POWERING AND PUZZLING:

OFFSHORE WIND ENERGY POLICY INNOVATION, IMPLEMENTATION, AND LEARNING IN MASSACHUSETTS

A dissertation presented by
Michael Julius Motta Jr.

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ABSTRACT OF DISSERTATION

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ABSTRACT

Public policy is not created in a vacuum. Policymakers actively seek policy ideas, experiences, and knowledge from other governmental entities to reduce uncertainty and inform decision-making. Although the policy learning literature is well-developed, most studies focus on mature policies that have already diffused among many governments. Further, existing frameworks presume no distinction between policy *invention* and policy *emulation*, a far cry from Steve Jobs' axiom that "innovation distinguishes a leader and a follower." This study makes that distinction by exploring how Massachusetts and federal policymakers learned from policy models elsewhere as they crafted first-in-the-nation offshore wind energy policies.

In Chapter 1, I provide an overview of the study, and argue that the case of U.S. offshore wind energy policy formation does not readily apply to existing theories of policy learning. Chapter 2 details the context in which U.S. energy policy is crafted, demonstrating that supplanting fossil fuels with alternative sources of energy is a task without precedent. Chapter 3 reviews the policy learning literature, showing that we have narrow conceptions of *why* policymakers seek policy lessons from elsewhere, *from whom* they learn, *what* they learn, and *how* they interpret and apply lessons learned. Chapter 4 presents this study's research method and analytic approach, describing how mechanisms of policy learning were inferred from interviews with key policy actors, archival data, and contextual information. Chapter 5 describes offshore wind energy governance in Massachusetts. Chapter 6 narrates six specific policy learning processes, and explains which factors were most explanatory, and what mechanisms were inferred from the data.

The results suggest that, despite having only a few directly analogous policy models to learn from, policy learning was prevalent. Implementers first sought lessons from Denmark and

the U.K., pioneers in offshore wind energy. Although they learned fundamental technical details and general environmental effects of offshore wind energy development, unique features of U.S. governance, and political circumstances, undermined emulation. As Chapter 7 concludes, this context—although unique—represents the new normal: governance in the face of substantial uncertainty.

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As a high school student, I gave my parents little reason to suspect I would someday achieve any degree of academic success, yet they never seemed surprised. Their confidence became my confidence. My Nana and Papa served (and serve) as my greatest inspiration, and without "lesson-drawing" from them, I would not be the person I am today. My most constant companion as I typed away in my office was Azzy. As John Prine observed, some humans ain't human. But as Azzy proved, some cats are. Azzy waited for me to defend my dissertation before passing on, and I cannot thank him enough for getting me through the early mornings and the long days. Thank you buddy.

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Who Puzzles the Puzzlers?

> Politics finds its sources not only in power but also in uncertainty–men collectively wondering what to do... Governments not only 'power'... they also puzzle... Much political interaction has constituted a process of social learning expressed through policy. (Heclo 1974, 305-306)

In 1997, Massachusetts made sweeping changes to its energy policy. The state deregulated its electricity market, enacted a renewable portfolio standard, and created a multi-million dollar fund to incentivize renewable energy development. In 2001, this policy trifecta encouraged a power producer to propose Cape Wind, an offshore wind (OSW) farm in Nantucket Sound. And so began a particularly apt example of Heclo's part-powering, part-puzzling conception of policymaking. Cape Wind, if approved and built, would be the first OSW farm in the U.S., and among the first in the world.

This study explores how policy puzzling (identified as 'policy learning' in the literature) informed the decision-making of state and federal policymakers crafting first-in-the-nation OSW policies from 1997-2006.[1] In doing so, this dissertation goes where few studies have gone before. Although the policy learning literature is well-developed, existing studies primarily focus on mature policies that have already diffused among many governments. By contrast, we know comparatively less about policy learning in still-emerging policy domains (Bennett and Howlett 1992).

As Berry and Berry (1990, 223) observe: "students of policy innovation explicitly choose not to study policy invention—the process through which original policy ideas are

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[1]When I began this dissertation, it appeared likely that Cape Wind would be up-and-running in 2016. As I write this sentence, it appears that Cape Wind may never go into operation (O'Sullivan 2015). Although I initially presumed Massachusetts would be the first (or second) U.S. state to have commercial-scale OSW capacity, the fact that it may not does not change the relevance of my study or its results. If anything, it highlights the uncertainty faced by policymakers. Even if Massachusetts—or the U.S. at-large—never has commercial-scale OSW capacity, state and federal policymakers were still policy innovators.

conceived.“ In fact, the literature defines 'policy innovation' as any policy adopted by a jurisdiction for the first time. As such, existing frameworks presume no distinction between policy *invention* and policy *emulation,* a far cry from Steve Jobs' axiom that "innovation distinguishes a leader and a follower" (Woo 2013). This study makes that distinction by exploring the dynamics of policy learning and diffusion as a policy model is newly-forming, before it can serve as an inspiration or as a cautionary tale for other governments. In many ways, this context represents the new normal: *governance in the face of substantial uncertainty* (Van Bueren, Klijn, and Koppenjan 2003).

Policy Inventors

Officials from the Massachusetts Technology Collaborative (MTC), a quasi-public economic development agency, were given broad discretion over the allocation of over $100 million to promote and incentivize the development and use of alternative energy. Had MTC officials opted not to consider Cape Wind, you wouldn’t be reading this. MTC was the gatekeeper and the starting point of this study.

MTC’s decision to consider Cape Wind also gave the impetus to the formation of OSW policy at the federal level. Like all proposed offshore construction projects, Cape Wind required a construction permit from the U.S. Army Corps of Engineers (the Corps). This was the extent of the Corps’ authority, but it was the only federal permitting agency with any statutory authority over OSW. That fact required the Corps to become the ‘lead agency,’ a legal classification that obligated it to conduct a comprehensive review of the proposal, and its alternatives, despite not having the knowledge, resources, or authority to do so.

Policy Learning and Diffusion

Put most simply, *policy learning* (PL) is a process in which a policymaker *actively* seeks policy ideas, experiences, or knowledge from another governmental entity to reduce uncertainty and inform decision-making. *Policy diffusion* (PD) occurs when a policy formulated in one jurisdiction affects policy in another jurisdiction, even if only by osmosis. I use the term '*policy learning and diffusion*' (PLD) to refer to situations when learning contributes to or causes diffusion. (As we will explore later, learning is not the sole cause of diffusion.)

Although these terms are not popularly known, examples are everywhere:

As I write this, policymakers in cities across the world are trying to figure out what to do about the rise of Uber, a multi-billion dollar "ride-sharing" service that seemingly came out of nowhere to threaten the existence of the long-established taxi industry. As urban policymakers throw up their arms in frustration about how to deal with this market disruptor, they look to others who are also throwing up their arms (Boroyan 2015).

Policy learning is even seen in presidential politics. During the 2012 U.S. presidential election, President Obama argued opponent Mitt Romney was a hypocrite for opposing 'Obamacare' when that health care plan in fact emulated 'Romneycare.' (Organizing for Action 2012). Reporting on the 2016 U.S. presidential election, the *New York Times* gave an account of a speech given by Governor Chris Christie of New Jersey, a likely presidential candidate, in Mexico:

> [Christie] quoted the writer Bill Bryson and the energy expert Daniel Yergin. He offered lavish praise for the market-oriented overhauls of the Mexican president... And he took pains to present himself, over and over, as an eager student prepared to absorb the lessons of his Mexican counterparts... 'I want to listen,' Mr. Christie said at one point. 'I have much to learn,' he declared at another. (Barbaro 2014)

PLD can also have life-or-death consequences. John Brennan, national security adviser to President Obama, concedes that:

> as our nation uses [armed drones], we are establishing precedents that other nations may

> follow, and not all of those nations... share our interests or the premium we put in protecting human life, including innocent civilians. (Entous 2012)

Kellerman and Peleg (2013, 3), examining Boston's response to the Marathon bombings in the *New England Journal of Medicine*, attribute much of the effectiveness of first responders to lessons they drew from Israeli first responders, who developed their expertise over years responding to terrorist bombings. A few months prior, Boston organized a conference for emergency medical personnel from around the world to share post-terror experiences. Other cities, the authors conclude, "should take that to heart."

Laboratories of Democracy

The dynamics of PLD are frequently seen in federal systems where subnational governments can serve as natural experiments, the so-called "laboratories of democracy," from which co-equal and higher-level governments can learn (Brandeis 1932). The U.S. model of federalism is most often associated with the "laboratories of democracy" metaphor. Defined generally, federalism is: "a political organization in which the activities of government are divided between [subnational] governments and a central government in such a way that each kind of government has some activities on which it makes final decisions" (Riker, 1975, 101). Under U.S. federalism, states have the same set of activities on which they can make final decisions. As such, policy contexts vary less between U.S. states than, say, between Northern Ireland and Taiwan, or other random pairings of governments around the world. It stands to reason that more similarly-situated governmental entities can offer more—and perhaps better—lessons to each other, or to their national government.

History provides plenty of examples of PLD among the U.S. state and federal governments. In the 1920s, states experimented with liberal social programs, many of which were emulated by the federal government in subsequent decades (Frederickson, et. al. 2011;

Nathan 1993). Policies also diffuse in the opposite direction. Many states emulated the federal government's Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) in regulating hazardous waste site cleanups (Daley and Garand 2005). Policy also diffuses like the Knight piece in chess—vertically and horizontally. In the early 1990s, the federal government deregulated interstate wholesale electricity markets, contributing to similar policies at the state-level for in-state retail markets (EIA 2010). The federal government did not mandate that states deregulate their in-state markets. It did not need to. Instead, starting with California and east coast states, deregulation diffused throughout much of the U.S., effectively leading to a national "electricity policy" (Komor 1994).

