EU has been more successful in driving towards an ecological paradigm shift than the US has. The previous two chapters examined and compared the nature of change in policy tools and policy goals in both the EU and the US to see if the first two types of ecological change had occurred. Already, one can see that in the EU this appears to be so, whilst in the US this is not the case. In the EU, the policy tools have becoming increasingly mature, and the policy ambitions behind these tools has steadily increased. In the US, it seems that the tools have remained the same, as have the general policy goals. Although this empirical analysis is helpful in qualitatively identifying if change has occurred, a deeper dive into the actual changing role of the state will help to more concretely identify concrete comparisons between the adaptive capacity of the EU and the US.

This thesis now moves to specifically investigate how an emissions trading scheme, or a fully operating environmental market, requires a stronger idea of commitment to climate change than as currently displayed in the US. Specifically, when comparing the impact of ideas during critical junctures one is able to see how the European commitment to strong ecological modernisation has been a more effective strategy for catalysing institutional change than the US's current approach has been. From the previous empirical chapters one is able to see how ambitious climate legislation, in particular proposals for an emissions trading scheme, will require drastic institutional adjustments before legislation can expect to be implemented in the US. This chapter (and the next) focus specifically on understanding how the two divergent approaches, a top-down vs. bottom-up approach, impact policy-choices. By focusing on the critical junctures identified in the empirical data collection process, these chapters will analyse how actors interact with ideas and how this in turn affects the decision-making process, and ensuing institutional adaptation in

both the EU and the US. Doing so will then provide deeper insights on the role of ideas in the policy-process and also on the incremental institutional changes that are needed to support society as governments move to address climate change.

In the decision-making process of the EU in regards to climate change, it is worth noting that the DG Clima is far from being the only important actor in European carbon policy. However, the role of the DG Clima—now separate from its previous role Directorate-General for the Environment (DG Environment) —shows that the EU has at least gone through one of the stages needed for an ecological paradigm shift, which is a change in the role of the state. Today, the DG Clima is much more than an environmental policy legislator, as it alone has the power to legislate proposals in relation to climate change (DG Clima, 2014). Thus, the EU's leadership assessed in this chapter and the next chapter will pay particular attention to the evolution of the Commission in the development of climate mitigation policy.

7.1 First critical juncture: the historical setting ahead of the 1992

UNFCCC conference

The UNFCCC conference in 1992 was the first critical juncture where divergent opinions in the conceptualisation of environment and economy in the EU and the US began concretely impacting their domestic carbon policy paths. Here, one can see how actors championing a strong approach to ecological modernisation first began to impacting the European strategy for climate change mitigation. Yet, it was also at this conference that the US framed its discussion on climate change mitigation policy that would resonate for decades. In particular, the critical juncture here marked the first instance in which ambiguity arose on the role of the US in global climate mitigation discussions, whereas this specific conference also helped concretely establish the EU's path towards climate leadership. During this time period, economic development and environmental protection were key agenda topics in both international policy arenas, as well as in domestic discussions in the

EU and the US. Both the EU and the US went into the international climate discussions in 1992 with very different domestic economic climates, which perhaps affected the construction, and importance placed, upon their individual climate mitigation policies.

In 1992, several European economies had high unemployment rates, stagnant growth rates, which seemed to be a point of frustration for both European citizens and policy-makers (Winkler, interview, 2015). Adding Eastern European economies into the EU after the post-Soviet collapse had placed additional economic pressure on European institutions. In particular, the agricultural industries, which typically had contributed to a significant portion of Eastern European growth, were significantly damaged (Winkler, interview, 2015). European policy-makers at the time were focused on creating a single market in which goods and services would establish a competitive single trading area, and where businesses could operate across borders (Winkler, interview, 2015). Therefore, the EU needed to develop an approach to economic development that would also address environmental degradation and produce economic growth. It was at this conference in 1992 where one can see how the notion of strong ecological modernisation as an effective strategy for climate mitigation goals first began impacting policy decisions.

At this time, it seems that citizens supported the need for environmental protection and placed pressure on European leaders to take action on environmental legislation, including climate change (Winkler, interview, 2015). In the EU, “the idea that the world needed environmental considerations within economic growth, and climate change could help to do so, go back a very long way,” explained Joan MacNaughton, former DG Energy for the UK, and active participant in the formation of carbon policy in the EU (MacNaughton, interview, 2015). “In part, this was due to the Scandinavian countries; they were active in environmental matters and climate change, for them, it was the best way to address both the problems of economy and

environment,” (MacNaughton, interview, 2015). Yet in addition to the positive cultural legacy in favour of environmental protection, the legislative branches of the EU were, at the time, also supported by citizens’ demand for pollution reduction, which seemed to be adding to the overall political demand for concrete action on the environment. A large part of the support for climate change) was the visual nature of climate change in Europe (Samyn, 2014). Delbeke for instance, once noted that, “as a kid, my mother hung out laundry to dry. Sometimes wind would bring fallout from a nearby power plant so she had to wash it again,” (Samyn, 2014). European citizens in this point, therefore, saw industrial growth as a key threat to their wellbeing and supported the need for environmental regulations.

Contrarily, the economy in the US was drastically different from the EU’s in the early 90’s. Whilst the EU was struggling economically, the US was experiencing an economic boom that was in part founded on as part of the “.com boom” in the Western United States (Evans, interview, 2015). The explosion of the Internet had caused an eruption of new businesses in both services and manufacturing, which had contributed significantly towards economic growth (Evans, interview, 2015). As a result, the ideas conceptualizing the economy and the environment in the US were drastically different from those in Europe. The US seemed to think it did not need to preserve the environment, but instead, needed to increase its technology presence in order to increase domestic growth rates. Therefore, there was not an economic need nor physical reminder to support discussions relating to the decoupling of economy and environment in America.

It was here where one can see the evidence of the movement to oppose a strong ecological modernist approach to climate change mitigation. When looking at the interaction of actors after the UNFCCC conference, it seems as though the shifting nature of the broader political spectrum in the US directly impacted discussions relating to climate change. What is interesting to note is that in Europe, it seems as

if the conservative opposition to the environment simply did not exist in Europe at the time (MacNaughton, interview, 2015). There were little early concerns about the environment limiting economic growth, and instead, neoliberal supporter such as Margaret Thatcher, helped to champion the importance of protecting local environments as part of industrial growth processes. This shows a difference in the construction of conservatism in the EU and US. Whereas conservatives in Europe took a humanitarian viewpoint that the environment deserved value, and therefore felt a moral obligation to protect the environment. In the US however, the conservatives, the Republican party, simply continued to look at the environment as a free part of production processes (MacNaughton, interview, 2015). This was a large initial difference in the attitudes towards the regulatory nature of environmental policy.

There was also a significant difference in what constituted the framing of the climate change problem in the EU and the US, which can be seen when looking at both the importance of the issue, but also the employees assigned to work on the policy tasks. In Europe, both conservatives and liberals agreed that when structured correctly, environmental regulation could help to increase competitiveness in the broader European economy (MacNaughton, interview, 2015). Therefore, climate change was framed as both an economic and environmental problem, whose tasks therefore required using both economists and environmental scientists. In the US, the environment remained an environmental policy problem, yet the policy tasks and associated responsibilities of carbon management remained unassigned. Therefore, looking at the interaction with the UNFCCC conference below shows how the US's weak ecological modernist approach to climate mitigation policy failed to produce a convincing case for addressing climate change. At the same time, this instance shows the positive incremental changes that were made in the EU in order to help it institutionally adjust.

7.1.1 Actors and their ability to influence policy in the EU

Prior to the UNFCCC conference in 1992 there were various actors who were able to informally influence the decision-making process of the EU in regards to climate change policies, mainly through treaty provisions, or other legal obligations. The President of the Commission had the right and authority to lead the tasks on climate as part of the position's umbrella duties. At the time, this was Jacques Delors. Although not necessarily an environmental advocate, Delors' main goal for the EU itself at the time was the unification of the European Single Market; an economic task (MacNaughton, interview, 2015). Although he originally was not convinced that climate change needed to be a main policy agenda item, he became convinced that it could become a useful tool for economic development mainly through the influence of the DG Environment. At the time, this was Carlos Ripa di Meana, an Italian national who championed the idea that environmental problems required a commitment by all European institutions (Andresen and Agrawala, 2002, pp. 41-51). He was a key player in pushing through the legal basis for action by the EU on climate change, which was initially provided by the 1987 Single European Act which introduced explicit environmental provisions into EU treaties (Barnes, 2010, pp. 41-57). Therefore, he was a key actor who helped promote the ideas of strong ecological modernisation within European legislation.

Di Meana had previously participated heavily in the Rio conference on sustainable development, again representing the EU at a key international environmental conference. He had participated in the drafting of several documents related to sustainable development, and believed that environmental policy problems required an aggressive approach to sustainable development (O'Riordan and Jordan, 1999, pp. 81-93). He therefore pushed for a carbon tax, which he saw as the best policy tool for creating a community-wide approach to an environmental policy problem.

Di Meana can be seen as representative of the widely seen high-skilled set of European policy-makers at the time. European member states were able to contribute individuals to help formulate the specific European position on climate change. At the time, there were two main types of policy tasks which were divided between member states and Commission officials related to climate change. The preparatory work prior to international negotiations was largely led by these “issue-leaders” or official appointed lead negotiators. These actors were assigned a specific task in climate negotiations due to either their specific skill-set, expertise, or desire to be involved (Barnes, 2010, pp. 41-57). This informal policy process was initiated to avoid the polarisation of climate policy in the instance of a weak presidency, or in the instance that actors in the international arena could potentially be seen as a risk for overwhelming the EU’s voice. Legally, therefore, member states could join together to block the presidency’s motions, but also individual commissioners’ motions.

Jos Delbeke at the time acted as an issue leader on behalf of Belgium and can be seen as playing a critical role in reconciling the President’s focus on a single market with the environmental commissioner’s desire to increase environmental protection (Forrister, interview, 2015). With a Ph.D. in economics, his background emphasised the need to create clear cost-benefits in order to create consensus on climate (Forrister, interview, 2015). He had previously acted as the Head of Task Force during World Summit on Sustainable Development in Johannesburg, and therefore, when looking at his positions, can see how he was responsible for was given helping to form an approach to carbon emissions reductions that was based on sound economics (Delbeke, 2015). He was appointed as Head of Unit for Climate Change as part of his responsibilities under the DG Environment where his duties required him to act as chief negotiator of the Commission at the UNFCCC Conference of the Parties on Climate Change in 1992 (Delbeke, 2015). Delbeke was therefore able to frame the issues beforehand and then bring them into the international arena.

Still, it is important to note that the passing of the precautionary principle in early 1992 helped set a positive precedence for environmental responsibility ahead of the summit (Wilkinson, 1997 p. 153-173). The precautionary principle shows how early on the EU was committed to understanding that climate change required a broader societal shift. This law was a marked change in how the EU designated responsibilities for environmental matters and legally helped to shift the EU towards a more ecologically-friendly economy. The precautionary principle required the EU to establish liability for environmental harm, thereby effectively institutionalizing the notion of “polluter-pays” (Wilkinson, 1997 p. 153-173). This principle states that if an action is suspected of causing harm to the environment, in the absence of scientific consensus, the burden of proof rests with industry, not the community, to prove their action is not harmful. The law therefore assumes that industrial development is causing damage to the environment and suggests that industry can take steps to prove otherwise, but in the absence of doing so, they are liable for damages to the environment (Wilkinson, 1997 p. 153-173). For climate change, this was important as the law removed the need for the EU to prove that the risks from climate change were real, and instead shifted responsibility towards industry to prove that climate change was not real. Legally, this meant if firms took action that did not show proper risk management, including environmental impact assessments, they could be held liable for environmental damages. Therefore, it was with this change in values and in the role of the state in setting ecological boundaries that the European delegates attended the first UNFCCC conference.

7.1.2 Actors and their ability to influence policy in the US

There were no formal responsibilities in regards to climate policy in the US at this time. Instead, the policy process was highly informal, and depended on the executive branch to identify who controlled negotiations relating to international climate change legislation, (Andresen and Agrawala, 2002, pp. 41-51). In terms of legislative responsibilities, in general, all legislative powers reside within the US Congress, between the House of Representatives and the Senate where various

policy committees can propose legislation. From the empirical analysis in chapters five and six, one can see that legislation in the US was proposed and discussed mainly within three legislative committees; the Senate committee on Environment and Public Works, the House Committee for Science, Energy, and Commerce, and in both the Senate and House Committees on Finance. Not only could Congressmen and Senators propose legislation within these committees, but governmental agencies were also able to propose individual plans and programmes at this time that related to climate mitigation policies (Steel et al, 2004, pp. 1-13). It's worth noting that often, agency plans were proposed as the result of a request from Congress for action. However, agencies still proposed legislation themselves at times, specifically in terms of budgetary requests. If the powers of the legislation fell under the umbrella of the agency, they could argue that they needed increased budget capacity in order to address the problem accurately (Steel et al, 2004, pp. 1-13). From the empirical analysis, it seems that the EPA may have made small requests when looking at the time period from 1992-2000.

During this time period, and still today, the American President can also propose legislation relating to carbon policy under the powers of executive order; however, at this specific point in time this was noted as unlikely to occur (Costa, interview, 2015). 1992 was an election year in the US and although George H.W. Bush had previously planned early action on climate change, he was nearing the end of his second term as president (Costa, interview, 2015). Although an executive order would have directed federal or state agencies to take action immediately, such an order would have required congressional approval to go into law. Bush as a candidate was not overly motivated as his order could have been overruled by the courts or nullified by legislators after he left term. In addition, it seemed as though Bush was reluctant to make any decision on climate when it was not a main agenda item for the American public (Costa, interview, 2015). In addition, Bush seemed less likely to address climate change because it was during this Presidency where the partisanship of carbon policies first began to occur in the US.

At this time, the Republican party in particular, interpreted carbon policy as a political issue, not as an environmental issue (Rowan, interview, 2015). The call for a shift towards a low-carbon future in particular seemed to resonate with a “big government imposing on big business, and that is how they sold it,” noted conference negotiator Peter Rowan and current environmental economic adviser to the UNFCCC. Instead, it is here where the US seemed to begin dividing not only amongst themselves, but from the international scientific community. “The American approach seemed to be based on the “free-market approach” which indicated that if the environment needed preserving, markets naturally reflect a shortage in supply; however, it also seems that the major thought at the time from the conservatives was that with enough money, Americans would be able to solve the problems related to climate change,” (Forrister, interview, 2015). However, it’s also worth noting that this time the US seemed to be reluctant to affirm the existence of specifically “global warming” or not; the science proving that climate change was real never seemed to have diffused the American policy makers at this time (Forrister, interview, 2015). Therefore, the American notion of how to address carbon emissions reflected a traditional American approach to environmental problems, which emphasized the importance of the formation of a market to reflect constraints on CO₂, like had been done previously in SO_x reductions (Goldblatt, 1996; Schnaiberg, 1980). Therefore, it’s here where one can see how the US’s idea of weak ecological modernisation emphasized the need for a non-regulatory and market-based approach to come out of the first UNFCCC discussion, such as an emissions trading scheme or carbon tax. Taking this approach automatically eliminated regulatory options as a policy choice for decision-makers.

Although the Republican party today is well-known for their reluctance to address climate change, it is also hugely important to note the negative impact that the liberal community had on climate change in the US. Although Republican decision-makers emphasised the importance of taking a market-based approach, so did the Democrats

at this time. During this period, the left moved much closer to the centre, which one can see also, “had a huge impact on what was being talked about before going into these international climate conferences,” noted John Topping, President and CEO of The Climate Institute and former Staff Director of the Office of Air and Radiation in the US EPA. “Not only did the Republicans gain more control during these discussions, but the Democrats accommodated them; they shifted right, and we did too,” (Topping, interview, 2015). The greatest example of this can be seen in the largest advocate of climate change, Al Gore. During this time period Al Gore was a popular Senate voice who heavily influenced how the US began to approach climate change. He was known as an “Atari Democrat”, which meant that he saw the advent of new technologies as the main opportunity for economic growth (Heilbrunn, 2000, pp. 48-55). Gore himself specifically championed the need for new technologies that would help the US become more environmentally efficient (United States Senate, 2013). He framed the discussions in what would have been considered a weak economic strategy, discouraging the use of regulation, pushing for market opportunities, and championing the notion that US could continue to deploy new technologies that could save the atmosphere (United States Senate, 2013). Although this was related more towards a conservative viewpoint in Europe, in the US, this was the Democratic position on climate change at this time.

A major policy change in a non-environmental dimension seems to have had dramatic impacts on the issue of climate change at this whole, which began at this time. Directly ahead of the UNFCCC conference was the repeal of the Fairness Doctrine (Forrister, interview, 2015). This deregulation on media helped shift the nature of policy debates in the US surrounding carbon policy further towards the Republican agenda and, “had a big effect on the understanding of climate change and sustainable development in the US,” points out CEO of the International Emissions Trading Association, Dr Dirk Forrister. This act shifted US public broadcasting systems away from public ownership towards privatisation. However, it seems that many of these public broadcasting agencies were sold to agencies with clear political agendas (Topping, interview, 2015). At the same time, the privatisation of media meant that television stations needed to achieve high-ratings.

It therefore, was not in the best interest of media organisations to promote factual news relating to climate as the statistical information related to carbon emissions reductions was considered quite mundane. Instead, the repeal of the Act helped increase the sensationalism of the media which had a very negative impact on the campaign for climate policy, which was a result in the increased partisanship of climate issues (Topping, interview 2015). There was no middle ground for climate change in the US, it was either depicted as either the end of civilisation for the left or an invented cause made up by Europe to limit the success of the American economy on the right.

At the time, Dirk Forrister was acting as a representative to the international negotiations, yet also was helping the Executive branch develop its proposal for an emissions trading scheme. He noted that, “while the Fair Media Act was in place, it was mandatory that any airtime being taken up by a private organisation had to serve a public good; after the airtime act was repealed, you could essentially say whatever you wanted as long as you paid for it,” explained Forrister, “and this was a big problem for the environment campaign” (Forrister, interview, 2015). The connection between media and the ability of the private sector to control its messaging through funding seems to have been a consistently negative source of influence on climate mitigation policy in the US. Although this points to a change in the role of the state, it is not a positive change for climate change. Instead, again, we can see here how the lack of an institutional-wide approach to climate change meant that there were different scenarios being presented to the public in regards to the impact of climate change. “The Western Fuel Lobby strategically invested in creating a sense of “us and them, and were very successful in doing so,” John Topping noted when discussing the beginnings of climate partisanship in the US (Topping, interview, 2015). Although the influence of the fossil fuel lobbies has been extensively covered in the US, a point that is traditionally left out from the negative climate campaign was also the negative influence that the Democratic party had through media campaigns and specifically, the negative influence of celebrities

associated with climate change in the US. “The Celebrity-Presidency was as successful in isolating the normal American from climate change concerns as the fossil fuel industry was,” Topping argued. “Gore being involved as the main decision-maker in climate change discussions, and at the same time running for Vice-President meant that when people didn’t like him, personality then could become a deciding factor in whether a citizen was for addressing this major environmental policy or not.” Although there are no studies that associate Vice-President Gore as a negative influence on climate change, it is interesting to consider the lasting impact that he may play on policy today.

