Wind Boom, Wind Bust: An Examination of the Conditions and Policies that Led to Germany's Wind Industry and Canada's Lack Thereof

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ABSTRACT

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This examination focuses on the supply conditions that affect federal political leaders' will and ability to create incentives that stimulate private investment in their nations' wind industry. Operating from a political economy approach rooted in institutional theory I investigate and compare the conditions, between 1970 and 2004, that influenced German and Canadian federal political leaders' motivation and capacity to design wind energy incentives for the private sector.

I begin with a brief introduction that highlights the significance of this topic within the context of advanced industrial countries' policy landscape. I then outline and qualify my methodological and theoretical choices for this investigation. A detailed analysis of the supply conditions affecting German federal political leaders' willingness and ability to create wind energy incentives follows. I subsequently assess the supply conditions affecting Canadian federal political leaders' willingness and ability. I conclude by suggesting that political pressure on German leaders to address the climate change challenge valorized their perception of wind turbines, which in turn catalyzed their will to create attractive incentives for private investment in the wind industry. Conversely, the political and economic benefits for Canadian leaders to deregulate energy markets coupled with the low degree of political concern pertaining to climate change during the mid-1980s restricted their willingness. In both case studies federal political leaders' ability to implement their will was determined by the level of cooperation they received from political, energy and financial organizations.

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DEDICATION

This is dedicated to Jen and Jane, for their loving support through thick and thin.

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List of Abbreviations

AC	Antecedent Condition
BMBF	Federal Ministry for Science, Education, Research and Technology
BMU	Federal Ministry for the Environment, Nature Conservation and Reactor Safety
CANWEA	Canadian Wind Energy Association
CO_2	Carbon Dioxide
CV	Condition Variable
DOE	Department of the Environment
DPG	German Physical Society
DtA	*Deutsche Ausgleichsbank*
DV	Dependent Variable
EC	Environment Canada
EEG	Renewable Energy Sources Act
EFL	Electricity Feed Law
EMR	Department of Energy, Mines and Resources
EWEA	European Wind Energy Association
FTA	Free Trade Agreement
G7	Group of Seven
GHG	Green House Gas
IEA	International Energy Agency
IMA	*Interministerielle Arbeitsgruppe*
IntV	Intervening Variable

IV	Independent Variable
NEB	National Energy Board
NEP	National Energy Program
NGO	Non-government Organization
NRCan	Department of Natural Resources Canada
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of Petroleum Exporting Countries
PC	Progressive Conservatives
R&D	Research and Development
WPPI	Wind Power Production Incentive

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1 Introduction

1.1 Background

Energy represents the lifeblood of an economy and is a chief determinant in a societies' standard of living. Accessible and affordable energy supplies have been crucial to the development of advanced industrial nations. Over the last thirty-five years, political leaders of these nations have explored renewable energy options as a result of the: increasing global demand for finite sources of energy; drastic fluctuations in oil prices and; growing environmental concerns pertaining to carbon-emitting fossil fuels.[1] Solar, wind and biomass energy have been the principle supply sources examined. However, over the last ten years, wind energy has emerged as the most cost effective of these alternatives. Moreover, it has become the fastest growing source of energy in the world, with a 30 percent annual growth rate. Between 1993 and 2003 alone, global wind energy production increased from approximately 2 800 MW to just under 40 000 MW (EWEA 2004).

Government employed regulatory and financial incentives have played a salient role in this rapid growth of wind energy production. The most successful regulatory incentive in stimulating wind energy production and decreasing technology costs has been a form of regulatory pricing legislation known as feed-in tariffs or feed-in laws. The chief idea behind them is that national governments establish the price of the wind energy and allow the market to determine capacity and generation. More specifically, national governments oblige electric utility companies to enable wind-generating producers (i.e. owners and operators of wind turbines) to connect to the electric grid, and purchase any electricity generated by wind turbines at a fixed minimum share of the retail price of electricity – at least 85 percent.[2] These prices and payments are guaranteed over a specific period of time – usually no less than five years. The costs of higher payments for wind energy are either covered by an additional per kilowatt-hour (kWh) charge on all consumers according to their level of use, or by a charge on those customers of utilities required to purchase wind generated electricity (EWEA 2004b; EWEA 2004c; Hvelplund 2002; Sawin 2004). Financial incentives such as tax credits and/or production subsidies have also been useful in sparking investment interest in the wind industry. These regulatory and financial incentives, in tandem or individually, represent national government's means of stimulating private sector investment into the wind industry. It has been the private sector's enthusiastic response to these incentives that have driven this remarkable wind boom (i.e. expansive growth in wind energy production and wind industry development) during the last decade.

Interestingly some advanced industrial nations have become pioneers of this wind boom while others have yet to harness the energy supply and economic benefits of this resource. National governments, which currently champion wind energy development, encourage private investment in the domestic wind industry through the employment of regulatory and/or financial incentives. The German case study represents the most dramatic example of how federal political leaders have used regulatory pricing and financial incentives to stimulate a wind boom in their country. In 1990, Germany had virtually no wind industry, having produced fewer than 250 MW of wind-generated electricity. By the beginning of 2004, Germany was the world's largest wind market, accounting for 14,609 MW (or 37 percent) of an estimated 40,000 MW of installed global capacity (EWEA 2004b: 36-7). Moreover, the German wind industry now employs approximately 45,000 people compared to a couple hundred in1990 (EWEA 2004b: 36).

During this same time period, Canada has failed to develop a wind industry and has managed to only install a minute amount of wind energy compared to Germany – despite having better wind resources. By December 2003, Canada had only managed to install 330 MW – or 2 percent of Germany's total generated capacity (CANWEA 2004). Unlike their German counterparts, Canadian federal political leaders have not established any regulatory incentives designed to stimulate the country's wind industry. In fact, it took these leaders until 2001 before they enacted the first and only financial incentive of note – the Wind Power Production Incentive (WPPI). Although this federal government production subsidy has gradually sparked wind energy production, industry advocates and analysts concur that it alone is an insufficient instrument in luring investors and manufacturers to develop a sustainable domestic wind industry (CANWEA 2004).

As the elements that initially sparked political leaders curiosity in renewable energy (i.e. energy supply, oil prices, and environmental concerns) assume an ever-increasing role in the national policy landscape the relevance of the discrepancy between nations that are wind energy leaders and those that are wind energy laggards augments. Certain advanced industrial nations are currently well positioned to take advantage of the energy supply and economic benefits of a robust domestic wind industry. Others are not. The puzzling question at the root of this dichotomy is: *Why* are certain advanced industrial nations ahead of others in the development of their wind energy industry?

This examination will analytically address this increasingly significant question by focusing on federal political leaders' will and ability to influence the development of their national wind industries.[3]

1.2 Central Question

The central question of this investigation is: What conditions affect the will and ability of federal political leaders to create incentives, which stimulate private investment in their country's wind industry? This central question is answered in the context of a comparative case study focusing on Germany's and Canada's federal political leaders. It is separated into two principal questions. Firstly, *what* were the conditions that affected federal political leaders' will? This question is complemented with the following questions: a) *How* did these conditions influence federal political leaders' willingness; b) *Which* conditions were more influential than others and c) *Why* did these conditions influenced political leaders' will.

Secondly, *what* were the conditions that affected federal political leaders' ability? This question is following by: a) *How did* these conditions influenced federal political leaders' ability to create regulatory incentives; b) *Which* conditions were more imperative than others in doing so and c) *Why* did these conditions influenced federal political leaders' ability.

1.3 Chapter Overview

This investigation is divided into four subsequent chapters: the *Research Design*; *The German Wind Boom*; *The Canadian Wind Bust* and the *Conclusion*. The *Research*

Design maps out and explains my approach to answering the central and subsequent follow-up questions of this investigation. I begin by providing a justification for my methodological and theoretical choices. I then elaborate on my reasoning for selecting the countries (Germany and Canada) and industry (wind) chosen. Finally, the time line for the examined period (1970-2004) is outlined and qualified.

The German Wind Boom begins with a *Federal Policy Overview*. Within this preliminary section, the relevant events, actions and policies pertinent to the development of the wind boom are chronologically traced from the early 1970s to today. Federal political leaders are the actors of focus in this examination that emphasizes the five-year period preceding the creation of Germany's wind energy incentive policy in 1991.[4] The following two sections are devoted to the analysis of federal political leader's *will and ability*, respectively, to create this policy incentive. The latter section on *ability* presents the domestic barriers confronting German federal leaders and how they overcame these barriers in establishing an incentive-based policy system. The chapter concludes with a brief section summarizing the causal explanation to the central question.

The Canadian Wind Bust mimics *The German Wind Boom* in format. It too begins with a *Federal Policy Overview* in which the relevant events, actions and policies pertinent to wind energy's development are chronologically traced from the early 1970s to today. As is the case in *The German Wind Boom*, federal political leaders are the actors of focus in this examination; however, in this chapter the time period emphasized is a six-year period from 1985 to1991. Canadian federal political leaders have never legislated a feed-in tariff for wind energy. The spotlight of attention in this section is therefore on the conditions that existed during this time period that influenced Canadian federal political leaders' low degree of willingness to create such a feed-in law. By 1987 the conditions which accounted for their low degree of willingness, compared to their German counterparts, had materialized and solidified their convictions. Thus particular emphasis is placed on the time period from 1985-1987. Following T*he German Wind Boom* format, the next two sections analyze the federal political leaders' will and ability to create wind energy incentive policies and to what degree they were able to accomplish this feat. The latter section on ability presents the domestic barriers obstructing Canadian federal leaders' ability, although it does not address how they resolved them, as they have yet to do so. Finally, this chapter concludes with a causal explanation as to why Canadian federal political leaders lacked the necessary will and/or ability required creating a similar wind energy incentive policy as their German counterparts.

The Conclusion section begins with a brief review of the main arguments made. I then assess the explanatory range of my findings and state the fundamental lessons learned. A word on the significance of my work then follows, which includes the practical implications of my findings. Suggestions of the benefits to specific stakeholders for continuing this research using the same research design are given.

Endnotes

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[1] For the purpose of this investigation, renewable energy is referred to as energy sources that produce usable energy without depleting resources. Renewable energy sources are defined as including biomass, wind, solar and earth energy. Energy produced from large-scale hydroelectric dams and nuclear generators do not qualify as renewable for the purpose of this examination.

[2] Wind turbines convert kinetic energy into electricity and produce what is commonly referred to as "wind energy". Wind turbines are modern windmills composed of three parts: a tower, a nacelle, and the blades. Wind drives the blades around a rotor, which turns a shaft that feeds into the nacelle. Within the nacelle, the shaft spins through a speed up gearbox, which turns the generator and creates electricity.

[3] In this examination, federal political leaders are defined as elected federal political leaders of the ruling government and/or senior civil servants of the federal Department or Ministry of focus.

[4] I define *wind energy incentive policy* as a single outcome that constitutes the regulatory pricing (i.e. feed-in tariffs) and/or financial incentives created to stimulate wind energy production and industry growth. This concept will be elaborated on further in the *Research Design*.

2 Research Design

2.1 Methodology

2.1.1 Comparative Case Study

This chapter outlines my approach to answering the central question of this examination - what conditions affect the will and ability of German and Canadian federal political leaders, respectively, to create a wind energy incentive policy, designed to stimulate private investment into their country's wind industry? The focus of comparison is on the degree of variation between the two countries' wind energy incentive policy (my dependent variable) and federal political leaders' will and ability (my independent variables) to create them. For the purpose of this examination I define *wind energy incentive policy* as a single outcome that constitutes the regulatory pricing (i.e. feed-in tariffs) and/or financial incentives created to stimulate wind energy production and industry growth. I define regulatory incentives as regulatory pricing legislation design to catalyze wind energy production and industry growth. Conversely, I define financial incentives as financial instruments designed spark wind energy production and industry growth. For the purpose of this investigation I define federal political leaders as the elected leaders of the ruling government as well as the senior civil servants of the federal ministries examined. When necessary to distinguish between these actors I refer to the former as the elected federal political leaders and former as the civil federal political leaders.

The first reason for comparing these two case studies is because this methodology allows me to verify my answer(s) found in the German case study with my findings in the

Canadian case study. As highlighted in the *Introduction*, the outcomes of the German and Canadian cases are significantly different. I therefore expect the variance between the independent variables to also be substantially different. Should my answer in the German case study be that certain specific conditions led to high degrees of political will and ability that in turn caused a high degree of the wind energy incentive policy, then I should be able to confirm this relationship through an inverse relationship in which certain specific conditions led to lower degrees of political will and ability causing a lower degree of the wind energy incentive policy.[5] For the purpose of this examination, the criteria for determining the highest degree of the wind energy incentive policy is the federal political leaders' creation of both regulatory and financial incentives to stimulate wind energy production and industry growth (see Table 2.1). The creation of regulatory incentives without adjoining financial incentives indicates a medium-to-high degree of the wind energy incentive policy, while the establishment of simply financial incentives demonstrates a medium-to-low degree of this dependent variable. A failure to create either regulatory or financial incentives indicates the lowest possible degree of the wind energy incentive policy – effectively zero.

The second reason for comparing these two case studies is that many of the general characteristics of these two countries are similar. Their similarity makes these two cases suitable for a comparative analysis according to John Stuart Mill's "method of difference".[6] There are three principal similarities between the countries that stand out. Firstly, both countries are G7 industrialized nations. In other words, Germany and Canada are considered to have attained a degree of industrial development that ranks among the best in the world. Secondly, the countries' governments operate according to a federal system. Germany and Canada have regional and national governments that share in the responsibility of governing their people. Although, these federal systems do not exactly replicate the jurisdictional boundaries between national and regional governments, they do allow me to compare countries with the same governing system.

Finally, both countries lacked a wind industry by the mid-1980s. In this comparative analysis focusing on the rise and stunted growth of the wind industry in these two countries it is important to remember that less than thirty years ago neither country had even experimented with research and design wind farms. The wind industry is therefore a relatively new one for both countries. The importance of these three principal similarities between the case studies is that they allow me to control for variables pertaining to these topics.

Table 2.1: Criteria for Determining the Degree of Wind Energy Incentive Policy

	Regulatory Pricing Incentives	Financial Incentives
High degree of outcome	C	C
High-medium degree of outcome	C	A
Medium-low degree of outcome	A	C
Low degree of outcome	A	A

Note: Outcome = wind energy incentive policy

C = creation of such an incentive

A = absence of such an incentive

Two differences relevant for this topic exist between these nations: 1) Germany's proportional representative electoral system compared to Canada's employment of a first past-the-post system; and 2) The prominence and influence of the German Green Party among the nation's political parties compared to Canada's non-influential Green Party. These differences may ultimately assist me in explaining the cause(s) for these countries' differing wind energy incentive policy. The possibility of the explanatory significance associated with these dissimilarities will ensure their place in my examination of these case studies. However, despite these divergences I deem the similarities between these two nations to be sufficient to warrant the employment of a comparative case study analysis through the "method of difference".

The third reason for this particular comparison is that it addresses the puzzling question previously introduced: Why are some advanced industrial nations ahead in their development of a wind industry, while others are so far behind? The similarities of these two cases underline their status as advanced industrial nations while the dramatic variation in their outcomes situates them as ideal candidates in resolving this puzzling question. Through this comparison I intend to gain an understanding of the extreme cases at either end of the wind development spectrum. My rationale is that these outliner examples represent the best starting-point in identifying the reasons behind this massive discrepancy in national outcomes. If I cannot recognize the principal conditions affecting federal political leaders' willingness and ability in these dichotic cases, I anticipate it will be considerably more difficult to do so in investigations that examine nations with moderate wind energy incentive policies.

I have chosen the employment of a comparative case study as opposed to other means of examination or observation for several reasons. Firstly, a single case study would produce a limited response to my central question in the sense that it can answer the question but it cannot verify this answer. As mentioned above, comparative case studies can substantiate the findings of one through the examination of another. Secondly, the German investigation does not embody a crucial case study, as it does not represent an examination in another theoretical field where this theory does not hold; therefore, a single case study cannot be deemed sufficient on the basis of it being crucial case study. Thirdly, while a large-n analysis would certainly yield useful data regarding outliners this methodology does not permit for the application of process tracing, which is crucial to unearthing the answer(s) to my central question.[7] Having detailed how and why the comparative case study is appropriate for this investigation I will now elaborate on my choice to examine supply conditions and their relevance to my independent variables (political will and ability).