Less studied is how U.S. states draw lessons not from other states or from the federal government, but from *foreign governments*. Governance differences between U.S. states and foreign governments, among other factors (e.g., cultural insularity), can make lesson-drawing from non-U.S. examples quite difficult. Yet, under certain circumstances—like the crafting of OSW policy—the various U.S. states do not have domestic examples from which to learn. They have no choice but to look beyond the nation's shores.

Puzzling the Puzzlers

In this study, I ask:

> Through what causal mechanisms did policy learning inform the decision-making of state and federal policymakers crafting first-in-the-nation OSW policies from 1997-2006?

The literature firmly demonstrates that policymakers draw lessons from the policy experiences of other governments, and that lessons affect decision-making, and ultimately policy itself (Bennett and Howlett 1992). Despite a well-developed literature, no existing framework was well-suited to answering this question for reasons of both subject matter and methodology.

The PLD literature neglects policymaking in still-emerging policy areas. And as a matter of methodology, the existing literature rarely examines up-close the actions and events linking a policy lesson learned with a policy lesson applied. We know that policy learning contributes to policy diffusion, but we know little about *how* it does so (Starke 2013).

Let me use the previously discussed real-world examples to explain what we know and what we don't know about PLD:

Although we can reasonably presume that 'Obamacare' was in some way inspired by 'Romneycare,' we don't know how federal policy architects actually drew, and applied, lessons learned from Massachusetts.

Governor Christie praised Mexico's recent deregulation of its energy markets, but how will policy lessons affect his policy positions? Where is the line between genuine policy "puzzling" and electoral "powering?"

John Brennan fears that U.S. policy on armed drones will diffuse to other nations. But how will other nations' policies change? More importantly: where, when, and against whom will they use armed drones?

We know that emergency personnel from Boston learned from emergency personnel from Israel, and that lessons learned might have saved lives. However, we do not know answers to questions like: Which specific experiences were shared? How were lessons interpreted and subsequently applied to Boston's policies? Kellerman and Peleg (2013) argue that other cities should follow the lead of Boston's first responders and draw lessons from those who have first-hand experience with terror attacks. This makes sense, and surely the advice applies to policymakers in other contexts. However, we know little about the causal mechanisms at work, especially when the decision-makers are mid-level agency officials or street-level bureaucrats like emergency personnel (Lipsky 2010). So, like Kellerman and Peleg, we can call for more and

better PLD, we can offer little advice for how to do so.

Overview and Summary

The remainder of this chapter describes this study's organization and provides an overview of the chapters to come.

Chapter 2 details the policy context in which state and federal OSW policy was crafted, and argues that supplanting fossil fuels with alternative sources of energy is a task without precedent. Reasons are several. Energy governance and electricity regulation in the U.S. is a complicated web that spans all levels of government, and includes actors from both inside and outside of governance. As the World Energy Council observes:

> "Energy policy affects everything we do, from issues of national concern such as national security, economic development, and sustainability, to more mundane aspects of our daily lives such as our access to power and fuels and the effect on our immediate environment." (World Energy Council 2011, 5).

Since the 1970s, U.S. policymakers have sought to encourage alternative energy development. Yet 40 years later, the percentage of the U.S.'s electricity from alternatives remains nearly the same: 12% (DSIRE 2014).[2] Historically, large-scale energy transitions (e.g., steam engines replacing water mills or electrical lighting replacing gas lighting), only occur after decades of innovation and experimentation (Norberg-Bohm 2000; Grübler and Wilson 2013; Yergin 2012). However, as Unruh (2000, 817) observes, the current energy transition is particularly arduous:

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[2]This figure excludes hydropower and nuclear. Although an "alternative," hydropower is criticized for its harm upon wildlife, waterways, and local industries like fishing. Similarly, nuclear power, despite emitting zero greenhouse gases, requires a place to dump highly-toxic waste, and carries the risk of a meltdown or terrorist attack. For these reasons, the EPA and others do not group them with sources like wind and solar.

> industrial economies have become locked into fossil fuel-based technological systems through a path-dependent process driven by technological and institutional increasing returns to scale. This condition... arises through a combination of systemic forces that perpetuate fossil fuel-based infrastructures in spite of their known externalities and... cost-neutral, or even cost-effective, remedies... [I]nstead of... correcting market and policy failures, governments frequently exacerbate them through subsidy and institutional policy.

Wind and solar power have several well-known advantages over fossil fuels: They do not emit pollutants during operation. The wind and the sun are more evenly distributed than pockets of oil and gas. They are not exhaustible and do not have fuel costs, creating less price volatility than fossil fuels. Many consider OSW to be a particularly promising alternative and critical to a successful energy transition (Motta 2014; NREL 2010). The New England and Mid-Atlantic coasts, as well as the Great Lakes regions, are particularly well-suited for OSW energy development. Each is close to population centers, and each has relatively shallow bodies of water and strong winds (Melnyk and Andersen 2009, 28). In fact, the amount of potential OSW energy in the U.S., not counting environmentally sensitive areas or areas within 3 miles of the coastline, is nearly 1 million mega-watts (Watson and Courtney 2004). To put this in perspective, total installed capacity in the U.S. was just over 1 million in 2011 (EIA 2013).

Although Unruh (2000), quoted above, implies that we could, with enough willpower, move away from fossil fuels tomorrow, alternatives are not without their own drawbacks. Alternative energy development imposes its own harms, implicating environmental concerns, laws, and approval processes, and ultimately, substantial amounts of litigation (Nagle 2013). Alternative energy is intermittent, and cannot be ‘stored’ in the way that fossil fuels can. (Except perhaps with new battery technology.) As a result, it is difficult to make them the primary source in a region unless a substantial number of wind turbines or solar panels are spread over wide distances (Komor 2004, 7; Melnyk and Andersen 2009, 15). Recent technological advances and favorable federal policies have also allowed for a substantial increase in the amount of accessible natural gas, lowering prices, and making alternatives less cost-competitive. At some level, most

agree that alternatives should replace fossil fuels. But the devil is truly in the details.

As this chapter describes, supplanting fossil fuels with alternative sources of energy is a task without precedent, requiring policymakers to craft policy with few, if any, existing models to learn from. This unique context does not readily apply to existing frameworks of PLD.

Chapter 3 reviews the literature that informed this study. In doing so, the chapter demonstrates how existing frameworks are not suitable for the unique context of OSW policy implementation as described above. The chapter begins with an overview of the *diffusion of innovations* literature, focusing on the diffusion of energy innovations. It then narrows in on *policy diffusion* and three of its major causes: competition between co-equal governments, coercion or persuasion by a higher-level of government, and influential external norms.

Next, Chapter 3 reviews the *policy learning* literature, showing how existing studies primarily focus on mature policies that have already diffused among many governments. The primary method used by PLD scholars is retrospective quantitative analyses that take place decades after the specific context for PLD has passed (e.g. studying the diffusion rates of state lottery programs after 47 states have them) (Berry and Berry 1990; Boushey 2010). Such post-hoc analyses ignore policies earlier in development, as well as policies that do not diffuse widely. Further, the dependent variable in such studies is typically whether or not a government adopted a statute in a given year. Treating diffusion as such ignores policy content, and misses the opportunity to explore how policy evolves as it diffuses from one adopter to another (Boushey 2010).

The literature's near-exclusive focus on diffusion of statutes also neglects the many other forms of public policy (Bennett and Howlett 1992). We know comparatively less about diffusion when legislatures defer important decisions to administrative agencies, or when policy

diffuses via broad policy networks that cross jurisdictional and governmental borders, and include several actors from inside and outside of government (Bennett and Howlett 1992; Sabatier and Mazmanian 1980). This approach also misses the role of personal contacts between policy actors, which Wolman and Page (2002) argue is the most common and important means of diffusion.

In short, Chapter 3 argues that we have narrow conceptions of *why* policymakers seek lessons*, from whom* they learn, *what* they learn, and how they *interpret* and *apply* what they learn. To address some of these shortcomings, this study is also informed by—and Chapter 3 also reviews—the 'process-tracing,' policy implementation, Advocacy Coalition Framework, and network governance literatures.

Chapter 4 presents this study's conceptual framework, research method, and analytic approach. In order to identify and explore mechanisms, my framework combines the contextual information provided in Chapter 2 with concepts described in Chapter 3. I used concepts from various literatures to identify and explore possible OSW PLD mechanisms that emerged from the data.

To this end, I used two stages of data collection and analysis. In the first round, I used exploratory, open-ended interviews and archival research to identify potential PLD mechanisms within the policy network. Interview subjects came from various state and federal agencies, as well as quasi-public and nongovernmental organizations, listed in Appendix E. In total, there were 11 interview subjects. Six causal mechanisms emerged from the first round of data collection and analysis. In the second round, I collected additional data from more in-depth, semi-structured interviews with key policy actors, in addition to archival data and contextual information. Sometimes PLD would be obvious, such as when a public document mentioned a

policy model from elsewhere, or when interview participants immediately identified why, what, when, and how they learned. Other times, it was less obvious, and inferences were made based on triangulated information.