7.1.3 The impact of ideas during the critical juncture

When looking at the historical setting in the EU and the US ahead of the UNFCCC conference one is able to note already clear divisions in the carbon policy paths of the EU and the US. Here, the American public and institutions that represented them began to divide in regards to climate change. At the same time, it’s here where one can begin to see the influence of strong ecological modernist ideas influencing the policy path formation of the EU. Therefore, at the meeting itself US delegates went into the negotiations already supporting the notion of creating an emissions trading scheme, which reflected its weak approach to climate change.

The EU's delegation represented its broader and more economic commitment to climate policy. Originally, the Di Meana had been pushing for a carbon tax, but this required a qualified majority vote, and there was strong opposition from many member states (Costa, interview, 2015). They saw a carbon tax as being overly regulatory and an unfair burden when looking at the disproportion of heavy-emitters between certain member states. The opposition consisted mainly of member states from the South, and those that were the most heavily industrialised. They believed that a carbon tax would penalise the industry members located in their borders (MacNaughton, interview, 2015). This opposition was supported by the UK and

Denmark, both of which had operating emissions trading schemes, and therefore the notion of using an international emissions trading scheme as the main policy tool for carbon emissions reductions (MacNaughton, interview, 2015). Although the strong idea of ecological modernisation called for a carbon tax, the bargaining process at the summit itself resulted in the EU moving towards the proposal of a carbon emissions trading scheme, as a regulated tool for monitoring carbon emissions reductions.

The US delegation was represented mainly by Gore, who played a critical role in framing the American responses to the UNFCCC conference. This combined with then Presidential-candidate Bill Clinton's more centrist platform resulted in a very different version of the idea of sustainable development and climate change in the US being brought into the climate-policy arena. Although the Americans saw an emissions trading scheme as a useful tool for CO₂ reductions, this was still an American liberal notion at the time. Therefore, this weak modernist idea still had to be proposed within broader American institutions upon the delegation's domestic return.

The US delegation at the juncture itself therefore pushed for the international climate discussions to focus on designing a market-based approach to environmental management like the US had used in the 1970's for sulphur dioxides and nitrogen dioxides (Forrister, interview, 2015). However, both the Democrats and Republicans in the US saw the polluter-pays-approach that the EU was pushing for as being "inflexible and resulting in costly action.... which can discourage technological innovation that lowers the costs of regulation." (Clinton and Gore, 1995). Al Gore was the lead proponent of the notion that the EU's approach was overly regulatory. He argued that an emissions trading scheme could work, but only if firms and nations could opt into the policy tool, not be forced to comply with its targets.

The calls for action that stemmed from the international discussion represented a compromise between the American and European viewpoints. Countries agreed to work to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous repercussions from an increase in the average surface temperature of the earth (Grubb et al, 1997). Countries therefore agreed to work towards the development of international legislation that would address the need for reductions. However, it's worth noting that the intent was to begin working on legislation that set no binding limits on greenhouse gases for individual nations, nor would the treaty be made to work towards enforcement mechanisms. Instead, the framework that resulted from this conference, the UNFCCC, was created to help countries work together in the future to form more specific actions that would lead towards the mitigation of climate change.

Therefore, it was with this proposal that the influential actors named above returned back to their domestic areas of governing. In the US, Al Gore and other democratic leaders returned home to push for Congressional support for joining the international community in officially mitigating climate change. In the EU, Jos Delbeke and others returned to their specific posts within the Commission, and specifically DG Environment to do the same. The European intention was to receive European-wide support for moving towards a specific carbon policy.

7.1.4 Incremental changes made in the EU after the juncture

The domestic policy responses to international demands of the UNFCCC therefore reflected a severe disproportion in terms of carbon policy. It was here, “where European leadership really began spreading with force, and began to focus on their need to reconcile the environment within the European economy”, said MacNaughton (MacNaughton, interview, 2015). The approaches to carbon policy in the EU and US represented the differences in the construction of their ideas

surrounding carbon policy, and in particular, in the role of the environment, regulation and economy.

After the conference, European economists returned home and began bargaining for the legal grounds that future legislation would require. The biggest reflection of European commitment to strong sustainable development could be seen in the White Paper, *Growth, Competitiveness, and Employment* (CEC, 1993). This paper argued that stringent environmental measures could also be beneficial to the economy, and used an economic approach favoured by the member states supporting strong sustainability in order to create a convincing argument that climate change could be used as a competitive good for the economy. It's worth noting that although Commission members like Di Meana had pushed for a carbon tax ahead of time, that a few countries argued that this would be too penalising on industry. Instead, the member-state majority supported the European position of an emissions trading scheme. As a protest, Di Meana resigned and Delbeke took his place in pushing forwards carbon policy in the EU (Grubb et al, 1997).

The white paper clearly displayed and emphasised the need for tools that would change patterns in environmental, economic, and also social dimensions of climate policy. Therefore, in addition to the emissions trading schemes, informational tools were emphasised as an important way used to create behaviour change for citizens, and to increase the understanding of the importance of addressing climate change (COM, 1993). Regulatory proposals were put forward to make sure environmental targets were stringent, and cooperative proposals were launched to keep industrial performance competitive. Overall, the white paper contained nearly 100 pages of strategic guidance as to how the European economy could improve going forwards.

When returning from the conference, European institutions adjusted to

accommodate and support the creation of an emissions trading scheme. Central to this was adjusting the skill sets of the people who managed and created environmental policy in the EU. The DG Environment underwent a change in staff, again reflecting Di Meana's resignation, which can also be seen as the EU moving away from a regulatory approach to environmental regulation to an overarching economic approach. The EU recognised that climate policy would need to interact frequently within economy and energy required economic expertise as well as a deep understanding of environmental policy. Therefore, Jos Delbeke, who had previously been responsible for only the creation of economic tools in the DG Environment, took helm of a newly created special environmental task force on climate change within his existing office (European Commission, 2012).

7.1.5 Incremental changes made in the US after the juncture

By the time the international legislation had finally been proposed to Congress, it was already the beginnings of a new election season in the US. At that time, President Clinton was running as a "New Democrat," a platform that had emerged after the democratic losses to Ronald Reagan in the 1980's. The large margin of losses to a Republican candidate caused the party to move more central to further represent the increasingly conservative interests of the American public (Hale, 1995, pp. 207-221). The party moved to represent a, "new public philosophy built on progressive ideals, mainstream values, and innovative, non-bureaucratic, and market-based solutions," (Giddens, 1981). The platform of these new ideas was referred to as the "Third Way", and was outlined by as a radical reconstruction of a centrist position to politics. The democratic ideas at the time differed from traditional Democrats strongly on the notion of economic growth, and the degree of governance; specifically, these ideas moved to combine a conservative notion of economics with a progressive approach to social policies. This position was developed as a way to merge liberalism with a more market-based focus to economics. Thus, as both Gore and Clinton had stemmed from the movement, they ran as democrats but embraced fiscal conservatism and a neoliberal approach to

economics. Although they both wanted to address climate change, their ideological background would already limit them to only using market-based and voluntary policy tools. Anything else was seen as overly burdensome on industry.

During this time Republicans had gained control of both houses for the first time since 1954 (Gimpel, 1996, pp. 115-117). This Congress, led by Newt Gingrich, entered into office with a list of specific objectives to address in the first 100 days of taking control. The Contract with America was signed by all but two Republican members of the House (Gimpel, 1996, pp. 115-117). This listed specific items of action for the rest of Congress, and specifically included a list of budget items that were seen as harmful to the government's economic prosperity. The EPA's budgetary allocation in particular, was a point of contention. The Republicans viewed the associated costs as being part of a regulatory burden, and when pushing for a balanced budget, pushed the EPA forward as part of the programmes that could be cut (Stowe, interview, 2015). This made it difficult for any environmental regulation to pass, even if the associated costs were minimal (Nekhaev, interview, 2015).

Although the provisions outlined in the compact for climate change seemed as if American support would be guaranteed in deploying the first legally binding treaties, Clinton and Gore had very different opinions as to what ratification would do to the US economy and the domestic environment. The Clinton-Gore administration took the viewpoint that, "pollution is often a sign of economic inefficiency and business could improve profits by preventing it", showing some degree of commitment to addressing the issue. This could be seen in the report they released outlining the American response to the UNFCCC (Clinton and Gore, 1995). This domestic response to the treaty discussed how the burden for cost of environmental degradation would be addressed by increasing efficiency in industry, and thus, naturally reducing emissions. The outline on climate change in the US

produced by the administration placed emphasis on a lack of bureaucratic interference in environment regulation, and recommended the use of market-based tool for addressing environmental policy goals (Clinton and Gore, 1995). Innovation, in this aspect, became a central component of climate mitigation policy in the US.

7.2 Second critical juncture: the historical setting ahead of the Kyoto Protocol, 1997

Although the UNFCCC began to meet on a bi-annual basis to monitor progress on developing climate change policy collectively, the next significant meeting for investigation is in 1997 in Kyoto, Japan. Building on the 1992 agreement and the need for sustainable development and climate change policy, this conference sought to produce an official international treaty on CO₂ reductions. The objectives of the KP were for countries to simply agree on their share of responsibility, agree to develop domestic methods that would address their emissions allocations. Reflecting their differences in ideational mind-set at the time, the EU and the US approached this meeting with contrasting viewpoints as to the role of governmental intervention needed to address carbon emissions, and also the types of tools that should be used to achieve carbon policy goals.

The economic setting in the EU in 1997 focused heavily on economic growth, and again, the integration of new European economies. The EU's focus on strong sustainable development meant that the EU would need to continue to maintain a positive relationship between industry members and European institutions in order to maintain a balance between environmental action and economic prosperity. This also meant that the European economic outlook needed to be revisited to ensure that its vision of growth reflected a commitment to ecological economics. Therefore, the Europeans at this time worked to communicate the importance of climate change,

and implementing new policy tools that would not negatively hinder economic growth.

In the US, President Bill Clinton had just taken office for the second time, with Al Gore as Vice-President again. Despite the noticeable place that climate change had had in the administrations previous election campaign, this time period featured a heavy discussion on the role of healthcare in the US. However, this might have been due to the fact that the Presidency was limited in terms of aggressiveness on policy measures. A marked difference at this time was the dominance of both the House and Senate by the Republican parties in the US. Still, Vice-President Al Gore acted as a champion to the climate cause.

7.2.1 Actors and their ability to influence policy in the EU

Prior to the meeting itself, it became clear that member states supported the development of an emissions trading scheme. As such, the EU began to quickly collaborate with member states such as Denmark and the UK to identify what type of data was required for the design and monitoring of emissions trading scheme (MacNaughton, interview, 2015).

Importantly, the ecological economic approach to sustainable development meant that the European approach to climate change naturally contained a certain consideration for maintaining a balance between economy and environment. This could be through policy items like the Treaty of Amsterdam which was officially signed in October of 1997, ahead of the conference. Although the legislation would not become legally impactful until 1999, the language that was laid out in the early days of the proposal were indicative of the broader European voice ahead of the KP meeting. Here, the European community specifically sought to reconfirm its commitment to integrating environmental considerations within European economic growth. This legislative proposal contained several statements that

impacted the broader European economic outlook, and thus, affected the capacity of European legislators in addressing climate change. The treaty focused on establishing a common market and an economic and monetary union, yet still included sustainable development as a major objective of the EU itself (EC Treaty, 1997). The document emphasised overall environmental protection as an overarching objective of European institutions. This meant that for all policy, including climate change, “environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities referred to in Article 3 in particular with a view to promoting sustainable development” (EC Treaty, 1997, Art. 4). This required the Commission to take action to prevent environmental damage from occurring, and to ensure that all economic activities in the EU should move to contain a certain degree of environmental considerations.

As the EU had legally joined the UNFCCC framework, the steps that the EU took after the 1992 conference put European negotiators on track to identify what the best means for carbon reductions in the EU would be ahead of the KP. European researchers worked with industry members prior to the KP to determine which specific policy proposal would be the best tool for emissions abatement in the EU. Delbeke chaired the meetings, and aimed to understand how to develop a “cost effective tool that could even provide economic opportunities”, (CEC, 2001b, p. xxi). Delbeke hosted meetings with industry heads to understand how to best develop, and allocate, the amount of carbon that could be used by industry. The industry consultations concluded with the recommendation to, “simplify the legislation related to the implementation and enforcement measures behind tools, which would also help deploy faster and more effective results in CO₂ reductions,” (CEC, 2002b). This recommendation would later prove to be problematic for the EU, yet helped the Climate task force initially create clear time dimensions to focus on the roll-out of the policy tool. Climate mitigation policy, in this stage, therefore, reflected the dimensions of strong ecological modernisation by including consultative processes ahead of the discussions. In addition, the EU maintained its

“top-down” approach by requiring Delbeke’s team to form a single European viewpoint ahead of the KP negotiations.

Therefore, strong ecological modernisation, combined with the general economic setting, caused European actors to go to Kyoto with a very specific viewpoint. First, any actions taken post-Kyoto were in line with scientific recommendation. Secondly, that legislation proposed afterwards ensured competitive and positive market impact in the EU itself; and thirdly, that decisions taken there reflect the consideration of and support of all member states.

7.2.2 Actors and their ability to influence policy in the US

The State of the Union (SOTU) address when Clinton began his term in 1997 outlined the shift in the relationship between the administration and the environment, and clearly showed the use of weak ideas that would be used to address environmental proposals. Again, reiterating the emphasis that technological developments would indirectly lead to environmental protection, the President analysed how “the new promise of the global economy, the Information Age, and life-enhancing technologies” would help to build stronger communities and a safer natural environment for American citizens,” (Clinton, 23 Jan 1996). Although climate change had been mentioned very quickly within the President’s first SOTU address in 1992, the environment was not mentioned until much later in the speech. Instead, Clinton’s discussions placed heavy emphasis on economic growth, yet failed to include the need for growth to be developed sustainably, or in line with technological developments needed to support the notion of weak ecological modernisation. Instead, the only mention of climate change outlined the duty to “make big polluters live by a simple rule: if you pollute our environment, you should be able to clean it up,” (Clinton, 23 Jan 1996). When taking this into account, it thus seemed natural that the US would be able to create a market-based tool to help lower CO₂ reductions.

7.2.3 The impact of ideas during the critical juncture

The American and European constructions of ecological modernisation impacted the types of actors that participated in the meetings in Kyoto, and the capacity in which they could influence domestic policy. Jos Delbeke continued to represent the EU at these negotiations. Prior to the meeting itself, it became clear that member states supported the development of an emissions trading scheme. As such, the EU had collaborated intently with member states such as Denmark and the UK in the weeks ahead of the meeting to identify what type of data was required for the design and monitoring of emissions trading scheme (MacNaughton, interview, 2015).

Although the EU had Commission members like Delbeke directly involved in the negotiation of the Kyoto Protocol, in the US climate change again was supported directly through the coordination of the executive branch. In 1997, President Clinton and Al Gore's administration had recently begun its second term in office. Therefore, when the administration took office in January of 1997, the North American Free Trade Agreement was a key legislative topic, and contained again proposals for environmental protection that would be produced through increased economic growth.

Still, Clinton reiterated the focus of the administration to "protect our global environment, working to ban the worst toxic chemicals and to reduce the greenhouse gases that challenge our health even as they change our climate", (Clinton, 23 Jan 1996). Thereby, when Todd Stern, a lawyer, joined Al Gore to represent the US as a special envoy on behalf of the President, it was expected that the US would support the international proposals for an emissions trading scheme. However, what failed to be taken into account, again, was that environmental proposals resulting from the international discussions would require executive order or Congressional approval. Therefore, it became important for American policy entrepreneurs to clearly demonstrate how the Kyoto Protocol would impact the American economy.

7.2.4 Incremental changes made in the EU after the critical juncture

After the conference, the signatory for the KP mandated that the EU required support from European member states. The majority support needed for official ratification of the EU was taken quickly and easily. European policy-makers had worked to show the domestic economic benefits of addressing emissions reductions amongst both industry members and European citizens (Winkler, interview, 2015). The institutional adjustments made after the KP meant that the EU's scientific expertise needed to develop directly in line with the recommendations of the IPCC and UNFCCC. After the conference, policy-makers in the EU focused on spreading information relating to the importance of addressing climate change and creating a citizen base that was supportive of the legislative actions that would need to go into place in order for the EU to meet its carbon reductions responsibilities. A critical aspect of this was the mandated change to the Commission itself. In order to encourage the dissemination of climate information, legislation was passed shifting again the EU's tone on climate change from active to pro-active. Now, in the instance that the scientific community released reports warning of dangers to the public in any aspect related to the environment, the Commission was ordered to take a public signal within the first six months of the policy landing on the DG Environments desk (Unspecified, 2007). This removed the chance that policy could "expire" and instead put a specific time limit for action in the hands of the Commission.

The most specific institutional changes that were taken after the KP, were the adjustments taken to accommodate and support the creation of an emissions trading scheme. As the EU lacked statistical information on a European scale in order to identify how to create the appropriate allocations for industry in the carbon emission-trading scheme, DG Environment worked to create a new special taskforce that would help to collect and disseminate information as related to CO₂ reductions (Unspecified, 2007). Central to this was adjusting the skill sets of the people who

managed and created environmental policy in the EU. Keeping economists involved in the project, as well as expanding the policy expertise to include scientists, helped the EU to retain purely fact-based discussions in regards to climate change.

The special task force on climate was therefore formed to continue the dialogue with industry to test the data that various European agencies collected. The DG Environment underwent a change in staff, reflecting the change of international demands that shifted away from a regulatory to an overarching economic approach. The EU recognised that climate policy would need to interact frequently within economy and energy required a different type of expertise. Therefore, Jos Delbeke, who had previously been responsible for only the creation of economic tools in the DG Environment, took helm of a newly created special environmental task force on climate change within DG Environment (European Commission, 2012). Here, one can see how having a DG Environment with an economic background was helpful in creating a clear understanding of the costs and benefits associated with climate change mitigation.

The EU then moved to begin working on the creation of an emissions trading scheme, which was a notion that originated from weak ecological modernisation, the emphasis of as strong ecological approach to climate change helped to make sure the initial emissions reductions targets were set stringently enough to accommodate both sides of the European spectrum. Still, the document clearly displayed and emphasised the need for tools that would change patterns in environmental, economic, and also social dimensions of climate policy. Therefore, in addition to the emissions trading schemes, informational tools post conference were used to create behaviour change for citizens, and to increase the understanding of the importance of addressing climate change (Tudway, interview, 2015). Regulatory proposals were put forward to make sure environmental targets were

stringent, and cooperative proposals were launched to keep industrial performance competitive.