2.1.2 Supply Conditions

A causal understanding of federal political leaders' will and ability to create a wind energy incentive policy that could catalyze a new wind industry begins with an identification of the conditions that influenced these actors. A probe into the conditions under which federal political leaders create an appealing market atmosphere for investment in to the wind industry must first distinguish between supply and demand conditions. Demand conditions are those under which stakeholders (usually market actors) advocate or lobby for their desired outcome. Supply conditions are conditions under which the actors able to accommodate these demands are willing to do so. Actor's willingness depends on the payoff gained from supplying this outcome. For political leaders, their willingness increases if their chance of retaining power is enhanced. The improvements of domestic economic conditions are frequently cited as the most reliable method of retaining power (Mattli 1999: 42). In order to supply the desired outcome, political leaders' willingness must be complimented by their ability to do so. Actors operating without this ability will fall short in their objectives, regardless of their degree of willingness. Conversely, actors that do not possess the will to pursue an outcome are not likely to do so, in spite of their ability. This examination investigates the supply conditions under which German federal political leaders were and Canadian equivalents were not willing and able to create the wind energy incentive policies that stimulated a new wind industry in their respective countries.

I acknowledge that demand conditions existed in these case studies but will focus solely on supply conditions because of the regulatory and legislative nature of the outcome. The regulatory nature of this outcome necessitates an understanding of the will and ability of the political leaders creating these regulations. In addition, this examination spotlights how and why private sector demand in the wind industry was or was not supplied by political leaders. Consequently, it is appropriate to concentrate on the supply conditions influencing this demand. Therefore, although the demand conditions would provide further insight they are not deemed necessary in this particular comparative case study to answer the central question. Yet, the stakeholders advocating renewable energy policies do surface throughout this examination and the implications of their demands on the federal political leaders' willingness will be addressed.

I will now compliment my qualification of a comparative case study examining supply conditions with an explanation of why the process tracing method is crucial in yielding answers to my central question.

2.1.3 Process Tracing

The process tracing method[8] will be employed in order to determine: 1) *which* initial conditions were responsible for the respective outcomes in each case study; and 2) *why* a causal relationship between independent and dependent variables holds.

An understanding of how and when these events unfolded should assist me in resolving why they transpired. By dividing the chain of events into a series of smaller timeframes I should be able to establish at what point(s) the antecedent conditions triggered the cause-effect link that connects the independent and dependent variables. Moreover, the incremental nature of process tracing will enable me to highlight the variation between each nation's creation of their wind energy incentive policy and how the timing of these policies effected the variation in their wind booms. Most significantly, process tracing will allow me to determine why a particular causal relationship in the first case study does not hold in the second and where in my observed timeline this variance occurs.

The process tracing method is more advantageous for my purposes than a large-n statistical analysis because of the limited explanatory range of a large-n analysis. A large-n can only tell me if a causal relationship holds, it cannot tell me why it holds. Since the aim of this examination is to determine what conditions stimulated the independent variables, how they did so and why, the process tracing method provides me with more useful information than a large-n analysis.

2.2 Theoretical Approaches

The following portion of the research design outlines the theoretical approach that I will be employing in explaining my answer to the central question. A brief address of alternative theoretical approaches that could have been used and my reasoning for not doing so will follow.

2.2.1 Institutional Theory

I intend to draw from institutional theory in explaining the central question of this examination.[9] Institutional theory highlights the difference between institutions and organizations and explains how and why the interaction between them configures the direction of institutional change. Institutions are defined as the human designed constraints that shape human interaction. Institutional theorists compare them analogously to the rules of the game in a competitive sport. Institutions consist of formal written constraints (ranging from constitutions to contracts) and informal ones (ranging from conventions to codes of behavior). The purpose of institutional constraints is to define the framework within which human interaction takes place. This classification therefore includes both what individuals are prohibited from doing and sometimes, under what conditions some individuals are permitted to undertake certain activities (North 1990: 3-11; Hollingsworth and Boyer 1997: 54-98). By defining and limiting the set of choices of individuals, institutions reduce uncertainty by providing structure. A significant additional consequence of institutional constraints is that they structure incentives in human exchange, whether political, economical or social.

Organizations (groups of individuals bound by some common purpose) become the agents of institutional change in the course of attempting to accomplish their objectives. Actors within organizations attempt to maximize their behavior either by making choices within the existing set of constraints (if the incentives are appealing) or by altering the constraints. The process of institutional change therefore begins with the perception of the actors in organizations that they could benefit from altering the existing institutional framework at some margin.[10] Actors that perceive an opportunity to accomplish their objectives by altering the institutional framework will do so. In order to accomplish this institutional rearrangement, the actors must by capable of changing the institutional constraints shaping this framework.

Acclaimed institutional theorists Douglass North and Lance Davis maintain that certain changes “in technology, market size, relative prices, income expectations, the flow of knowledge, or in the rules of the political and economic game” create conditions in which certain actor’s perceived gains may increase (North and Davis 1971: 61). Despite the possibility of these gains, “some inherent economy of scale, externality, risk aversion, market failure or political pressure” often prevents actors from seizing these gains within the existing institutional constraints (North and Davis 1971: 61). Whoever can innovate new institutional constraints that overcome these obstacles can therefore realize these gains. A new arrangement is only expected to materialize when the expected benefits from or costs of innovation are such that the actor(s) reconfiguring the institutional constraints will profit. Thus, as the potential benefits from the restructured constraints increase, the motivation of the actor(s) capable to innovate this arrangement is also expected to increase. Conversely, as the costs of restructuring these constraints increase the motivation of the actor(s) will decrease.

Government organizations usually assume the role of innovator in situations where laws, statues or constitutions are the institutional constraint of focus. North and Davis cite situations where undeveloped private markets that "may yield substantial profits [but] which cannot be realized under a fragmented market structure" as prime scenarios in which governmental innovation occurs (North and Davis 1971: 28). Of course, gains for government actors often extend beyond economic parameters and often include a political dimension. As is the case with any actor seeking to create institutional change, the perception that such changes will allow government actors to meet their particular objective(s) is the principle factor stimulating their motivation (North and Davis 1971: 40).

The reasoning behind my decision to draw from institutional theory for this investigation stems from the fact that the outcome examined is a combination of institutional constraints. The dependent variable is a single outcome that constitutes various institutional constraints. Since the aim of this investigation is to answer what conditions, motivations and capacities influenced federal political leaders to create and to avoid creating institutional constraints that supported the wind industry, it is logical to draw from a theory that focuses on explaining the impetuses behind institutional change and constraints.

Many of the obstacles that North and Davis cite as preventing actors from seizing gains are present within the wind industry. Prior to creating the Energy Feed Law, German federal political leaders had to rationalize how they were going to overcome such obstacles as; the insufficient economies of scale inherent in the industry; the public and private sectors' aversion to risk in what was an uncertain energy sector and; any possible market-based and/or political pressure to concentrate governmental financial and legislative support behind traditional energy industries (i.e. fossil fuels and nuclear). These obstacles were present in Germany prior to the country's wind boom, when energy producers did not profit from a virtually non-existent wind energy market. The extensive literature detailing the correlation between the introduction of the EFL and supplementary financial incentives and the explosion of Germany's wind energy production and industry lead me to conclude that the institutional rearrangement facilitated by the wind energy incentive policy overcame the aforementioned obstacles (Gipe 1995: 37-40; IEA 1998b: 121-5; IEA 2000: 53-64; Sawin 2003a: 94-101). Institutional theorists would point to the creation of these institutional constraints as the chief explanation as to how these obstacles, which previously preventing the nation's transition from one that did not profit from its wind resources to a global leader in wind energy production, were overcome. The missing link in such an institutional rationalization of these events is the explanation as to who specifically gained from the creation of these institutional constraints. Since the innovators in Germany's utility and banking rearrangements were the federal political leaders of the ruling government they would have to have been the chief beneficiaries, for the institutional theory to hold in this particular case. Part of the focus of this examination is to determine what conditions stimulated the willingness and assured the ability of federal political leaders to enact these institutional constraints. The other portion of the focus is conversely on what conditions limited the willingness and restricted the ability of another country's federal political leaders, during the same time period, to enact these same institutional constraints. The employment of institutional theory in examining these case studies leads me to ask the same primary questions as those raised in my focus, namely: what conditions contributed to federal political leaders' motivation to address these aforementioned obstacles and what perceived gains or costs influenced this motivation. This nexus between my central questions and those invariably raised in such circumstances by institutional theory highlight another reason why I have chosen to draw from institutional theory for this investigation.

2.2.2 Structural Theory

Structural theory explains how and why *similar* outcomes develop, in spite of the nature of the agents involved. Structuralism is applicable where "similarity of outcomes prevails" (Waltz, 1979: 39).[11] Structural theory does not explain how and why substantial differences in outcomes occur[12]. The focus of the case studies used in this examination is on two countries with two *different* outcomes (i.e. wind energy incentive policies). Thus, drawing from structural theory does not explain the causes for these varying outcomes between case studies. Its usefulness in resolving these differences is therefore negligible and consequently I will not employ structural theory in this investigation.

2.2.3 Classical Liberal Theory

Classical theory explains market self-regulation as the appropriate forum for individuals to satisfy their private wants and needs (Ricardo, [1892] 1951: 290). According to classical liberal theorists, the public's well being will best be accomplished without the intervention of public agents, given the uncertainty of wisdom surrounding political decisions. Moreover, private actors operating within a self-regulated market are far more likely to achieve their desired ends than by adhering to "artificial" regulations administered by political agents. Thus, classical liberal theory explains the role of the government in private affairs as little more than the legal protector of an individual's property rights (Smith, [1776], 1937: 651). The classical liberal approach is therefore ill suited to explain my central question because it does not assist me in determining the conditions that led to government intervention in the energy marketplace. The classical liberal approach highlights the benefits of a market functioning *independent* of political influence, while the aim of my examination is to explain what instigates political leaders to *influence* market conditions – specifically, by creating incentives for private investment in a particular sector of the market. Clearly, the classical liberal approach and the aim of this investigation are at odds and consequently, the classical liberal approach will not be employed in explaining my central question.

2.3 Case Selection

2.3.1 Germany

Germany is the country chosen for the first case study because its government has provided private investors with the most attractive wind energy incentive policy in the world (BMU 1994; Reiche 2002: 4; Sawin 2003b: 1). Since a portion of the focus in this examination is on the conditions that provoke political leaders' will and assure their ability to create such an influential wind energy incentive policy, the federal political leaders of the country examined must have demonstrated this willingness and ability to foster a wind industry through such a policy. Germany's Conservative-Liberal Coalition Government, which ruled from 1982-1998, installed the most dramatic legislative and financial wind incentives of its time (IEA 1998a: 121-5). No other country's federal political leaders had employed the same high degree of regulatory pricing intervention in the market conditions of their wind industry as they had. Similarly, no other country in the world has experienced such a dramatic growth in their wind production and industry as Germany (Sawin 2003a: 94-8). These policies and results respectively illustrate the political leaders' willingness and ability to foster a wind industry within Germany. As previously mentioned in an above qualifying statement I deem this willingness and ability to be requisites of any observation focused on establishing the conditions that stimulate such willingness and ability. Germany therefore represents an ideal country of observation for determining the conditions that catalyze political leaders' motivation and capacity to promote the market incentives that encourage private investment in the wind industry.[13]

2.3.2 Canada

Canada has been selected for the second case study because throughout most of the 1990s, when German federal political leaders were promoting the expansion of their country's wind industry, Canadian federal political leaders did not provided private investors with a similarly attractive wind energy incentive policy. In order to meet the objective of the comparison case study method, the country compared to Germany ought to have demonstrated limited will and/or ability to provide the wind energy incentive policy needed to catalyze investment in the wind industry.[14] A minimal degree of regulatory and/or financial incentives created by this country's government can be seen as an indicator of its federal political leaders' limited will and/or ability.[15] Canada's absolute lack of a wind energy incentive policy throughout the 1980s and 1990s consequently; a) demonstrates its federal political leaders' minimal will and/or ability to pursue such an incentive policy; b) marks an ideal end point to work back from in tracing the domestic conditions that weakened leader's will and/or ability and; c) makes Canada an ideal comparative case study with Germany, in that it might validate the findings in the Germany case study through its inverse causal relationship between the afore-specified independent and dependent variables.

Canada shares many similar general characteristics with Germany (see *Comparative Case Study*), not least of which is a federal system. Denmark and Spain, for instance, as *unitary* countries with a significant wind industry would not qualify as complimentary comparative case studies in this respect. In addition, Canada possesses equal if not greater wind capacity potential than other candidate countries. The reason(s) why Canadian federal political leaders did not take advantage of wind resources that rank among the greatest in the world should therefore be that much more significant than similar advanced industrial countries that have far lower resources to harvest. It is based on this initial analysis that Canada has been chosen as the complementary country of observation.

There are varying reasons for not choosing other advanced industrial nations for this comparative case study. Countries such as the United States, Spain and England were not chosen because they have developed burgeoning wind industries and therefore do not measure up to the previously mentioned qualifications. Nations such as France were dismissed because their Green Parties were a more influential presence in their electoral system during the time period of focus. This investigation seeks to compare countries that had influential and non-influential Green Parties during the same timeline in order to determine if there presence was a factor in the examined outcome of each nation. Nations such as Sweden, whose electoral system operated according to proportional representation, have not been chosen for similar reasons. Finally, advanced industrial nations with a high degree of centralization in their political system, such as Russia or Italy, were not chosen because they do not vary sufficiently from Germany's political system to determine the importance of this variable with regard to the final outcome.

2.4 Wind Industry

My choice for examining the wind industry is based on several factors. Firstly, it constitutes an industry that has grown dramatically in recent years in certain advanced industrial nations while remaining dormant in others (EWEA 2004a: 8). The attractiveness of this facet of the wind industry is that it guarantees the opportunity to design a comparative case study in which there exists large variation between the respective dependent variable. Countries that have experienced growth in this industry have notably done so after their government's have introduced regulatory pricing and financial incentives for this sector. Conversely, countries that have failed to experience significant growth in the wind industry have either suffered from a lack of legislative and financial incentives or have become victims of ill suited legislation and government policies.[16] These characteristics hint at the likely-hood of discovering variations in my independent variables, another desirable element for the focus of my investigation.

The broad topic addressed in this examination is: Why are political leaders in certain countries inclined to create an incentive policy that can stimulate private investment in new industries, while political leaders in other countries are less inclined, if at all, to act accordingly?

The wind industry strikes me as a suitable industry to search for answers to this broad question because it represents a new industry that has received corresponding government incentives and private investments in certain advanced industrial countries while receiving little of either in others. The dichotomy of responses exhibited by these country's political leaders formulates a sturdy foundation from which I can observe the varying degrees of political will and ability and hopefully determine the antecedent conditions that influenced each nation's approach.

Secondly, in keeping with the broader question, the wind industry exemplifies the significance of political leaders' regulatory and financial support towards the development of new industries; as such endorsements are paramount to this industry's establishment, development and longevity (Beck and Martinot 2004: 1- 7; IEA 1999; IEA 2000; Wilkins 2002: 203-10). As demonstrated over the last thirty-years, the success of industries in the renewable energy sector often hinges on the regulatory and financial encouragement of the government.[17] The predication on government support for renewable energy industry's success ensures that the observation of a flourishing renewable industry within any country will involve the creation of private investment incentives by political leaders. Conversely the failure of a renewable industry will likely entail a lack of policy involvement from political leaders. The near certainty of government incentives tied to successful renewable industries virtual guarantees that any such industry that I observe should lead me to the conditions that spark political leaders' motivations and enable their capacity.

For the purpose of addressing the broad topic entailed in this investigation, I have specifically selected the wind industry because it represents the most cost competitive renewable industry in most advanced industrial nations.[18] The wind industry has arguably become the most successful global renewable energy industry – based on capacity performance, costing reductions and government incentives received - and therefore is an ideal industry from which to observe the conditions that fuel political leaders' willingness and ability. Germany's wind industry in particular has demonstrated enormous success in attracting government incentives and private investment, thereby achieving competitive pricing through eventual economies of scale (Sawin 2003b: 3). It is based on this success compared to other renewable industries that I have chosen the wind industry and specifically the German wind industry for the industry of choice in this thesis. Other renewable industries, such as solar, small hydro and geothermal were not chosen because they have not achieved these same levels of success in the public and private sectors and therefore do not meet the above mentioned criteria to the same high degree (Martinot, 2003: 1).