To explore and identify the emergent causal mechanisms, this study uses the 'process-tracing' approach. *Causal mechanisms* are the sequence of actions and events that link a condition or cause (e.g., policy learning) with a purported outcome or effect (e.g. policy diffusion) (Bennett and George 2005). In the same vein, *process-tracing* is a qualitative method in which researchers seek "empirical traces" of the actions and events that constituted the causal mechanisms between a purported cause and its purported effect (Starke 2013, 574).

Rather than testing the relationship between causes and effects, process-tracing studies presume causation, and seek to discover *how* or *why* A led to B. This method is particularly well-suited to single-N, within-case analyses where theory-building or theory-development, not generalizability, is the goal (Bennett and George 2005). Process-tracing studies allow (and encourage) the use of highly-contextualized concepts and explanatory factors from multiple theories in order to see which explanatory factors were present, which were most significant, and which should be modified for future studies (Hall, 1997).

The study conceptualizes the PLD process as having four stages:

In the first stage, policymakers, faced with uncertainty, form an *intention* to learn ("How could we possibly implement this law? We don't know anything about offshore wind! We must see who else has done this!") In the second stage, they *acquire* a lesson from elsewhere ("Thank you for answering my questions about your offshore wind policy.") In the third stage, policymakers *interpret* what they learned in the context of their own policy problem and governance structure ("That is an interesting policy model they've got, but I am not sure it is politically feasible here.") In the fourth stage, policymakers decide how to *apply* the lesson

("Let's borrow this one element of their policy model, but not the rest of it.")

To guide my search for "empirical traces" of these stages, I asked secondary research questions related to each, shown in Figure 1.1 below.[3] The answers to each of these questions were considered the causal 'links,' which taken together comprise a PLD mechanism.

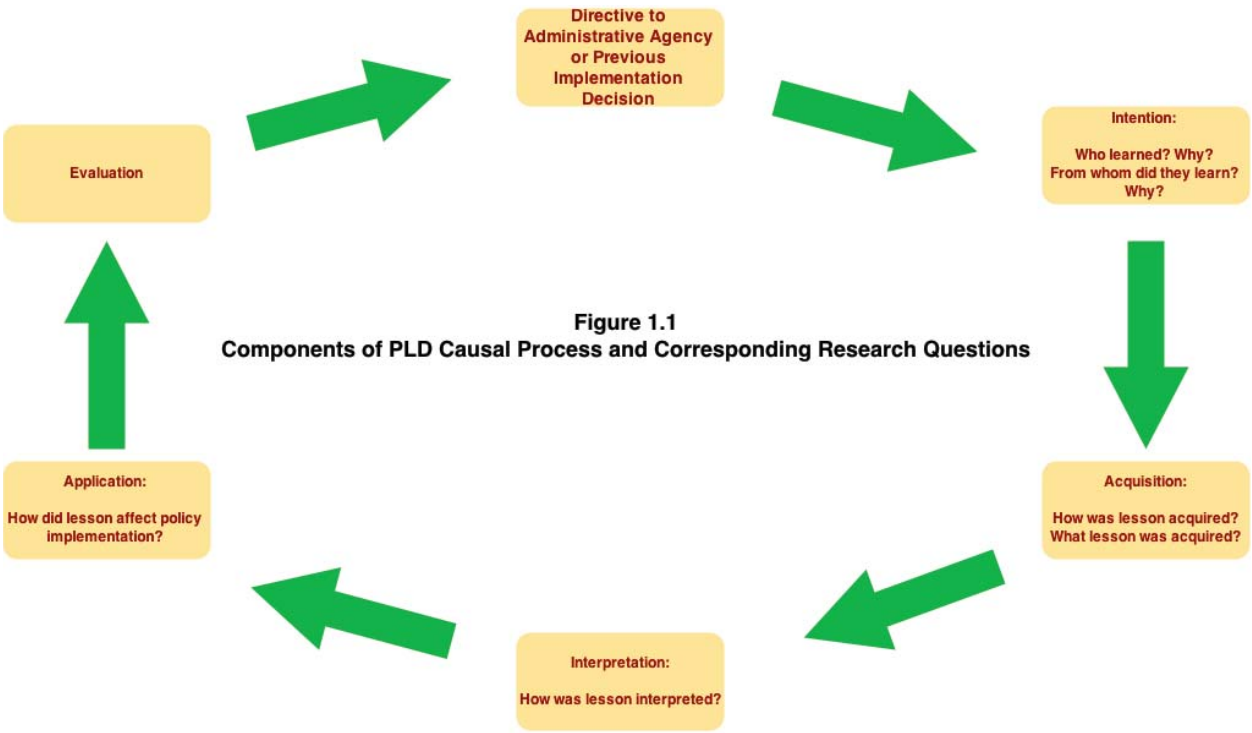

Figure 1.1
Components of PLD Causal Process and Corresponding Research Questions

Adapted from Bennett and Howlett (1992), Heikkila and Gerlak (2013), Rose (1993; 2005), and Wolman and Page (2002).

Chapter 5 builds upon the general context provided in Chapter 2, describing the specific dynamics of OSW policy implementation in MA. It serves two purposes. First, the chapter introduces the cast of characters and policies that played the key roles in the PLD

[3]I conceptualized "application" of a particular policy lesson as *policy diffusion*, the end of the PLD causal process. Therefore, I did not explore subsequent "evaluation" of policy lessons. However, I include it here as it highlights the iterative nature of PLD--PLD processes often lead to subsequent PLD processes.

processes. Second, Chapter 5 explores the role of causes other than learning that may have played a role in diffusion, such as competition between Massachusetts and other states, federal coercion and persuasion, and influential external norms. By parsing (to the degree possible) the various causes, stronger inferences could be made.

Chapter 6 describes the actions and events that emerged from the data, which factors were most explanatory, and what PLD mechanisms were inferred. Despite having only a few directly analogous policy models to learn from, PLD was prevalent. Implementers first sought lessons from Denmark and the U.K., pioneers in offshore wind energy. Although they learned fundamental technical details and general environmental effects of OSW development, unique features of U.S. energy governance, and political circumstances, prevented emulation of effective policies from elsewhere.

Chapter 7 discusses my results and their implications for PLD theory and practice. From the six mechanisms narrated in this study, I infer a more general mechanism regarding how policy implementers engaged in OSW PLD. I then evaluate the efficacy of OSW PLD in light of the fact Cape Wind may never go operational, and what this means for the energy transition overall. In conclusion, I argue that my study highlights a methodological problem for PLD studies, strengthening the contention that process-tracing studies have much to offer our understandings of PLD.

Chapter 2: A Wicked Solution for a Wicked Problem

This chapter first provides basic definitions relevant to understanding what follows. Next, I consider the ongoing transition to alternative sources of energy. I then explore the role played by uncertainty, innovation, and experimentation in energy transitions. This is followed by a look at federal and state energy governance, and in particular, the role of mid-level officials and nongovernmental actors. I conclude by looking at OSW specifically.

Basic Definitions

The electrical system has four components:

1.) Generation (e.g., an offshore wind turbine spinning a rotor)

2.) Transmission (e.g., an electrical line on the ocean bottom carrying electricity onshore)

3.) Distribution (e.g., a web of electrical lines transporting electricity to consumers)

4.) End-use (e.g., flipping a switch)

Power generators are those who convert a fuel into electricity (e.g., Cape Wind Associates.) *Providers* sell at the retail level (e.g., National Grid) to *consumers* (e.g., Northeastern University.)

Baseline plants are the primary generators in a given area, and are always up-and-running. *Peaking* plants are generators who are on-demand, and used when the baseline plant cannot meet demand (i.e., during the day when people are awake and using electricity.) *Secondary* plants are generators who serve as back-ups, and require 'notice' before they can be brought online (i.e., during summer months when air conditioners are running) (Komor 2004).

Fossil Fuels and the Alternatives

Since the 1970s, U.S. state and federal policymakers have pursued alternative means of generating electricity. The existing energy mix of fossil fuels—oil, coal, and natural gas—is not sustainable for several reasons. Fossil fuels are finite, and prices are volatile. Oil is unevenly distributed around the world, forcing the U.S. to import from unstable regions of the world, and risking oil spills.[4] (Komor 2004). Fossil fuels are also unevenly distributed in the U.S., making some states—particularly those on the east coast—rely on out-of-state sources of electricity (Melnyk and Andersen 2009, 28). Fossil fuels also emit pollutants into the air, endangering public health. Last but not least, generating electricity from fossil fuels is responsible for about a quarter of the U.S.'s greenhouse gas emissions (Boden, et al. 2010).

Alternative sources include onshore and offshore wind; solar rays; hydropower; biomass; and nuclear. The latter three, although technically 'alternatives' to fossil fuels, are often criticized and excluded from the list of "acceptable" alternatives. Hydropower is criticized for its harm upon wildlife, waterways, and local industries like fishing. Biomass relies on deforestation, removing trees that would otherwise absorb carbon dioxide and reduce the level of emissions. And nuclear power, despite emitting zero greenhouse gases, requires a place to dump highly-toxic waste, risks nuclear meltdowns, and creates a target for terrorist attacks. Unless I state otherwise, when I use the term 'alternatives,' I am referring to wind and solar.[5]

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[4]Although oil generates only about 3% of the U.S.'s electricity, I include it in this discussion because oil is the dominant fuel in other sectors: transportation, petrochemicals, agriculture, and heating. In this capacity, oil is responsible for most of the U.S.'s greenhouse gas emissions. In an alternative energy regime, automobiles could be powered by electricity generated from alternatives instead of from gasoline derived from oil. In addition, if alternatives displace natural gas as a generation source, natural gas (which emits less carbon than oil) can become the dominant fuel in petrochemicals, agriculture, and heating (Melnyk 2009, 10). Thus, transitioning to alternatives for electricity generation has the potential to de-carbon other sectors as well.