In addition, by 1999 the Treaty of Amsterdam had gone into place legally. The Treaty emphasised the importance member states were to play in the environmental policy process in the EU, and called on member states to report any environmental concerns that they believed might harm the functioning of the internal market. This also indirectly helped support climate change dissemination, as member states were required to take into account “any new development based on scientific facts,” (EC treaty, 1997, p. 9) This translated into climate action, as the same proposal required key stakeholders, as identified by policy topic experts, to review any protective measures proposed in response to new findings, and to communicate their opinion on the effectiveness of protective measures (EC treaty, 1997).

The reinforcement of ecological ideas under the Amsterdam treaty meant that policy options to European policy-makers reflected a broad and wide variety of policy tools. Informational tools were a critical aspect in helping institutions to “learn” and develop in direct line with the increasing complexities in the European markets (CEC, 2005b). Agencies themselves were responsible for maintaining information and for recommending areas where they needed further data for informed decision-making (CEC, 2005b). At the same time, the EU stressed the importance of spending 3% of GDP on research and development by 2010; this ensured further contribution to the technological developments needed to combat climate change (CEC, 2005b). Member states were encouraged to take advantage of funds needed for the transition to low-carbon technologies, specifically, encouraging member states to move towards renewable energies that promoted better resource efficiency.

7.2.5 Incremental changes made in the US after the critical juncture

Although the US signed the Protocol, negotiators returned with a proposal that required congressional approval before the US federal could take action. While the EU worked to create the agencies needed to present a unified case for climate mitigation policy, the US failed to create the institutional coordination needed for disseminating and analysing new information. Here, one can see how the US's focus on a lack of governmental interference in climate policies made it difficult to increase the regulatory capacity of the EPA; instead, the only way to push forward CO₂ regulation was through a special mandate from the President, which supported the signing of the Kyoto. This then, transferred a large amount of responsibility to the executive branch of the US, which further I believe further increased the partisan-association of carbon policy. Making the executive branch responsible for climate change matters meant that climate change shifted from being an environmental matter to becoming a political issue.

The KP was debated in both the House Committee on Energy and Natural Resources, as well as in the Senate Committee on Energy and Finance. It seemed that at the time, "industry in the US supported the proposal, yet there was still a need for clear information to understand how various types of commitments would affect economic performance" said then CEO of Alstom, Philippe Joubert (Joubert, interview, 2015). Statistical information used in the House debates to support the findings was unclear in regards to the correct ambition needed for targets, as well as in regards to the specific obligations of developing countries in meeting their commitments (Forrister, interview, 2015). Friends of the Earth, the most liberal lobby organisation, had data that showed the US needed to implement aggressive targets, whereas the Environmental Defence Fund recommended weaker targets (Forrister, interview, 2015). At the same time, there was a heavy amount of lobbying that took place during this time period where a large amount of information was given to members of Congress in attempts to distort the severity of climate change (Topping, interview, 2015). Congressional members therefore, were completely

unable to form a unanimous position as to which levels of emissions would be sufficient for addressing environmental improvement, and avoiding negatively impacting the US economy.

Here, one can also see how the institutional eruption of conservative non-governmental organisations made any type of climate change legislation difficult to implement. Although the documentation of fossil-fuel influence on the climate campaign has been noted for impacting legislation in general at this time, the extent of these efforts appear to go much further than previously documented. For instance, several of the interviewees in this dissertation commented on a specific legacy of fact distortion associated with think-tanks that are found throughout the US. Specifically, interviewees pointed to the negative impact that the American Enterprise Institute, Cato, and the Competitive Enterprise Institute, all had on negatively informing the climate campaign in the US (Topping, interview, 2015; Forrister, interview, 2015; Neil, interview, 2015). At this specific instance in time, these institutions began to create a case for further weakening the need for reducing CO₂ emissions, which they described as a direct threat to American economic growth. "These institutions were mainly in charge of creating questions about data and high-ranking officials in the science world- those have been fuelled and found much higher in the US. Federally, in the US, Republicans questioned everything; 97% of scientists in the EPA and DOE agreed this was a problem, and that we needed to create policies to do something, yet it was a select few who choose intentionally to ignore it, and to build a campaign around that," John Topping stated when questioned about the role of lobbies during his time in office (Topping, interview, 2015). "These organisations also fed into the federal staffers- there was a conscious effort to do that. Junior staffers were influenced and courted by these organisations and they were in charge of briefing policy-makers. They told them exactly what the corporate interests at the time wanted them to, and that limited the chance of creating federal climate policy", said Topping while giving insights on the closed policy debates (Topping, interview, 2015). Therefore, American policy-

makers moved to propose even weaker approaches to carbon policy as it seems they saw any type of policy relating to the KP as detrimental to the competitiveness of the American economy.

As a result of the disinformation campaign, many policy tool options were eliminated for policy-makers. There was apparently little chance that any proposal relating to climate change would pass, and even smaller chance on a specific carbon policy. Instead, fossil-fuel companies rallied to support a tax to kill the proposal of an emissions trading scheme, even though the specific tool had stemmed from the American discussions that began as early as 1992 (Boersma, interview, 2015). However, this was not because they thought a tax would be less damaging, but because, "they knew supporting a carbon tax would not get congressional approval. Instead, "by supporting that and opposing cap and trade, it seemed that the Kyoto's proposals were completely misaligned with American economic interests," (Stowe, interview, 2015). Therefore, the type of tool to best address CO₂ became even further distorted and climate change as a whole became an economic threat to the US.

The lack of coordinated information in the US instead, resulted in Congress supporting the viewpoint that an emissions scheme would become economically damaging to American economic growth. Chuck Hagel, a Republican from Nebraska, and Robert Byrd, a Democratic senator from West Virginia, a coal state, led the proposal of the Byrd-Hagel bill, the US response to the Kyoto Protocol. The bill forbade the US from signing international environmental treaties that did not include developing countries. Hagel, at the time, was head of the Department of Defence (DOD), which was the organisation with the largest carbon footprint compared to any other organization on the entire planet (Little, 2005). His viewpoint on the Kyoto Protocol was that "any time you put mandatory caps on any program- which I'm opposed to- you are going to have a consequence, and I don't

think it's going to be a good consequence", (Little, 2005). He believed that the mandatory caps would lower industrial productivity and efficiency, and also would "lower job choices, and [would] lower the whole quality of economic dynamics when you try and artificially cap energy use" (Little, 2005). Mandatory reductions thus, were removed as a policy tool option.

The policy response to Kyoto was instead Byrd-Hagel, which acted as a final example of how weak ecological modernisation affected the American choice of carbon policy tools. Although the Kyoto Protocol was designed to accommodate American policy-makers, the failure to communicate the impact of emissions reductions resulted in the failure to create a policy response to mitigation demands. Instead, the US was officially banned from signing international environmental treaties relating to climate change where developing countries were not obligated to commit, thereby sharing the legal burden with the US. Policy proposals therefore, remained stagnated, and simply continued in line with efficiency standards proposed by the EPA.

7.3 Conclusion: comparing the impact of ideas on the change in policy paradigms and the roles of the state in the EU and US from 1992-2000

The first critical junctures examined in this period show how the EU's idea of strong ecological modernisation led to an effective approach to climate mitigation policy. The ideas of actors at this time influenced many gradual institutional adjustments that caused the EU to begin moving towards a new form of economy. These junctures mainly examine the impact that gradual institutional adjustments have had on the organisational and administrative capacity of the EU. The junctures analysed showed how strong ecological modernisation led to the creation of a convincing notion for climate change policy. Here the diffusion of strong ecological norms influenced the policy-choices of European policy-makers, and led to the creation of

new agencies. DG Clima specifically placed economists at the centre of European climate policy, who were then able to identify the information needed to clearly show European citizens and policy-makers the benefits of creating climate policy. This increased the institutional capability of the EU, which helped to increase the EU's climate capabilities.

The emphasis on taking an aggressive approach to ecological modernisation in the end, moved the regulatory agenda towards a more dynamic atmosphere for business while at the same time increasing a more “sustainable, integrated, European climate and energy policy,” (Costa, interview, 2015). A critical objective for achieving this long-term transition was strengthening the internal market to ensure competitiveness. This legislation specifically called for the restructuring of financial measures to help better emphasize long-term goals of the economy instead of focusing on short-term results. This is what prompted the development of tools like the EU Eco-Management and Audit Scheme (EMAS) and green accounting standards.

Contrarily, these junctures show how in the US, the weak approach to ecological modernisation impacted the level of changes made in the policy process. These junctures examine the impact that this idea had on shaping the perspectives of American policy-makers. Here, the junctures show how these ideas caused climate mitigation goals to be held as environmental goals, yet failed to become an overall goal for development across broader American federal agencies. Although several different agencies in the US recognised the importance in addressing climate goals, these agencies failed to develop a unified approach to mitigation goals. As a result, it was difficult to for policy-makers to form a clear understanding on the economic impacts of climate change. The failure to have a concrete, overarching institutional approach to climate change allowed negative climate information to enter the system, and instead, a norm that climate policy would damage American economic

competitiveness became an institutional norm. As such, climate change goals in the US remained uncertain.

Chapter 8. Comparing the impact of ideas on changes in policy paradigms and the role of the state in the EU and the US from 2001-2012

Tracing the junctures below examines the degree of influence that pre-existing notions have on actors when making policy choices within the carbon policy processes of the EU and the US. During this juncture, one can see how variations in the approach to ecological modernisation had an impact on the evolution of institutional structures both in the EU and US. This juncture shows how with strong institutional cooperation, and an informed scientific approach, ecological concerns came to become fully entrenched in the European economy. At the same time, these junctures highlight the lack of American engagement in the international climate policy arena, and the negative impact that this has had on the domestic formation of US mitigation regimes. As such, these junctures below show the problems that come without having an overarching commitment to climate change and the positive impact that engaging with the international arena has had on the evolution of European domestic institutions. This time period highlights in particular how the EU's strong ecological approach to climate policy continued to drive an effective policy-pathway to a low-carbon future, whereas the US's approach to climate mitigation policies failed to result in an increase in the adaptive capacity of American institutions.

The previous chapter focused on analysing the difficulties in creating institutional support for climate mitigation policy in the US and the EU. The critical junctures of both the first UNFCCC conference and the KP show how difficult it was for the US to push the environmental agenda forward without having an overarching commitment to climate change mitigation. At the same time, the previous chapter highlighted a lack of institutional evolution in the US as opposed to the sophisticated evolution of European policy entrepreneurs and policy arrangements. This chapter retains a focus on international climate conferences and seeks to showcase the differences in incremental changes that joining the UNFCCC meetings, as opposed

to not officially ratifying the KP, have had on the EU and the US. Whilst the previous chapter highlighted the difficulties that the US had in even committing to this type of policy, this chapter seeks to give a deeper understanding in the division of policy paths that are caused by engaging in the international policy arena. This chapter focuses specifically on emissions trading schemes as a policy outcome in order to better understand the impacts that strong versus weak ecological modernisation have on institutions seeking to create ambitious climate policy. This chapter shows how the idea of strong ecological modernisation has specifically influenced the institutional adaptation needed to support the development of a CO₂ trading scheme.

8.1 First critical juncture: the historical setting ahead of the Marrakesh Accords, 2001

The year of the Marrakesh Accords marked an even further division in the climate policies of the US and EU. The domestic carbon policy paths post-Kyoto Protocol had previously already resulted in very different approaches to how to address climate mitigation policy in the US and EU. In the US, climate change became associated with Clinton, and “after his impeachment, there was a negative-legacy of corruption and taint that spread to the climate agenda,” commented American policy-maker, Dr. John Topping. Together with the Senior Climate Fellow of the Brookings Institute, Tim Boersma, the two both described how September 11 further weakened the American ability to interact in an international policy realm.

The main instance in which the inability of the US to engage in an international, top-down, approach to climate change is evident was at the Gothenburg conference that took place prior to the Accords. The meeting for the European Council was held in June, in Sweden, ahead of the October conference. Here, this meeting focused heavily on European enlargement, sustainable development, economic growth, and

broader issues related to the reform of European institutions. The Summit took an especially significant turn ahead of the Accords when President George W. Bush chose to attend the assembly. He was the first US President to visit Sweden, and he chose to do so specifically to discuss the place of the US in climate change and to drum up support for US foreign policy in the Middle East. Unfortunately, although the occasion helped to reinforce the European position on both globalisation and in international cooperation on addressing global warming, the occasion also helped to further isolate the US in terms of climate policy. More than 50,000 protestors attended the European meeting ahead of the Accords, including more than 15,000 devoted specifically to a “Bush Go Home” protest. The centrality of these arguments focused both on the Middle-East and on the US’s lack of responsibility in global climate agreements. Thus, while the meeting helped the Swedish government to push for stronger sustainable development strategies in the EU, it also gave George W. Bush ammunition for showing how the international arena was “anti-American”. This instance ahead of the Summit helped Bush emphasize his points that an American only approach, one that was led by the EPA, and informed by Congressional expertise, would be the most effective way to combat climate change.

8.1.1 Actors and their ability to influence policy in the EU

The Treaty of Amsterdam had provided a path that further increased the supranational authority for European institutions in the area of climate mitigation policy. To build on the strength of the newly outlined institutional arrangements in the EU, the Union revisited its approach to growth and development in the Lisbon Strategy for Growth and Jobs. Written by European economists such as Maria João Rodrigues and Christopher Freeman, the economic strategy for development in the EU emphasized the need for knowledge and learning in governance. Again, reflecting the commitment to ecological modernisation, the Commission outlined the need for “sustainable economic growth with more and better jobs and greater social cohesion,” (CEC, 2006, p. vi). Although the original drafting of this legislation included nearly no mention of sustainable development, the influence of

Nordic actors in key positions of power helped to push ahead the importance of sustainability as a whole. The EU Presidency at this time was under Swedish regime and after the 2009 Gothenburg meeting of the European Council, text was added to the document to help reconcile environment economy as again, a “win-win” strategy for development.

At the centre of this European economic vision was a reiterated focus on climate change, which was seen as the best example an environmental policy that could also produce economic growth. In particular, including climate concerns in the economy were seen as key to making the EU, “the most competitive and dynamic knowledge-based economy in the world,” (CEC, 2006, p. vi). The EU thus, worked to create quantifiable progress in sustainable development, and climate change became the realm for doing so (CEC, 2006, p. vi). Carbon policy, and specifically, the emissions trading scheme became a critical tool for showing quantifiable progress in European policy (Helm, 2015).

The reinforcement of strong ecological ideas under the Lisbon Treaty meant that policy briefings to European policy-makers before the conference reflected a broad and wide variety of policy tools. Informational tools were seen as a critical aspect in helping institutions to “learn” and develop in direct line with the increasing complexities in the European markets (CEC, 2005b). Agencies themselves were responsible for maintaining information and for recommending areas where they needed further data for informed decision-making (CEC, 2005b). At the same time, the EU stressed the importance of spending 3% of GDP on research and development by 2010; this ensured further contributions would be made to the technological developments needed to combat climate change (CEC, 2005b). Member states were encouraged to identify where specific funds were needed for the transition to low-carbon technologies; specifically, the Commission worked to

encourage member states to move towards renewable energies that promoted better resource efficiency (CEC, 2005b).

Jos Delbeke was to attend the conference on behalf of the Climate Change Unit, DG Environment in the EU (Our Director General, 2015). He coordinated with all relevant stakeholders beforehand, and helped to develop a document that would provide an outline of the economic impact that CO₂ reductions would have on the broader EU economy. Politicians like Margot Wallström, Commissioner for the Environment, helped to push forward the strong ecological approach in broader European institutions beforehand, and pushed for an institutional-wide approach towards climate mitigation policy that was centralised out of the EU, yet supported by member states (Bernstead, interview, 2015). Ms. Marianne Wenning also helped to support Jos Delbeke bringing extensive expertise in environmental economics into the policy arena. She was Head of Unit in Europe Aid and in DG Environment (industrial emissions and air quality) before becoming Director for Legal Affairs and Cohesion in DG Environment from 2011 to 2013 (European Maritime Day, 2017).

8.1.2 Actors and their ability to influence policy in the US

The shifting overall American conservatism at this time period had enormous ramifications on the passing of climate legislation in the US. President Bush himself embodied the changing ideals of the Republican party at the time, and played a large role in the climate negotiations in the international arena. Although the international arena focused now on strengthening the international regime for emissions trading schemes, Bush was determined to push forward the recommendations of a weak approach in the international climate policy. Bush had previously opposed the Protocol as he opposed the Kyoto Protocol because it exempted major population centres such as China and India, from compliance, and [allegedly?] would cause serious harm to the U.S. economy (Bush, 2001). Instead, Bush took the viewpoint

that climate policy tools should focus on improving air quality and electricity efficiency standards, a continual of the proposals that had been used to achieve environmental progress before in the US in the 1970's. Bush asserted that any strategy for climate mitigation should include a gradual “phasing in of reductions over a reasonable period of time, providing regulatory certainty, and offering market-based incentives to help industry meet the targets,” (Bush, 2001). Rather than engaging with the international arena, Bush pushed forward a domestic policy regime on climate change, showing again, the negative impact that a weak ecological modernist approach has on carbon policy outcomes. Instead, he supported policy measures with weaker targets as the “purported lack of sound science” surrounding climate certainly made it difficult to enforce a degree of regulation in the US (Forrister, interview, 2015).

Fundamentally, avoiding atmospheric damage requires cross border coordination, and September 11 made that impossible in the US. "This moved the US away from working together, and instead, the US began thinking in a “them” vs. “us”- context for all policy; essentially, everyone and all concepts proposed from overseas were seen as negative entities within every branch of the American political system,” said Boersma (Boersma, interview, 2015). This either supports the hypothesis, which is that a lack of coordinated viewpoint helped increase the opportunity for information fact distortion, or points to a larger obstacle of the US building an anti-UN idea. Regardless, this seemed to have significant impact on how the US viewed working with UN institutions in general. Thus, while the EU joined international negotiations for developing operational rules for an emissions trading scheme in Marrakesh, Morocco, US negotiators did not even join in the discussions in Marrakesh, even though they had negotiated with the EU beforehand on the technical components that were to be outlined in the Marrakesh Accords.

Instead, Christine Todd Whitman, head of the EPA, gave a firm answer to acting German Chancellor Gerhard Schröder by saying, “no, we have no interest in implementing that treaty,” (Borger, 2001). Although both she and Treasury secretary Paul O’Neill both pushed for the need for American support of the KP, the President gave a speech ahead of the conference pointing to American concerns with the legislation. Think tanks supported the President by pointing out “Americans would be better served if the Administration adopted a "no regrets" plan of action to reduce greenhouse gases domestically over the short term and augmented efforts to improve research and climate modelling capabilities so that policymakers could better understand how climate change is affecting the environment,” (Coon, 2001). Here, we can see how the US’s own lack of domestic expertise in Science impacted their vision of the global forum. It’s interesting to point out that in the EU, the climatic modelling understanding had increased mainly under Jacqueline McGlade after the KP. Her position was expanded so the EU could continue to monitor and understand its own impacts on global climate change (EEA, 2013). However, this shows again, the negative impact that not engaging with the international arena, or using a weak ecological approach, had on the domestic capacity adjustments of the US. Although the US may have needed an internal understanding of climatic modelling capabilities, the EU was informed on those issues by the IPCC as part of its participation in the framework discussions.