2.5 Time Frame

2.5.1 Germany

My time frame of examination for the Germany case study is a chronological time period starting in 1970 and continuing through to 2004 (see Figure 1.1). I begin in 1970 because it was in this year that the German government, lead by the Social-Liberal Coalition, began the country's modern-day environmental policies (Beuermann 2000: 88; Weidner 1997: 3). I examine the regulatory approach adopted by the Social-Liberal Coalition during the early 1970s and the rise of the Green Party starting in the mid-1970s. I then briefly observe the formation of the Conservative-Liberal Coalition Government during the early 1980s before shifting the emphasis of this study to a five-year period starting in 1986 and spanning to 1991. It is within this period that I anticipate the focal events that influenced the federal political leaders' will to enact the wind energy incentive policy to have transpired. This anticipation is based on the year in which the EFL was established (1991) and the understanding that German policies, while generally progressive, have a tendency to develop in incremental stages.[19] I have designated a five-year time lag period prior to the creation of the EFL based on this anticipation. Although the time frame focus of this chapter is on this five-year period my overview extends to the present day with a brief observation on the effects of the incentive policy on the wind industry since 1991. The time frames of this chapter are therefore divided as such: a) 1970–1979; b) 1980-1985; c) 1986-1991; and d) 1992-2004.

2.5.2 Canada

My time frame of examination for the Canadian case study is a chronological time period starting in 1970 and continuing through to 2004 (see Figure 1.1). I begin in the 1970s by illustrating the Canadian federal government's priority on energy diversification as opposed to environmental guiding principals. The focus then shifts to the political after-effects of the Liberal Government's National Energy Policy between 1980 and 1984. The focus of this investigation is on the following section that spans from 1985-1991. The Progressive Conservative Government's deregulatory policies during 1985 require me to begin this focus prior to 1986 (as was the case in the German case study). I anticipate that the policies and events that transpire within this six-year time span (1985-1991) were chiefly responsible for the limited will and/or ability of the federal political leaders. I will compliment my observations of this six-year period with a brief overview of the events and policies that have developed since 1991. The time frames under examination in this Canadian case study are therefore: a) 1970-1979; b) 1980-1984; c) 1985-1991; and d) 1991-2004.

Figure 2.1: Time Line by Country

<u>Germany</u>

Time Frame	1970-1979	1980-1985	1986-1991	1992-2004
Description of Period	The Regulatory Approach and Rise of the Green Party	The Conservatives' Decade	The Formative Years	Historic Success

Canada

Time Frame	1970-1979	1980-1984	1985-1991	1992-2004
Description of Period	The Energy Diversification Approach	The National Energy Policy Controversy	The Formative Years	A Wind Energy Laggard

Endnotes

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[5] I recognize that this vocabulary could lead the reader to believe that I am testing a hypothesis, which is something I wish to avoid in a investigation that seeks to answer a question. I am simply endeavoring to strengthen my response to central question by including the Canadian case study.

[6] According to Van Evera, Mill advocates the "method of difference" when the investigator "chooses cases with similar general characteristics and different values on the study variable. The idea behind this approach is to control for the effect of third variables as best as possible. For more information, see Van Evera (1997: 56-8).

[7] A large n-analysis would be more useful in a follow-up paper to this examination that would test a hypothesis derived from the findings discovered in this work. For more on the usefulness of large-n analyses, see Van Evera (1997: 50-5).

[8] For more on the process tracing method, see George and McKeown (1985: 34-41); King, Keohane, and Verba (1994: 226-8); and Van Evera (1997: 64).

[9] For the purpose of this investigation the reference to institutional theory also entails new institutional theory.

[10] Note that one of the crucial differences between institutional theory and rational choice theory is that institutional theorists acknowledge that actors receive imperfect or incomplete information and process what they do receive through imperfect mental constraints.

[11] I acknowledge the Marxist and Neo-Marxist argument within the structuralist approach and that this theoretical school is not simply limited to the structural realist argument highlighted by Waltz. However, regardless of which strain of structuralist theory is employed, the preoccupation of the theory remains on similar outcomes.

[12] For examples of structuralist authors' penchant for explaining similar outcomes and the failure to explain different outcomes of energy and environmental policies in other countries, see Paterson and Grubb (1992) and Patterson (1996: Ch. 2 & 3).

[13] Denmark represents perhaps the best viable alternative to Germany in a case study of this nature because the Danish Government has also provided substantive legislative and financial wind incentives that encouraged the development of a wind industry; moreover, these incentives chronologically preceded Germany's (IEA 1998b: 63 –77). Despite the spark in Danish wind investment, presumably caused by government incentives, the growth of its wind industry and wind production did not occur as rapidly as Germany's did over the same period of time. I have consequently opted for the German case study in the anticipation that a higher degree of their wind energy incentive policy caused Germany's larger wind capacity and indicates deeper political will and possibly superior ability by its political leaders to implement this incentive than Denmark's. My anticipation is based on the notion that had the Danish federal political leaders possessed a greater will and ability than their German counterparts than their wind energy incentive policy would have been greater than or at least matched the Germans'. Germany, therefore strikes me as a better-suited candidate for exploring the conditions that provoke high degrees of will and ability from federal political leaders to create aforementioned wind incentives.

[14] I have delineated this stipulation because a comparison of substantially varying degrees of political will and ability between nation's political leaders should yield varying initial domestic conditions from which these country's leaders based there will and determined their ability, according to institutional theory. Considering that the focus of this examination is to determine the conditions that influence political leaders' will and ability to create and implement market intervention incentives this stipulation seems necessary and elementary.

[15] The reasoning here is that if the political will and ability were stronger we would expect to see a high degree of wind energy incentive policy.

[16] For more on government legislation and policies that produced poor wind capacity results within their country, see Gipe (2003: 5-7) and Sawin (2003b: 1).

[17] Renewable energy industry's reliance on government assistance usually stems from uncompetitive pricing compared to other energy industries (often due to high initial capital costs). For more on government assisted financial measures for industries in the renewable sector over the last thirty years, see Beck and Martinot (2004: 1-7).

[18] Wind energy is virtually cost competitive with hydro and nuclear energy pricing when turbines are sited in locations where strong wind resources exist. Wind energy's competitive pricing with industries such as hydro and nuclear power stems in large part from private investments and government-assisted programs driving down high initial capital costs. For more on wind energy's competitive pricing, see Sawin (2003a: 94-101) and IEA (2000: 53-64). As a reminder, a *renewable industry* is defined in this investigation as a renewable industry that does not include large-scale hydro or nuclear operations.

[19] For more on how and why German policies and incremental development, see Katzenstein (1987: 4-7).

3 The German Wind Boom

3.1 Introduction

Before 1991, there was virtually no wind energy production in Germany. Today, Germany boasts the largest production of wind energy in the world with 38 percent of installed global capacity.[20] Wind energy now constitutes 6 percent of Germany's energy needs and appears on course to meet government targets of 25 percent by 2025.[21] Over the last fourteen years, Germany's wind industry has rocketed from obscurity to one of the largest in the world.[22] The remarkable expansion of this industry in such a limited time period has qualified the German wind power experience as a major success story by many energy experts worldwide (IEA 2000: 53-64).

A growing field of literature that has examined this wind boom traces its origins to the conservative-liberal coalition government's wind energy incentive policy. This policy strategically included a combination of the 1991 Electricity Feed Law (EFL) and its complementary financial incentives (Gipe 1995: 37-40; IEA 1998b: 121-5; and IEA 2000: 53-64; Sawin 2003a: 94- 101; and Sawin 2003b: 1-2).

In 1992, wind energy became prominent in Germany. The 1990s witnessed steady growth, fuelled significantly by the relationship between installed wind energy capacity and wind turbine production. The combination of wind energy capacity and wind turbine production are often used as indicators to highlight the causal relationship between the EFL, accompanying financial incentives' and the wind boom (IEA 1998b: 121-5; IEA 2000: 53-64; and Sawin 2003a: 94- 101). In other words, regulatory and financial incentives are effective means to the ends of increased wind industry development and energy production. Related literature offers tremendous knowledge-sets for other countries searching for successful methods of stimulating wind production and industry. This investigation does not examine the outcome of these government measures, but instead focuses on determining the reasons why the political leaders developed the willingness to create this wind energy incentive policy and how they gained the ability to implement it.

In essence, I take a step back from the outcome of the wind boom itself to examine the *motivations* of and the *means* through which the principal actors that both overcame the institutional constraints and developed the institutional context necessary to inspire the birth of the German wind energy industry. Within this framework, the wind energy incentive policy becomes the outcome, or dependent variable, while the political will and ability become the independent variables.

This chapter begins by setting the creation of the wind energy incentive policy within the context of a broader federal policy overview. This portion of the chapter examines the major trends and key events in German federal policy from the 1970s to today, with particular emphasis on the period ranging from 1986-1991. The latter half of this chapter analyzes the conditions that motivated the federal political leaders' willingness and ability. Operating from a political economy approach rooted broadly in institutional theory, I analytically argue that the federal political leaders' valorization of wind energy technology provoked their willingness. Moreover, their access to the organizations capable of implementing it assured their ability to create the wind energy incentive policy.

3.2 German Federal Policy Overview

3.2.1 The 1970s: The Regulatory Approach and Rise of the Green Party

At the start of the 1970s, without the political pressure from other stakeholders, the recently formulated Social-Liberal (SPD/FDP) Coalition Government (1969-1982) launched the genesis of Germany's modern environmental policies. This coalition government was significantly influenced by the first ideological shift in post-war Germany – the so-called "extra parliamentary opposition." The "anti-authoritarian movement" of the 1960s was also a major influence for the coalition government that worked in close cooperation with large business organizations and scientific experts to establish environmental programs and an accompanying body of policies and laws (Weidner 1997: 2-15). Contemporaneously, the dominant social-liberal ideology viewed the state as a control center for society. This office-holding ideology had a profound influence on the orientation of environmentally related programs and laws. The result was a hierarchical regulative approach to environmental policy, characterized by "command and control" instruments (Weidner 1997: 3).

The federal government's fundamental environmental principles included precautionary measures, polluter pays, and cooperation between all affected parties in this public policy sphere. These defining principles were incorporated into Germany's initial environmental programs and institutions. Government programs such as "Quick-start" (1970) and the "Environment Program" (1971), in conjunction with the creation of the Federal Environmental Agency (1974) and the German Council of Environmental Experts (1974), highlighted these central principles, allowing them to guide the original environmental aims of the coalition government. Law-based command-and-control policy guided the implementation of these principles. The government's regulatory approach is also reflected in the dominance of lawyers throughout these environmental administrations (Beuermann 2000: 88).

By the mid-1970s, the social-liberal government's policies and programs were considered progressive and worthy of "front-runner" status at the international scale (Beuermann 2000: 89). To this day, numerous OECD countries have not yet fully adopted these fundamental environmental principles. Regardless of this newfound global status, the limitations of regulatory measures dependent upon state controls were soon exposed in the wake of the 1973 oil crisis. Cautioned by business leaders and trade unions not to implement financially damaging policies, government officials steered away from previous enthusiasm concerning environmental initiatives (Weidner 1997: 3). The state-centric approach had several flaws. For example, it proved inept in reacting to an economic downturn. Further, the state-centric approach gave little legal opportunity for social actors representing environmental interests.

New social movements took root during the 1970s across much of Western Europe. These social movements popularized and politicized environmental policy that was centered on energy (Weidner 1997: 3). During the 1970s Germany's Green Party emerged from this social movement as an alternative to traditional parties. Supported by many of the environmental actors unable to gain access to policy makers in the highly regulatory government, the Green Party founded itself on an anti-nuclear platform (Conradt 1996: 133-5; Roberts 2000: 84). The Green Party's foray into the political forum ignited civic engagement focused on sustainable environmental policy. Protests and demonstrations organized by environmental NGOs against businesses involved in environmentally harmful practices took root. Most significantly, the Green Party re-orientated the traditional political parties more towards environmental issues. Extensive reporting by the media on environmental problems such as smog and de-forestation also contributed to this re-orientation (Beuermann 2000: 100-1).

3.2.2 The Early 1980s: The Conservatives' Decade

Under the leadership of Chancellor Helmut Kohl, the Conservative-Liberal (CDU/CSU/FDP) Coalition Government (1982-1998) came to power as environmental issues continued to gain momentum in the political arena. By 1983, the Green Party had taken advantage of the proportional representative electoral system and secured seats in both the Laender (state) and federal parliaments. By the mid-1980s, the conservative-liberal government was challenged by two parties, the Greens and the Social Democrats. Both opposing parties employed environmental protection as a platform topic. These two parties also confronted the coalition government to ensure that it addressed energy security and pricing issues, in light of the oil crisis of 1979 and 1973, via the promotion and support of renewable energy technologies. With building pressure to "green" their policies, the conservative-liberal coalition, which was expected to conduct weak environmental policy on account of its traditional support coming from economic interest groups, began an unexpected journey into unprecedented environmental legislative territory.

3.2.3 1986 – 1991: The Formative Years

3.2.3.1 The Chernobyl Opportunity

1986 marked a watershed year in German environmental policy. The origins of the government's tumultuous year with environmental matters can be traced to the Chernobyl nuclear catastrophe on 26 April 1986. The significance of this environmental disaster was neither the environmental nor the health-risks that accompanied it but rather the criticism against the conservative-liberals for not adequately advising and proactively protecting Germany from these environmental risks (Beuermann 2000: 87). As mentioned above, the Green Party was rooted in anti-nuclear policies. This foundation gave the Green Party the opportunity to use the Chernobyl disaster to publicly question the ruling government's energy policy that was based on nuclear proliferation.[23] Consequently, in 1986, the government created the Federal Ministry for the Environment, Nature Conservation and Reactor Safety (BMU). This ministry was established to address the following issues: nuclear safety; attention devoted to environmental policy in the federal governmental decision-making processes; and; to further cross-sector policy approaches. The BMU began as, and remains to this day, one of the smallest ministries in terms of staff and budget (Beuermann 2000: 87). Regardless, the BMU played a crucial role in formulating landmark environmental legislation, as I will analytically document below. Equally significant with regard to the federal political leader's creation of the BMU was their perception of a need to address these nuclear and environmental-related concerns with concrete measures. Therefore an entire new ministry was formed to address short, medium and long-term environmental affairs. The creation of the BMU has institutional theoretical significance because the BMU reflects the elected federal political leaders' perception that the political costs of failing to recast institutional arrangements were too great to ignore. This pattern of the federal political leaders reacting with tangible measures to address the perceived costs of ignoring political pressures would resurface continually during the next four years with regard to the issue of climate change.

3.2.3.2 Climate Change as a Political Issue

On the heels of criticism directed towards the government's nuclear-heavy energy policy, the German Physical Society (DPG) released a report on climate change in the summer of 1986. This report propelled public interest on this now dominant environmental issue. The media embraced the topic of climate change and the German public was inundated with reports of its possible devastating consequences. For example, the cover of the political magazine *Der Spiegel* exhibited the cathedral in Cologne half submerged under water.[24] Political debates on the topic ensued in the Federal Cabinet, the German Bundestag and the Bundesrat. With an election set for January of 1987, and both the Green Party and the Social Democrats campaigning on environmental protection, climate change and government measures to proactively mitigate its negative impact became a significant topic of public debate (Beuermann 2000: 101-2).

After winning their third consecutive coalition government the conservative-liberals took an increasingly active role in the affairs of environmental protection. In September of 1987, the federal government, along with 24 other nations signed the Protocol on Substances That Deplete the Ozone Layer – otherwise known as the Montreal Protocol. The following month, in response to the DPG report on climate change the government created the Enquette Commission on Preventive Measures to Protect the Earth's Atmosphere (*Vorsorge zum Schutz der Erdatmosphare*). Environmental problems became established challenges to all levels of the political administrative system.

Accordingly, environmentally oriented businesses and business associations became more prominent.[25] Companies within these associations began framing renewable technologies as producers of low carbon emitting energy. Business associations, political opposition parties, and environmental NGOs, such as Greenpeace began promoting renewable energy technologies as a solution to the central climate change challenge: the reduction of CO_2 emissions. Finally, federal political leaders began to perceive the political benefits of supporting the expansion and commercialization of wind turbines.

3.2.3.3 Entering the Climate Change Industry

At the outset of 1989, the conservative-liberals took their first steps into the wind energy industry. The government's first venture into the wind industry began with the research and development "100 MW Wind Program" that was conducted by the Federal Ministry for Science, Education, Research and Technology (BMBF). This program offered an investment rebate incentive or an on-going production payment of the 0.08 DM/kWh to anyone operating a wind turbine. Further, privately owned wind turbine plant operators were eligible to receive 0.09 DM/kWh from the utility for electricity delivered to the grid (IEA 2000: 56). These rebates were provided in exchange for participation in long-term measurement and evaluation reports. The program quickly exceeded its 100 MW target and consequently a new target of 250 MW was set. This target was also quickly met and exceeded. The program had tangible significance beyond its immediate success. A couple of examples are worth identifying here. They include encouraging the overall wind development market that in turn empowered German manufactures to sell their machines at higher prices to finance internal R&D in order to continue to develop the wind power market. The wind power program enabled the federal government to track and publish years of useful data on capacity, generation, and operation of wind machines. This transparent research continues to this day (Sawin 2003a: 97).