[5]Other alternatives exist, like wave and tidal energy, but they are still in experimental stages, which was even more

Alternatives have several advantages over fossil fuels: They do not emit pollutants during operation. The wind and the sun are more evenly distributed. (Although the wind blows and the sun shines everywhere, some parts of the world have more favorable conditions than others. For example, in Massachusetts, available land is in the western part of the state, but the population is in the east, making transmission cost-prohibitive on a commercial scale.) Wind and solar rays are not exhaustible. Alternatives do not have fuel costs, so prices are less volatile (Komor 2004)

Alternatives are not without their own drawbacks, however. Alternative energy is intermittent, and cannot be 'stored' in the way that a chunk of coal can. (Although improved battery technologies may make storage possible.) As a result, it is difficult to make them a baseline or peaking plant unless a substantial number of wind turbines or solar panels are spread over wide distances (Komor 2004, 7; Melnyk and Andersen 2009, 15). And recent technological advances and favorable federal policies have substantially increased the amount of accessible natural gas. For these reasons, alternatives are not yet cost-competitive enough to challenge the incumbent fuels on a large scale (Paltsev et al. 2011).

Despite the seeming advantages, progress towards these alternatives has been slower than many expected (Howlett 2014; Smil 2010). Excluding hydropower and nuclear, but including biomass, the percentage of the U.S.'s electricity from alternatives was the same in 2013 as in 1975: 12% (EIA 2013)

Energy Transitions

Although, to be fair, large-scale energy transitions don't come easy (Norberg-Bohm 2000; Starr 1973). Historically, large-scale energy transitions only occur after decades of

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true from 1997-2006.

innovation and experimentation. According to Grübler and Wilson (2013) and Smil (2010), such transitions share three characteristics: (1) Technology innovations, developed separately, couple together, creating synergistic effects that make new end-uses possible. (2) Innovation and experimentation occur despite the cost-effectiveness of the status quo technologies (often aided by favorable public policy.) And (3), diffusion of the new technologies—and displacement of the status quo technologies—occurs over several decades.

The transition from water mills to steam engines, and the transition from gas to electric lighting, provide two examples of such transitions.

In the early 19th century, water mills were used throughout the U.S., particularly in New England. The mills grinded grains into flour, cut wood, and manufactured nails, wire, paper, dyes, and textiles. However, the energy output was limited, and could not be transported (Nye, 1998). Over the course of the next few decades, more energy-efficient steam engines began replacing water mills. Wood was burned to heat water within a boiler, creating steam power that could be transported in pipes, allowing for improved manufacturing processes and greater transportation distances (Temin, 1966).

By the middle part of the 19th century, steam engines and water mills had equal market shares. By the 1870s, steam power was the largest source of power in the United States, except in New England. New England held onto water power longer than most other northern states because of greater access to water and more existing water mills than other states. However, by 1890 each source was used equally, and by 1900 steam-powered mills outnumbered water mills 2-to-1 (Nye 1998; Temin 1966). The use of steam power allowed for the growth of cities that were not on bodies of water. Steam engines also allowed for the diffusion of steam-powered locomotives, which connected cities in the Northeast during the first half of the 19th century, and cities elsewhere in the U.S. in the second half (Rosenberg 1972). Transportation

continues to be one of the primary consumers of energy in the U.S. (EIA 2014).

During the 19th century, gas produced from burning coal was used for lighting in heavily-populated areas in the U.S., and was later used for heat and cooking. However, gas use—largely unregulated—proved to be dangerous, causing explosions and fires. In the Great Boston Fire of 1872, over 3,000 people were killed, and much of the city burned to the ground (Rosen 2003). For such reasons, much less dangerous (but initially more expensive) incandescent lamps powered by electricity were adopted in lieu of the gas lamps. However, the first electricity generating plants used direct current (DC) systems. Changing the voltage of DC from high (for long-distance transmission) to low (for end-use) only made it cost-effective if the electricity was generated within 1 mile of the end-point. It was not until alternative currents were developed that incandescent lamps became market dominant (Hargadon and Douglas 2001). In addition to providing safer lighting, electricity also allowed for industrial automation and assembly lines. These increased efficiencies suddenly made it cost-effective to develop and manufacture all sorts of goods—including what would become a popular end-use of energy: gas-powered automobiles (Carr 2008).

Unruh (2000, 817) argues that the current energy transition will prove more arduous than these examples, insofar that:

> industrial economies have become locked into fossil fuel-based technological systems through a path-dependent process driven by technological and institutional increasing returns to scale. This condition... arises through a combination of systemic forces that perpetuate fossil fuel-based infrastructures in spite of their known externalities and... cost-neutral, or even cost-effective, remedies... [I]nstead of... correcting market and policy failures, governments frequently exacerbate them through subside and institutional policy.

If you accept Unruh's characterization and apply it to the three requirements of a successful energy transition above, the odds for a successful transition to alternative energy are not great, at least in the near future. Fossil fuel-based infrastructures prevent real-world

experimentation and 'learning-by-doing,' inhibiting the development of innovations and the potential for synergies. On the other hand, if this transition, like the others, will span 80-100 years, we have decades left before this transition becomes the exception.

Regulation and Deregulation

With a few exceptions, the U.S. federal government regulates interstate electricity transmission, and states decide from where their electricity is sourced and how retail energy markets are structured. The federal government also regulates in-state emitters of pollutants—such as coal power plants (Massachusetts v. EPA 2007). Other exceptions include federal jurisdiction over nuclear and hydropower power plants, and state jurisdiction over cross-border distribution if coupled with an in-state retail sale (Komor 2004, 73).

In the U.S., for most of the 20th century, investor-owned utilities controlled energy generation, transmission, and distribution. In many cases, the same utility controlled the entire process from generation through end-use (Komor 2004, 67). In most of Europe, the energy sector was also highly-regulated, but utilities were public or quasi-public. In the last quarter of the 20th century, this began to change in both the U.S. and Europe.

In 1978, the U.S. Congress passed the Public Utility Regulatory Policies Act (PURPA), which required power providers to purchase electricity from qualifying non-utility ("independent") power producers, weakening the hold of utilities on the electricity sector. PURPA also introduced price controls ('feed in tariffs') to prevent utilities from overcharging non-utilities for their electricity. In theory, this leveled the playing field. However, prices were set at the amount the utilities saved by not generating the electricity themselves. In most states, prices were calculated by state officials based on projections that the price of fossil fuels would rise. As it turned out, the price didn't rise, and utilities were stuck in long-term contracts paying

two or three times more than their actual “avoided cost.” Although a clear loss for utilities, it was a boon for independent power producers and investment in renewables, including wind (Komor 2004, 137-138). Similar feed-in laws, with even more generous prices, placed Denmark as a world leader in alternative energy. At present, over 40% of their electricity is generated from onshore and offshore wind power (Gillis 2014).

The U.S. federal government did not mandate that states deregulate their retail energy markets, but they didn’t need to. (In contrast, the E.U. required its member states to deregulate.) On their own, many U.S. states deregulated their markets, starting with California and East Coast states, where electricity rates were relatively high (Komor 1994). In-state electricity or energy ‘deregulation’ refers to a shift towards an open market allowing for competition between utilities and independent power producers (Al-Sunaidy and Green 2006). However, although a 'deregulated' energy retail market is more open than a 'regulated' market, “[t]he energy market... is [still] about as unfree as a market could be.” (Komor 2004, 11).

As with deregulation in other industries, the purpose is to lower costs. Research suggests that deregulation, on the whole, lowers electricity costs for consumers (Killian 2008). Deregulation can also benefit alternative energy development. For one, independent power producers are more likely than utilities to market ‘green’ programs, such as programs that allow consumers to pay a slightly higher price for alternatively-sourced energy (Roe et al. 2001).

However, deregulation has two consequences adverse to alternative energy development. First, states are less able to use sticks against independent power producers than they are able to do with utilities. Second, market investors prefer short-term gains, and alternative energy’s gains are anything but short-term (Komor 2004). For these reasons, in deregulated states, alternative energy development depends on policies that also incentivize production of, and long-term investment in, alternatives.

Encouraging Alternative Energy Development (Or Trying To)

An increasingly popular way to encourage alternative energy development is the pairing of a renewable portfolio standard (RPS) with a 'green certificate' program (Komor 2004, 172). RPSs require that a certain percentage of electricity sold by a provider come from a preferred source.(Preferred sources vary from state-to-state, but wind is often one of them.) Since Iowa "policy invented" the RPS in 1983, about half of the states have followed (Carley and Browne 2013). In theory, this creates a market for alternative energy generation. However, if there are only one or two energy providers—which is true in many states—supply of alternative-sourced energy might exceed the amount producers need to satisfy their RPS requirements. Or, this same fact might dissuade power producers to enter the market in the first place, making demand exceed supply.