It is also worth noting that in addition to a lack of internal expertise, there was also a noted effort made to distort facts related to climate change at this time (Pearce, 2010). The Hockey Stick controversy is perhaps the best example of the negative influence that the fossil fuel industry was able to exert on the public acceptance of climate change. In 1998, the IPCC released a report outlining increasing changes in the global surface temperatures and was quickly met with criticism from scientists based mainly in the US (Pearce, 2010). It was later revealed the American Petroleum Institute had funded anti-climate researchers to conduct research and make media appearances in which they were to question the novel statistical methods used in the

graphs (Boykoff and Boykoff, 2004). In addition, Bush and Cheney both had extensive experience and continued interaction with the fossil fuel industry ahead of the meetings to discuss how a cheap oil strategy was the only way for the American economy to grow (Roberts and Downey, 7 July, 2016). The pro-fossil fuel regime in place at the time certainly did not help to create a pro-active approach towards carbon emissions reductions.

Instead, the American's technology-centric approach continued to present limited options to American policy-makers ahead of the Accords and further distorted the importance of climate change throughout the American media (UCS, 2004). Despite the fact that the focus point of the 2001 Accords was to address the role of markets and technology in climate mitigation policies, US politicians insisted that "the global economy would be better served if the US continued to lead opposition to the Protocol's command-and-control regulatory approach and looked for alternative ways to encourage nations to reduce emissions voluntarily," (Coon, 2001). Although the Accords were to focus heavily on the issues of an emissions trading scheme, the broader political atmosphere at the time argued that the "U.S. economy would be better served by low tax and deregulatory policies and a competitive domestic energy market that fosters long-term improvements in energy efficiency and new technologies," (Coon, 2001).

8.1.3 The impact of ideas during the critical juncture

American policy-makers briefed before the conference were unable to take official, legal responsibilities in any international climate negotiations (Forrister, interview, 2015). Instead, the EU joined with developing countries to develop almost all of the terms of the deal at the conference. EU negotiators were able to show, for the first time, an in-depth analysis not seen in previous environmental treaties (MacNaughton, interview, 2015). The treaty's outline was extremely detailed, and helped to push forwards the EU's strongly economic, and heavily statistical,

approach to the environmental problem (MacNaughton, interview, 2015). The document also paved a legal pathway for a future-monitoring regime.

Although US participants did not take part in the Accords, the conference itself focused heavily on the issue of “capacity building in developed countries” (Vrolijk, 2001). The Accord itself focused on better understanding the individual UNFCCC obligations of each country, but also, on how more Annex 1 (large industrialized nations) could be incentivised to commit to further obligations for global emissions reductions. The EU took an approach that was based on the recommendations of the scientific community, and pushed for an absolute cap, or agreed upon limit, on global emissions reductions so that countries would feel pressure to develop stronger national policies (UNFCCC, 2012). However, conference negotiators still tried to accommodate the American point of view, despite their lack of official presence. The discussions therefore produced “Kyoto Mechanisms”, which were new programmes designed for increasing the role of finance and technology transfers in mitigating climate risks (Vrolijk, 2001).

The main outcomes of the Accords were for countries to share and collaborate on “learning experiences”. A technology transfer group was established as part of the new Clean Development mechanisms so that in addition to a market-based emissions trading scheme, there would be a technology focus “so the US can also take part in future negotiations (Vrolijk, 2001, p. 46). Although the period seen from 1992-2000 had focused on a research period for the involved nations, the period from 2001 going forwards clearly established an action framework for both markets and for technology. The period going forwards was to specifically look at the “removal of barriers, environmental regulation, and end means needed for technology” that would be used to mitigate carbon (Vrolijk, 2001, p. 41). Although the US championed this as their favoured domestic strategy for achieving international carbon policy aims, they still did not support the discussions insisting that their own domestic regime would eventually produce the same results as the international framework.

8.1.4 Incremental changes made in the EU after the juncture

The Commission showed the European commitment to strong ecological modernisation when the European Climate Change Programme (ECCP), was launched in 2001 to specifically support the European's learning ambitions as stated in the Marrakesh Accords. A specific working group within the ECCP was set up to discuss how to construct an emissions trading scheme among participating nations and industries with different economic backgrounds in the EU (CEC, 2001b). It brought together scientific experts from various European agencies to discuss how to specifically address climate change in a robust policy manner, specifically when taking into account the desire to create a new carbon market. Members in these discussion groups were chosen for their availability to ensure consistency in discussions and, where possible, the EU tried to identify representatives who had been involved in previous discussions, and were well versed on the subject of mitigation overall (CEC, 2001b). Many organizations were represented by the same representative that had attended both the 1992 and 1997 meetings, which helped to ensure continuity in European climate policy development (Forrister, interview, 2015). The ECCP, thus, was launched to act as a forum for exchanging views prior to the launch of the EU ETS, and to help build broader coordination amongst various European stakeholders that would be critical in achieving European climate mitigation goals. The ECCP can be seen as a programme of the EU centralising its climate research under one main umbrella. Although responsibilities related to climate change would grow amongst various individuals, the ECCP helped to act as a centralised programme for collecting data, viewpoints, and the overall progress of European climate mitigation.

The emphasis on learning and data collection at the Marrakesh accords was helpful in influencing the European institutional adjustments made after the meeting. National Focal Points were created under the umbrella of the EEA to make sure European-level information matched the data collected from over 1,000 experts

across 350 national institutions (EC, 2012). In order to become a verifier within these organisations, scientists were required to obtain a license and accreditation to ensure all the information they produced was completely accurate and without industry influence (EC, 2012). The EU then created a register of verifiers under the general authority of the Commission to ensure environmental data was coordinated, communicated and completely non-biased (EC, 2012). The EU consequently, continued to expand on the information it had available, and by 2005 had an impressive array of statistical information collected that could be used to show how emissions reductions would impact economic production and consumption (Forrister, interview, 2015).

With the informational data collected from the ECCP, European climate economists were able to focus on how to create an emissions trading scheme that officially launched in 2005. The main choices on how to design such a scheme were designated to Delbeke and his team immediately after the conference. The largest, and first, contention was over the degree of centralization of the structure itself; mainly, in how the structure should act in connection across countries the various countries, or the degree to which centralisation would be needed in the emissions trading scheme (Kruger, Oates, and Pizer, 2007, pp.112-133). A strongly centralized structure placed emphasis on the supranational level, whereas a decentralized structure would allow the decision-making to remain within member states. Depending on how the agency was constructed would affect the flexibility in pricing mechanisms over time, and in the degree of compliance to the authority (Ulrecht, interview, 2015). A decentralized structure construction would give individual member states responsibilities for setting targets, for distributing permits, for verifying data, and for enforcing fines. A centralized system would allow all of the responsibilities to lie within the EU level, including the responsibilities to ensure member states would comply with their targets. The EU's strong approach to ecological modernisation waivered here, where one is able to see the negative impacts of moving away from a strongly centralised approach to climate change.

The EU chose to create a structure that lay somewhere in between the EU-centralised powers and member-state distributed levels of power and, as a result, ended up with a scheme that only fulfilled about half of its original intentions (Kruger, Oates, and Pizer, 2007, pp.112-133). Still, within the next few years following the Summit the EU successfully interacted with the international regime to create its own emissions trading scheme.

8.1.5 Incremental changes made in the US after the juncture

Discussions within the US Congress following the conference focused on deciding if the US should address climate change through CO₂ reductions, even though environmental experts in the EPA urged Congress to do so (Topping, interview, 2015). Still, the President and his advisors continued to question the scientific certainty in climatic models and instead, moved the US further towards a weak approach to carbon policy. The lack of overarching commitment to climate change meant that carbon policy was still handled between the Executive Branch (as the topic touched on foreign policy aspects as the KP was an international treaty) and between the EPA. Although most literature reviewing interest here would point to the negative impact that the media was able to have on climate change, it is important to point to the incremental institutional changes that the US's ideological approach to climate change caused at this time.

As the US's weak approach to ecological modernisation emphasized a domestic, economic driven-approach to climate change the President removed President Clinton's previously created Executive Council on Environmental Competitiveness that had been established following Vice-President Gore's initial signature on the KP. This organisation, which had included the Kyoto and Marrakesh legal negotiator Todd Stern, was instead replaced by the Council of Environmental Quality (CEQ) to provide economic recommendations on supposedly building a domestic-facing carbon emissions trading scheme (Forrister, interview, 2015).

However, the personnel staffing the organisation was much different than the EU's environmental economists and instead contained, "a hard-line group of advisors with close links to the US oil industry," (Harrabin, 2006). Specifically, CEQ Chairman James L. Connaughton's capabilities were questioned due to his previous professional experience in lobbying for deregulation on environmentally harmful industries such as the Aluminium Company of America and the Chemical Manufacturers Association of America (Harrabin, 2006). The American Petroleum Institute, for example, had previously employed Phillip Cooney, before he took a chair position in the CEQ. This meant that climate policy makers in the US were perhaps more suited towards creating energy policy, as opposed to pure climate policy.

The lack of an official organisation reporting on carbon data was a large difference from the EU at this time. Although the EU had no specifically centralised location for carbon data, the deployment of the ECCP meant that the EU was moving towards a more centralised vision of climate change. Therefore, when the international level proposed the needed emissions levels to agree upon, the EU was able to confirm the impacts of such a proposal with their own domestically collected data. Instead, at this time in the US, the EPA did not have the regulatory authority to collect emissions data. Instead of having a response to the global call for reductions that was based on an analysis of past polluting activities, the US instead released its predictions for what such an agreement would mean in the US. Instead of an environmentally informed discussion on climate change, the US responded with an energy position. The DOE released a report titled, "An Analysis of Strategies for Reducing Multiple Emissions from Power Plants" that estimated future American pathways for reductions that was based off of the DOE's existing energy prediction data methodologies (DOE, 2001). Although the report emphasised the importance in creating a market-based tool to achieve deep decarbonisation, it questioned the level of global capping needed to achieve reductions (DOE, 2001). Therefore, this shows the problems of only coordinating a domestic response to climate against an

international response to climate change. This report, backed only by American collected data, directly contradicted the international advice given by the IPCC to UNFCCC members.

The CEQ responded with its own analysis on American decarbonisation pathways stating that including caps on carbon as part of a multiple emissions strategy would lead to a more dramatic shift from coal to natural gas for power, and thus, higher electricity prices when compared to regulating only sulphur dioxide and nitrogen oxide (Harrabin, 2006). Although the DOE report slightly questioned international data, the CEQ report took a hard-stance against the recommendations set forth by the UNFCCC. Policy-makers located in both the House and Senate who were responsible for creating and implementing carbon policy at this time were therefore sent conflicting messages as to what levels of reductions targets were necessary to achieve decarbonisation in the US and what the economics behind doing so would look like.

In addition to institutional adjustments made in the Executive Branch, the legislative branches of the US government also went through incremental changes in order to help inform the American position on climate change policy. During this time period the jurisdiction of carbon policy legislation was moved away from the Committee on the Environment towards being a responsibility of the House Committee on Energy and Energy Resources. Unfortunately, this small change coincided with changes in staffing rules in the House of Representatives. This now meant that seniority, not capabilities, would be used to judge how policy-makers were assigned to various committees (Stewart and Jonathan, 2005). Republicans specifically changed committee assignment rules to decision-by-seniority preference; the longer a representative had been in office the higher preference he/she received for picking committee seats. The Energy and Natural Resources Committee was a senior Committee, and thus, a first choice for the oldest member

on the House to choose (Topping, interview, 2015). This meant that a new policy topic was led by Congressman Fred Upton, a Republican from Illinois, whose background consisted of training from the US Military Academy and teaching at a high-school level (Upton, 2015). Upton continually questioned the science behind mitigation proposals, which was clear when looking at his non-scientific background. Policy options were thus proposed and analysed by policy-makers who were not suited to the task of statistical analysis that is needed for forming carbon policy.

The focus of using a weak ecological modernist approach to climate mitigation policies resulted in limited and less ambitious policy choices be available to American policy-makers. Limiting policy options to market-based tool failed to produce the information needed to form a clear understanding of the effects of carbon policy. At the same time, the lack of informational tools provided a window of opportunity for external organisations to increase negative campaigns, which resulted in pressure to produce even weaker legislation. As a result, policy tool options in the US remained focused on producing legislation that reflected the technology-induced idea of sustainability. Again, these tools sought to increase clean energy jobs, renewable energy targets, and energy efficiency standards in buildings in cars. These tools would produce easy wins for decarbonisation strategies, but are typically noted as the “low-hanging fruit” needed to achieve deep decarbonisation (Ergas, 2012, pp. 86-95).

8.2 Second critical juncture: the historical setting ahead of the Copenhagen Summit, 2009

The Marrakesh Accords showed the differences in carbon policy pathways that the EU and the US would continue upon for the early 2000's. Whilst the EU clearly moved to create, and launch, its own emissions trading scheme, the US moved rather uncertainly towards a generic market-based policy tool. Although the UNFCCC

meetings continued to meet on a bi-annual basis after Marrakesh, it is really the conference in 2009 where you can see the impact of strong ecological modernisation moving the EU towards a more effective decarbonisation strategy than the US. Although the Summit typically has been investigated as a disappointment, due to the failure to again bring the US into an international regime, the Summit also uniquely highlights the ability of the Europeans to shift its own climate regime towards a much more ambitious pathway for reductions. However, the conference is also important for showing how the approach used by the US is ineffective, even when its domestic institutions are governed by a pro-climate regime.

The historical setting ahead of the Copenhagen Summit in 2009 had a drastically different tone when compared to the previous UNFCCC conferences. President Barack Obama had taken over the Presidency of the US, and for the first time since the KP, officials seemed convinced that the US would make a commitment to reducing their emissions. Despite the European crisis coming into effect in early 2009, negotiators felt that Denmark, a Nordic nation whose government reflected commitments to strong ecological modernisation, would help to reinforce the emphasis for international cooperation, and would help to support the long-term benefits needed for climate mitigation policies (MacNaughton, interview, 2015). In the US, President Obama had taken office just prior to the conference in 2008. For the first time, sustainable development ideas seemed to take a bigger place in policy discussions.

The lack of popular support for President Bush's overall policies at the end of his presidency meant his opposition to climate provided an opportunity for Obama to gain public support of a climate campaign. However, here, again, the lack of specific organisational authority for climate mitigation, or specific policy to address it, meant that the Executive branch would take a leadership role in informing the climate mitigation strategies of the US. Positively, a major part of this platform was joining

the international community in reducing emissions. “This was a turning point for the US, and a key opportunity to create lasting and effective mitigation policy,” noted Dr. Robert Stowe, Harvard professor of economics and multiple-COP participant (Stowe, interview, 2015). “President Obama had run on a campaign that featured climate change as a key aspect of his policy agenda, and Copenhagen seemed an opportune moment for the US to express a commitment to climate mitigation goals.” However, it seemed that doing so was already an impossibility before the Americans even entered the discussions.

The financial crisis of 2008-2009 had shifted both the EU and the US to being concerned about the overall well-being of their economies. When the recession began to take place in the US first in 2007, all discussions relating to carbon policy, “took a back burner to anything that was not related to employment and economy. Instead, the recession questioned the general state of the economy, people’s priorities for policy, and how much attention should actually be given to climate change,” Tim Boersma stated. “The government moved to address security concerns and climate change was part of that notion, but was not an immediate concern due to the stress it encountered with financial discussions”, Boersma pointed out when commenting on the construction of climate and economy in the US. Here, it seems again, that the US’s lack of economic understanding of the benefits of climate change moved them towards the construction of an uninformed climate discussion. Instead, the EU’s approach to decarbonisation used the environment to help identify opportunities in economic growth that would coincide with the overall aims of European mitigation legislation. It is yet again at this instance where one can see the importance of moving climate change policies toward a centralised, over-arching development strategy, rather than acting as only an environmental policy.

8.2.1 Actors and their ability to influence policy in the EU

The EU reiterated a commitment to strong sustainable development in the Lisbon

Strategy that went into play shortly before the Summit. The financial crisis put pressure on European policy-makers to ensure emissions reductions ambitions would not impact the growth path of the EU. European policy-makers prior to the conference were therefore focused on how to set commitments in a way that would create meaningful progress for the EU ETS, yet avoid harm to individual European member-state economies (MacNaughton, interview, 2015). However, by allocating significant power to the individual European nations, the climate policy of the EU became significantly weaker.

Although institutional changes post-Marrakesh meant that the EU had the necessary data to launch an emissions trading scheme, the DG Environment still lacked the authority to set the caps on emissions, and the coherence to form a unified opinion on what the appropriate allowances should be as a result of the decision to allocate a certain degree of responsibilities towards member states (Hintermann, 2010, pp. 43-56). As a result, in the years ahead of the Summit, the EU struggled with retaining power against industry opposition. The lack of centralised authority in the EU gave the member states significant power, including the legal authority behind emissions reductions compliance (CEC, 2003). Rather than having a uniform requirement for reductions, companies were instead able to choose between three main options in regards to how they could participate in the EU ETS. First, parties could simply choose to make investments in more efficient technologies, or agree to shift towards less carbon intensive energy sources for production purposes (CEC, 2003). The second option presented to parties was an option to purchase allowances or credits from the emissions market, and the third option was to combine the first two options into a unique cooperative scheme (CEC, 2003). In the instance that parties found they had more emissions allowances than they actually needed, companies were able to sell them to other firms or back to the system (CEC, 2003). Although this gave both member states and industry members a certain degree of flexibility in choosing how to reduce their emissions as part of the EU ETS, it also meant that there was a lack of authority monitoring progress and enforcing stricter compliance.

The biggest problem in the initial construction of the EU ETS was both the lack of available authority in the EU, and the lack of enforcement that resulted from the shared responsibility decisions. Interesting, this also created informational problems, again, when regarding the data that was needed for carbon compliance. Member states used UN data, which differed from the European data, which was slightly weaker than what the EU recommended (Ellerman and Buchner, 2007, 2007, pp. 66-87). Unfortunately, few countries in the EU had their own data to verify their own targets, except for Denmark and the UK (MacNaughton, interview, 2015). Although the ECCP had made a large focus on increasing information, the data was collected on a voluntary basis for firms (Egenhofer et al, 2011). In addition, the collection and reconstruction of the data needed to estimate allowances absorbed a significant amount of financial resources, and policy attention in broader environmental institutions.