Through active observation of the turbine's ability to produce carbon free energy, political leaders became less risk averse, more confident and therefore supportive of the wind power industry. Instead of being paralyzed by fears of wind energy risk, the political leadership of Germany became increasingly cognizant of the political and economic capital that successful wind energy policy could provide. Hence, as mentioned above, the political *will* for a German wind industry was built through concrete evidence of its initial effectiveness and bright future.

In early 1990, climate change was a central topic on the ministerial agenda following the completion of the Enquette Commission's report on Preventive Measures to Protect the Earth's Atmosphere. Dissatisfied with the Commission's report, Chancellor Kohl demanded that the BMU formulate a CO_2 reduction target for the Federal Cabinet to focus on. The BMU returned to Chancellor Kohl with a feasibility study recommending a reduction target of 30.5 percent. In June of 1990, the Federal Cabinet adopted a CO_2 emissions reduction target of 25-30 percent by the year 2005, based on 1987 CO2 emission levels (Beuermann 2000: 101). The significance of this policy would prove to be immense. In one swift legislative move Germany not only entered into the CO_2 reduction effort, it actually catapulted itself to a world-leader status in the fight to ease climate change. Up until 1990, no other nation on earth had set such an ambitious reduction target. From this point forth, Germany was in a strong negotiating position within the EU and internationally on the subject of climate change politics.[26]

The Federal Cabinet's adoption of its lofty CO_2 emissions target was quickly followed by the creation of an inter-ministerial working group (*Interministerielle Arbeitsgruppe* – IMA). Supervised by the BMU, the IMA represented several federal ministries, including Finance, Economics and Agriculture. The objective of the IMA was to investigate all possible methods of reducing CO2 emissions to meet the targeted emissions reduction level. The IMA produced 109 options for reducing CO_2 levels, ranging from educational awareness campaigns to the promotion of renewable energy technologies. These policy options were consequently submitted by the BMU to the Federal Cabinet for its examination. The measures pertaining to renewable technologies held the most authority amongst the high-ranking members of the Cabinet.

In January 1991, after having won the December federal elections, the conservative-liberal coalition government passed the Electricity Feed Law (EFL) – *Stromeinspeisungsgesetz*. The EFL provided the single greatest opportunity for the development of a sustainable wind energy market. Significantly, the EFL required utility companies to purchase electricity generated from all renewable technologies in their supply area. Further, the utility companies were required to pay a minimum price for these renewable energy sources. In the case of wind energy technology, the price was stipulated at 90 per cent of its going retail price (IEA 1998b: 121; IEA 2000: 57-8; Sawin 2003a: 95).[27] This requirement guaranteed a market for renewable energy sources and the price regulation provided tremendous incentive for investment in wind turbines because the price for selling the electricity generated was set above the cost of producing it. The difference went back into the pockets of the turbine investors and enabled them to sustain and eventually grow their business operations. By fostering these terms that developed a captive and profitable market for renewable energy sources, the EFL reduced uncertainty for renewable energy investors and sparked an explosion of wind turbine installations and wind energy production (Gipe 1995: 25; IEA 1998: 121-5; IEA 2000: 56-61; Sawin 2003b: 3-6).[28]

Accompanying the EFL were financial incentives that encouraged private actors to invest in wind turbines. In addition to the investment rebates offered in the "100 MW" and later the "250 MW Program", government subsidies were provided for a guaranteed ten-year period for wind turbine owners and operators. These subsidies could total but could not exceed twenty-five percent of the combined cost of the wind turbine, site preparations and constructions. Because the subsidy percentage was based on operational performance, investors were rewarded for the quality of their installation (IEA 2000: 56-7). Hence, this regulation employed a strong accountability factor. Similarly, income tax credits were granted to turbine operations that met specific equipment standards, thereby allowing individuals to take tax deductions against their investment (Sawin 2003a: 97). By 1991, the above mentioned financial incentives along with the market certainty provided by the EFL made wind turbines an appealing investment.

German federal political leaders perceived an opportunity to benefit politically from the development of the wind industry. Obstructing their access to this political gain was the uncertain and underdeveloped market conditions surrounding wind turbines. Using their constitutional jurisdiction over energy regulation, federal political leaders changed the institutional constraints pertaining to this sector in order to bring certainty to the market. The anticipated and realized outcome of this institutional change included the stimulation of a sustainable domestic wind industry and an explosion in wind energy production. Most importantly, to the actors responsible for the institutional change was the overall favorable reaction from the German public and opposition parties. The German wind energy incentive policy was and continues to globally recognize as the crowning policy achievement that sparked the development of a nation's wind industry. As for the Conservative-Liberal Coalition, it enjoyed another seven years as the ruling federal government. Although this wind energy incentive policy was not solely responsible for this electoral success, it is significant to note that this government was not voted out of office in the next election. This result was largely due to their proactive response to the climate change challenge.

3.2.3. Since1991: Historic Success

Over the last thirteen years, Germany has become the world's largest producer of wind energy. From 1990 to 2001, the average annual increase in wind capacity was 60.5 percent and in the past three years the average annual increase in cumulative capacity has been 34 percent (IEA 2004: 310). If this trend continues, wind energy will be supplying ten percent of the country's electricity by 2010 (EWEA 2004b: 35). The EFL was introduced in 1991, amended in 1998, replaced by the Renewable Energy Sources Act (EEG) in 2000 and most recently revised in August 2004. At the core of each of these modified versions of the original EFL has been a legislated obligation for electricity distributors or utility companies to purchase energy from wind generators at specified fixed costs. The EFL and the EEG have been complimented by financial incentives, such as concessionary loans and tax credits. However, industry analysts unanimously concur that the primary policy driving this tremendous wind energy boom has been and continues to be the federal political leaders' regulatory pricing incentives (EWEA 2004b: 35; EWEA 2004a: 15; Hvelplund 2002: 3).

3.3 Political Will

3.3.1 Stimulating Willingness

By 1988, the conservative-liberal coalition government was challenged with the task of responding to the growing alarm over climate change. Political opponents, namely the Green Party and the environmentally friendly Social Democrat Party, were confronting members of the federal government and demanding that they address the arguments made by environmental NGOs, such as Greenpeace, members from the scientific community and the media (Weidner 1997: 8). Debates in the Bundestag and Bundesrat, coupled with demonstrations in the streets of Berlin and a flux of news reports in the newspapers and on television anchored climate change as a popular topic amongst Germans (Beurermann 2000: 100-1). As previously discussed, federal political leaders responded in 1990 by setting an ambitious goal for CO_2 reductions that culminated in the 1991 wind energy incentive policy designed to assist in reaching the emission reduction targets. While the previous section highlighted the events and timeline that resulted in this outcome, this section will emphasize the motivation fuelling this policy choice. What follows below is an investigation into the *motives* that stimulated German federal political leaders' willingness to create the above detailed wind energy incentive policy.

The source of the federal political leaders' motives to address the climate change challenge included increasing public pressure, both within and outside the state and federal parliaments, for CO_2 emission reductions. The challenge of analysis now lies in determining the federal political leaders' motive for responding specifically with the wind energy incentive policy.

3.3.2 Political Leaders' Principal Objective

The nature of the German federal political leaders' response to the climate change challenge through the reduction of CO_2 emissions appears to have underscored a primary objective of these actors. One of the chief aims of elected political leaders is to stay in office. Elected political leaders are therefore motivated in their actions by outcomes that improve their chances of retaining power. As previously mentioned in the research design chapter, policies that notably improve domestic economic conditions are cited as amongst the most reliable methods of achieving this aim (Mattli 1999: 42). By 1990, climate change had gained momentum as an important issue facing all political parties jockeying for power in a federal election year: The election was held on 12 December 1990. For members of the conservative-liberal coalition government to dismiss this issue would be to concede the votes of those German's concerned with environmental issues. In keeping with this primary objective to retain power, a dismissal of such a presumably large cross-section of votes was therefore not an option for the ruling political leaders. The government was therefore bound to address the CO_2 issue. As emissions were predominately emanating from the transportation, industrial and energy sectors, the proposition of reducing CO_2 emissions presented the government with the following choices: a) imposing strict command and control policies that involved the threat of financial penalties on businesses within these crucial economic sectors; or b) finding alternative means of reducing emissions without penalizing the industry associations and businesses operating within these sectors.

Faced with these choices most political leaders will be inclined to choose the latter, as it represents a less combative solution toward powerful stakeholder groups, thus forwarding their aim of remaining in power. It should come as no surprise then that the conservative-liberal leaders chose the latter rout in addressing the climate change challenge. Hence, the EFL did not require the industrial or transportation sectors to reduce their CO_2 emissions to any degree.[29] Instead of curbing industrial growth – a position advocated by many environmental NGOs – the government actually promoted it, albeit for renewable technologies. Essentially, the government encouraged energy producers, manufactures and investors along with their respective industrial associations to create a new sector within the economy to meet the demands imposed by the climate change challenge. In this respect, federal political leaders of the conservative-liberal coalition abided by the aforementioned ideal methodology of retaining power through the improvement of economic conditions.

3.3.3 *The Valorization of Wind Turbines*

The conservative-liberal leaders' decision to address the climate change challenge by endorsing the development of renewable energy technologies appears to have been largely fuelled by their perception of the economic value tied to these technologies. During the late 1980s, opposition political parties, environmental NGOS, and members of the scientific community constantly reminded the conservative-liberals of the economic, environmental and social externality costs associated with CO_2 emissions. It was the demand by these stakeholders for government to address the externalities produced by traditional (or fossil fuel) energy that compelled the government to take action and look for a solution towards internalizing these externalities. Renewable technologies, such as wind turbines, offered a means of generating needed electricity without creating many of the externalities produced by coal, oil or gas production. In addition, the success of the 100 MW Program dissolved, to a large degree, the governments' risk aversion to this technology. Renewable energy technologies therefore attained a high degree of value from the conservative-liberal leaders' perspective, based on: their need to produce a climate change policy; their goal of improving economic conditions; and their desire not to negatively affect the economic gains of competing traditional energy industries. The economic value that was not associated with these technologies prior to the government's perceived need to address CO_2 emissions had therefore materialized according to this combination of needs, goals and desires.

It is significant to note that this case study unfolded according to a principal tenet of in institutional theory: that actors capable of institutional rearrangements become agents of institutional change when seeking to maximize their behavior according to their objectives. Through their creation of institutional constraints between the utility companies and wind operators the federal government chose the solution regarding climate change that least affected the gains of other traditional energy competitors. The conservative-liberal government could have chosen a climate change policy that reduced subsidies to coal companies in order to dampen investment enthusiasm in this CO_2 emitting industry, but it did not. Instead it maintained and even increased subsidies in this coal industry over the course of the 1990s (IEA 1998b: 86). Clearly, the government did not see the value in reducing its financial endorsement of an industry that produced 55 percent of the country's total generated electricity and represents a major financial contribution to the German economy (IEA 1998b: 81-2). This behavior by the federal political leaders suggests that its valorization and subsequent endorsement of one industry did not preclude their support for its competitor. It also suggests that the federal leaders' motive for promoting wind turbines may have also stemmed from an opportunistic desire to develop a new industry as much as for the publicly proclaimed mitigation of CO_2 emissions.

Standing in the path of the government's decision to promote wind energy technologies as a fundamental element of their 1991 policy that addressed climate change, were the costs involved in developing a market for this technology.[30] High initial capital costs for the production and installation of these technologies along with the high retail prices of these alternative energies, compared to traditional energy prices, represented the two major obstacles to market development. The EFL directly addressed the latter obstacle by obliging utility companies to purchase renewable energies produced from wind turbines at 90 percent of its retail cost.[31] Federal political leaders remedied the former cost obstacle by encouraging its publicly owned bank (*Deutsche Ausgleichsbank* – DTA) to provide long-term low-interest rates for customers seeking a loan to invest in renewable energy technologies. To further encourage the development of this technology sector, federal political leaders created additional financial incentives, including tax credits and industry subsidies. The conservative-liberals' concerted effort to overcome these cost barriers indicates the high degree of value that they associated with these emerging technologies. Had prominent members of the ruling collation, including Chancellor Kohl, not recognized the potential high degree of value these technologies entailed, the effort and coordination of creating new institutional constraints would not likely have transpired. These efforts are indicative of the federal political leaders' high degree of *will* to create the wind energy incentive policy.

According to institutional theory the political leaders' effort to achieve the wind energy outcome indicates that these members of government perceived that the gains from this institutional change would be worth the effort and costs involved in bringing them to fruition. From an economic perspective, the cost of creating the market conditions for investment in the wind industry was not prohibitively high for the ruling government. Providing subsidies and R&D funds for prospective investors and manufactures was nothing new to the government. Moreover, the amount of money contributed through various financial incentive programs was minimal compared to other existing energy industries. On the other hand, the economic costs of not promoting alternative energy technology could have been incompatibly greater than the cost of the government's financial incentives if the consequences of climate change advocated by numerous stakeholders proved true. Having signed the Montreal Protocol in 1987, the conservative-liberals were well aware of the damaging economic ramifications of acid rain on the nation's forestry industry and therefore had a pre-supposed perspective on the true costs of externalities on societies' welfare (Beuermann 2000: 108). The costs of promoting wind technology were consequently minor compared to the possible costs of failing to do so.

Similarly, the political cost of the EFL was also minimal considering that the stakeholders most negatively affected by this law – the utility companies – were predominantly publicly owned companies. On the other hand, the political costs of not tabling the EFL could have been disastrous for the ruling federal political leaders. Without a strict law illustrating the manner in which government was planning on re-orienting energy use, their 1990 CO_2 reduction target could have been disregarded by competing political parties as broad sweeping election-time fodder with no substantive action plan to realize referenced goals. The result would likely have been a resumption of strong public pressure from the same stakeholders demanding substantive policies against climate change. This pressure could have ultimately culminated in the toppling of the conservative-liberal coalition government by opposition parties. The political gains from the EFL therefore included the quelling of these pressure groups and the federal political leaders' ability to point to concrete legislation as proof to the German people that they were serious about fulfilling their promises on climate change control – a gain that once again forwarded the political leaders' primary objective of staying in power. It should therefore be clear that the political and economic benefits for the federal political leaders of promoting wind energy were greater than the costs of not doing so.

In sum, the federal political leaders' valorization of wind turbines stimulated their will to establish groundbreaking wind energy incentive policy. These political leaders recognized that wind turbines not only represented a solution to their needs but that this technology also potentially represented a new market in the energy sector. Of course, with a new market comes a new opportunity for economic development, which is a principal driver of a political leader's popularity. Obstructing this new renewable energy market were institutional, market and regulatory barriers. These obstacles will be discussed in the next section of this examination. Briefly here, the challenges and the contemporaneous federal political leaders' resolution to overcome the policy hurdles unearthed what institutional theorists identify as the motives driving institutional change. As North and Davis noted, "The possibility of profits that cannot be captured within an existing structure leads to the formation of new (or the mutation of old) institutional arrangements" (North and Davis 1971: 39). Motivated by political and corresponding economic gains, the conservative-liberal leaders enacted formal constraints; these were meant to reconfigure the institutional arrangement between the utilities and wind turbine operators. The legislative obligation implemented by the EFL on utility companies to purchase wind energy from regional producers at fixed rates represented the new institutional constraint. This restructuring of the utilities' energy portfolio, along with the boost in investor confidence that was generated from it, created the stable market conditions in which the wind industry subsequently flourished-in. The political will for promoting the wind energy incentive policy can therefore be traced to the economic and political value these actors perceived in the wind turbine technology.

3.4 Ability

3.4.1 Domestic Barriers

The conservative-liberal leaders' faced three major domestic barriers to the development of a wind turbine market. Successfully overcoming all three barriers required varying degrees of cooperation on behalf of the three organizations involved: 1) state-level governments which are responsible for implementing federal policies; 2) utility companies which are responsible for the distribution and storing of electricity; and 3) banks which are necessary in the assisted financing of these technologies.

The federal political leaders' ability to surmount these barriers ultimately enabled them to produce their desired outcome: a profitable wind energy market.