For these reasons, many governments have created market mechanisms in the form of the "green certificate." (They are called different names in different countries. The U.K. refers to them as renewable obligations) (Haas et. al. 2011; Wood and Dow 2011). Green certificates decouple the power generated from the source of the power. That is: Alternative energy producers generate electricity. Then, not only can they sell that electricity to a provider, but alternative energy producers also earn—and can sell—a green certificate. Assuming they maintain or increase their value, they mitigate the market problems described above. Not only can alternative energy producers sell their certificates to providers in their own state, but they can sell certificates to providers elsewhere who are trying to meet their RPS goals. They may also sell certificates to investors, or companies and governments trying to meet self-imposed goals (Komor 2004, 173). In theory, this creates a market allowing for the values of green certificates to rise.

Federal and State Agency Officials, and the Courts They Get Summoned To

The important role played by agency officials in energy policy cannot be overstated. Table 2.1 shows most (but not all) of the federal agencies involved in siting, permitting, and installing power plants. Note that most states have analogous statutes and administrative agencies for many of the statutes listed, not to mention the discretion of local and regional authorities.

The number of agencies involved and permits required creates several targets for those opposed to the project to make their case. Unruh (2000), quoted above, does not cite one of the primary obstacles to alternative energy: environmental law. Alternative energy development imposes its own harms, implicating environmental concerns, laws, and approval processes, and ultimately, substantial amounts of litigation. As Nagel (2013) observes: "Renewable energy is most touted for its environmental benefits, yet environmental laws pose one of the most significant obstacles to developing renewable energy" (Nagel 2013, 73).

In 2012, a law firm surveyed 34 renewable energy projects around the U.S., and found that 18 were undergoing litigation, and 16 had either been settled or already reached a verdict. All of them (Latham & Watkins 2012). Many if not most of these legal challenges are brought at the local or state level by national interest groups.

The National Environmental Policy Act and analogous state laws were particularly critical in this case study. These laws require executive and regulatory agencies—via mid-level officials and street-level bureaucrats—to analyze the possible environmental effects of all 'major actions' they undertake (a broadly-defined term which encompasses the granting of permits), and to consider whether comparable, less harmful alternatives exist. Prior to the action being undertaken, an environmental agency (e.g., the Environmental Protection Agency at the federal

Table 2.1. Federal, state, and local-level implementing agencies involved in permitting of offshore power plants in Massachusetts

Enabling Law or Regulation	Implementing Agency	Role
Federal		
National Environmental Protection Act	"lead agency"	Issue Finding of No Significant Impact; Environmental Assessment; and/or Environmental Impact Statement
National Historic Preservation Act	"lead agency"	Consider effects on protected historic sites
Clean Air Act	EPA	Issue air permits
Clean Water Act	EPA; Corps	Issue permits for discharges and dredged materials
Marine Mammal Protection Act	National Marine Fisheries Service	Consider effects on marine mammals
Endangered Species Act	US Fish and Wildlife and National Marine Fisheries Service	Consider effects on endangered species
Rivers and Harbors Act	Corps	Issue permits for construction in federal offshore waters
Federal Aviation Act	Federal Aviation Administration	Approve construction in or near airspace
Coastal Zone Management Act	state agency, administered by National Oceanic and Atmospheric Administration	Consider federal plans in context of state plans
PURPA	FERC	Hear complaints about power purchase agreements
Executive Order 12898	"lead agency"	Consider effects on minority and low income populations
Migratory Bird Treaty Act	Fish and Wildlife Service	Consider effects on migratory birds
State		
Massachusetts Environmental Protection Act	Massachusetts Environmental Protection Act Office	Review environmental projects prior to state permitting processes
MA G.L. c. 164, § 69H	Department of Public Utilities, Energy Facilities Siting Board	Issue permits for construction of large power plants, transmission lines, and pipelines
Wetlands Protection Act, Rivers Protection Act	Barnstable Conservation Commission and Yarmouth Conservation Commission	Approve transmission lines that pass through Barnstable waters or Yarmouth waters can be superseded
Cape Cod Commission Act	Cape Cod Commission	Issue permits for developments that affect air, ground surface water, environment, historical sites, etc.

Adapted from Tierney (2007).

level) must deem the analysis adequate.

When an action is undertaken by one agency, the procedure is relatively straight-forward. However, when multiple agencies are involved (which is most often the case in energy and environmental domains), it becomes more complicated. Under federal law, one agency must be designated 'lead agency,' and absent a legislative provision, there is no standard method for choosing one. The lead agency must coordinate with the other agencies, conduct an exhaustive analysis, and issue their findings publicly, and then to the environmental agency. Based on their analyses, agencies must either submit an Categorical Exclusion, Environmental Assessment (EA), or Environmental Impact State (EIS) to the EPA. (40 CFR § 1508.4)

Categorical Exclusions apply when policy actions clearly present no risk of significant adverse effects, or the environmental agency has previously approved an EA or EIS for a similar action. Many oil & gas projects are categorically excluded for the latter reason.

An EA is used when an agency, after a relatively brief analysis, issues a Finding Of No Significant Impact (FONSI.) FONSIs can be challenged in court.

If an initial analysis does not sufficiently reveal the risks of, and alternatives to, the action, the lead agency is responsible for submitting an EIS. An EIS requires much more rigorous process to determine the existence and extent of adverse effects, and a subsequent issuance of a document of hundreds or thousands of pages. (As opposed to EAs which are often less than 15 pages.) EISs also require consultation with affected parties and the public (40 CFR § 1508.11)

Wind Energy

Wind energy is really solar energy. That is: the sun heats air in the Earth's atmosphere, pushing the cooler air across the Earth's surface and creating kinetic energy—wind. Based on water-pumping windmills, wind turbines transfer the kinetic energy into mechanical energy

through spinning rotors, which in turn generates electricity. Turbines have 'design wind velocity' and 'maximum operational velocity.' The first is the ceiling of the output, beyond which the output stays the same. That is: more wind doesn't necessarily mean more energy. When the maximum operational velocity is reached, the blades are designed to tilt away from the winds to protect them (Melnyk and Andersen 2009).

Onshore

Onshore wind turbines were first used in the late 19th century, but were not used on a commercial-scale until the 1970s. Since then, turbine technology has improved considerably, allowing for more cost-effective collection of wind energy. Initially, most wind generation was in the U.S., but the industry did not survive the 1980s. In the 1980s, California incentivized installation of turbines without requiring actual production, resulting in a whole lot of turbines and very little electricity. This policy failure dissuaded others for the next decade.

Denmark took the baton. From the early 1990s to the early 2000s, Denmark's wind power capacity grew six-fold. It became the hub of both turbine construction and use (Yergin 2012). Denmark installed the world's first commercial-scale OSW turbines, and their wind leadership continues today. About half of the world's turbines are still constructed there, and by the middle of the century, Denmark plans to generate all of its electricity from onshore and offshore wind (Gillis 2014).

In 2013, 4% of the U.S.'s electricity came from onshore wind. Despite its relatively small contribution compared to fossil fuels, onshore wind increased an average of 30% each year from 2003-2014, and is the fastest growing source of energy (Wiser and Bolinger 2009). The Department of Energy (DOE) has estimated that wind power could account for 20 percent of the nation's electricity supply by 2030 (EIA 2014).

Offshore

Offshore wind is a different story. This is despite having far more potential than onshore wind. Offshore wind is stronger, more frequent, and does not have geographic or man-made obstacles. In addition, installation is easier because transportation beneath water is less disruptive to existing infrastructure than across land. Also, more wind can be captured because offshore turbines draw fewer aesthetic objections. (This is true in Denmark and the U.K., but as this case study will show, this is perhaps not the case in the U.S.)

The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) considers OSW to be a particularly promising alternative source for the U.S., and critical to a successful energy transition (NREL 2010). The New England, Mid-Atlantic, and Great Lakes regions are particularly desirable places for OSW energy development. They are close to population centers, have relatively shallow bodies of water, and strong winds (Melnyk and Andersen 2009, 28.) NREL estimates 90.1 GW of OSW potential in these regions for projects built in water depths of 30m or less—this is equivalent to over 90 large nuclear power plants. This does not include areas within 5 nautical miles of shore, sensitive habitats, avian flight areas, mammal habitats, shipping routes, or areas of particular aesthetic importance (Melnyk and Andersen 2009, 12, 28) In fact, the amount of potential OSW energy in the U.S. (not counting environmentally sensitive areas or areas within 3 miles of the coastline) is nearly 1 million mega-watts (Watson and Courtney 2004). To put this in perspective, total installed capacity in the U.S. was just over 1 million in 2011 (EIA 2013).

OSW's potential cannot be mentioned without its unique challenges. Daniel Yergin (2012, 35), a foremost expert on energy policy, articulates many of them:

> Planting these giants securely into the seabed is no easy thing. They need to be able to withstand the enormous, relentless stresses from the tides and waves, from the salt, from the winds themselves, and from the storms that, with no mercy, will pound and assault them. Corrosion is a big problem. So is the risk that water will get in through the vents and damage the electronics. Also they are much harder to repair. The integration costs are also

> higher. Extra-durable cables have to be laid that will connect each of the turbines to a substation and to the land. These cables will have to be much tougher than on land[.]

In the late 1990s and early 2000s, as U.S. policymakers crafted first-in-the-nation OSW policies, Denmark and the U.K. were the only nations on the verge of commercial-scale OSW capacity (Haas et al. 2011).