The emphasis on producing results quickly caused time to be a large problem in the EU ETS, specifically when looking at time in regards to the ambition of targets set for the launch of the tool. Firm accounting measures were needed to ensure that the time dimensions set would allow firms to accurately apply the discount rates that were a central part of the EU ETS. The EU ETS needed to identify a period, where, “profit produced now included and compensated for the costs of complying with the ETS in the future” explained Dr. Robert Stowe. "Without a future goal of a cost, the scheme would have been unable to provide a useful discount-cost as no compliance measures could measure potential reductions," (Stowe, interview, 2015). Therefore, at the launch of the EU ETS in 2007, the EU called for a target of, “up to 50% by 2050 compared to 1990” (Council Press, 6272/07). This was identified as a period and ambition that would produce both the, “medium and long-term evolution” of policy targets (Directive 2009/72/EC).

The European target originally adopted had reflected an overly ambitious schedule for implementation. Data was not prepared accurately, and the emphasis in launching the tool as soon as possible harmed both the tool, and the sustainability of the EU. Member states were given significant authority, which was supposed to help retain a certain degree of flexibility for firms within the system (Ellerman and Buchner, 2007, pp. 66-87). Unfortunately, the Emission's Trading Directive issued 95% of available allowances to emitting industries as a result of member-state data (Ellerman and Buchner, 2007, pp. 66-87). This previous move away from the regulatory nature of the EU, towards letting firms voluntarily help identify allowance shows the problems a non-regulatory climate regime can experience.

However, in 2007, the price of carbon dropped near to zero, showing an incorrect construction of supply and demand, which resulted from the division in reporting responsibilities taken amongst member states. Still, the EU moved to fix their main policy tool and the revised EU ETS was adopted in December 2008, reflecting an increased dedication to a strong ecological strategy to decarbonisation. Here, the EU moved to further centralise the authority of EU-level institutions, yet did so in a manner which still sought to avoid too much of a regulatory focus. Auctioning instead of receiving allowances for free helped to develop further incentives for compliance, and also reduced the role of windfall profits for energy producers⁴ (CEC, 2004). However, more authority was needed to further develop a stronger legal base, as was attracting more firms to the notion of launching the role of emissions auctions.

Experience from the first trading period showed that the decentralised system needed to collect data and streamline implementation heavily contributed to

⁴ These profits occur when energy producers pass on the costs incurred through allowance purchases to consumers despite receiving them for free.

excessive allocation of allowances and the resulting crash of the carbon price (CEC, 2004). For the problems with the tool to be addressed, the EU would need to make institutional adjustments in the responsibilities of data collection, but also in allocating the authority behind information collecting at the EU level. At first, the EU suggested the creation of a department that was both climate and energy, but not environmental. However, a group from the European Parliament wrote to Barroso saying expressing that they were, “a little alarmed at the suggestion that a new Commission Directorate General for Energy and Climate Change might be established without environmental considerations,” (Schoenefeld, 2014). Instead, Parliament expressed its opinion that:

“Climate policies require a transversal and sustainable approach, looking at industrial emissions, transport, energy, buildings, agriculture, development and foreign policy, and we feel that having a Directorate General responsible for both energy and climate would not be best placed to deliver such a horizontal approach. To the contrary there is a risk that short-term economic interest would interfere and conflict with the aim of designing effective and sustainable climate policies” (Health and Environment Alliance, 2009).

The UNFCCC conference therefore was a key opportunity for the EU to expand the individual countries, and firms, involved in the coverage of the EU ETS. Continuing the momentum after the conference would require European institutions to adjust their existing institutions in a manner that would help them better coordinate an overarching European commitment to climate change.

8.2.2 Actors and their ability to influence policy in the US

When Obama himself had taken office in 2008, he showed the first signs that a strong ecological approach to climate change would be used for achieving climate mitigation goals in the US. The general tone of Obama's speeches seemed to indicate the fact the US would move away from its domestic focused regime to engaging with the international community. At the same time, Obama also began to show signs of creating a more ecologically-focused carbon policy. When outlining his plan of action, he commented on the need to address climate change by stating that:

“Few challenges facing America, and this world, are more urgent than combatting climate change. The science is beyond and dispute the facts are clear- sea levels are rising, coastlines are shrinking. We've seen record drought and spreading famine-storms are growing stronger with each passing hurricane season. Climate change and our dependence on foreign oil will continue to weaken our economy.”⁵

Although Obama gave support to the epistemic community for the first time, scientists and NGO's proved to be a point of contention in the policy-process of the US. Specifically, NGO's presented a problem when they voiced their disagreement on the stringency of emissions targets. Without the clearly proven official cost-benefit analysis on various emissions targets and baselines that were needed from an environmental perspective, the Heritage foundation for example, was able to argue with the economic impact that different emissions targets would have. Therefore, these various targets were discussed heavily in the media prior to going into the negotiations. The Wall Street Journal (WSJ) and the New York Times

⁵ State of the Union Address, 2008 make sure the font matches with below

(NYT) presented even further contradicting viewpoints on the American reductions; the Journal pointed to the possible negative impacts on the economy that a 40% reduction target would have, whereas the NYT economist Paul Krugman's published opinion were that targets were not important, but creating a clear cost for carbon was (Krugman, 2009). Here, he pointed out that "even when polluters receive free permits, they still have an incentive to reduce their emissions if there is a clear cost for carbon, that way they can sell their excess permits to someone else," (Krugman, 2009). Despite the fact that interests are commonly referred to as the main source of misinformation in regards to climate in the US, it can be seen that the simple lack of clear information at all in regards to climate also impacts the ability of the US to create ambitious carbon policy.

Still, before the conference, various members of the US government including Hillary Clinton, Barack Obama, and again, Todd Stern, emphasized that solving the climate problem required international cooperation, and pledged that the congressional members attending the conference would be able to return home with mechanisms that would reflect an American commitment to climate change. The American vision of the UNFCCC negotiations was supposed to focus on the role of technology, which mirrored the idea of weak ecological modernisation in the US. The NYT wrote that the President would seek an, "expansion of domestic energy supplies, both from traditional fuels like oil and natural gas and from cleaner sources like wind and the sun," to help fight climate change. From fossil fuels, for instance, the US seemed keen on championing themselves as the country most likely to make progress on carbon capture and storage. However, it should be noted that many European supporters, specifically nations like the UK at this time, were against the notion of relying on technology to produce significant reductions (Neil, interview, 2015). However, still, President Obama pushed ahead of the conference to open up new federal land to develop wind farms and solar energy plants to reduce the nation's reliance on foreign oil, thereby decreasing its carbon footprint (Wilson and Nakamura, 2012, Jan 24). Therefore, the US delegates again including

representatives from the Executive Branch, including the President himself, attended the COP in 2009.

However, it's still important to note that overall, the American economy was still suffering from the crash of 2008. Overall, American policy-makers were focused on creating legislation that would lift banks out of recession and would do so quickly. This contrast created a problem for the US and climate mitigation goals. "When discussing sustainability and climate change, you need financially to shift towards a thinking that it long-term, and this was difficult," said Rowan (Rowan, interview, 2015). "The recession in 2007-2008 helped further the idea of a market-based approach to carbon reductions, and as a result, direct legislation for climate mitigation policy was limited," (Rowan, interview, 2015). Instead, again, the emphasis was made that increasing the role of technology transfers in global climate would help the US to produce both environmental protection but also increased economic growth. This meant that US policy tools would remain limited for US policy-makers at the conference itself, which again shows the negative impact that a weak ecologist approach had on American carbon policy.

8.2.3 The impact of ideas during the critical juncture

The EU delegation, once again headed by Delbeke, thus, went to Copenhagen hoping to enhance the European support of the EU ETS in the international forum, and increase the amount of countries involved in the scheme (Delbeke, 2015). The overall economic problems appeared to be separated from the climate problems discussed at COP, in particular due to the Danish leadership (Bernstead, interview, 2015). Denmark had been an early supporter of emissions trading schemes, and even had launched their own trading scheme prior to the EU ETS and saw COP as a critical moment for pushing forward both European leadership on sustainability but also Danish leadership in the EU (Bernstead, interview, 2015).

The Danish negotiator at COP embodied the strong ecological approach of the EU itself. Connie Hedegaard, a previous Minister of Environment from Denmark, was “playing in her own home field”, notes Björn Bernstead, the head of the World Wide Views on Climate Change project, a dissemination organisation for climate change, and previous 2009 delegation member. “She had an advantage in pushing across solutions, because she already knew the media, and was comfortable speaking with them. She was very clear in saying climate was not a trade-off between economy and environment, but that creating carbon policy was a win-win situation for the economy and environment; she reiterated this point throughout her media conferences in Copenhagen,” noted Bernstead (Bernstead, interview, 2015). Hedegaard emphasised the importance of a strong international scientific standards and had the, “IPCC weigh in the news frequently, to show that climate change was getting worse, and was an economic risk,” (Bernstead, interview, 2015). Interestingly, Hedegaard was seen as a conservative politician who saw climate change as part of a moral obligation to the planet.

Hillary Clinton was named Special Envoy for Climate Change, the first person to be appointed so as within the duties of Secretary of State in the US government. This placed all climate mitigation policy discussed within the state department, specifically within foreign affairs. Obama also approved Todd Stern as the administration’s second special envoy. Both Clinton and Stern joined a delegation going to the UNFCCC with an intention to show the new American commitment to climate change, and to begin developing a domestic policy towards a low-carbon policy path in the US. Rather than joining the discussions with the existing countries who had ratified, the US delegates focused on negotiating with China to produce a commitment that was more technology-focused. Technology standards, or investment targets, were proposed to reflect a commitment to the reduction of emissions. This would have allowed the US to create a contribution that mirrored its own success. “A peer review mechanism, or technology-indicator could have moved the US into being an environmental leader” Rowan commented, “yet they

simply could not create the overarching idea that it was important to do something”. (Rowan, interview, 2015). However, perhaps this was due to the lack of regulatory authority on collecting data. “By the end of the conference, it was obvious that the Chinese would not agree with the American standards, which differed from their own estimation of what was needed for technology investments and carbon reductions targets specifically,” (Evans, interview, 2015). As neither country had participated in any of the previous climate conferences, they were left debating against each other’s own domestically collected statistics.

The Copenhagen conference resulted in what was considered an international failure of climate legislation. As the US had spent the majority of its time negotiating with China, a vacuum had opened for developing countries and Nordic nations to argue against the US’s proposals for joining the agreement. Many nations felt that the US’s proposals on both technology and emissions reductions were too weak to create any effective change in emissions reductions. At the same time, many nations also felt it unfair of the US to take such weak positions when at the time, the US was one of the world’s largest industrial supporters. Although the Conference documents proposed an increase in cooperation and ambition on behalf of many nations, it still failed to officially include the US in any sort of official commitment to carbon emissions reductions.

8.2.4 Incremental changes made in the EU after the juncture

Although the conference itself may have been considered a disappointment, it should be considered a major victory for the strength of European domestic climate regimes. As a result of conference participation, Delbeke and others involved in the discussions were able to prove the utility of a centralised carbon agency during the conference. As a result, the Climate DG was given increased responsibilities shortly afterwards as a new and separate agency, with its own director, which increased the legal authority needed to maintain consistency across its carbon market. The final

decision to create a DG Clima November 24, 2009 and the EU appointed Jos Delbeke (CEC, 2009). Hedegaard took the helm of the newly created Commissioner for Climate Action, who was charged with coordinating the environmental dimensions of climate change and citizens' concerns. Her mandate was to promote the development and demonstration of low carbon and adaptation technologies, and develop a strong science and economic base for climate policy. This organization would also be responsible for crosscutting responsibility for developing adaptation to climate change in the EU and for working with other commissioners to understand how carbon reduction policy action would affect various policy branches.

The heavy Nordic leadership at the Summit also created a positive addition to the EU ETS itself. Shortly after the conference, the EU ETS moved to include Norway, Iceland, and Lichtenstein in the EU ETS, which expanded the amount of energy-intensive installations under coverage, and therefore, increased the ambition behind European targets (CEC, 2014). As a result, the proportion of general allowances that were distributed freely fell by a slight margin to 90% (CEC, 2014). The penalty for non-compliance increased by more than double its value in the previous phase, and rose to €100 per tonne (CEC, 2014). The amended system addressed many of the problems that the EU had encountered prior to the summit. The changes moved more centralised authority to the EU, and moved the overall climate mitigation system closer to a centralized form of governance. This shows how an increased institutional, and increasingly democratic approach to carbon policy helped solved the market-based problems in European carbon policy.

Although the Nordic leaders helped to push for a strong approach in international emissions to be taken, concessions with industry caused institutional bargaining to produce weaker targets. However, the EU was still able to increase its institutional authority in the realm of climate change. Member states lost significant authority when the EU gained decision-making authority over National Action Plans (NAPS).

The second phase projections were based on the 2005 emissions verified data, which was collected from the launching of the ECCP (CEC, 2004). This implies that the creation of the ECCP helped to streamline informational tools, and helped them to deliver on their intentions. The nations lost authority on the choice of allocation, mainly so the European Commission could develop a European-based methodology for assessing member states allocation places (Hoffman and Betsill, 2009, pp. 15-18). This was done to create a cap that was a more accurate representation of the aggregate industries included in the system. From there, the EU provided a firm European-wide cap on the number of emissions allowances that were to be distributed.

Although the EU did not succeed in fully modifying their emissions trading scheme, the Europeans still moved forward in creating a new form of market. “The EU moved from sustainable development to creating environmental equity”, commented early critic and economist Dieter Helm. “The EU’s approach may not have not been flawless, but the approach towards sustainable development is unprecedented; they intended to create value for the environment, and they did,” (Helm, interview, 2015). In the decision-making process of the EU in regards to climate change, the DG Clima is far from being the only important actor in European carbon policy, yet the role of DG Clima, now separated from its previous role in DG Environment, itself shows the importance the EU has placed in climate policy.

8.2.5 Incremental changes made in the US after the juncture

The US delegation returned from the conference without an official agreement, yet with a recommendation to reduce its domestic greenhouse gas emissions by 20% below 1990 levels by 2020 (UNFCCC, 2009). Although the President seemed in favour of the proposal, an international agreement would still require Congressional majority support for official signatory status. However, there were several obstacles internally needed to support mitigation goals. This was the first Congress in which

different parties controlled the House and Senate since 2001-2003. The House was controlled by a Republican majority of 242. This was the least productive congress since the Second World War, with the lowest approval ratings. Despite international proposals continuing to call for an emissions trading scheme, which was in fact a proposal that had mirrored the American delegation's recommendations, the internal domestic policy approval proved to be difficult in the US. "The Republicans blocked anything that came up for new legislation, and questioned the connection between the costs of the trading scheme as opposed to the economic benefits that would be created from developing such a tool," (Boersma, interview, 2015).

The lack of understanding of environmental economics here seems to be a much greater norm than previously identified. The committee discussions included questions about data; the high-ranking officials in the science world who made recommendations on the proposals prior to the domestic development were questioned extensively for their validity and expertise during the Senate committee discussions (Boersma, interview, 2015). Although the executive branch supported the proposals, the internal support from the EPA caused many conservative congressional members to question how the area would impact the energy and growth of the US (Neil, interview, 2015). From this instance forwards, the distrust between the government and scientific community would only increase in the US, proving to be detrimental to climate mitigation policies.

This contention between emissions, information, and the economic utility of climate change caused over 100 bills proposing emissions trading schemes to fail in 2009. However, the lack of understanding of how the US would need to support emissions was not clearly shown domestically, missing again, the utility of expressing the cost-benefits of climate change, and an opportunity to create domestic support for international arrangements. Policy proposals of tool types therefore, remained stagnant. The Waxman Markey Bill was proposed as a final resolution of how to

address environmental problems, and “can be used as a case-study of all of the problems passing American climate policy will encounter in the United States” as said by Dirk Forrister. The discussions beforehand reflected not only the lack of economic concerns to climate change, but showed how, “the extreme right sees climate change and its association with United Nations as a threat to the national interests of the US” (Boersma, interview, 2015). However, even more problematic was the lack of skill-set American politicians had when attempting to coherently explain and estimate how the emissions trading scheme would function in the US.

For the first time in American history, a coalition of private organisations supported an emissions trading scheme. The US Climate Action Partnership (USCAP) was a joint dialogue between industry and environment that contained organisations like Shell, BP, WRI, Pew, and Brookings Institute. “The problem, however, was not the lack of information at this point: it was the failure to have the right people in the right place- at the right time!” Forrister explained when commenting on the pivotal moment that would have pushed an emission-trading scheme ahead (Forrister, interview, 2015). This can further be seen when analysing the capabilities of the specific legislators involved in the passing of the bill.

Henry Waxman, a democrat senator from California, and Ed Markey, a democratic senator from Massachusetts, sponsored the Waxman-Markey Climate Bill in 2009. The bill proposed an innovative solution by combining tools from that would spur technology, and aim to lower emissions. The bill included renewable electricity standards, informational tools, and a package of cooperative measures that would help industry comply in the instance targets was put in place. Specifically, the bill sought to develop "emission allowances" that would create tradable pollution permits modelled after the Clean Air Act (ACES, 2009). However, the lack of capabilities in US decision-making created a large problem Waxman himself became responsible for creating the legislation relating to the emissions trading

scheme. “Waxman was confronted with an obstacle and did not feel confident in making the decision to pass the policy. He was presented with a variety of climatic and economic models that showed him what international science recommended as opposed to what the costs to the US economy would be. He simply did not understand the difference between a standard growth equilibrium model as opposed to the environmental Kuznets⁶ model that was needed to make a decision, nor did he have the time to take to do so as it was soon going to be August in Washington,” Forrister explained (Forrister, interview, 2015).

The timing of the legislation proposal, and its closeness to the close of Congress, presented a problem in terms of prioritization for the policy outcomes. “Lindsay Graham, who was also a supporter of the bill, dropped out simply because immigration came onto the scene and he was supporting that, and felt that was enough to challenge conservatives ahead of recess,” (Forrister, interview, 2015). Although Graham had been a strong supporter of climate legislation with John McCain traditionally, the closeness to election season created a problem for Graham and other politicians who were seeking re-election that year. “Barbara Boxer (a Democratic representative from California) was up for re-election, and when she dropped out of the bill Waxman got nervous. Barbara was in an election year, her incumbent was (Jim) Inhofe (a long-time climate legislator) and she did not want to be attached to anything too risky”, (Forrister, interview, 2015). Therefore, Barbara Boxer dropped out of Senate floor discussions, causing her proposal to fail. Therefore, the partisan connection to policy also meant that during an election year very few legislators wanted to support a climate proposal.

⁶ A environmental Kuznets model hypothesizes that as an economy develops, market forces will first increase then decrease economic equality. In this instance, the model was used to show how carbon emissions would increase alongside economic growth, but eventually cause a market decline after peak emissions were reached.