3.4.1.1 Regional Government Cooperation

With the requirement of 60 percent of state government approval for federal laws to be amended in the Bundestag, the conservative-liberal coalition benefited tremendously from the Greens' and Social Democrats' willingness to advance "environmental modernization". It was these two parties that were inciting the ruling government to take action in addressing climate change and it was these same two parties that were advocating the inclusion of renewable energy as part of the solution to this problem. The 1988 and 1990 state elections in Schleswig-Holstein and Lower Saxony - the two states that had characteristically high capacity levels through strong winds for wind energy, ultimately empowered the SPD (State Premier: Björn Engholm) and a governing coalition of SPD and Greens (State Premier: Gerhard Schröder), respectively. The 1990 state election of the SPD and State Premier Johannes Rau for North-Rhine/Westphalia, where wind capacity levels were also strong, solidified a SDP stronghold of Germany's northern states. The south, where large hydro capacity levels exist would also benefit from the EFL. The Bavarian state was maintained by the CSU and its State Premier Max Streibl in the 1990 elections while the CDU and its State Premier Lothar Späth presided over the Baden-Wurttemberg state at the time the EFL was tabled in the Bundestag.[32] The northern state-level representation of SPD, and Greens which were particularly favorable towards the installation of wind turbines in their territories, along with CDU and CSU's approval of their federal party's renewable policy provided Chancellor Kohl and his conservative-liberal coalition government the ability to pass the EFL through the Bundestag and Bundesrat. This favorable northern-state partisan dynamic also ensured that the EFL would be implemented according to the letter of the law.

3.4.1.2 Utilities' Obligation

The federal political leaders' approach towards enlisting the utility's cooperation can be characterized as instructive. The creation of any sustainable renewable technology market requires the guarantee of a central grid, responsible for the storage and distribution of produced energy.[33] Any government aiming to develop such a market must therefore enlist the cooperation of utility companies. With a single formal institutional constraint (the EFL), the conservative-liberal leaders did more than enlist the utility's cooperation; they obliged them to act according to their will. High levels of public ownership in the country's utility firms enabled them to implement the terms of the EFL. As of 1992, 68.8 percent of Germany's 606 utility companies were publicly owned - the grand majority of which were owned by regional public authorities. Of the remaining 31.2 percent of utility companies with private or mixed (public and private) ownership, public authorities have insured themselves a majority vote through double voting rights in shareholder meetings.[34] As a result of this high degree of public ownership within the utility firms, government policies concerning the content of utility's energy portfolios were likely to be implemented. Strong support for the EFL by the coalition government's two principle opposition parties, the SPD and the Greens, solidified approval for renewable energy within most utilities companies. The ability to pass and implement the EFL without any substantial opposition from the utility companies therefore resided in the government's high degree of ownership and voting rights within these institutions.

3.4.1.3 Financing Accessibility

Similar to its experience with the utilities, the federal political leaders' ability to convince the *Deutsche Ausgleichsbank* (DtA) to cooperate with its wind energy development policy relied on its ownership of the bank. Banking institutions provide the financing for the large loans needed to support the initial high capital costs attached to most renewable technologies. Most often, investors are not inclined to sink large amounts of money into loans that do not offer attractive financing terms. For these reasons, banking institutions represented an important stakeholder in the federal government's quest to stimulate a wind energy sector. The publicly owned DtA bank provided the federal leaders with a high degree of access to a financial operation that it could influence in adopting favorable financing terms for renewable technologies. Therefore the federal political leaders' ability to overcome the financial domestic institutional barrier was facilitated by its ownership of the DtA.

3.4.2 Renewable Technology Barriers

There are two principal categories of barriers to renewable technology development: firstly, costing and pricing, and secondly, legal and regulatory. The conservative-liberal leaders had to overcome both of these obstacles to develop a profitable and sustainable wind market. The leaders' competency in overcoming these hindrances was based on their ability to initially conquer the major domestic barriers. With the cooperation of the three principal domestic organizations, the state-government, the utilities, and the DtA bank, the conservative-liberals were capable of fashioning an attractive market atmosphere for investment in wind energy. The section that follows demonstrates how the federal leaders took advantage of this cooperation in order to overcome these market barriers.

3.4.2.1 Costing and Pricing Barriers

High initial capital costs and a premium in lending rates on loans offered by banks were the principal *financial* barriers to fostering a market for wind turbines. Anew, as is the case with most new technologies wind turbines also incur high initial capital costs.[35] In addition to initial high capital costs, investors interested in new technologies are often confronted with banks that demand a premium in lending rates for financing the loans needed to cover these costs (Beck and Martinot 2004: 5). Recognizing the disincentive that these conditions placed on private businesses to invest in wind energy, Chancellor Kohl's ruling government resolved these barriers by persuading the DtA bank to offer low-interest long-term loans for wind investments with the agreement to refinance the bank (Sawin 2003a: 97). In a marketplace dictated by competition it did not take long before other non-publicly owned banks agreed to similar arrangements. The federal political leaders' ability to address these financial barriers was therefore predicated on their favorable access to a major bank.

3.4.2.2 Legal and Regulatory Barriers

The inability for renewable energy producers to gain favorable access to the utility grid can be characterized as a *legal* or *regulatory* barrier. The absence of a legal or regulatory framework compelling utility firms to negotiate and purchase renewable energy in a uniform manner per industry inevitably encourages power purchase agreements on an individual ad-hoc basis (Beck and Martinot 2004: 7). These inconsistent conditions leave wind energy investors and producers little future financial certainty. This proactively discourages investment. Unreliable and possibly discriminatory purchasing prices by utilities companies over interconnection costs from, for example, the wind turbine to the utility grid via distribution lines can also subject wind producers to discouraging costs (Beck and Martinot 2004: 8). The German federal government's response to these regulatory barriers was the EFL. By obliging the utility companies to purchase renewable energies within their region at fixed prices, which were pegged at 90 percent of retail price for wind energy, this regulatory framework provided prospective investors and producers with the essential certainties. These certainties included: a consistent market for their products guaranteed by favorable distribution conditions and; a constant price set to ensure profitability. Once these crucial regulatory conditions were made law, the German wind industry began its rapid ascent to global leader status. The EFL's effect of removing investor uncertainty in the wind industry represents a prime example of how a government's creation of institutional constraints can lead to the formation of new institutional arrangements. Significantly, the conservative-liberals' ability to implement this law relied on the cooperation of state-level governments. The federal government's access to the cooperative support of the regional governments was therefore paramount to overcoming regulatory and legal barriers.

3.5 A Causal Explanation

This following section will provide a brief overview of my answer to the central question posed at the beginning of this paper: *What were the conditions and policies that led to the creation of Germany's wind energy incentive policy?* The establishment of the wind energy incentive policy (DV) was a result of the electoral system (IV) and degree of centralization of the political system (IV).[36] The federal political leader's valorization of wind turbines (AC) was stimulated by the following supply conditions (CV): a) their perception of a need to formulate a climate change policy; b) their goal of constantly improving economic conditions as a means of retaining power; and c) their desire not to disrupt the economic gains of competing traditional energy industries. To a high degree, it is believed that the third condition is a product of the second. The content of the first condition is not considered absolutely necessary for this condition to materialize, because under different circumstances climate change concerns could be replaced with energy conservation or security concerns; however, the perception by political leaders of a need to formulate a policy that originates from at least one of these concerns is. The independent variable (IV) with respect to *willingness* emanating from the comparison in this examination is the electoral system, through which the Green Party accessed national and sub-national representation. However, this independent variable alone did not lead to the establishment of the wind energy incentive policy (DV).

The cooperation of the organizations capable of implementing the federal political leaders' will was crucial to the outcome. These three organizations were: a) the state-level government; b) the utility companies; and c) the banks (CV). The high degree of centralization of the German political system determined political leaders' high degree of access to these organizations capable of implementing their will. The degree of centralization of the political system (IV) enabled the political leaders to overcome the renewable technology barriers (IntV), which resulted in the high degree of their intended outcome (DV).

In my original overview of supply conditions I noted that political leader's willingness towards a particular outcome must be complimented by their ability to achieve it (Mattli 1999: 42). This case study has demonstrated that both will and ability existed and that ability did indeed compliment willingness. The perceived ability to access the cooperation of the organizations capable of implementing their will no doubt increased the political leader's willingness, as they recognized that it would not cost them great efforts to harness this ability.

Endnotes

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[20] This figure is in absolute terms.

[21] For more information, see Deutsche Welle (2004).

[22] This reference is in absolute terms.

[23] At the time the conservative-liberal government had commissioned the construction of twenty new nuclear power plants. For more on this development, see Muller and Stahl (1996: 290).

[24] For more details on the German Physical Society's report and the reaction to it, see Beuermann (2000: 100-1).

[25] What is today referred to as Germany's eco-industrial complex traces its roots to these original business associations started in 1988. For more details on the eco-industrial complex and environmental-oriented business associations, see Weidner (1997: 10).

[26] For more information on Germany's international stature as an environmentally-friendly nation as of 1990, see Weidner (1997: 10-11).

[27] Utility companies reacted to this obligatory pricing legislation by passing on some of these new costs to electricity consumers as increases in their utility bill.

[28] The EFL also provided similar favorable pricing conditions for solar energy; however, for the purpose of this investigation I will only discuss the ramifications pertaining to wind energy.

[29] I acknowledge that the EFL did require utilities in the energy sector to conform to command and control policies; however, since many of these regional and national utility companies were partly owned by the federal and state governments their impact in affecting government's retention of power is lessened. This particular dynamic between federal energy laws and state-owned utilities is discussed later in this examination.

[30] These costs and the obstacles associated with wind technology and renewable energy in general will be expanded upon further on in this investigation.

[31] Government also obliged utilities to purchase solar energy at a minimum 90% of its retail prices.

[32] Election information has been drawn from the John Hopkins University's American Institute for Contemporary American Studies at http://www.aicgs.org/wahlen/history.shtml

[33] For more details on the implications of central distribution and storage from the utility grid on the development of a renewable energy market, see Sawin (2003a: 90-106).

[34] With no major discrepancies in ownership between 1992 and 1990 I have used 1992 statistics based on the improved accessibility compared to 1990 stats.

[35] The high initial capital costs for wind turbines have been historically reflected by the lower amount of installed energy capacity per dollar invested compared to traditional energy sources. For more on costing, see Beck and Martinot (2004: 4).

[36] For more on the terminology chosen in this section, see Van Evera (1997: 7-12).

4 The Canadian Wind Bust

4.1 Introduction

Today, Canada trails most advanced industrial nations in its generation of wind energy. Wind energy currently constitutes 0.4 percent of Canada's energy supply. Like all energy industries, renewable energy relies on government incentives that encourage actors in the private sector to invest in these technologies and bring down their high initial capital costs. As demonstrated in the previous chapter, German federal political leaders had fostered the will and capitalized on their ability to create a wind energy incentive policy by 1991.[37] As this chapter will illustrate, Canadian federal political leaders have only recently developed the will and have yet to harness the ability to develop a similar wind energy incentive policy. Thus the specific question posed in this chapter is: what conditions account for the limited will and/or ability by Canadian federal political leaders, during the late 1980s/early 1990s, to create a wind energy incentive policy similarly favorable to the development of a wind industry?

This chapter begins by setting the limited will and/or ability to create a wind energy incentive policy within the context of a broader federal policy overview. This portion of the chapter examines major trends and key events in Canadian federal policy from the 1970s to today, with particular emphasis on the period ranging from 1985-1991. I then briefly summarize the policy and actions taken by the federal government since 1991 before analyzing the specific conditions that restricted federal political leaders' will and ability. Operating from a political economy approach rooted broadly in institutional theory, I suggest that the federal political leaders' desire for deregulatory electricity policies limited their will and that their lack of support from crucial organizations restricted their ability to create wind energy incentive policies similar to that of their German counterparts.

4.2 Canadian Federal Policy Overview

4.2.1 The 1970s: Energy Diversity and Disappointments

The following overview of Canada's stalled wind energy growth traces an energy policy trajectory more so than an environmental one. The reason for this is because the failure of Canada's wind energy development has been far more influenced by previous federal governments' electricity regulations than by their environmental ones, or lack thereof.[38] As this section examines the Canadian federal energy policies and conditions that led to this outcome, the focus will be on the actors responsible for these policies – the elected federal political leaders and senior civil servants of the Department of Energy, Mines and Resources (EMR) (now know as Natural Resources Canada (NRCan)). Established in 1966 to formulate national and coordinate provincial energy policies, EMR has been *the* department responsible for molding Canada's diverse energy landscape. The oil crisis in the fall of 1973 inflated the prominence of EMR within the Canadian federal government and ignited a firestorm of policy initiatives; legislation and funding based on the principle of energy self-reliance and focused on diversifying Canada's energy portfolio. Since the early 1970s, the federal government's fundamental guiding principal of energy self-reliance has constituted *the* core element of most of the EMR's policies. The energy self-reliance principal as defined by EMR was "reducing the vulnerability of Canadians to arbitrary changes in price or supply of imported energy by using domestic resources to the greatest extent possible and protecting against interruptions in the supply of energy that must be imported" (NRCan 2004d: 35). Spurred on by the oil crisis of 1973, this principal became *the* guiding principal behind Canada's national energy strategy and has overwhelmingly shaped the federal government's supply and demand policies to this day. The tangible proof of the federal government's devotion to the energy self-reliance principal can be seen in its commitment to policy initiatives, legislation and funding that focused on the diversification of Canada's energy portfolio. EMR's focus on generating multiple sources of energy supplies while reducing overall demand initially resulted in an expressed interest in renewable energies. By February 1977, the federal government had established a Renewable Energy Resources Branch within the EMR.[39] The unfamiliarity of these renewable energy supplies compared to oil, nuclear and hydro during the 1970s, coupled with their inability to produce similar financial gains as energy conservation programs quickly dampened enthusiasm for these renewable technologies within EMR by the early 1980s. As a result, renewable technologies, such as wind turbines, that entailed high initial capital costs and seemingly provided little room for financial reward were quickly dismissed as an ineffective means of fulfilling the self-reliance principle. In general, Canadian federal political leaders had essentially lost their enthusiasm for renewable technologies as a pragmatic beneficial instrument. Instead, they saw a technology plagued with cost restraints. The result was that an opportunity to foster substantial willingness for the development and commercialization of renewable energy technologies was missed.

4.2.2 *The Early 1980s: The National Energy Policy Controversy*

The Federal Liberal Government's National Energy Policy dominated the events of the early 1980s. In October of 1980, the federal government published its energy strategy for the upcoming decade in a report entitled the National Energy Program (NEP). The NEP encouraged the federal government to increase its share of Canadian oil revenue from 10 to 33 percent, through tax increases and large retroactive interest charges on oil and gas discoveries.[40] Having signed the Natural Resources Transfer Agreement in the 1930s, the federal government did not have the constitutional authority to regulate such constraints on the revenues of oil companies and provincial governments. Federal political leaders' attempted regulatory approach was immediately met with strong opposition from Alberta's provincial government, the oil industry and the Progressive Conservative opposition party.[41] A dramatic paradigm shift ensued, as all three stakeholders waged war on command-and-control regulatory policies, while promoting deregulatory energy measures.

In July 1984, Brian Mulroney, then leader of the Progressive Conservative Party, released an energy policy statement that called for: deregulation of the oil, gas and electricity industries; improved cooperation between federal/provincial/industry actors; and increased electricity exports. This statement would subsequently become the foundation of the federal government's energy program after the PC's historic landslide electoral victory in September 1984. The PC's had campaigned on providing Canadians with a less intrusive government, which emphasized deregulations in the energy sectors. Given their overwhelming electoral victory it is understandable to see why federal political leaders felt they had the green light from Canadians to fulfill this mandate. The result was the replacement of the NEP with a strategy that executed a massive deregulation of the oil and gas, and ultimately the electricity sector – the latter of which severely stalled the development of the wind industry. The following section will explore the ramifications of this deregulatory era on federal political leaders' interest in creating regulatory incentives for the wind industry.

4.2.3 1985-1991: The Formative Years

4.2.3.1 The Deregulatory Energy Policy Era

The six-year period from 1985 to 1991 marks the pivotal years in examining the reasons for Canadian federal political leaders' limited willingness to create the regulatory incentives which could have stimulated the birth of a wind industry. These years can be summarized by the federal political leaders' quest to deregulate energy sectors and take advantage of United States' supply needs, through continental trade. The Progressive Conservative government's energy plan was simple – sell cheap abundant oil, gas and electricity to the U.S. Albertan oil and gas fields and Quebec hydro dams alone provided the PC government with the sufficient energy surplus to make this plan viable. Crucial to this energy policy was the ability of utilities and government's on both sides of the Canadian- U.S. boarder to negotiate and trade energy with relatively few regulatory restrictions. A salient feature of this new energy policy was regional accords that would allow provinces' to "free industry from excess regulation and taxation so that it could adjust and compete in a free market" (NRCan 2004b: 3). Equally important to the PC government's strategy was the ability of producers and consumers to conclude contracts on the basis of buyer-seller negotiated prices as opposed to prices regulated and administered by government. The deregulation of the energy sectors, therefore, became of paramount importance to the federal political leaders' overarching energy and trade policies. Over the course of 1985, the PC government translated its vision into a reality with the creation of the following regional accords: the Atlantic Accord, 11 February 1985; the Western Accord, 28 March 1985 and; the Frontier Policy, 30 October 1985. In addition, the federal government had, in cooperation with its provincial counterparts, established a deregulation of oil prices (as of 1 June 1985) and an understanding to deregulate natural gas prices by 1 November 1986 (31 October 1985) (NRCan 2004b: 3). The negative political ramifications of the NEP controversy had crushed federal political leaders' willingness to adopt a regulatory approach to energy policies. These regional accords reflect the institutional constraints that indicate federal political leaders' willingness to deregulate the energy sector.