Denmark, for decades the leader in onshore wind, installed pilot OSW projects at Vindeby in 1991 and at Tuno Knob in 1995. In 2001, Denmark began installation of a Middelgrund, an OSW farm with much more capacity, visible from Copenhagen. In 2002 and 2003, Denmark installed the world's first two commercial-scale OSW farms at Horns Rev and Nysted, The U.K. began its foray into OSW in 2003, but would not have commercial-scale capacity until 2008 after running into market obstacles and aesthetic objections (Higgins and Foley 2014). Their OSW leadership continues today. As of this writing, Denmark is nearly entirely dependent on onshore and offshore wind, and the U.K. has about half of the world's total installed OSW capacity.

Although the U.S. does not yet have commercial-scale OSW capacity, Texas likely will in the next few years, and Massachusetts might. Many other coastal states are in earlier stages of implementation. And, assuming one or more of these projects go through, the U.S. will still be one of the earliest adopters of commercial-scale OSW development. At present, only ten countries have installed capacity.

In this chapter, I described U.S. OSW energy policy governance. In the next chapter, I review the PLD and related literatures, and show how no existing theory is suitable for analyzing PLD within this context.

Chapter 3: Policy Learning and Diffusion: Missing the Trees for the Forest

Overview

The narrow focus of the PLD literature makes it difficult to apply one existing theory or conceptual framework to this study. However, a synthesis of existing frameworks provides a reasonable starting point. To minimize redundancy, some concepts are only briefly mentioned in this chapter because they are detailed as part of the conceptual framework in Chapter 4.

The first section in this chapter reviews the *diffusion of innovations* (DOI) work of Rogers (1962; 1971; 1983; 1995; 2010) and his intellectual heirs. Although much of the DOI work concerns the diffusion of "hard" technologies (e.g., personal computers and the Internet), it has since been applied to a wide range of innovations as diverse as nursing home procedures (Kovach et al. 2008), marketing techniques (Ram & Jung, 1994), economic philosophies (Simmons and Elkins 2004), and of course, public policy (Berry and Berry 1999). Rogers defines technology quite broadly: an "instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome" (Rogers 2010, 13). Such a definition makes it is easy to see why his framework is so flexible. It is difficult to imagine an innovation that does not fit this definition.

The second section looks at the *policy diffusion* (PD) literature. PD is affected by both 'internal' and 'external' factors. Internal factors might include political beliefs or socioeconomic conditions within a polity. External factors might include competition between co-equal governments; coercion or persuasion by a higher-level of government; and norms that influence policy in multiple jurisdictions. This section also serves to show the relatively narrow focus of the PD literature: statutes that have already diffused among many governments (e.g., state lotteries and renewable portfolio standards.) The primary method used by PD scholars is

quantitative analyses that take place years, if not decades, after diffusion begun (e.g., retrospectively studying the diffusion rates of lottery programs and renewable portfolio standards.) This focus ignores policies earlier in development and policies that do not diffuse widely. As Berry and Berry (1990, 223) observe: "[S]tudents of policy innovation explicitly choose not to student policy invention—the process through which original policy ideas are conceived." And this is not the only gap. The dependent variable in most studies is a whether or not a state adopted a policy in a given year (e.g., Berry and Berry 1990; Boushey 2010; Karch 2007). This neglects: the evolution of policy content during diffusion; forms of public policy other than statutes, (e.g., mid-level or street-level administrative decision-making); and the role of personal contacts and nongovernmental actors (Boushey 2010; Lipsky 2010)

In the third section, we turn to the literature most central to this study: *policy learning.* (Because my focus is on learning and its result—diffusion—I use the term *policy learning and diffusion*, or PLD.) I review the findings of PLD studies from numerous contexts: street-level and macro-level, historical and contemporary. I argue that we have narrow conceptions of PLD. In particular, we know little about: *why* lessons are sought; *who* learns; *from whom* they learn; *what* they learn; *how* they interpret what they learn; and *how* they apply what they learn (i.e., policy diffusion.)

In the last three sections of the chapter, I review literatures that help fill these gaps. To understand 'causal mechanisms,' I look at the *process-tracing* literature. To broaden the conception of who can learn, I turn to the *policy implementation* literature. To broaden the conception of the context in which learning occurs, I turn to the *advocacy coalition* and *network governance* literatures.

Diffusion of Innovations

Katz (1999, 144-145) argues that:

> It cannot be far wrong to assert that every one of the social sciences and humanities has, at least intermittently, given attention to the question of how things—ideas and practices—get from here to there.

Over the course of five decades, Everett Rogers (1962; 1971; 1983; 1995; 2010) analyzed the diffusion of innovations, particularly those that diffused among many adopters. He conducted countless studies of his own, but perhaps his greatest contribution was synthesizing previous work—dating back to the early 20th century—and creating a unified conceptual framework to understand them.

Early studies were sociological, and some of the most important early work concerned diffusion of agricultural innovations, like Ryan and Gross's (1943) study of the diffusion of hybrid seeds between farmers. Other early studies regarded the diffusion of educational practices such as kindergarten and driver training programs (Rogers 2010, 22). Today, Rogers (2010. 16) estimates the existence of at least 5,200 DOI studies, most of which confirm his hypothesis that innovations—regardless of type—diffuse in similar patterns. Diffusion begins slowly among a few brave early adopters and continues until it reaches a critical mass, at which point the innovation diffuses widely, before petering out. Studies also identify which perceptions and characteristics of potential adopters make them more likely to become actual adopters.

It is also important to observe how intertwined policy innovations are with 'hard' technological innovations. Rogers (2010, 174) provides the example of Segways. State and federal regulators had to decide whether a Segway was closer in function to a motorized wheelchair or to a motorcycle. Regulators determined that Segways were closer to the former. As a result, they can legally be ridden on sidewalks, and they avoid restrictive licensing and other

potentially prohibitive regulations. Now it is hard to find a city in the U.S. where you can't get a tour on a Segway.

As I write this, Uber, a multi-billion dollar "ride-sharing" company whose business model challenges the entire business structure of the taxi service industry, is answering questions before the Boston City Council and in other cities as well. City transportation regulations (and state) have the power to continue, or stymie, the diffusion of the Uber model (Boroyan 2015)

Who Diffuses?

Before discussing policy diffusion (PD), we must ask: who is the diffuser? Policies do not walk across jurisdictional borders. Policies diffuse via individuals. However, it is organizations (e.g., legislatures or agencies) that formally adopt or implement policies that are affected by a policy from elsewhere. Individual and organizational decision-making is inseparable. For that reason, many PD studies (and DOI studies generally) use individuals and organizations as proxies for each other (Berry and Berry 1999, 234-237).

Important Definitions

This study adopts many concepts and definitions from Rogers' (2010) work, listed below. I italicized those phrases that are particularly applicable to the PLD process.

Uncertainty: the degree to which a number of alternatives are perceived with respect to the occurrence of an event and the relative probabilities of these alternatives. *Uncertainty motivates individuals to seek information*, as it is an uncomfortable state (*xx*).

Innovation: an idea, practice, or object that is perceived as new by an individual or another unit of adoption. An innovation presents an individual or an organization with a new alternative or alternatives, as well as new means of solving problems. However, the probability

that the new [innovation] is superior to previous practice is not initially known with certainty... *Thus, individuals are motivated to seek further information about the innovation in order to cope with the uncertainty that it creates* (12).

Diffusion of innovations: The diffusion of innovations is... a social process in which subjectively perceived information about a[n] innovation is *communicated from person to person*. The meaning of an innovation is thus gradually worked out through a process of social construction (19).

Re-invention: the degree to which an innovation [from elsewhere] i*s changed or modified... in the process of its adoption and implementation* (35).

A few important notes regarding these definitions:

First, Rogers' definition of innovation shows the origins of the PD literature's narrow conception of innovation. Although the definition makes no distinction between invention and emulation of an innovation, this was not always the case. Tarde (1903), perhaps the first diffusion study, argues that the distinction is critical, and focuses only on emulation. Rogers (2010, 175) acknowledges that they have "not received much scholarly attention[,]" but justifies it by arguing it "is not so clear cut when we acknowledge that an innovation is not necessarily a fixed entity as it diffuses within a social system." While I agree that innovations are not necessarily fixed entities, I argue that if a lesson is drawn from an innovation elsewhere, and applied in some fashion, there is some "there" there, even if the adopted innovations bare little similarity (e.g., if a lesson learned convinces someone *not* to adopt an innovation policy from elsewhere.)

Under this definition, anything man-made, and adopted by anyone anywhere, is an innovation. Not just the wheel, but the word 'wheel.' Because of this amorphousness, it is important to differentiate types of innovations. Rogers describes innovations as having two

components: the innovation itself, and the knowledge necessary to use the innovation. What diffused thousands of years ago was not just the wheel, but also how to use it. To use a policy analogy: policy adoption might be the diffused innovation, and regulations, implementation practices, and institutional structures might be the knowledge necessary to use the innovation. (Of course, regulations, implementation practices, and institutional structures can also be conceptualized as the diffused innovation, as they are in this study.)

Rogers categorizes innovations as ideas, practices, or objects. Bingham (1978) examines the diffusion of municipal policies in the U.S., and distinguishes practices (he calls them "processes") from objects (which he calls "products.") Diffused practices include computerization of housing authorities, public libraries, police forces, and funding for one-on-one teaching in public schools. Diffused objects include materials for construction of public housing, and theft detection systems in libraries. Although not part of the study, one might imagine (and I do) that ideas in this case to mean knowledge of computers being used in schools, or a study that shows the benefits of one-on-one teaching.