The conflicting economics could be seen in disputes between both the EPA and Congressional Budget Office as opposed to what the UNFCCC recommended for targets. Here, the agencies recommended that the estimates of the cost of carbon reductions would range from approximately \$70 to \$80 billion in 2015 to \$90 to \$120 billion in 2030 (Waxman and Markey, 2009). Approximately 80 per cent of allowances were to be given away as free until 2025, after which an increasing amount would be allocated until about 70 per cent of allowances were finally auctioned in 2031 (Waxman and Markey, 2009). A percentage of the revenue generated from the sale of these allowances would “be used to protect consumers from increases in energy prices; assist vulnerable industries transition to a clean energy economy; support investments in clean energy and energy efficiency; aid domestic and international adaptation to climate change, worker assistance and training, and prevention of deforestation; and to ensure that the bill remains budget-neutral,” (ACES, 2009). The international community had emphasized that the US would need to make allowances costly before the time period of 2030 in order for the policy to be effective.

Uniquely, the bill also presented an option to create a system of emissions offsets, which would allow, “capped sources to increase their carbon emissions by up to 2 billion tons annually, if they invest in projects that offset their target emissions reductions” (Waxman and Markey, 2009). This legislative proposal showed the US acting in accordance with international standards and moving towards the construction of new policy tools, which would have indicated a shift towards using a strong approach to ecological modernisation.

Although the bill seemed as if it would satisfy both liberals and conservatives, it failed to produce a clear case of economic benefits, which was mainly due to the lack of authority needed to enforce and interpret the statistical expertise present. Climate change was neither framed as an environmental nor an energy problem in the US, and as such, no agency held the authority to collect data on emissions. The

EPA, in particular, lacked the legal capacity to execute an emissions trading scheme as they had in previous scheme for nitrogen oxide (NO_x) and sulphur oxide (SO_x) (EPA, 2014). This meant that statistical information was likely to come from several different organisations, especially when taking into account the heavy role of media involved in climate change discussions in the US.

The lack of regulatory power at the federal level in the US also meant that states had significant authority to override, and ignore, federal recommendations. Some states, such as California, became tired of the federal partisanship and moved to create their own state-level policy. This also meant that state-level authority meant that federally, senators were responsible for taking decisions relating to carbon policy. “A fair amount of debate arose over the authority and power of the officials involved, showing the lack of coordination problem among federal viewpoints,” MacNaughton, interview, 2015). “The lack of monitoring of ministers in the US at the state-level meant that you only had the political head, such as a senator, or maybe a finance person, coming with him to explain the policy problem and solution.” This meant that decision-makers were likely to lack the statistical background needed for effective decision-making on carbon schemes, and specifically, for creating emissions targets.

The need for further analysis on the economic impact of the proposed targets behind the proposal resulted in significant delay of an emissions trading scheme, which further contributed to the detriment of American policy strength (Forrister, interview, 2015). When the bill finally reached the committee floors for debate late in August, it was right before summer session was about to commence (Forrister, interview, 2015). As a result, senators were fatigued and focused on only passing key legislative proposals. When the bill failed to reach the momentum necessary to pass, due to financial service bills dominating policy discussions, the bill was changed to be an additional item on the ARRA, rather than being a stand-alone piece

of legislation. When ARRA entered floor discussion for debate in September, many of the proposals were struck down, including the Waxman-Markey Bill. “Delbeke saw an opportunity, and he was able to address it in the EU; he saw a window of time open and he took it. Unfortunately, that window was not opened when the debates on the Waxman Markey Bill took place. We almost had it, but because of the change of sponsors, and the confusion over the content, we missed the window,” (Forrister, interview, 2015). Timing here affected the success of the bill hugely, as did again, the partisan connection to carbon policy.

As previous recommendations had also failed to cause incremental changes, US institutions were thus left with a limited range of policy options, and with proposals that were not ambitious. The administration was only able to use stimulus money to promote green technologies, and to again, promote higher automobile standards (EPA, 2015). Still, the EPA began developing guidelines for record-keeping and reporting measures to form a future base for an agreement on CO₂ reductions. The EPA was to become “a partner for providing information and research for excellence and leadership” (Clinton and Gore, 1995, p.3). However, the agency lacked the legal authority for enforcing any penalties. CO₂ was not a pollutant the US had committed to reducing under all of the previous Clean Air Act, and thus, lacked the power to enforce industry compliance with information sharing (Topping, interview, 2015). The US policy-makers were unable to use informational or regulatory tools and could only choose between market-based or voluntary measures, such as performance standards.

8.3 Conclusion: analysing the impact of ideas on institutional change in the EU and US from 2001-2012

The junctions analysed above give insights on the obstacles that climate mitigation policy tools face during times of economic recession or during periods of conflict. Climate mitigation policy, without being emphasized as a priority policy area,

consistently fails to display a convincing case which is needed for policy attention and support. These junctures also further emphasize the problems that come without having a centralised agency to coordinate statistical information and create a clear cost-benefit for addressing CO₂ reductions. However, these junctures further emphasize the need for understanding the role of actors and policy-choices more intricately. This chapter shows that a lack of change in policy tools and goals is perhaps due to organisational problems in the US; actors who are responsible for approving climate mitigation policy seem to find the area complex.

Instead, the critical junctures here highlight how a strong approach to ecological modernisation has resulted in positive institutional adjustments in the EU. In particular, one can see in this period how the focus on open participation and on the international dimensions of development helped European institutions to develop in a robust manner. Whilst US institutions struggled to collect the economic data needed to show a convincing case for climate change, the EU's emphasis on having a science-based approach to climate change, one informed by ecological dimensions (such as in the case of Jacqueline McGlade) were able to influence immediate institutional reform. Recognising climate change as a new policy issue meant that the EU was able to create new institutions to collect a vast amount of statistical information. This information was useful when the EU ETS's pricing floor dropped. Although the democratic participation of industry members was useful in helping garner support for an emissions trading scheme initially, the industry encouragement to move towards more voluntary measures meant that the EU accommodated weaker standards than were needed to ensure a value for carbon was maintained. Here, one can see how actually moving towards a stronger degree of centralisation has been increasingly beneficial for the EU's climate mitigation goals. It was only when the EU moved industry compliance power away from member states towards the European-level itself when progress began to move on the EU ETS.

Overall, when looking at these last two specific process tracing chapters, it seems that the EU has indeed made several more robust institutional changes than the US has. The changes shown in the empirical data chapters show that the EU has used a more diverse range of policy tools for adding policy. They also show that the EU's ambitions in policy have grown more consistently than the US's. When moving to conclude on the two process-tracing chapters then, one is able to see how a strong approach to ecological modernisation has been impactful in driving the adaptive capacity of the EU. Specifically, when looking at the impact that ideas had in spurring changes in the role of the state and in the hierarchy of goals related to climate, we can clearly conclude that the DG Environment has definitively grown more robust, as has the EU's overall attention to climate mitigation goals. Now, this thesis moves to conclude more concretely on the overall differences in institutional changes that these divergent ideological approaches cause.

Chapter 9. Conclusion: comparing the impact of ideas on the institutional adaptation of the EU and US from 1992-2012

The success of the recent COP21 agreement centres largely on the further inclusion of key emitters within global emissions reductions. As such, understanding the institutional capacities of the EU and the US in delivering upon their climate ambitions provides useful insights as to the authenticity of current global carbon reductions commitments. This thesis therefore, sought to gain a more critical understanding of the nature of incremental changes needed for spurring an ecological paradigm shift. It worked to understand why the EU and the US ended up in such different places in regards to CO₂ reductions policies today, despite both initially pledging climate mitigation leadership in 1992. Rather than focusing on the impact of interests in the policy-process, this thesis critically assessed how ideas have impacted climate mitigation policy. Supporting the EU as an intellectual leader, this dissertation focused on understanding the institutionalisation of climate ideas, and the correlation between a strong approach to ecological modernisation and ambitious mitigation policy. Overall, this research sought to understand the nature of institutional changes needed to support society as countries transition towards a low-carbon economy.

This thesis specifically examined the impact that both weak and strong ecological modernisation have had on the institutional path of development for nations seeking to develop a specific climate mitigation policy. By tracing twenty years of climate mitigation tools in both the EU and the US, this thesis examined the differences in type, ambition, and achievement that have resulted from ideas impacting mitigation policy choices. Taking a historical institutional approach emphasized examining how actors are influenced by ideas both externally and internally to the climate policy process; therefore, by tracing the specific development of the EU ETS as compared to the failure of emissions trading scheme proposals in the US, I was able to concretely analyse how ideas impact domestic policy-choices taken in regards to climate mitigation policy. The clarification of the relationship between ideas and

ecological institutional change helps to more critically assess the place of two key state actors within international carbon emissions reductions efforts.

This concluding chapter summarises and displays the main findings of this thesis. It begins by examining the place of the EU and the US in global emissions reductions efforts. Expanding on Hall (1993) and Eckersley's (2004) work in the area of ecological and paradigm changes, it summarises the research conducted to analyse the degree to which the EU and US have institutionalised ecological considerations. Focusing on the changes seen in policy tools, goals, paradigms, and roles of the state, this chapter specifically examines the correlation between strong ecological modernisation and intellectual leadership in the EU. As this thesis has displayed the empirical differences that strong and weak modernisation have had on policy tools, it then moves to identify the key institutional barriers that are imposed through a weak ecological modernist approach to climate mitigation policies. By identifying the main structures and tools that have led the EU towards intellectual leadership, this chapter points to the institutional changes that are needed to support American climate ambitions. Finally, this chapter recognises the limitations to this research, and concludes with recommendations for research that may further enhance international climate mitigation studies.

9.1 Examining the results of the hypothesis

This thesis began with the hypothesis that the notion of strong ecological modernisation initially helped to create a convincing idea for addressing climate change policy in the EU, whereas the idea of weak ecological modernisation was insufficient for creating climate mitigation policy at the federal level in the US. Therefore, this thesis sought to achieve two main aims:

1. To identify and compare the existing climate mitigation policy in the EU and US, and to understand the impact that divergent ideas have had on the type and ambition of climate mitigation tools.
2. To understand the nature of ecological paradigm, change in the EU, and the institutional mechanisms that have led to the to the operation of the EU ETS.

Overall, this research sought to understand the capacities and capabilities of the US and the EU in achieving climate mitigation goals. Theoretically, this required focusing on the nature of change in the EU, and identifying which types of actors and mechanisms have contributed to the institutional adjustments of the EU. The theoretical lens of historical institutionalism provided a clear path for understanding how contradicting approaches to ecological modernisation impact the development of climate mitigation legislation. The focus on ideas acting as drivers allowed me to clearly understand how pre-existing ideas and personal bias of actors' contributed towards incremental changes and institutional adaptation in both the EU and US.

The most important findings in this thesis confirm the hypothesis, which is that a strong ecological approach to climate change policy helped lead the EU to create a convincing case for climate change. As a result, mitigation policy in the EU has produced ambitious goals in carbon policy and eventually led to the institutionalisation of climate mitigation considerations, which can be seen in the EU ETS. The institutional approach to climate mitigation policy in the EU produces a unified agreement that the environment should be valued amongst a range of stakeholders at the European-level. Communicating with member states, scientific organisations, and NGO's through consistent democratic consultation processes has helped it retain a statistically accurate and economic approach to climate mitigation policies. By making continual changes that reflected a true learning process, the EU was able to ensure it demonstrated and created a value for CO₂ reductions. Although at times industry is overly influential on the emissions trading scheme itself, the

cohesive support for CO₂ reductions allows the EU to engage at the international level with a voice that reflects ambition in climate mitigation. If anything, the EU's approach can be seen as a market-based, as many of the tools it has created are made to ensure a stable balance between economy and environment.

Weak ecological modernisation as an overarching idea seems to create a contention between stakeholders including industry, citizens, NGO's, and scientific organisations. In the US, legislation is constructed within the occasional but not mandatory inclusion of key members of the scientific community. In the EU the decision-making process mandates specific scientific consultation within the policy process. The static location of the venue for data collection in the DG Clima in the EU makes it easier to collect and display clear targets, ambitions, and goals for CO₂ reductions. Although carbon reduction considerations are initiated within various policy arenas, it is coordinated clearly though DG Clima. Agencies like Eionets gather information from several outlets, including industry and the public, help to act as a gathering point for ensuring data is scientifically correct and transparent (EC, 2012). They in turn report to the DG Environment, who builds on their assessments of broader tools that are needed to support these reductions, and consult with member states to clearly identify mechanism to best support change. The DG Clima then collects all of this information and collaborates with industry members, scientific experts, and climate policy-makers, to ensure an equal institutional approach is taken. This then creates a clear economic incentive for climate mitigation policies.

The weak, or technocorporatist, approach to modernisation that the US has used in climate change has led to the institutionalisation of deeper obstacles that future climate regimes will have to overcome at the federal level. The weak ecological approach in the US means that no single agency can regulate climate change. Therefore, carbon policy is discussed within various dimensions, and the

coordination of statistical data needed to show a convincing case for carbon reductions is changed frequently. Specifically, when executive administrations change, so do the policy organisations that control climate mitigation goals. These changes make carbon policy seem to be partisan oriented, associating climate change frequently as a liberal concern. It's interesting to note that the idea of strong ecological modernisation in the EU has not been associated as a partisan issue as several conservative politicians saw carbon reductions as a moral responsibility. This points to the need for a better understanding of the environmental impacts of climate change overall in the US. However, the policy legislation examined here shows the strong geographical bias that exists in climate mitigation support. The strong division between climate supporters and climate doubters in energy-intensive states seems to influence the degree of support policy-makers have for the subject. The complexity in understanding climate mitigation policy seems to be difficult for policy-makers who are short on time agendas, even if they have constituent support.

9.2 Understanding the incremental changes that strong ecological modernisation spurred in the EU

Building on Eckersley's (2004) theory of ecological change and Hall's (1993) theories on paradigms and policy change, the research I have gathered provides further insights on the nature of institutional changes that are needed to support societies as they address ecological challenges. My thesis took two divergent approaches to ecological modernisation and analysed the extent to which they were able to drive change. As carbon policies are fundamentally an environmental concern, I have shown that without using a strong ecological modernisation approach, the change that is needed to embed climate considerations in the economy will fail to occur. The section below therefore reviews the empirical and analytical research in this thesis to analyse the key institutional changes that have been caused by strong ecological modernisation including change in policy tools, policy goals, and paradigms. It also points to the importance of changing institutional capacity by examining the change of actors in the EU as compared to the US.

9.2.1 Change in the coordination of information: moving towards shared responsibility in the EU

When looking at the research it seems that a critical part of the EU's success has been using accurate and consistent information is needed to effectively influence actors to show the true economic value of addressing climate change. Using strong ecological modernisation ideas seems to help the EU to reinforce a societal-wide support for climate change altogether. This appears to be made significantly easier by cooperating with the UNFCCC, who helps the EU to streamline their climate progress in terms of monitoring and reporting.

This US clearly has not been able to develop a convincing case for climate mitigation goals, and instead, it seems as though actors in the US are in danger of further weakening the case for climate mitigation policies. Taking a domestic, technocorporatist approach seems to have negated the interaction, and integration, of non-governmental organisations and epistemic community members into the policy-process. As such, climate change considerations remain a solely environmental topic, and have failed to be integrated into the overall economic considerations of the US. However, this failure may be attributed to the difficulty in presenting a convincing case for climate mitigation targets. With so much information coming from a variety of sources, it seems that it is difficult to create consensus. Climate change policy seems to be an issue that policy-makers are anxious to support, yet cautious to implement the tools that are needed for imposing emissions reductions.

The overall economic construction of climate change that often exists and is discussed in the EU through NGO's like the IEA, UNFCCC, and the World Energy Council, seems to have not yet made it into credible policy discussions in the US. Instead, Greenpeace acts as the main international voice, whilst domestic organizations such as the Sierra Club and the National Resource Defence Council

often take the lead on constructing climate as an environmental concern. Furthermore, these associations often may increase the partisan association of climate change due to the lack of clear voice that they present on carbon reductions. These agencies often argue on the appropriate base-line reduction and overall carbon targets as they are often seen as “environmentally aggressive”. Here, again, the lack of authority for carbon data collection at the federal-level in the US means that NGO’s are given conflicting ideas of what carbon targets should be, depending on the international data they gather statistically information from. This makes informing and supporting mitigation legislative standards difficult for those in the NGO community, and appears to very much reduce the credibility of environmental groups, and climate change advocates, in the US entirely.

Media also seems to play an increasing influential role in the policy-process, one that becomes less regulated in the US. The fear of isolating voters seems to have increased dramatically with regards to the increasing role of television and media in the election process. It seems important to ensure media messages are in line with the institutions recommendations during critical climate conventions, like the UNFCCC meetings where media interactions helped to attract citizen support for climate goals. With the increasing “celebrity-factor” in the US, and the ability of non-climate groups to negatively influence press campaigns, it indeed seems as though decision-makers themselves often are presented with biased and inaccurate ideas as to why climate change should be addressed. In Europe, both conservatives and liberals seem to agree on the moral case for climate change, which has been communicated effectively to broader European stakeholders. In the US, there has been no convincing case for climate change, and instead, there are oftentimes conflicting messages sent to the public, which indeed may impact the importance that broader citizens place on climate change policy.

Although Americans may be able to create a convincing case for addressing climate change, it seems certain that the EPA will not be an effective institution for doing so, simply due to the pre-existing notion of the EPA as an overly regulatory body. Instead, the DOE seems to pass legislation related to mitigation much more easily. Specifically, when taking into account Obama's praise of energy policies in the US, it does seem that the DOE will be better placed to handle climate change. However, without having an overarching goal between environment, energy, and economy, it will be difficult to measure and assess the US's emissions progress. Instead, the US needs to better understand and communicate how climate change will fit into the American policy portfolio.

9.2.2 Change in organisational structures: centralising the responsibilities of carbon management

Ideas in the EU change in accordance with administration yet are continually built upon the notion of strong ecological modernisation. Commissioners often come from member states reflecting the best of European capabilities, yet the actors involved are constantly changing to ensure those with the most suited backgrounds on working on specific agenda items. This shows the effectiveness in the coordination of administrative duties behind policy tasks in the EU. Contrarily, I can see no change in policy coordination in the US when compared to how climate policy responsibilities have changed in the EU. In the EU, the strong ecological approach means that international norms and citizens preferences are able to penetrate and influence the structuring of European institutions. The effectiveness of the EU's institutions depends very much on the structures, coordination, decision-making, and management mechanisms that come from international negotiations. These international institutions now act as learning structures that help to ensure that continual adaptation occurs, which directly helps the Europeans achieve their goals.

Organisational changes seem to happen with much less contention in the EU when compared to the US. The EU's unique targets actually require the revision of administrative duties to ensure capacity is being addressed. Organisational changes

in the US, and specifically administrative duties relating to carbon the collection of data, is a significant problem. With each change in administration comes a different unit that is tasked with collecting information relating to emissions data. Under Bush, this was transport, under Clinton it was the EPA Atmospheric team, and under Obama it has returned to the EPA.