4.2.3.2 Solidifying Deregulation

Validation of the PC's deregulatory energy strategy surfaced as a result of yet another energy crisis. Towards the end of 1985, world oil supply was surging past demand, in large part due to increased energy conservation and exploration programs following the spike in oil prices during 1979. Fearing a diminishment of market share, Organization of Petroleum Exporting Countries (OPEC) plunged its oil prices. The result was a drastic decrease in global oil prices in which the price of international crude oil dropped from US$28 per barrel in December 1985 to $ US$15 per barrel in June 1986. By March 1986, Canadian oil prices had fallen by 60 percent (NRCan 2004b: 14). Facing the possibility of a sever recession in the Canadian oil and gas industry, the federal political leaders put their faith in the provinces' and industries' ability to navigate their way through this crisis with their recently acquired pricing maneuverability and reduced taxation burdens.

To the great delight of those advocating a deregulatory strategy, the dividends of this approach materialized. By July 1987, the outlook for the oil and gas sector was looking positive again. Drilling activity in Western Canada had risen 125 percent since July 1986 and major oil and gas companies, such as Syncrude, Suncor and Petro-Canada, all resumed megaproject expansions across the country (NRCan 2004b: 16). Industry analysts cited the extinction of heavy taxes, such as the Petroleum and Gas Revenue Tax, and regulatory policies that had been so unpopular during the early 1980s as the chief reasons for the improved conditions in Canada. For the PC government, the appearance of a positive recovery was both a victory for their party's popularity, especially in Western Canada, and for their deregulatory approach. Significant, for institutional theorists, is the political benefits the elected federal political leaders gained from pursuing institutional constraints that promote deregulatory energy policies. The relevance of this recovery, with regards to the wind industry, was the virtual consensual endorsement among federal political leaders of a deregulatory energy strategy. This high degree of enthusiasm of the deregulatory approach extinguished any possible existing willingness from these actors to entertain federal regulations of Canadian energy sectors, with the exception of nuclear – for security purposes.

4.2.3.3 Electricity Exports to the U.S.

Confident that their deregulatory policies would trigger a rebound in the oil and gas sectors, the political leaders of the PC government had expanded their focus to electricity exports by the fall of 1986. In November 1986, Minister Masse of EMR requested that the National Energy Board (NEB) develop a report on changes that might be made to reduce and simplify the regulation of electricity exports and international power lines. Parallel to this exploration were the federal government's ongoing negotiations with the U.S. government regarding the Canada-U.S. Free Trade Agreement (FTA) (which had begun in January 1986). Of central importance to these negotiations were the agreements by both governments to prohibit most restrictions on energy exports and imports and for Canada to deliver cheap electricity to meet the U.S.'s growing supply needs.[42] With this context in mind, the salient points of the federal government's revised electricity policy should come as no surprise. In November 1987, after reviewing the NEB's report the Minister of EMR outlined in a public statement the new electricity policy that would guide Canada's future. The two principal objectives of the policy were that: 1) the Government of Canada should work with the provinces to ensure that the supply of electricity to Canada is reliable, flexible, provided at minimum costs and with environmental safeguards; and 2) the new policy should optimize Canada's export opportunities (NRCan 2004b: 10).

Focal to the realization of these export opportunities was the government's emphasis on the deregulatory approach.[43] The EMR's electricity policy was governed by three broad regulatory principles: "regulation should be used only where there is clear evidence that its benefits exceed its costs; the regulatory process should create incentives for self-regulation by industry; and regulation by the Government of Canada should not duplicate provincial regulation" (NRCan 2004b: 10). In no uncertain terms these principles were broadcasting the federal government's endorsement of deregulation.

The significance of these principals and EMR's new electricity policy agenda to the focus of this investigation is that they stunted the development of a wind industry. This strategy discouraged federal regulatory pricing incentives, such as feed-in tariffs. It should be stressed here that there is no evidence to suggest that federal political leaders employed deregulatory electricity policies to smother wind energy development. In fact, to the contrary, it is interesting to see that the federal government's first research and development wind farm was established in August 1987 at Cambridge Bay, Northwest Territories.[44] The reality was that federal political leaders were only beginning to experiment with wind energy mere months before they had finalized an overarching national electricity policy with massive continental trade implications. It is difficult to see how federal political leaders in the PC Government or EMR could have been fully aware of the implications these deregulatory policies would have on the creation and sustainability of a wind industry that had yet to be born. Canadian wind advocates themselves did not yet display this understanding. Moreover, European case studies, demonstrating the correlation between regulatory pricing incentives and robust wind industries only began to emerge in the mid-to-late 1990s. Regardless of this absentee foresight, any proposal to impose heavy regulations in the electricity industry on the eve of the FTA agreement for the sake of an unproven renewable technology industry would have been immediately dismissed. The political and economic benefits of pursuing these regulations were perceived as minimal, while the costs would have were seen as colossal.

Of course, without these regulations, which guarantee access and pricing, investors shied away from investing in products with high initial capital costs, and unclear indications of the market size. The economies of scale required reducing the costs of these technologies and ultimately the price of the energy they produce never materialized. The wind industry consequently lacked financial appeal. In sum, by the beginning of 1988, the seedlings of a Canadian wind turbine industry, having just entered the federal government's initial R&D phase, were blown away by federal political leaders' enthusiasm over a deregulatory electricity strategy.

4.2.4 Since1991: A Wind Energy Laggard

The Canadian wind industry has only experienced marginal growth since 1991. In 1992, Wind Power Inc. (WPI), a Calgary-based company, founded the first Canadian wind farm in Pincher Creek, Alberta in an attempt to develop a niche market in an oil-dependent province hit by slumping oil prices. Over the course of the next several years, the Canadian Wind Energy Association (CANWEA) pressed federal and provincial political leaders with a strong lobby campaign. During this same period, the concept of *sustainable development* had become popularized in Prime Minister Chretien's Federal Liberal Government, in the wake of the 1992 Earth Summit, and by 1996 it had become a guiding principle within the Department of Natural Resources Canada (NRCan) (the former EMR). By the end of 1996, NRCan had produced the *Renewable Energy Strategy*, which promoted the development of renewable technologies as a tangible means of achieving sustainable development. By 1998, federal political leaders within NRCan identified wind power as one of the most attractive forms of renewable energy.

This appeal stemmed mostly from wind's increasing cost competitiveness with traditional energy and potential to create domestic employment opportunities and generate tax revenues. Despite this newfound willingness, federal political leaders were limited in their ability to create incentives that could support a wind industry. Without the constitutional authority over regional energy jurisdiction and the provincial governments' willingness to cede their constitutional authority over energy regulation to the federal leaders, these actors found themselves unable to implement regulatory pricing legislation over provincial utility companies. Feed-in tariffs, that had been the principal drivers of wind energy development in Germany, were therefore beyond federal political leaders' ability. As a result, they were only capable of implementing financial incentives. The Wind Power Production Incentive (WPPI) has been the chief financial incentive deployed by the federal government. This declining rate premium (beginning at 1.2 c/kWh in 2001 and declining to 0.8 c/kWh in 2006) assists wind energy investors and/or distributors in the wind sector by closing half the cost gap between wind and traditional energy sources.

The WPPI was designed to stimulate the development of 1000 MW of wind energy in Canada while at the same time challenging provincial governments to contribute to closing the rest of the cost gap. This financial incentive has been relatively successful in catalyzing wind energy production and provincial involvement in it. To date approximately 700 MW of the 1000 MW target has been met. However, these financial incentives have neither generated the same capacity growth rates nor investment appeal for foreign turbine companies seeking for market certainty as the German wind energy incentive policies. Despite these limitations, the Liberal Federal Government has recently indicated an increased willingness to expand wind capacity installations with Prime Minister Martin's Throne Speech that declared a goal of quadrupling the WPPI target to 4000 MW. This historic commitment demonstrates that Canadian federal political leaders are willing to develop wind energy production but lack the ability (constitutional authority) to implement the regulatory incentives that have been tremendously successful in stimulating Germany's wind boom.

4.3 Political Will

4.3.1 Sources of Unwillingness

By November 1987, Progressive Conservative federal political leaders had unveiled a new national electricity policy which stressed the deregulation of the electricity sector. For the purpose of this examination, the significance of this provincially supported federal electricity policy is that it denounced regulatory pricing policies. Feed-in tariffs, like those used to stimulate the German wind industry have consequently been ignored. The previous section highlighted the events and policies that resulted in federal political leaders' decision to abandon regulatory energy policies for deregulatory ones. The following section focuses on the motivations fuelling this shift in policy direction, namely: what conditions limited federal political leaders' willingness to stimulate private investment in the wind industry through a wind energy incentive policy?

Understanding why federal political leaders' displayed minimal willingness to pursue this policy requires an analysis of the costs these leaders perceived to be associated with the attempted creation of such institutional constraints. The following analysis therefore examines the electoral (i.e. political) and economic costs and potential benefits facing these federal political leaders prior to the release of their new electricity policy.

4.3.2 The Popularity of the Deregulatory Approach

A traditionally business-friendly party, the Progressive Conservatives embraced the deregulatory approach to governing that had been popularized by the Regan and Thatcher administrations during the early 1980s. During the 1984 election campaign Brian Mulroney and members of the PC party stressed their intention to deregulate the energy industries and establish less intrusive pricing and taxation policies.

Energy industrialists and provincial governments (especially in Alberta and Quebec) immediately embraced this energy platform. The PC party was rewarded with the largest victory in Canadian electoral history. If deregulatory rhetoric had earned the PC party political currency during the 1984 elections, then deregulatory policies had brought them political credibility after the 1986 oil crisis. In contrast to the Liberal government's disastrous command-and-control regulatory measures, the PC's deregulatory approach was widely heralded as being responsible for Canada's energy market rebound in the mid-1980s. Thus by the fall of 1987, the political leaders in both the PC party and EMR had respective political and economic reasons to continue supporting deregulatory energy policies. Moreover, the political and economic costs associated with energy regulatory policies were conversely large. The PC's deregulatory strategy had quite simply performed better than the Liberal's heavy regulatory one. The PC leader's willingness to abandon a strategy that had worked so fabulously for them up to this point for a strategy that had so severely failed their predecessors was understandably non-existent. With little to gain from abandoning their winning formula the PC leaders' had no motivation to do so.

From an institutional theorists' perspective, the institutional arrangements brought on by the deregulation of the oil and gas industries improved the federal political leaders' relations with their provincial counterparts and prominent energy companies. Moreover, the institutional constraints producing these arrangements proved to the public that this federal government would follow its rhetoric with actions and that those actions would assist Canadians in avoiding an otherwise crippling energy recession. Elected federal political leaders of the PC party therefore also gained political popularity based on the institutional arrangements spawned from these institutional constraints. With all this positive reinforcement of their deregulatory energy strategy it should come as no surprise that by 1987 federal political leaders were highly motivated to deregulate the electricity industries in order to take advantage of the economic and political benefits stemming from continental trade with the U.S.

4.3.3 Benefiting from Exporting Electricity

Improved federal/provincial relations, large financial gains and a stable market for Canada's surplus electricity supply all contributed to the federal political leaders' willingness to establishing deregulatory electricity policies. By 1987, the development of mega-electricity projects in Quebec (e.g. the James Bay hydro dam) and Ontario (e.g. the Pickering nuclear power plant) had provided these provinces with a volume of electricity surpluses that the energy-hungry U.S. market desperately coveted. The provincial governments endowed with these energy commodities consequently stood to reap massive financial gains from their sale to the U.S. The Free Trade Agreement that the PC and Republican governments had been negotiating throughout 1986-7 had been largely predicated on the "open" trade of this energy (along with oil and natural gas). Thus by simply loosening regulatory requirements in the electricity industry, the PC federal government could: a) realize the energy component of the FTA; b) ensure a demand market for Canada's electricity supply and; c) assist in directing copious amount of U.S. money into the coffers of Canada's most influential electoral provinces. By altering the institutional arrangements between utility companies and foreign consumers, through the probation of most restrictions on energy exports and imports the federal political leaders gained improved provincial relations and in effect an agreement of free trade relations with the U.S. government. While the former benefit tightened the PC Party's stranglehold on key provinces entering the 1988 elections, the latter allowed it to bring to fruition its ultimate vision of "open" continental trade. The federal political leaders therefore had strong electoral and economic reasons to craft these institutional arrangements and, as the following four sections will highlight, numerous reasons to avoid command-and-control regulatory ones.

4.3.4 Avoiding a Provincial Showdown

The negative electoral ramifications for the elected federal political leaders could have been enormous had they pursued regulatory energy legislation during the late 1980s. As is the case with most energy resources, provincial governments have constitutional jurisdiction over electricity regulation. Provincial leaders therefore, have regulatory authority over the public utility companies operating within their boarders.

Consequently, the federal government would have required the approval of the respective provincial governments in order to legislating feed-in tariffs (a topic that shall be discussed further below). The NEP crisis had clearly demonstrated the electoral hazards of attempting to impose intrusive energy regulations on unreceptive provincial governments. The adamant disapproval by the Albertan provincial government of the NEP cost the Liberal party the western vote in the 1984 elections – which significantly contributed to their national electoral defeat. Since this period, the provincial governments had exhibited absolutely no willingness to entertain federal command-and-control regulations that ran counter to their preferred deregulatory approach. Moreover, the likelihood of increased provincial opposition to feed-in laws compared to the NEP was high because unlike these oil regulations that principally affected only Alberta, electricity regulations could have financially burdened all provincial utility companies and therefore incited the wrath of all provincial governments.

Thus, any attempt by the federal government to establish feed-in wind energy legislation would have involved a pan-Canadian federal-provincial power struggle over energy management. Any such clash would have ended badly for the federal government as the provinces have constitutional jurisdiction over both electricity regulation and the utility companies that would have been theoretically regulated. Had the PC federal government engaged in this jurisdictional battle with the provinces: it would have ultimately lost; the feed-in laws would have been rejected; and the PC government's image would have likely suffered in the public eye, especially in the western provinces. The political leaders of the PC government potentially had a lot of political momentum to lose heading into an election year had they attempted to re-arrange the supply obligations of provincial utility institutions. This cost was too high for federal political leaders seeking to get re-elected to entertain. Understandably, for a set of actors seeking to stay in power, the prospect of inciting the fury of the country's provincial governments and utility companies, on the eve of an election year (1988) could not have been appealing.

4.3.5 What Climate Change?

For the federal political leaders, the electoral benefits of pursuing regulatory pricing incentives for the wind industry were negligible during the late 1980s and early 1990s. By 1987 the concept of climate change had barely begun to surface as an issue on Canada's federal policy agenda.[45] Unlike in Germany during the late 1980s, the Canadian federal government was not battling against opposition parties campaigning on an environmental platform featuring climate change. The Canadian media also paid relatively little attention to climate change in 1987.[46] Without pressure to address climate change from their political opponents, the political leaders' of the federal political leaders had little reason to perceive the need to formulate a climate change policy. The public demand for climate change policy had not been generated and accordingly the lack of such policy was not anticipated to hurt the PC party's chances for re-election. Since there did not exist a substantial public demand for a solution on climate change, the economic-environmental benefits validating the valorization of wind turbines, which developed in Germany during the late 1980s, had not materialized in Canada by 1987. The electoral gains to be achieved by the PC federal leaders for pursuing an energy management struggle with provincial leaders under the banner of a climate change crisis were therefore not evident.

4.3.6 Wind: The Unknown Energy

By 1987 wind energy production was very limited in its international scope. The Danes, who had pioneered wind turbine production in the early 1980s, were supplying the overwhelming majority of turbines for the Californian wind boom of the mid-1980s (Gipe 1995: 50-1). Outside of Denmark and California, wind energy was not being produced or used to any notable degree elsewhere in the world. Within Canada, renewable energies, in general, had a poor track record of energy development and financial returns for the Canadian government over the previous decade. When considering the limited emergence of wind energy in other countries around the world along with the poor perception of renewable energies within EMR it should come as little surprise that it took until August 1987 before the federal government even began flirting with the potential of wind energy. The consequence of only beginning to explore wind energy by August 1987 is that energy policy writers and analysts were already finalizing a deregulatory strategy that ran counter to the idea of regulatory pricing policies. In effect, any possible window of opportunity to pursue feed-in tariffs had been closed by the combination of the NEP controversy and the successes attributed to the PC government's deregulatory policies.