Innovations do not travel alone. Some are so interconnected that they are interdependent. In fact, innovations typically only diffuse after two or more innovations are combined synergistically (Rogers 2010). Beer bottles, for example, were a great invention, allowing people to buy beer and bring it home with them. However, until the bottle cap was invented, beer bottles had to be corked, and for that reason, did not diffuse widely for fifty years. Steam-powered mills rely on boilers and pipes that run long-distances (Edwards 2015). Outdoor lighting requires incandescent lamps, electricity, and knowledge of alternative currents. The same can be said for policy innovations.No statute, regulation, procedure, or street-level action exists in a vacuum—particularly in the U.S., in which local, state, and federal governments have overlapping and somewhat amorphous jurisdictional boundaries.

Factors Affecting the Diffusion of Innovations

DOI studies have three primary goals: (1) determining which factors influence an innovation's rate of adoption, (2) determining which perceptions of potential adopters influence whether they become actual adopters, and (3) determining which characteristics make a potential adopter more likely to adopt. Rogers initially used qualitative ethnographic and interview methods to explore diffusion. His later work was more quantitative, and it is this type that successors have emulated.

Rate of Diffusion

The majority of DOI studies find that innovations diffuse at a similar rate. Plotted over time, diffusion tends to follow a 'S-curve,' shown in Figure 3.1. Rogers conceptualizes diffusion as a five-stage process, and he divides adopters into five groups based on when they adopted the innovation: (1) After a period of research and development, the innovation is 'invented.' (Thus, the *inventor* is the first adopter, not those who researched and developed an idea prior to adoption.) (2) A slightly larger group of *early adopters* view the innovation favorably, and adopt it. (3)(4) The innovation is widely perceived as successful, reaches a critical mass, resulting in rapid diffusion by an *early* and then *late majority* of adopters. (5) The *laggards* adopt the innovation. (Those who choose not to adopt are not part of these analyses.)

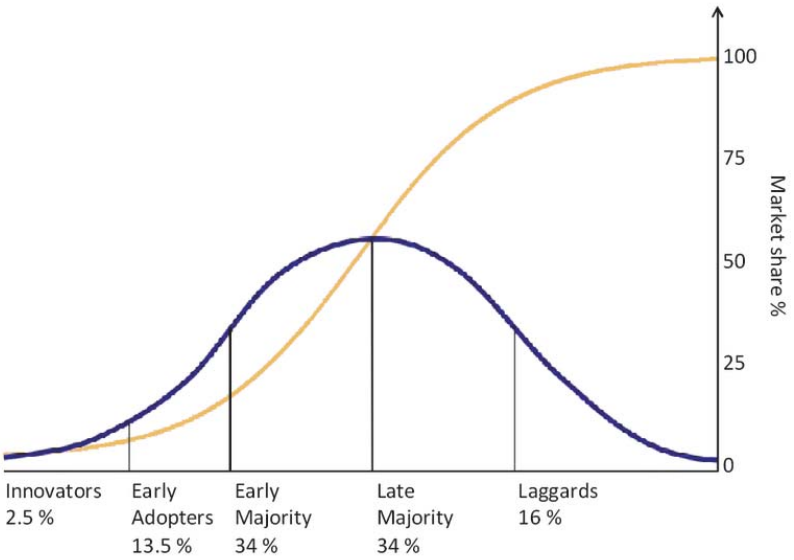
To use an example literally right in front of me:

Invention: In the late 1960s and early 1970s, the U.S. Department of Defense funded the Internet's predecessor, ARPANET (Rogers and Allbritton 1995).

Early Adoption: In 1994, 3% of public classrooms had access to the Internet.

Late adoption: In 2004, 94% of public classrooms have access.

Laggards: As of 2010, near 100% do (Gray, Thomas, and Lewis 2010).



Based on Rogers (2010). Licensed under Public Domain via Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Diffusion_of_ideas.svg#/media/File:Diffusion_of_ideas.svg).

To use policy a policy example: Puerto Rico adopted a public lottery in 1934. New Hampshire followed in 1964. (If you include U.S. states, the District of Columbia, and territories, this constitutes 4%, nominally higher than indicated by Rogers, but close enough.) New York adopted a state lottery in 1967. Today, 44 states have lotteries (Berry and Berry, 1990; Isidore 2013).

Perceptions Affecting the Decision to Adopt

Rogers (2010) and others argue that five perceptions influence whether a potential adopter becomes an actual adopter: relative advantage; compatibility; simplicity; trialability; and observability. Of these, the first two are the most significant. These factors are close in kind to the factors used by PLD scholars like Rose (1992), which are used in the conceptual framework and described in Chapter 4.

"*Relative Advantage* is the degree to which an innovation is perceived as better than the idea it supersedes" (572). The status quo might be an existing idea, process, or object (e.g.,

the Dewey Decimal system.) The status quo can also be the absence of an innovation, such as the Internet, which has no clear predecessor. In an early DOI study, Ryan and Gross (1943) studied the diffusion of the use of hybrid corn seeds by farmers. Farmers perceived them to be advantageous over the seeds they used because of their profit potential and cost-effectiveness. Because many farmers shared this perception, use of the new seeds diffused quickly.

As an innovation is re-invented and improved by adopters, the innovation's perceived relative advantage can grow. Rogers cites the example of the N-Trak, a more affordable and precise means of testing for the level of nitrogen in agricultural soil. Despite advantages at the onset, use of the N-Trak did not diffuse until its cost-effectiveness outweighed the inconvenience of changing existing routines (Rogers 2010, 260). As explained in Chapter 2, and given detail later in this chapter, energy technology innovations require significant re-invention in order to become cost-effective and gain enough relative advantage to diffuse widely.

"*Compatibility* is the degree to which an innovation is perceived as consistent with existing values, experiences, and needs." (Rogers 2010, 34). Kaplan (1999) found that (exactly) 2.5% of power companies had adopted photovoltaic technology. Others, although familiar with the technology, decided not to adopt because the new and potentially revolutionary technologies were perceived as incompatible with the companies' existing and more centralized organizational structure (Rogers 2010, 279). Holloway (1977) fairly argues that the line between compatibility and relative advantage is arbitrary. Moore and Bebbasat (1991), for example, analyzing the diffusion of personal computers in workplaces, code the statement of "a personal workstation improves the quality of work I do" as relative advantage), and "a personal workstation fits well with the way I like to work" as compatibility (Rogers 2010, 255). Although 'compatibility' is similar to 'relative advantage,' I would argue the first is a consideration of the 'Big Picture' rather than a comparison between an innovation and a narrowly-defined 'status quo.' A

hypothetical example would be if, in Ryan and Gross (1950), the hybrid seed—despite being advantageous—did not diffuse because of a moral opposition to cross-pollinated seeds.

Simplicity[6] is how easy (or difficult) the innovation can be understood and effectively used. To continue with the example of Holloway (1977), statements like "[l]earning to use a personal workstation is easy for me" were coded as simplicity.

Another example is the fact I am typing on a 'QWERTY' keyboard rather than its long dead, but arguably more efficient, rival: the 'Dvorak' keyboard. The QWERTY keyboard was designed without much thought to efficiency, whereas the Dvorak's keys were placed according to how often they were used together. Despite its relative advantage, the Dvorak never supplanted the QWERTY because switching from a keyboard to which you are accustomed to a different setup is really, really hard, and the benefits of changing are not immediate (Rogers 2010, 28). Dropbox functions essentially the same as FTP uploading and downloading that has been around for as long as the Internet has. But Microsoft simplified the process by automating it, and making the process more user-friendly. As a result, use of FTP diffused in 2010 and 2011 rather than in 2000 and 2001.

Trialability is the potential for experimentation and "learning-by-doing." That is, if an innovation can be tweaked after adoption, it is more likely to be adopted than if subsequent modification is difficult. Moore and Bebbasat (1991) code "I've had a great deal of opportunity to try various personal workstation applications" as trialability. As one might expect, trialability is less important for later adopters because they can learn from the trials of others (Rogers 2010)

As I write this, the Obama Administration is considering a proposal to lay the Keystone XL Pipeline, designed to move tar sands oil from northern Alberta, Canada through the

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[6]Difficulty' is actually the term used by Rogers and others, but I use the term 'simplicity' to keep consistent with the other terms..

prairie states to refineries in Louisiana. Opponents argue that the pipeline poses unacceptable environmental risks compared to its purported benefits, particularly as it would pass through the U.S.'s largest water aquifer. Moreover, once installed, it will be difficult if not impossible to modify the path of the pipeline (Swift et al. 2011; Krauss and Rosenthal 2010). This is different from an innovation like Dropbox, in which 2.0 can replace 1.0.

Observability is the extent to which potential adopters can learn from early adopters. If the results of earlier experiments are not visible, then adopters must go it alone as if they were first. But if results are visible—and particularly if there are many of them—then an innovation can be adopted with more confidence. To identify this factor, Holloway (1977) sought statements such as "[i]n my organization, one sees personal workstations on many desks." (Rogers 2010, 255)

Google was able to see what predecessor search engines like Alta Vista had done right and what they had done wrong. They learned what to do and what not to do. A primary argument in support of medicinal marijuana in Massachusetts was that other states had done it well (e.g. New Mexico, in which licenses are difficult to get.) And a primary argument in opposition was that other states had done it poorly (e.g. California, in which anyone can get a medicinal license in 15 minutes on the Venice boardwalk) (Caplan 2012).