Approaching climate policy today seems to require an increasingly centralised approach to climate mitigation policies. The DG Clima has a much more direct focus on climate change than the Enviro DG does. Increasing the statistical and mathematical knowledge needed for better understanding the complexity of climate mitigation policies seems to be an impressive feature in European policy. Deploying a strictly statistical organisation for targets shows commitment in addressing the factual demands of the policy field, but also, in contributing to the understanding of the continual changes needed to support new ambitions and goals. The informational centres and scientific backgrounds of researchers within these organisations meant that climate policy retained a strong connection to science in the EU.

In the EU, information from scientific organisations enters the policy institutions where it is handled by specific administrations. Mainly, the EU gathers statistical emissions information⁷ used for developing its carbon policy from two places: the UNFCCC ,and the DG Clima (one international organization and one domestic organization). Although the DG Energy and DG Environment also collect information in regards to emissions data, DG Clima remains the single organisation that informs and aggregates the statistical data that is used for developing the EU's carbon policy. The UNFCCC provides early recommendations on targets and

⁷ This data is normally related to meteorological information (including atmospheric data) and emissions data related to energy consumption and production.

reductions, but then it is left to the EU to take those estimates and verify and develop its internal reductions targets. Therefore, as soon as information relating to emissions reductions targets enters the EU each individual agency is required to identify and verify its own place within emissions reduction. For instance, the DG Energy is required to develop and propose actions that are related to energy consumption and production; the DG Environment is responsible for identifying what the state of the current environment is, and what actions are needed to protect the environment from further atmospheric damage. However, DG Clima is the only organisation that coordinates the viewpoints of energy, environment and economy to form a single emissions target for the EU. This process ensures that targets are kept in line international standards, but are also directly informed and verified through the EU's own processes.

This is not the case in the US. Statistical information (specifically CO₂ reductions targets imposed from the UNFCCC) enters the policy arena where it is quickly met with opposing standards. However, this may be due to the long-standing trust issues between American politicians and the UN (Stowe, interview, 2015). As such, the UNFCCC is not the officially recognised body in regards to statistical data for the UN; instead, the US has its own data collection agency, the US Energy Information Administration (EIA) which shares data responsibilities with the DOE, National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA). Therefore, statistical information comes from defence (DOE), energy (DOE), and commerce (NOAA), yet no agency currently has the authority to aggregate and assimilate data. In addition, since the EPA has gained the authority to begin collecting environmental-related data in the *Massachusetts v. EPA* lawsuit, there are now even more conflicting viewpoints on the needed emissions reductions for the US. Although the UNFCCC may prescribe targets to the US, different agencies may project a different viewpoint of what is actually needed. Therefore, without a centralised agency to collect information and form an accurate baseline targets, it's difficult for agencies, and the actors within

them, to accurately estimate what the cost-benefit of emissions reductions truly are in the US. This was seen in the 2009 passing of the Waxman-Markey bill for instance, where the deciding authority on the bill was unable to decipher and understand the differences in the various economic models that were used between agencies to forecast the cost-benefit of emissions reductions.

The lack of a unified approach shows that climate mitigation goals will be difficult to achieve at the federal-level, regardless of the political affiliation of the executive branch. State-level responsibilities in mitigation policies do allow states like California to display climate leadership, but at the same time, also allows states to use anti-climate rhetoric that fail to diffuse notions that climate change is a threat to American competitiveness. The notions of environmental standards are fragmented amongst internal organisations, and thus evidence produced in the policy-process often meets opposition. Still, the emphasis on technology-driven results shows that increasing the strength of research and development programmes, and introducing different types of economic tools may be likely to succeed in the US.

The organisation and coordination of the House of Representatives seems to be an additional obstacle for policy-makers attempting to promote federal-level mitigation policy. The various committees involved in discussion seem to allow non-climate advocates considerable room for influence on the policy process. Despite the continual changing of committees responsible for climate policy, this has positive influence on policy formation, such as the addition of amendments by environmental advocates. However, this also has negative effects as it opens the door for those wanting to negatively impact the policy process. Again, the lack of clear information that outlines the economic impacts of climate change, and gives recommendations on avoiding those impacts, fails to produce a convincing notion for modernising the economy with ecological considerations. Nancy Pelosi's introduction of a new committee in 2007 shows how the House is definitely

responsible for at least a portion of the weak policy proposed in the US. When creating a new committee that combined both House Republican and Democratic experts, the committee effectively helped to create several ambitious items of carbon legislation. However, these were stopped by specific actors and through the distortion of information that has become uniquely linked to the George W. Bush administration.

Without maximum term limits, Republican members are often elected without opposition because they are able to retain seats due to familiarity with their district. Although this would not matter as representatives are directly elected, the change of committee assignments seems to have greatly affected climate issues. House members with seniority have typically chosen main committees of importance, and specifically energy. It seems that these members vote according to their long-standing traditions on environmental legislation, as opposed to what the policy demands of carbon actually entail. As such, many proposals die within the House, ranging from outright dismissals but also from failing to act within the appropriate time required for changing bills into legislation.

Without a centralised agency coordinating information, the US seems unable to form a clear viewpoint as to what its emissions targets should be and instead, target opinions remain divided by venues, partisan-interests, and changes in administration. Without having clear statistical data, the economic foundation needed to show the long-term benefits behind emissions targets is impossible to formulate or defend. Without such a centralised statistical agency, the benefits shown to stakeholders will remain inconsistent. As such, the US will be unlikely to create an emissions trading scheme, and perhaps, may be in danger of not reaching mitigation goals as they fail to track progress. When considering the consistent instances in which climate change information was distorted within this twenty-year period, it seems increasingly unlikely that the US will be able to address climate

change without making institutional adjustments that have a direct mandate to coordinate carbon policies.

9.2.3 Change in actors: shifting responsibilities towards topical experts

Change in actors who participate in the policy-process seems to have been a critical factor in the EU's institutional progress. There is a significant difference between the actors that push climate policy forward in the EU as compared to those in the US. Rational choice decision-making implies that humans are able to make rational cost benefit assessments (Ostrom, 1998, p. 1-22). However, within carbon policy, the correct data needed to economically calculate the opportunities within long-term decision-making must be matched by sophisticated statistical comprehension. The correct information and the correct calculations give actors the capability of being rational decision-makers. Making the institutional adjustments to reflect these capabilities has been central to the European success.

Both economists and energy experts helped the EU to ensure that the institutional capabilities within its organizations matched the rate of incoming knowledge. Environmental experts first brought in the idea of sustainable development which was an economic, institutional approach to environmental policy. The EU then adjusted its institutional responsibilities to reflect increased intellectual capabilities that matched the growing complexity of carbon policy. Environmental experts were joined by economists and scientists, and as such, a variety of tools continued to be proposed. The ideas centralised by economists like Jos Delbeke, ensured that equal support was given to broader European stakeholders.

Failure of policy innovation, and therefore, innovative ideas, may be due to the limitation of actors themselves in climate policy circles. In the US, the same actors remain situated within the policy arena for significant amounts of time. Vice-President Al Gore has acted as a senate member, a Vice-President, and now as an expert witness. John McCain has also been involved in the process for a

considerable amount of time; Hilary Clinton was Secretary of State under Obama who himself, also served on the committees affecting climate change. Now, Hilary Clinton is running for President, against Senator Sanders, who was also located in the climate policy discussions during this investigation. The same key actors have remained within the arena for almost the duration of the policy time indicating that life-long politicians may be greater in number and authority than new actors. However, this is of increasing concern when considering the introduction of the celebrity factor within politics.

9.2.4 Change in policy tool options: increasing the diversity of choices

The ideas of ecological modernisation seem to heavily affect the policy tool options that are available to policy-makers. The US seems to thus, only allow their policy-makers to deploy market-based or voluntary tools. These are the only tools that are likely to not harm the economy, nor be met with stakeholder criticism. Despite an emphasis on an economic approach to climate change the US does not push forward on developing its own approach to climate change. Economic tools are limited, and the use of finance, which is often seen as the crux of technical efficacy, does not play a big role, at least during this time period. Although private sector financing in clean energy has significantly increased in the US in more recent years, the government support of RandD seems limited for the emphasis put on the technological and private sector driven approach in the US's mitigation policies.

Information plays a strong role in initially affecting the tools in carbon policy, yet informational tools do not seem to take place frequently in the US. Information affects the outcomes of climate policy in three key ways; in targets, in baseline information, and the degree of ambition that is set within the policy itself. When viewing the tools collected, we can see how informational tools played a direct role in contributing to the leading and lagging climate policies in the US and the EU. Through the EU's static location of DG Clima, and through the collaboration with

industry members, the EU is able to ensure that their targets and ambition are set accurately to create a unified idea of how carbon policy should develop. Thus far, the targets on how industries need to meet targets have not been able to be enforced with trust without a centralised authority to collect and aggregate greenhouse gas data. However, this may be affected more greatly after the Supreme Court case Massachusetts v. the EPA. The regulatory authority maybe the initial organisational change needed to spur further changes within the US.

In the EU, climate actors are able to use a variety of tools; regulations are clearly laid down and enforced, in addition to a variety of other complex arrangements. Economic tools are consistently deployed alongside informational tools to collect and observe data. The informational tools help industry members and the public to understand the complexity of the tools deployed. Voluntary agreements are made similarly to the US with the automobile industry acting as a key player.

The EU ETS overall, helped to enforce the consistent need for change and evolution in the EU by providing a clear cost for carbon compliance. The tool allows decisions-makers to monitor and update progress on emissions reductions, and also provides an economic incentive for doing so. The ECCP however acts as a strong collective framework for achieving carbon goals. The programme itself is largely reflective of the European climate policy. The programme works with epistemic community members to provide clear targets, timelines, and baseline years for achievement. These include leading industry members, key economists, and also members of the scientific community. These targets are then unanimously decided and later enforced. The organisation, or programme, helped to act as an tool itself by crossing different administrations to provide timelines for completion. Through these types of unique action programmes, the EU removed party association from climate change, and helped to build broader societal support for reducing CO₂.

9.2.5 Change in policy-paradigms: moving away from environmental policy towards an institutional approach

This study defends the notion that strong ecological modernisation provided a better approach to climate mitigation goals than the weak ecological modernist approach. Taking an institutional approach means that changes in administrative capacities occur in the EU constantly, thereby ensuring that European climate institutions continuously evolve in response to new information. The US tries to do this but does not succeed. Instead, and perhaps because of the heavy influence of corporations in the decision-making process, institutional adjustments are difficult. At times, even policy-makers themselves frown upon the changes due to the jurisdictional territory attached to certain policy areas in the US.

The strong ecological modernist viewpoint, which serves as the basis for the European approach to sustainable development, has continuously evolved, displaying that true innovation is in fact spurred by changes in ideas themselves. In the EU, political players push climate concerns forward with strong backgrounds in economics and environmental economics. The EU produced the necessary intellectual capital needed to influence and coordinate the variety of stakeholders in the policy process to convince them to respond to a new policy demand. This shows how the EU institutionally adjusted to support increasing complex policy demands.

The US has consistently addressed carbon policy considerations with a weak ecological modernist approach, but has been unable to implement any lasting legislation. This is most likely due to the fact that climate mitigation policies are rarely considered by anyone other than the environmental agency or the executive branch in the US. In the US, these political players tend to be lawyers and politicians, whose skills in legal measures do not match the construction of market-based tools that the US prefers. Instead, these qualities are more suited towards regulatory tools.

Still, the understanding of the long-term benefits associated with CO₂ reductions seem to be misconstrued in various notions of competitive damages in the US, that heavily impacts the economic validity of legislation. Without strong support from a variety of stakeholders, the evolution of institutions does not seem to occur. Instead, mitigation techniques are likely to be proposed but, without the institutional changes needed to increase intellectual capabilities, policy choices are likely to result in weaker ambition and goals in carbon policy, if they can be implemented at all.

In the US, specifically, ecological ideas often enter the policy-process and encounter divided opinions as to how climate will affect the economy. On one side are those who see the benefits of carbon reductions and, on the other side, are those who still view see addressing climate change as a threat to American competitiveness. Rather than the organisational strength in climate policies being increased in line with policy-demands, executive administrations create new agencies under their own leadership, which makes climate mitigation policy associated with individuals. This then makes climate policy a major obstacle that each new President has to address. Instead of continual smaller changes, the US only seems to attempt to take major changes in regards to implementing climate policy.

In addition, the overall approach to ecological modernisation in the US remains stagnant on the construction between environment and growth, and shows an uncertain approach that centres on economic growth leading to increased technological innovation. However, this viewpoint seems to have become increasingly conservative in the US, which leads one to question. What is the American definition of success in climate policy, and how does the country hope to achieve this?

9.3. The need for new ideas to spur incremental changes in the US

The thesis shows how many dimensions climate policy truly impacts. It also shows how complex and partisan-associated climate change policy has truly become in the US. Looking at the history of climate change policy shows a great deal of obstacles that future policy proposals are likely to encounter. The increasing partisanship of climate change issues seems to indicate a low chance of carbon policy implementation without an economic demonstration of the opportunities and risks associated with climate change in the US. However, without addressing the role of media sensationalism it seems unlikely that such a study would create noticeable impact in the US, especially when considering the history of misinformation campaigns attacking climate change science in the US.

When taking into account the US's recent decision to pull out from the Paris Agreement, it seems that pro-climate actors in the US will need to work to ensure that institutions change to support the overarching goals as needed to achieve ambitious climate legislation. It seems important to consider how to engage the US in a meaningful manner that lacks precedence, and therefore the risk of inherited bias that seems to be a constant connection in the US. This could require using a different type of policy tool, such as a carbon tax. It also seems that industry exerts a large influence on American institutional structures which indicates the need for increasing incentives in RandD and also regulatory targets to ensure compliance. Without developing an indicator for technological development, or investment in renewable energy, this thesis questions how the US will be able to make a meaningful contribution to the efforts needed for global emissions reductions.

In the US ideas and policy currently related to climate change now enter the system and create divided opinions as to how climate change will impact both the economy and broader society. This leads to a clear division between those who see the benefits of carbon reductions, and those who see reductions as limiting to economic growth.

Rather than the organisational strength being increased in line with policy-demands, executive administrations create a new agency, which poses a shock to the system. Instead of continual smaller changes, the US only seems to attempt to take major changes. It may be helpful for the US instead, to create a centralised agency that coordinates climate data and is separate from historical connotations to climate change.

At the same time, this thesis recognises that when considering the US's emphasis on technology being used to achieve CO₂ reductions, it has excluded the quantitative tracking of investment considerations in the private sector towards carbon-capturing technologies. Although it is important for institutions to support communities as they move to address climate change, it may in fact be premature to assume that all American efforts were captured in this study- specifically, those investments made in renewable energy technologies and in carbon utilisation.

The most interesting, and perhaps impactful, area for future research would be the theoretical construction of an ecological idea in the US; one that aligns better with the American economic mentality of short-term results and security. Since this study has begun, the concept of resilience and adaptation measures has become further emphasized as a critical part of the low-carbon transition. With an emphasis on short-term goals and infrastructures, this area may in fact be one that helps America to begin addressing its climate goals. However, like sustainable development, this area can be somewhat vague; in order for America to truly progress in climate adaptation as part of a mitigation strategy specific goals and measures for progress would need to be developed. Again considering the emphasis on technology and the need for clean coal in countries like China and India, this could be an area where the US may be able to deliver climate leadership.

Overall, this research supports the notion that ideas are the key catalysts to change: not interests (Blyth 2001; R Lieberman, 2002; Levi, 1997; Weingast, 1996). Change itself seems to only occur in reaction from capable actors who are able understand the complexity of carbon policy, due to their previous understanding that carbon policy requires a change in environment and the economy. Even with the creation of new structures to implement carbon policy, actors that support these structures must receive information and know how to address it, in order to cause a change. Information in carbon policy seems to help forms the basis of actor's ideas, which in turn affects their policy choices. Information helps to generate new ideas in this area, which leads to innovation in policy tools.

This thesis also sought to assess empirical evidence relating to incremental change, or the category of change that has been most recently described as evolutionary (Steinmo, 2014). This study suggests that incremental change is necessary for organisations to address climate change, and the US's current system lacks evolution in environmental policy due to the lack of smaller organisational changes that need to spur further institutional adjustments. As evolution can be described as institutional adaptation, it seems as if the US system is unresponsive to policy innovation. As evolution can be described as institutional adaptation, it seems as if the US system is unresponsive to policy innovation.

Updating the American economy with ecological considerations will require the adjustment of time, which seems to be a considerable obstacle in policy. Sustainable development infers long-term decision-making whereas development in the American neo-liberal sense has to do with immediate returns. In the EU, climate mitigation programmes often span over years, and at times, decades to allow time for the transition of environment within the economy. However, the environment is valued overall because it has been understood that within economic growth can cause detrimental environmental effects. The US will need to create a stronger

emphasis and policy-framework to convince stakeholders of the long-term benefits of avoiding climate change and its effects.

Considering the political instability that has occurred in Europe in 2015, this thesis also recognises the need to understand member states, and other individual nations, commitments to climate mitigation ambitions in order to understand how times of strain may inhibit climate mitigation. Specifically considering the economic impact that a social cost for carbon has, it becomes necessary to understand to what degree individual countries have institutionalised climate mitigation policies. The pressure to address short-term decisions, such as jobs and unemployment, may conflict with the idea and operation of strong ecological modernisation. Yet the evolution of European structures alongside the demands of international climate change legislation shows the EU itself growing increasingly effective. In the EU, implementing carbon policy has resulted in a shift for long-term thinking of economic success for firms. As environmental policy has grown with European competence, it is easy to see how its continued success may depend very much on the success of the EU itself, as increasing centralisation seems connected to carbon policy success. Without a strong EU focus in climate change, one can question the likelihood of member states to individually contribute in such a meaningful manner towards international carbon abatement. The study of carbon policy presents a outline of how governmental institutions can effectively respond to a new policy challenge.

Appendix 1: Table of European carbon policy tools 1992-2001

Type of Tool	Tool	Location of policy proposal	Action taken
Informational	SAVE program Focused on buildings and transport. Aimed at providing consumers with information about the energy consumption of buildings and transports.	<i>Commission Energy</i>	<i>Implemented</i>
Cooperative	Thermie programme Demonstration and promotion of new energy technologies from the Energy Directorate-Generale	<i>Commission, Energy</i>	<i>Implemented</i>
	JOULE Programme Research and development	<i>Commission Research</i>	<i>Implemented</i>
	Automobile Efficiency Standards	<i>Commission Environment</i>	<i>Implemented</i>
	Member-state Industrial Collaboration Goals	<i>Commission Economic and Financial Affairs</i>	<i>Implemented</i>
Economic	The Fifth Environmental Action Programme The first program that set out clear objectives, targets, and time frames for the European environment policy. Focused on reducing pollution levels and implementing legislation that would benefit the EU.	<i>Commission Environment</i>	<i>Implemented</i>
	ALTENER program Promote the market for renewable energy source and their integration into the internal energy market.	<i>Commission Energy</i>	<i>Implemented</i>

The Cost of Prospective Initiative *Commission proposal by UK DFID* *Implemented*

Focused on evolving normal accounting measure from standard financial considerations into including all factors related to environmental impact.