Federal political leaders' limited familiarity of wind energy also hindered their willingness to pursue the issue with their provincial counterparts. In order to convince provincial governments to adopt feed-in tariffs for wind energy federal political leaders would have had to demonstrate a case for the financial viability of a wind energy industry. The problem was that officials within EMR knew very little about the potential of wind energy, and politicians within the PC government knew even less. Without the historical or statistical evidence to illustrate the viability of wind energy as another solution to national energy concerns, federal political leaders were unable to make a compelling argument that could have reduced risk aversion and convinced provincial governments to impose obligatory pricing mandates on their utility companies. Essentially, the federal political leaders would have been asking their provincial counterparts to incite the fury of their utility companies on the basis of an unproven guess. In this regard, federal political leaders' lack of knowledge regarding wind energy contributed to their unwillingness to propose regulatory pricing incentives and consequently a wind energy incentive policy similar to their German counterparts.

4.3.7 Declining Energy Concerns

With signs of the oil and gas sector's rebound emerging by the summer of 1987 and its zealous commitment to nuclear and hydro development established, the federal government's energy concerns had waned since the beginning of the year. The dramatic downturn in Canada's oil and gas industry that had been such a source of concern for federal, provincial and territorial energy ministers in January 1987 had begun a positive upswing by the summer and with it the outlook of these energy ministers overseeing it. The increasing degree of nuclear power within the national energy portfolio also contributed to the reduced concern over future energy supplies.

By early 1987, nuclear energy constituted 15 percent of Canada's electricity supply and CANDU reactors had achieved global recognition as the best product in the field (NRCan 2004b: 36-43). Despite the Chernobyl disaster in April 1986 and a high proportion of the Canadian public that had consistently been opposed to nuclear energy, the federal government, with no significant opposition from other political parties, increased the speed of their nuclear power programs (NRCan 2004b: 24). The federal energy R&D budget for 1987 reveals that 52 percent of total R&D for this year went to nuclear development.[47] The status of nuclear energy had been solidified as a prized supply source in the Canadian energy landscape. With declining concerns over the oil and gas sector, increasing confidence in the capacity of nuclear and hydro energy to offset periodic fossil-fuel supply slumps, and no significant data on the potential of wind energy, federal political leaders' willingness to stir defiant provinces over controversial regulatory energy policies prior to an election year was understandably slim. As a result, a wind energy incentive policy was not on the federal political leaders' agenda.

4.4 Ability

4.4.1 Domestic Barriers

Much like today, the Canadian federal government of the late 1980s faced three major domestic barriers to the development of a wind industry. Overcoming all three barriers would have required varying degrees of cooperation on behalf of the three organizations involved: a) provincial governments (which have constitutional jurisdiction over energy resources and would be responsible for implementing federal policies); b) the utility companies (which are responsible for the distribution and storing of electricity); and c) the banks (which are necessary in financing these technologies). Without doubt the cooperation of the provincial governments' is the most important in overcoming these barriers. The previous section has demonstrated that the federal political leaders did not have the willingness to pursue regulatory pricing incentives. The following brief overview of provincial political leaders' constitutional authority over energy resources illustrates that even if these federal leaders had the will their lack of ability could have still thwarted the creation of such regulatory incentives.

4.4.1.1 Regional Government Cooperation

When discussing *ability* in the context of Canadian federal-provincial energy relations the most salient aspect is the fact that federal political leaders do not have the constitutional authority to create or implement energy regulations at the provincial level. The importance of this reduced regulatory capacity is that any federally proposed electricity legislation pertaining to provincial regulation requires the provincial government's approval and cooperation.[48] Since the NEP crisis, provincial governments have been adamantly against federal intrusions in their energy affairs. During the late 1980s, the feed-in tariff legislation implemented in the German case study would have been seen and vilified as such command-and-control regulation. Thus the federal political leaders had neither the ability nor the support of their provincial counterparts to establish feed-in tariffs. Unlike Germany, Canada did not have any provincial governments in place during the late 1980s and early 1990s that demonstrated a willingness to significantly advance "environmental modernization" through renewable energies. Similarly, it wasn't until the mid-to-late1990s that some provincial governments became receptive to the energy supply and economic benefits of wind power. Without the support from the provincial governments and lacking the constitutional authority to implement effective legislation federal political leaders could not (and still cannot) advance the development of a wind industry through regulated pricing incentives.

The broader implications of this observation is that the provincial leaders' willingness to cooperate with the federal government in creating feed-in tariffs was (and continues to be) supremely significant to any analysis of the conditions influencing Canadian federal political leaders' ability to catalyze a wind industry. Without the constitutional (or legal) authority to implement provincial electricity regulations the federal leaders must rely on the provincial leaders' willingness to exercise their ability accordingly. The crucial point to be recognized here is that due to their lack of legal authority, federal political leaders' willingness alone cannot produce regulated pricing incentives for the Canadian wind industry.

4.4.1.2 The Provincial Utilities' Barrier

Publicly owned utilities' provide us with a practical example of how reliant the federal government is on provincial political leaders' ability and willingness to foster feed-in tariffs. Provincial governments' jurisdiction over energy resources includes their ownership of public utilities. The federal government is therefore at the mercy of provincial governments with regard to regulating pricing measures over the utilities. Provincial public utility companies owned 82 percent of total generated electricity in 1987. The remaining portion was divided between: industrial establishments (eight percent), investors (ten percent); municipalities (one percent); and two territorial crown corporations (one percent) (NRCan 2004b: 53). As noted in Chapter 3, the creation of any sustainable renewable technology market requires the guarantee of a central grid, responsible for the storage and distribution of produced energy. The establishment of such a market often requires the government to enact laws that oblige the utility companies to buy all wind energy produced in their region at a guaranteed price. The only authorities capable of obliging Canadian utility companies to adopt such obligations are the provincial governments. By 1987 provincial governments had not yet significantly researched wind turbine technologies and had no reason to believe that they could become a financially viable industry. Provincial political leaders possessed full jurisdictional authority and demonstrating no intention or desire to implement regulatory pricing obligations over their utilities. Under these conditions, had federal political leaders even gained the will to impose feed-in regulations on utility companies (which they did not) they still would have been unable to do so. This examination of publicly owned utilities illustrates the absolute importance of provincial political leaders' willingness to the creation of regulatory pricing incentives.[49]

4.5 A Causal Explanation

This section will provide a brief overview of my answer to the central question posed at the beginning of this chapter: *what conditions account for the limited will and/or ability by Canadian federal political leaders, during the late 1980s/early 1990s, to create a wind energy incentive policy similarly favorable to the development of a wind industry?* The absence of a wind energy incentive policy (DV) in the early 1990s was the result of the electoral system (IV) and degree of the centralization of the political system (IV).[50] These independent variables ultimately resulted in federal political leaders' lack of willingness and restricted ability to create a wind energy incentive policy similarly favorable to the development of a wind industry as the Germans'.

The political lack of willingness was molded by federal political leaders' desire for the deregulatory electricity policies (AC). The supply conditions (CV) that provoked their willingness for such electricity policies were the political leaders': a) enthusiasm for deregulatory policies in general; b) willingness to take advantage of the benefits from electricity exports to the U.S.; c) desire to avoid a political showdown with provincial political leaders; d) perception of the unnecessary need to formulate a climate change policy and; and e) ignorance towards wind energy's potential contribution to energy self-reliance. While the first two conditions alone could have been sufficient to influence federal political leader's unwillingness towards heavy command-and-control electricity regulations, the third condition coupled with their jurisdictional inability to implement such regulations virtually guaranteed their unwillingness.

The fourth condition further increased their likelihood of unwillingness in that it does not present these leaders with a perceived pertinent environmental crisis to resolve. The perception of such a crisis itself does not guarantee a reversed willingness towards regulatory pricing incentives that promote wind energy; however, it does improve the prospect of political leaders valorizing alternative renewable supplies of electricity generation. Consequently, the combination of the fourth and fifth conditions understandably contributed to federal political leaders' disregard for the potential value of wind energy. This rationale also leads to the obvious conclusion that political leaders must be aware of both the benefits of wind energy (be they energy, economic or environmentally-related) and the realistic possibilities of harvesting those benefits, in order to valorize it as a prized commodity. While these supply conditions provoked these leaders willingness for such deregulatory policies, the independent variable (IV) with respect to *willingness* emerging from the comparison in this examination is the electoral system. Canada's first past-the-post electoral system is not designed to support the rapid development of newly founded political parties. Therefore, the recently founded Green Party (1983) had neither national nor sub-national representation during this period in question. As a result, no federal political party in parliament identified and focused on the climate change challenge. During the 1980s, no party raised concerted awareness on this issue and applied constant political pressure on the ruling federal leaders to champion a solution to this emerging problem. Consequently, the value of wind turbines to address this challenge similarly did not materialize. Equally as important, without the Greens present in parliament, no party identified the detrimental implications that deregulatory policies posed to the development and growth of a Canadian wind industry. This author does however acknowledge that it is difficult to ascertain the degree to which the existence of an influential Green Party would have altered the policy decisions by federal political leaders. However, regardless of this uncertainty it is clear that without the ability to implement a wind energy incentive policy similar to Germany's, their willingness to do so is somewhat less relevant.

The low degree of centralization of the Canadian political system denies federal political leaders the ability to implement a comparative wind energy incentive policy. Their lack of constitutional authority over electricity regulations and utility companies arrests their ability to implement obligatory pricing regulations. Therefore the degree of centralization of the political system is the independent variable (IV) with respect to *ability* in this examination. The significance of this independent variable on the outcome is only exhibited to a minimal degree in this case study as the federal political leaders were unwillingness to develop a wind energy incentive policy. The absence of provincial leaders' and utility executives' cooperation (CV), denied federal leaders' the ability to access these organizations capable of implementing the will to create regulatory energy pricing incentives (AC). Again in this particular case study the lack of federal political leaders' willingness to create and implement obligatory regulated energy pricing incentives decreased the antecedent condition's (AC) relevance in the outcome (DV). Due to their own disdain of regulatory energy policies, the federal political leaders did not seek provincial leaders' cooperation in pursuing such policies. This mutual unwillingness to create such regulations was more than sufficient to ensure that no such policies emerged.

In my original overview of supply conditions I noted that political leaders' willingness towards a particular outcome must be complimented by their ability to achieve it (Mattli 1999: 42). This case study has demonstrated that the federal political leaders' possessed neither the will nor the ability to create a wind energy incentive policy. At the same time, it also illustrates that according to Canadian constitutional restraints it is provincial political leaders' will, based on their exclusive jurisdictional authority over electrical regulations, that is at the core of any future regulatory developments in Canada's wind industry.

Endnotes

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[37] For the purpose of this examination I define *wind energy incentive policy* as a single outcome that constitutes the regulatory pricing (read feed-in tariffs) and/or financial incentives created to stimulate wind energy production and industry growth.

[38] Traditionally, Canadian political leaders have failed to maintain environmental concerns as issue of national priority. With an abundance of natural resources and a lack of environmentally oriented political parties, energy development has frequently trumped environmental concerns in the Canadian political landscape. Unlike many of its European counterparts, the Canadian federal government has never operated according to pre-cautionary principals. It has never had the Green Party form the official opposition or rule as the official government. Historically, it has rarely prioritized the environment over economic concerns and has seemingly only developed substantive environmental policies and programs when compelled to do so by wide-scale media and public attention (Harrison 1996). The creation of the Department of the Environment (DOE) (know now as Environment Canada or (EC)), in June 1971, itself followed a dramatic three-year increase in media attention and public concern over air and water quality (Harrison 1996; Parlour and Schatzow 1978). Its rapid relegation from an anticipated "super department," capable of enhancing the status of the environment throughout the federal policy decision-making process, to a coordinating agency for scientific and technical research highlights the historical periphery importance of environmental issues in the Canadian political landscape. The DOE failed to live up to the high hopes surrounding it in the early 1970s because it was: "limited by constitutional restraints over provincial jurisdictions; overwhelmed in the attempt to integrate the mandates of the various recently merged departments; and at times stifled as the newcomer in the large bureaucratic structure of the federal government" (Dwivedi et al. 2001: 51). The DOE also suffered from the lack of a complimentary political party championing environmental development and strong guiding environmental principals.

[39] The principal function of this branch was to make sure that renewable energy received full consideration when policy decisions were being made. An additional CAN$ 10 million in R&D funding was also provided for this branch upon its creation. In October, in what appears to be a noteworthy indicator of the federal government's priorities, the Minister Gillespie of EMR announced an additional $ 15 million in

R&D funding. Of these additional funds, $ 6.3 million were earmarked for renewable energy and $ 5.6 million for energy conservation. While both renewables and conservation constituted virtually three-fourths of this additional funding, it was renewable energy that received preferential funding treatment (albeit slight). For more details on these renewable energy policies and legislation, see NRCan (2004d: 53).

[40] The NEP was promoted under the banner of national energy management and focused on three primary objectives: security of supply and ultimate energy independence; opportunity for Canadians to participate in energy industries, especially oil and gas; fairness in pricing and the sharing of revenues among governments and industry. The last of these three objectives proved to be a source of considerable contention between the federal government, industry and western provincial governments as it involved the federal government's objective of increasing the federal revenue share of oil industry revenue from about 10% to 33%. Increased taxes, such as the Petroleum and Gas Revenue Tax – by which oil and gas producers were subject to a tax of 8% of their net operating revenue – proved to be another source of resentment between these parties. The federal government's declaration of a 25% interest charge on a resource development project at any time prior to authorization of a production system for a particular field was viewed in the oil industry as a confiscation of revenues. For more details, see Doern and Gattinger (2003: 28-32); Doern and Toner (1985); and NRCan (2004d: 81 –90).

[41] Two days after the NEP was released, Alberta Premier Peter Lougheed declared in a TV broadcast, his provincial government's decision to reduce oil production by 15% over the next 9 months as a retaliatory measure against the federal government. Canadian oil and gas companies reacted by publicly chastising the federal government's interventionist approach, arguing that their cash flow would be severely reduced by the NEP's regulatory policies. The Canadian oil industry downgraded its drilling expectations for 1981 by 57%. In March 1982 the Progressive Conservatives (PC), effectively boycotted the passing of the NEP bills - consequently shutting down the House of Commons for over two weeks. For more details, see Doern and Gattinger (2003: 28-32), and Doern and Toner (1985).

[42] By early 1985, lead officials within the U.S. Department of Energy had come to the consensus that purchasing electric power from Canada was a better alternative than expanding power generation facilities within the U.S. to meet increasing supply needs. The rise in electricity rates along with the decline of

electricity-intensive steel and aluminum industries contributed to this rationale. For more details, see NRCan (2004c: 86).

[43] Under the new electricity policy, applicants would normally secure authorization for their proposal in the form of an NEB permit which would neither require a public hearing, nor Governor in Council approval. If for any reason the proposal might not be in the Canadian public interest, the Governor in Council, on the advice of the NEB, could require that a public hearing be held. Regulation by the Government of Canada, through the NEB, was to concentrate primarily on those special aspects of a proposal that may not have been sufficiently dealt with by provincial regulatory policies and procedures, in order to ensure specifically that: export and international power line proposals do not have unacceptable environmental or other impacts outside of the sponsoring province; and Canadians wishing to purchase electricity to serve their own domestic requirements are given fair market access to electricity at prices no higher than the price being offered to export customers for electricity being proposed for export. For more details, see NRCan (2004b: 19).

[44] The federal government's problematic conflicting strategy between a commitment to deregulatory policies and to a diversification of renewable energy resources was epitomized in EMR's November 1987 report on renewable energy development, entitled "Energy in Canada: A Backgrounder Paper." The report acknowledges that Canada was entering "a new energy era in which a wide variety of energy sources would compete to meet the energy needs of individuals, businesses and industry" (NRCan 2004b: 24). The report goes on to outline how "in a market-oriented environment, Canada's future energy mix would largely be determined by millions of separate decisions made by consumers and producers, based to a large extent on relative energy prices" (NRCan 2004b: 25). Finally, the report concludes that in the long-run renewable energy technologies, including wind and solar, may be "perfected," resulting in the rise of a new dominate supply of energy. Of course, the problem with this strategy is that it did not account for the dampening of investor enthusiasm that would ensue without guaranteed access or regulated pricing laws. Thus irrespective of political leaders' apparent desire to see renewable energies assume a more prominent role in Canada's energy portfolio, without the electricity regulations encouraging an appealing and certain market, the initial costs entailed in developing a wind industry exceeded the perceived benefits. It is in this regard

that the conflicting strategy between a commitment to deregulation policies and the promotion of a wind energy industry are fundamentally problematic.

[45] For evidence of a lack of climate change policy attention, see NRCan (2004b).