Cohesion fund *Council of the EU* *Implemented*

To help cushion the losses of industries and member states against the new objectives of the EU, or provide funding for member states and industries that needed safeguarding from carbon penalties

Cost-Benefit Analysis Mechanism *Commission Environment* *Implemented*

Used to determine the utility of policy choices by ingraining environmental considerations into traditional economic analysis methods

The Community's Eco-Management and Audit Scheme *Commission Environment* *Implemented*

Encouraged private companies and public bodies to improve their environmental performance within areas of economic activity by outlining accounting standards that integrated environmental considerations

The Cost of Prospective Initiative *Commission for Environment* *Implemented*

Evolving traditional accounting methods to include factors related to environmental impact

Appendix 2: European carbon policy tools from 2001-2002

Type of Tool	Tool	Location of policy proposal	Action taken
Regulatory	<p>The Sixth Environmental Action Programme</p> <p>While the targets of the 5EAP were seen as regulatory, the 6EAP focused on supplying information to industry members as well as government officials.</p>	<i>Commission for Environment</i>	<i>Implemented</i>
	<p>Motor Vehicle Reduction Rates</p> <p>Reduction target rates set for industries producing outside the EU, with a focus on motor vehicles. CO₂ emissions of vehicles produced in 2012 to be no more than 130 g/km.</p>	<i>Commission for Environment</i>	<i>Implemented</i>
	<p>Emissions reductions targets</p> <p>Limiting the amount of carbon produced by six main industries; Energy, steel, cement, glass, brick making and paper/cardboard production: these industries were noted as the highest contributors to CO₂.</p>	<i>Commission Environment</i>	<i>Implemented</i>
Informational	<p>Energy labels</p> <p>Helps consumers and businesses to identify products and services that have a reduced environmental impact throughout their life cycle</p>	<i>Commission Environment</i>	<i>Implemented</i>
Cooperative	<p>The European Electricity Grid initiative</p> <p>Focused on the whole system requirements necessary to prove the likelihood of zero emission fossil fuel plants at the industrial level.</p>	<i>Commission Energy</i>	<i>Implemented</i>
	<p>The European Wind Initiative</p> <p>Launched to deploy large-scale wind turbines that are relevant to on- and</p>	<i>Commission Energy</i>	<i>Implemented</i>

offshore development for the renewable energy sector.

	<p>The Solar Europe Initiative</p> <p>Focused on developing a research, development, and demonstration roadmap to set the EU on a path for photovoltaic development.</p>	<i>Commission Energy</i>	<i>Implemented</i>
	<p>The Bioenergy Europe Initiative</p> <p>Focused on deploying the next generation of biofuels within the overall energy strategy</p>	<i>Commission Energy</i>	<i>Implemented</i>
	<p>The Sustainable Nuclear Fission Initiative</p> <p>Aimed at increasing funding behind technology related to nuclear energy production by focusing on the future production of fission technologies.</p>	<i>Commission Energy</i>	<i>Implemented</i>
	<p>European Electricity Grid Initiative</p> <p>Focused on the system requirements necessary to transition the European electricity grid to a zero-carbon future</p>	<i>Commission Energy</i>	
Economic	<p>Green tariffs</p> <p>Aimed at increasing the incentives for investment within renewable energy sources.</p>	<i>Commission Energy</i>	<i>Implemented</i>
	<p>The European Emission Trading System</p>	<i>Commission for Climate</i>	<i>Implemented</i>

Appendix 3: Tables of American carbon policy tools 1992-2001

Type of policy tool	Policy tool	Location of Policy Proposal	Action Taken
Regulatory	<p>The National Environmental Policy Act</p> <p>Focused on air particulate and global warming, the EPA formed the first environmental policies to regulate industries impact on the environment including environmental impact assessment and streamlined risk assessment methodologies.</p>	<i>Executive order</i>	<i>Proposed</i>
	<p>The Presidential Directive on Carbon Dioxide Emissions</p> <p>Focused on promoting retail competition in the electric power industry, delivering efficiency increases in order to reduce greenhouse gas emissions</p>	<i>Executive order</i>	<i>Implemented</i>
Informational	<p>The North American Agreement on Environmental Cooperation</p> <p>This treaty consisted of a declaration of principles and objectives concerning conservation and the protection of the environment in the face of increasing economic activity.</p>	<i>Foreign policy treaty</i>	<i>Implemented</i>
Cooperative	<p>Automobile fuel efficiency standards</p> <p>Mileages standards were introduced as a way of reducing CO2</p>	<i>EPA</i>	<i>Implemented</i>
	<p>The Climate Change Action Plan</p> <p>Launched several tools to reduce domestic greenhouse gas emissions in a number of sectors across the economy through a range of partnership efforts.</p>	<i>Executive order</i>	<i>Implemented</i>
	<p>Department of Energy (DOE) Climate Change Programme</p> <p>Formed in cooperation with the electricity sector, this tool sought to encourage participation from utility firms</p>	<i>DOE</i>	<i>Implemented</i>

to voluntarily reduce their carbon footprint.

	The Energy STAR Programme	<i>DOE/EPA</i>	<i>Implemented</i>
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Jointly deployed by the EPA and DOE, this program was put in place to reduce energy consumption in homes and office buildings across the Nation.

	The Energy Star Building and Green Lights Partnership	<i>EPA</i>	<i>Implemented</i>
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Launched to encourage increase efficiency within the built environment, this program worked to provide funding for buildings to undergo efficiency upgrades.

Economic	The Comprehensive Electricity Competition (CECA) bill	<i>DOE</i>	<i>Implemented</i>
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Restructured the US electric industry and increase competition to drive down increasing electricity costs.

Appendix 4: American carbon policy tools 2001-2012

Type of policy tool	Policy tool	Location of Policy Proposal	Action Taken
Regulatory	<p>Climate Stewardship Act of 2003</p> <p>Establishes Federal climate change research and related activities, enhancing measurements, standards, and technologies that enable the reduction of greenhouse gasses.</p> <p>Directs the Administrator of the Environmental Protection Agency (EPA) to establish and maintain the National Greenhouse Gas Database, including the development of measurement and verification methods and standards.</p>	<p><i>Senate proposal, Senator Joe Lieberman,</i></p>	<p><i>Died in House</i></p>
	<p>Keep American Competitive Global Warming Policy Act of 2006</p> <p>To establish a market-based system to regulate greenhouse gas emissions and to promote advanced energy research and technology development and deployment, and for other purposes.</p>	<p><i>House proposal, Senate Committee for Energy and Commerce, Science, International Relations, Education and the Workforce</i></p> <p><i>Senator Tom Udall, (R-NM)</i></p>	<p><i>Introduced, fail to reach Senate</i></p>

<p>Climate Stewardship Act of 2004</p> <p>Expands Federal climate change research initiatives.</p> <p>Establishes a program for the market-driven reduction of GHGs by covered entities through the use of tradable emissions allowances. Allows tradable allowances to be sold, exchanged, purchased, retired, or otherwise used as authorized by this Act.</p>	<p><i>House proposal, Science Energy and Commerce</i></p>	<p><i>Died in House committee</i></p>
<p>The Climate Stewardship Act of 2004</p> <p>This act proposed to reduce emissions levels to the 2004 levels by 2012, 1990 emissions levels by 2020, and 60% below the 1990 level by 2050.</p>	<p><i>House proposal, Committee Science, Energy, and Commerce</i></p> <p><i>Rep. Wayne Gilchrest (R-MD)</i></p>	<p><i>Proposed</i></p>
<p>A resolution recognizing the need for the Environmental Protection Agency to end decades of delay and utilize existing authority under the Resource Conservation and Recovery Act to comprehensively</p>	<p><i>Senate proposal by Barbara Boxer (D), Senate Committee on Environment and Public Works</i></p>	<p><i>Introduced</i></p>

The Global Warming Pollution Reduction Act of 2006	<i>Senate proposal, Finance; Senator John Kerry, (D-MA)</i>	<i>Proposed; died within Committee on Finance</i>
This act attempted to integrate CO2 regulations into industry operations.		

The Global Warming Pollution Reduction Act of 2007	<i>Senate proposal, Finance; Senator John Kerry, (D-MA)</i>	<i>Proposed; died within Committee on Finance</i>
This act attempted to integrate CO2 regulations into industry operations.		

The Global Warming Pollution Reduction Act of 2008	<i>Senate proposal, Finance; Senator John Kerry, (D-MA)</i>	<i>Proposed; died within Committee on Finance</i>
This act attempted to integrate CO2 regulations into industry operations.		

The Federal Leadership in Environmental, Energy, and Economic Performance	<i>Executive order</i>	<i>Proposed; rejected by Senate</i>
Issued targets and emissions requirements for all federal agencies as recommended by the targets set by the Copenhagen Accord.		

The Climate and Clean Air Coalition	<i>Executive order</i>	<i>Proposed; Died in Senate</i>
Launched to make immediate and rapid progress on climate change, mainly in improving air quality by targeting black carbon, methane, and hydrofluorocarbons.		

	<p>The Programmatic Environment Impact Statement (PEIS)</p> <p>Tool analyses potential environmental, social, and economic impacts associated with the proposed 2012-2017 Outer Continental Shelf Oil and Gas Leasing Program (the Program). This PEIS evaluates the potential impacts from oil and gas exploration and development on six planning areas of the Outer Continental Shelf.</p>	<i>Bureau of Ocean Energy Management</i>	<i>Implemented</i>
Informational	<p>An Abrupt Climate Change Scenario and its Implications for United States National Security</p>	<i>DOE</i>	<i>Implemented</i>
Cooperative	<p>The Advanced Research Project Agency-Energy</p> <p>Focused on 'out of the box' transformational energy research that brings together scientists, engineers, and entrepreneurs to develop innovation within cleaner technologies.</p>	<i>DOE</i>	<i>Implemented</i>
	<p>The Operational Energy Strategy Implementation Plan</p> <p>Department of Defence and Department of Energy Cooperative project that sought to address energy security. Used an annual budget of \$240,000 to focus on renewable energy projects, incorporating energy efficiency standards, and reducing fuel usage in the US military</p>	<i>DOE</i>	<i>Implemented</i>

	<p>The Major Economies Forum on Energy and Climate</p> <p>Launched to facilitate a dialogue among major developed and developing economies to make progress in meeting the climate change and clear energy challenges.</p>	<i>Executive Order</i>	<i>Implemented</i>
	<p>The Clean Energy Ministerial</p> <p>Intergovernmental organisational project created specifically to drive the transformation needed to transition to a low-carbon economy</p>	<i>Executive Order</i>	<i>Implemented</i>
Economic	<p>The Climate Leaders Offset Methodologies</p> <p>Developed a standardized approach to determine the eligibility of projects proposed for carbon reductions.</p>	<i>EPA</i>	<i>Implemented</i>
	<p>Climate Change Technology Tax Incentives Act of 2005</p>	<p><i>Senate proposal, Committee on Finance; Senate Chuck Hagel, (R-NE)</i></p>	<i>Died in senate</i>

The Climate Stewardship and Innovation Act

The bill was proposed to encourage leadership within climate measures, specifically in research and innovation.

Senate *Proposed*
proposal,
Committee
Environment
and Public
Works;
Senator John
McCain (R-
AZ)

Comprehensive Electricity Competition Bill

Bill designed to restructure the electricity market in a direction that included environmental provisions in the energy market

Senate *Proposed;*
proposal *Died in*
House

The Climate Change Credit Corporation

Focused on providing funding for industry and consumers who complied with the Climate Stewardship and Innovation Act.

Senate *Proposed;*
proposal *Died in*
House
Committee
Environment
and Public
Works.

John
McCain (R-
AZ); Joseph
Lieberman
(ID- CT)

<p>The McCain and Lieberman Climate Stewardship Act</p> <p>Called on the government to fund researching and commercializing efforts involved in producing new energy technologies.</p>	<p><i>Senate proposal</i></p> <p><i>Committee Environment and Public Works.</i></p> <p><i>John McCain (R-AZ); Joseph Lieberman (ID- CT)</i></p>	<p><i>Proposed; expired on floor</i></p>
<p>The Green Climate Fund</p> <p>A joint project between global nations that would provide financing energy efficient projects.</p>	<p><i>Executive order</i></p>	<p><i>Implemented</i></p>
<p>The New Energy for America Act</p> <p>This plan would use indirect and direct economic tools to help America transition away from an oil-dependent economy to a new cleaner, more efficient energy economy.</p>	<p><i>Executive order</i></p>	<p><i>Proposed</i></p>
<p>The New Energy Plan for America</p> <p>Seeks to create five million jobs by investing \$150 billion over the next ten years to encourage the transition to clean energy sources.</p>	<p><i>Executive order</i></p>	<p><i>Proposed</i></p>
<p>Tax credit extension for renewable energies</p>	<p><i>DOE</i></p>	<p><i>Implemented</i></p>

The American Clean Energy and Security Act

The bill would have established an emissions trading plan similar to the EU ETS and proposed the first coverage period for 2012-2050.

Senate proposal

Senate proposal

Committee Environment and Public Works.

John McCain (R-AZ); Joseph Lieberman (ID-CT)

Proposed; died in Senate floor

Appendix 5: List Interviewees

Anonymous, governmental source who has been involved in climate mitigation policy for over ten years, but could not officially comment due to governmental restrictions, Paris, 10 November, 2015.

Bernstead, Björn, Head of EU project “World Views on Climate Change”, London, 8 July 2015.

Boersma, Tim, Senior Fellow for Climate Policy at the Brookings Institute, London, 20 June 2015.

Costa, Alessandro, Head of Strategic Affairs, Enel Industry Group, Manila, 17 June 2015.

Evans, Peter, Co-founder Centre for American Progress, previous policy advisor in the US, London, 1 June 2015.

Forrister, Dirk, CEO of International Emissions Trading Scheme, US delegate to COP 1992- 2007, COP Participant 1992-2015, 20 July 2015.

Helm, Dieter, Economist, Oxford University, Special Advisor to the European Commission, London, 1 August 2015.

Joubert, Phillippe, CEO, World Business Council for Sustainable Development, Chair of the Prince of Wales’s Trust, Manila, 18 June 2015.

King, Ian, Head of Policy and EU ETS at the Department of Climate Change (UK), London, 20 July 2015.

Lee, Caroline. IEA economist, climate change policy analyst, COP participant 2013 and 2015, Paris, 15 July 2015.

Levina, Ellina, IEA economist, climate change policy analyst, COP participant 2001-2015, London, 30 June 2015.

MacNaughton, Joan, Former DG Energy UK, original representative of the UK at the 1992 UNFCCC conference, London, 17 June 2015.

Mills, Simon, Head of Sustainability, City of London, London Accords, London, 14 June 2015.

Neil, Stuart, Head of Communications for the World Energy Council, COP participant 2009-2015, London, 2 July 2015.

Nekhaev, Elena, Director and Senior Advisor, Technical Programmes, World Energy Council, London, 3 July 2015.

Rowan, Peter, UN Economist working on ETS in 2009, 2011, and 2015, London, 8 May 2015.

Stowe, Robert, Dean of Harvard Environmental Economics, leading author on carbon policy in the US, and EU ETS, 11 May 2015.

Topping, John, Former EPA administrator, Taskforce on Air and Pollutions, London, 10 May 2015.

Tudway, Richard, Economist, Oxford University, Previous employee of British National Economic Development Office, Organisation for Economic Co-operation and Development. Principal Economist for Centre for International Economics. London, 15 May 2015.

Ulrecht, Stephan, Head of Governmental Liaison, E.On, German Policy Adviser on Industry Emissions, Manila, 17 June 2015.

Williams, Leslie, lawyer and former legal representative for the state of California, 14 July 2015.

Winkler, Sandra, Director, Energy Policies and Sustainability, World Energy Council, COP Participant 2009, London, 3 July 2015.

Appendix 6: Letter of request for the interview process

University of Nottingham

School of Politics and International Relations

Nottingham

UK NG7 2RD

Email: ldxkk7@nottingham.ac.uk

Dear xyz,

I hope you don't mind my contact, but I wanted to get in touch with you in regards to completing an interview for my doctoral dissertation. I believe that your extensive experience in the climate policy process would help me to better understand the coordination between information, ideas, and individuals when attempting to pass carbon policy.

My dissertation examines the achievements of both governing areas in regards to climate change mitigation policy and discusses key obstacles and success stories of the two areas on the path to a low-carbon economy. Using a typology of tools, I investigate the utility of regulatory, informational, economic, and voluntary types of tools on CO2 reductions. By using an institutional approach, I then trace the impact of ideas within policy-discussions. As such, the interview process will seek to examine the differences in the framing of climate change within the EU and the US, and to compare the impact of sustainable development in the EU to the more limited approach as seen in the US.

I do realise that this is rather limited information, but the interview process takes an exploratory approach. The interview itself would only take up to 45-60 minutes, and would mainly seek to use your extensive experience in climate legislation to give original opinions on the differences in perception and framing of climate change. I'd be happy to have an initial call to explain further, but would happily arrange the interview via skype if possible. I very much look forward to hearing from you, and I do hope we can engage further.

Kind Regards,

Katrina Kelly

Appendix 7: Sample questions for the interview process

Katrina Kelly

Interview Guide for Process-Tracing

Questions

General introduction

1. First, are you aware that the information collected in this interview will be recorded and will be officially used for a research study? If so, do you give consent for information gathered here to be used in my written dissertation, and specifically, to be used for quotes? If not, do you prefer to proceed with anonymity?
2. Can you just tell me a bit about your background and how it relates to this study?

How is climate change framed in the EU as compared to the US?

3. What is the primary policy sphere that drives EU climate change policy? US?
4. To what extent has ecological modernisation acted as a practical policy driver in the EU? In the US? Sustainable development?
5. To what extent has citizen participation or civil society driven the policy-process?
6. To what extent and why has policy-making interacted with science as it comes to fruition?
7. Can you give an example of where input from the scientific community made an impact on the policy trajectory in the EU or US?
8. Do you feel that policy-makers are comfortable and knowledgeable on the topic of climate change? Why or why not?

9. Can you identify specific junctures or changes as to when you saw the EU climate policy becoming stronger?
10. Can you identify specific legislative or institutional barriers to climate success in the EU or US?

General wrapping up questions

11. Why do you think the US still has not imposed climate mitigation targets?
12. How has the EU been able to implement emissions trading scheme but the US has unable to?
13. If the US had proposed a different type of carbon tool, such as a tax, do you think this would have passed? Why or why not?

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