[46] The Canadian media did however become more fascinated with the topic in 1988 when James Hansen, a distinguished American scientist, told Congress and the world about the Greenhouse Effect and the concept of climate change. For more details, see Fletcher and Stahlbrand (1992: 181).

[47] For the fiscal year ending in March 1987, the overall level of energy research and development (R&D) expenditures in Canada was $940 million, of which $470 million was spent in industry, $380 million by the federal government, and $90 million by the provincial governments. Of the federal government's expenditures 52 percent consisted of funding of nuclear R&D through Atomic Energy of Canada. For more details, see NRCan (2004b: 28).

[48] "Under the Constitution Act, legislative authority over management of national resources, and the generation, transmission, and distribution of electricity, rests primarily with the provinces. The provinces have jurisdiction over generating facilities within their boarders and over intra-provincial transmission grids. This mandate of the National Energy Board (NEB) with regard to electricity supply is restricted under the *NEB Act* mainly to regulation of exports and to facilities related to international and designated interprovincial transmission lines" (National Energy Board 1992: i).

[49] Note that the third domestic barrier, the banks, and the renewable technical barriers were not discussed because without provincial governments' and utilities' support the point is mute here.

[50] For more on the terminology chosen in this section, see Van Evera (1997: 7-12).

5 Conclusion

5.1 Summary of Findings

The focus of this investigation was on federal political leaders' will and ability to influence the development of their countries' wind industry. The German case study examined what conditions fostered the will and ability of German political leaders' to establish a wind energy incentive policy that stimulated the creation and development of their country's wind industry. I will now briefly summarize the answers to this question and its accompanying sub-questions. The following three conditions provoked the federal political leaders' willingness: 1) their perception of a need to formulate a climate change policy; 2) their goal of improving economic conditions in general; and 3) their desire not to disrupt the economic gains of competing traditional fossil energy industries.

Of these conditions, their perception of a need to formulate a climate change policy was the most influential. The reason why this condition was so influential in shaping federal political leaders' will was because climate change had became a politically explosive issue that elected federal leaders could not afford to avoid if they were to achieve their objective of staying in power. The costs of avoiding this issue were therefore greater than those entailed in addressing it. The result was that this condition, along with the other two combined to valorize wind turbines and thereby influence federal political leaders' will to establish a wind energy incentive policy that stimulated private sector investment in the development of the country's wind industry.

The following three conditions enabled members of the German federal government to create the desired wind energy incentive policy: 1) constitutional jurisdictional authority and state-level policy cooperation over energy regulation; 2) public ownership of the utility companies; and 3) public ownership of a national bank.

All three conditions were crucial in generating this ability. The reason why the sum of the conditions facilitated the federal political leaders' implementation of their will was because it allowed them to hurdle the traditional costing and regulatory barriers associated with the development of a wind energy industry. These conditions enabled them to overcome these barriers by providing these actors with the necessary cooperation from the organizations capable of facilitating the implementation of their will.

In contrast to the German case study, the Canadian one asked what conditions accounted for the reduced will and/or ability of Canadian federal political leaders' to establish a similar wind energy incentive policy favorable to the development of a wind industry. The following five conditions reduced Canadian federal political leaders' will: 1) their high enthusiasm for deregulatory policies; 2) their willingness to benefit from electricity trade with the United States; 3) their desire to avoid a federal/provincial jurisdictional battle over energy regulation; 4) the fact that climate change was not yet on their political radar in 1987; and 5) their lack of awareness regarding wind energy.

Of these five conditions the first three listed were the most influential in reducing willingness because they provided these actors with attractive economic and political justifications to avoid any policy approaches that involved regulating the energy sector. The latter two were significant in that they did not present these actors with the political or economic benefits needed to stimulate their willingness to create incentives for the wind industry. The result was that the sum of these conditions reduced Canadian federal political leaders' willingness to endorse a wind energy incentive policy that conflicted with their prioritized deregulatory approach.

Since the federal willingness did not exist during the specific time period of focus the ability to translate this will into action had less relevance with regard to the final outcome than in the German case study. However, the conditions that affect Canadian federal political leaders' ability are very relevant today, in an era where willingness has been exhibited. The following three conditions therefore obstructed, and continue to obstruct, federal political leaders' ability to generate a similar wind energy incentive policy to a high degree: 1) a lack of constitutional authority over provincial energy jurisdiction; 2) provincial political leaders' resistance towards command-and-control energy policies; and 3) provincial ownership over public utilities.

Of these three conditions, the first two are the major impediments to federal political leaders' ability. All three, but particularly the first two, conditions hinder their ability by preventing them from overcoming the traditional barriers of renewable energy development. These conditions denied federal political leaders the necessary cooperation from the organizations capable of facilitating the implementation of their will.

5.2 Explanatory Range

This examination determined what conditions prompted and reduced federal political leaders willingness and ability to create a wind energy incentive policy. In both case studies the outlined conditions revealed the domestic elements that influenced each country's respective outcome. This investigation has illustrated that the differences between each countries' domestic conditions contributed to the diverging degree between their will, ability and wind energy incentive policy. In this respect, the findings from this examination cast a wide explanatory range over this comparative case study. However, it is limited in deciphering the conditions in other countries that influence federal political leaders to create a wind energy incentive policy. Since this study probes the specific domestic conditions of these two countries its findings are limited to countries with similar domestic conditions. This being said, my examination of two advanced industrial countries at the farthest ends of the outcome spectrum compensates somewhat for this country specific focus. The discovery of the conditions found in this comparative case study in other countries does not justify, on its own, the assertion that the similar degrees of willingness, ability and the wind energy incentive policy will ensue in these countries. Instead, the discovery of such conditions can act as a guide in determining the motivations behind such independent and dependent variables. These conditions would then need to be qualified with a complete overview of the additional domestic conditions that could affect these motivations.

Any desire to expand my findings into a hypothesis concerning all advanced industrial countries would require a large-n analysis that would test a hypothesis based on my findings. Such an analysis would be useful in determining whether the conditions discussed in this investigation represent the core conditions influencing federal political leaders in virtually all advanced industrial countries.

5.3 Two Lessons Learned

Lesson # 1: The independent variable with respect to "willingness" (the necessary condition) stemming from the comparison in this examination is the electoral system.

This investigation demonstrates how different electoral systems (proportional representative in Germany and first-past-the-post in Canada) influenced the Green Party's access to subnational and/or national representation. The German case study isolated which specific domestic conditions can increase political leader's degree of willingness towards augmenting installed wind capacity levels. Arguably the most prominent of these conditions was the presence of a powerful Green Party, vested with the ability to influence legislative and electoral outcomes. This influence came in large part as a result of the proportional representative electoral system that provides a pragmatic means for newer political parties to effectively challenge the electoral dominance of more traditional ones in a coalition government. The political pressure exerted by the Greens (during the late 1980s) on the ruling government, to address the public's fears over climate change was crucial in fostering a significant degree of willingness. By 1990, this pressure had contributed to the Federal Cabinet's adoption of a 25-30 percent CO_2 emissions reduction target by 2005. By the end of 1990 the pressures and suggestions by the Greens to meet these carbon targets had contributed tremendously to the valorization of wind turbines, which catapulted leader's will to develop a wind industry through regulated pricing incentives. This influential pressure exerted by the Green Party on the ruling government was made possible by the fact that it had become a powerful party in a coalition government, as a result of a proportional representative electoral system.

In Canada, the Green Party's absence during the 1980s and most of the 1990s, resulted in negligible political pressure by a federal party on the ruling government to reduce nuclear energy programs and support wind energy technologies as a partial solution to the climate change challenge. Unlike their German counterparts, the Canadian Green Party operates in a first-past-the-post electoral system that does not provide pragmatic means for a newer political party to effectively challenge the electoral dominance of more traditional parties. As a result, the Green Party did not and currently does not have access to subnational and/or national representation. The Canadian Green Party has subsequently lacked a voice, never-mind an influential one, in Parliament concerning their perspective on the policies and programs of the ruling government. The importance of the Greens' absenteeism is particularly noticeable in the wake of the 1986 Chernobyl disaster and 1992 Earth Summit. With no influential federal Green Party to challenge the ruling government at these opportune occasions the valorization of wind turbines did not take place until the federal Liberal's informal Kyoto commitment in August 2001 – an entire decade after the German's more ambitious carbon reduction target was set.

The first lesson learned from this particular examination is that in a country (Germany) where an electoral system operates according to proportional representation there existed greater representation of environmental interests in the subnational and national parliaments, which led to greater support for renewable sources of energy, than in a country (Canada) where a first-past-the-post electoral system was in place. Further investigations beyond this one could lead to a testable hypothesis from this independent variable. The hypothesis from this particular independent variable (electoral systems) would be: if a nation's electoral system exhibits proportional representation, then we are more likely to witness the representation of environmental interests in the subnational and national parliaments, which should led to greater support for renewable sources of energy.

Lesson # 2: The independent variable for "ability" (the sufficient condition) emanating from the comparison in this investigation is the degree of centralization of the political system.

This examination highlights how the degree of centralization in a democratic political system can determine federal political leaders' ability to create national wind energy incentive policies. The Canadian case study illustrated those federal political leaders working in a decentralized political system lack the constitutional authority to create the regulatory elements present in the German wind energy incentive policy. As a result of this institutional constraint Canadian federal leaders' ability to implement such a policy is completely reliant on provincial political leaders' willingness to comply. The example of the National Energy Program controversy demonstrates that any attempt by the Canadian federal government to dictate intrusive energy policies to provincial governments will be met with vehement opposition and will ultimately fail. Without the constitutional jurisdiction, the federal government simply does not have the ability to implement obligatory pricing regulations for wind energy. Federal political leaders willing to stimulate increased wind capacity generation are therefore restricted to financial incentives, such as the WPPI. In order to move beyond financial incentives towards a national feed-in tariff system, the federal government would require the willingness and cooperation of individual provincial governments.

The German case study illustrates how a more centralized political system reduced the relevance for regional government compliance. German federal political leaders required 60 percent of regional governments to approve the implementation of their feed-in law. Although the German case demonstrates the federal leaders need for regional cooperation it illuminates their reduced reliance on this cooperation in order to implement such regulations.

The second lesson learned from this examination is that German federal political leaders operating in a more centralization democratic political system were less reliant on their regional counterparts to implement the regulatory pricing measures related to the wind energy incentive policy than Canadian ones. Further investigations beyond this one could lead to a testable hypothesis from this independent variable. The hypothesis from this particular independent variable (degree of centralization of the political system) would be: the more centralized a democratic political system is, the less likely regional political leaders are able to veto federal leaders' plans to implement regulatory pricing policies for renewable energy sources.

5.4 So What?

From a political-economy perspective, the principal significance of this examination is that it explains why a government of an advanced industrial state adjusted market conditions in order to strongly encourage the redirection of private capital into a specific industry of choice, while the government of a similarly advanced industrial state did not.

The explanation of what motivated federal political leaders' decisions and why these decisions affected the wind industry should be of substantial importance to any student of the dynamic interplay between the state and market.

The discovery of how instrumental political leaders' valorization of wind turbines is in fostering their willingness to promote this technology has tremendous implications for the future growth of the wind turbine industry in other countries. Similarly, the exposure of the conditions that provoke political leaders valorization of this technology are highly relevant for policy and industry analysts pondering whether an opportunity to create wind energy incentive policies similar to those in German currently exist in their country. In this regard, the significance of this examination is that it provides a guide or starting point for federal political leaders of advanced industrial nations who are presently strategizing and analyzing the benefits, costs and capacity entailed in providing the incentives that stimulate the development of a domestic wind industry. Increasing global energy demands along with decreasing supplies of traditional sources and the environmental concerns posed by our fossil-fuel economy make this an increasingly urgent matter. This examination relays the experiences of two advanced industrial nations, Germany and Canada, in the hope that by clarifying the reasons for their respective success and failures current and future federal political leaders can formulate constructive wind energy incentive policies that take advantage of the knowledge-sets established in this investigation.

The significance of the discoveries made in this research extends beyond the confines of this particular case study. Comparing the German case study with the Canadian, using a process tracing method, exposed the specific domestic conditions that contributed to the each nation's divergent outcome during the early 1990s. Future research comparing Canada's domestic conditions to other nations' could similarly yield further useful insight for various stakeholders in this field. Canadian federal political leaders could benefit by learning what specific conditions provoked political willingness in other countries and determine if any such conditions exist in Canada and could be used to motivate provincial political leaders' willingness. In addition, Canadian federal leaders could gain valuable insight from the measures taken by other national governments' in terms of improving upon current policy incentives, particularly WPPI.

Provincial political leaders could benefit by learning which incentive policies worked and which failed - and under what particular circumstances – in an attempt to formulate their own strategy on generating a domestic wind industry and augmented installed capacity levels. Moreover, provincial governments would gain valuable knowledge on regional issues ranging from interconnection regulation and pricing to shaping and gaining community acceptance for wind farms. Additional case studies of other nations would benefit provincial political leaders by illustrating how other national and regional governments under similar circumstances have resolved these complex issues.

Scholars of the wind energy field would also be well served to continue in these comparative case studies. Those focusing on the Canadian market could identify what conditions in other successful countries could be useful in catalyzing domestic production. Furthermore, they could assist political leaders by highlighting what policy measures were most and least effective in other countries that share similar national-regional jurisdictional boundaries. Scholars more concerned with the global market could use the domestic conditions emphasized in this case study to analyze and explain the stimulant behind current wind energy policies, or lack their of, employed by national governments around the world. One such example of this analysis would be identifying the countries whose national governments' maintain constitutional authority over energy regulations and have demonstrated interest in augmenting installed wind capacity levels. Ongoing research of this nature could expose developing trends in the wind industry and in the domestic conditions that most often compel political leaders to stimulate industry growth.

Investors and manufacturers in the wind industry can also benefit from such comparative research. These stakeholders could gain a clearer understanding of which countries are most beneficial to invest in by identifying and recognizing the common domestic conditions that have most frequently motivated political leaders to support the creation and maturation of a wind industry. Conversely, manufactures and investors could avoid sinking money into countries where the domestic conditions do not traditionally lend themselves to a vibrant wind industry.

Advocates of wind power, such as NGOs and lobby groups, would benefit from the lessons learnt in comparative case studies by gaining detailed knowledge that could be used to inform political leaders on how to structure policies in a manner that suits their desired ends. Drawing from experiences around the world, wind energy lobbyists could strengthen the persuasiveness of their arguments and become a trusted source of advice on the industry for political leaders looking for informed perspectives to assist in their understanding. The obvious benefits from this privileged position would be the possibility of influencing the content of future policy decisions.

Further investigations building on the findings and lessons learned from this one could test the previously mentioned hypothesis relating to the independent variables: electoral system and degrees of centralization of the political system. Thorough testing using large-n case studies would be required for both hypotheses. In the first case study, a focus of interest, in light of the findings from this investigation, would be the level of support for wind energy policies in advanced industrial nations that have proportional representative electoral systems and where the Green Party was in a coalition government at the national level. In the second case study, the focus of interest would be on regional political leaders' legislative influence over federal leaders depending on the centralization of the political system. However, a subsequent focus of attention could be centered on the degree to which non-governmental actors (e.g. industrial and/or labor organizations), influence federal political leaders' wind energy policies in centralized democratic systems.

Of the two independent variables, the latter (degree of centralization of the political system) appears most relevant to Canadian federal political leaders' future attempts to develop a domestic wind energy industry. The practical implications for federal leaders' willing to catalyze a wind industry yet legislatively restricted in their ability to implement national regulatory pricing measures are: 1) to take the provinces to the Supreme Court, under the Provision of Good Government, in an attempt to regain federal jurisdiction over energy related matters; or 2) to develop bilateral conditional agreements with individual provinces wherein federal financial incentives are committed in conjunction with provincial regulatory pricing measures. The first option is a high risk one that would likely result in dramatic political clash between federal and provincial leaders. It could be seen as a highly unpopular move in the media, as was the case with the Liberal's National Energy Program and the case itself would likely drag on for years before a verdict is reached.

The second option, based on bilateral partnerships would present far less risks for federal political leaders in addition to providing provincial leaders motivation for enacting substantive wind energy support policies. This approach could have a mixed result, with some provincial governments accepting these terms while others might not. However, the establishment of regulatory and financial incentives in several provinces alone could encourage investors and turbine companies to establish domestic manufacturing operations. A consistent demand for wind energy, resulting from utility companies' legislated mandate to purchase a specific portion of their electricity supply from this renewable source, along with favorable investment conditions would more than likely lead to the rapid development of a robust wind industry in Canada. As the economic and employment benefits of this new industry become apparent to other provinces, their government's willingness to engage in similar bilateral agreements would likely increase. For these reasons, the second option appears far more viable and promising for federal leaders willing to stimulate Canada's wind energy industry.

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