Makse and Volden (2011), using the DOI framework, analyze the diffusion of several U.S. state criminal justice policies. They find the presence of all five of the perceptions listed above. An important question, which the literature only speaks to briefly, is: do implementation rules, procedures, and practices diffuse differently than statutes? Boushey (2010) says yes. Comparing the diffusion of legislative term limits and family caps on cash assistance with a policy that involves more regulation, medical savings account, he argues that highly- technical policies are less prone to rapid diffusion. He attributes this lag to the decreased role played by

electoral politics, and the increased role played by policy experts and mid-level officials who are shielded from the whims of the public. (As we'll see, this case study presents a counterexample.)

Who Adopts When?

According to the literature, several characteristics distinguish earlier from later adopters. (The literature often uses organizations as proxies for individuals, and vice versa, but as we'll see, some terms better fit one than the other.) Rather than list each characteristic, I group the factors into three broad categories: resources; communication; and sophistication. These are my categories, not the literature's. With a couple of word choice changes, the terms within the categories are from the DOI, PLD, and energy innovation literatures. They are operationalized and given more precise definitions in Chapter 4.

Resources include financial resources, amount of formal education, decision-making discretion, and institutional flexibility (Rogers 2010; Shipan and Volden 2012).

Communication includes general participation in social networks; the number and quality of interpersonal relationships; and contact with 'change agents,' individuals who influence adoption decisions in a preferred direction, and other potential adopters (Grübler and Wilson 2003; Rogers 2010)

Sophistication refers to general abilities to cope with uncertainty and interpret *empirical and technical information*; general familiarity with innovations elsewhere; a willingness to 'hedge bets' on multiple innovations (e.g., investing in both solar and wind power, or in two types of turbines); and a favorable view of new ideas and applied research generally (Rogers 2010).

Gaps in the DOI Literature

According to Rogers' innovation-decision model, adopters (as either an individual or

organization) go through five stages: They (1) learn about an innovation elsewhere, (2) view innovation favorably, (3) decide to adopt the innovation, (4) adopt the innovation, and (5) evaluate the decision to adopt (Rogers 2010, 169). However, even as Rogers and his intellectual heirs admit, few studies have tested this model, or even examined individual adopters going through the adoption process. There are two gaps in particular this study addresses.

First, because most studies are retrospective and focus on widespread diffusions, we know little about: the early stages of diffusion and decisions *not* to adopt. To use an earlier example: we can describe the diffusion rate of public lotteries in the U.S., but we know little about the details of decisions by Puerto Rico and New Hampshire to become early adopters, or about the decisions of the 6 states that do not have public lotteries. A more consequential example: we can explain little about why 6 million babies die every year during or just after childbirth despite the fact that cheap and "simple, lifesaving solutions [being] known for decades." (Gawande 2013).

Second, the *post hoc* approach does not allow for exploration of interactions between actors involved in the DOI process (Rogers 2003, 18–19).

To address these gaps, Rogers suggests that future studies of diffusion should shift the emphasis from retrospective "snapshots" to examinations of diffusion in real-time. Such studies ought to ask questions such as "What are the key linkages and interrelationships among the various organizations involved in the... process? Particularly, how do [actors interact when] making the decision to [adopt] an innovation?" (165)

Yet, few have taken his advice. As Stacks and Salwen (2008, ch. 27, 14) put it:

> Alternative methods of data gathering have been little utilized, even as a means to supplement the predominant approach of survey data gathering and quantitative methodologies of data analysis. One wonders why ethnographic methods like in-depth interviews and observation have not been utilized more widely, especially in the organizational innovation studies... The dominant style of diffusion investigations is thus the quantitative analysis of data gathered by survey interview methods from large samples.

> The overall effect of these dominant research methods has been to emphasize an understanding of the diffusion process as the product of individual decisions and actions. Interpersonal influences on individuals in the diffusion process have been underemphasized because of the research methods used.

Policy Diffusion

Diffusion or Convergence?

Before we continue, it is important to differentiate two distinct, but overlapping, concepts: policy *diffusion* and policy *convergence.*

Convergence occurs when different governmental entities have contemporaneous and similar public policies. This dynamic can, but need not, result from a policy diffusing across a jurisdictional boundary. Convergence can, at least theoretically, occur co-incidentally. A government might, for example, respond to crime with the creation of a police force without influence from the "knowledge of policies, administrative arrangements, institutions and ideas... [of a] political system [elsewhere.]" (Dolowitz and Marsh 2000)

Likewise, *diffusion* does not necessarily result in convergence, such as when a government decides what *not* to do based on a policy from elsewhere. In this case, there is diffusion without convergence.

Convergence and diffusion most often result from a combination of multiple external sources (i.e., diffusion) and internal (i.e., coincidence.) Rogers (1993) and Dearing and Rogers (1996) attribute the widespread diffusion of Drug Abuse Resistance Education (DARE) programs between municipalities to both types of dynamics. Programs shared fundamental characteristics—like administration by police officers—but programs were customized ("re-invented") to fit the specifics of the municipalities' drug, alcohol, or gang problems. Likewise, Larsen and Agarwala-Rogers (1977) analyze 104 policy adoptions by California mental health agencies, and find that re-invention occurred more often (55-49) than straight-up emulation. Berry (1994) looks at state agencies which adopted "strategic planning" initiatives (in which

organizations explicitly defined their purpose, underlying philosophy, and internal processes), and finds that state agencies are more likely to adopt such an initiative when it is a post-election year, when they have more interaction with the private sector, and when a comparable agency from another state did so. The first two suggest internal factors, while the third suggests an external factor.

Legalization of marijuana in U.S. states provide other examples. Washington and Colorado legalized marijuana in 2012, Oregon and Alaska in 2014, and others are expected to follow. Policy lessons were likely drawn from state-to-state, but policies differ slightly, and in each case, policy change also came via national groups seeking to "nationalize" policies by going state-to-state (Chemerinsky et al. 2015; Hammer 2013).

As with the marijuana legalization example above, it is often not obvious which aspects of a policy resulted from diffusion and which resulted from coincidence. Consider the liberalization of markets in the late 20th century. Liberalization likely resulted for a host of reasons, some born out of a desire to emulate, others in order to gain assistance from the International Monetary Fund, or to become a member of the World Trade Organization (Hazeltine 1917; Simmons and Elkins 2004).

Perhaps because it is often difficult, if not possible, to disentangle the contributing factors to convergence, much of the literature presumes that the presence of convergence indicates that diffusion occurred. Sometimes this presumption is clearly warranted. Rogers (2010, 208) provides the example of ten states copying California's 1931 Fair Trade statute, including typographical errors. Other times, diffusion is less obvious. Makse and Volden (2011), studying convergence of state policies expanding the rights of criminal defendants, presume diffusion rather than similar internal conditions as the cause of convergence. Frederickson, Johnson, and Wood (2004, 21), observing the increasing convergence of state tax abatements,

comment that “[s]urely this rapid spread of location incentives did not happen because state governments independently reached the same conclusion about their desirability."

Given the interconnectedness of the modern world and the governments therein, these presumptions are justifiable. It is far easier to imagine purely coincidental convergence happening centuries ago when vast distances separated civilizations. Boushey (2010, 50) makes this point, observing that "the proliferation of radio, television, Internet, and mass-communications technology permits the rapid flow of information, making positive feedback cycles and the rapid diffusion of innovations more common[.]"

Nevertheless, it is important to distinguish the two terms. As we'll see later, the literature focuses almost exclusively on diffusion when policies converge, neglecting situations in which diffusion occurs without convergence.

What Do Internal Determinants Determine?

Studies identify several internal factors that influence if and when a state adopts a policy from another state, each analogous to DOI concepts (Berry and Berry 1999). Among these factors are socioeconomic conditions (e.g., amount of drug abuse, per capita income, or level of urbanization), political conditions (e.g., a liberal ideology or inter-party competition), administrative capacity, and legislative professionalism) (Berry and Berry 1999, 230; Bingham 1978; Boushey 2010). (These are given more attention in Chapter 4.)

But how do these characteristics actually contribute to convergence or diffusion? To what extent do these factors contribute to states independently creating similar policies? To what extent do these factors make it more likely that a state will be receptive to the policy experiences of other jurisdictions? And when a policy diffuses from one state to another because they share particular characteristics, which gets the credit? Berry (1994) highlights a situation when it is unclear what an internal determinant actually determines. Berry finds that state agencies are more likely to adopt a “strategic planning” initiative when they have more financial resources

and are larger in size. Did greater financial resources and a larger size make it more feasible for implementation of a strategic planning initiative? Or did these factors make it more feasible for them to draw a lesson from elsewhere? Or was it a combination of both? Similarly, Cale and Reams (2013) argue that the most important factor in explaining variation in state climate mitigation policies is geographic proximity of one state to another with a similar policy. According to them, "[t]his finding supports the 'horizontal diffusion' of state actions..." (42) It may very well be true that proximity makes diffusion more likely. However, might not internal factors, such as similar effects of climate change, also play a role? For example, all coastal states experience erosion. Severe storms—such as Hurricane Katrina—affected several states.

Horizontal and Vertical Diffusion

U.S. states (and other subnational governments) serve as natural experiments ("laboratories of democracy") from which co-equal and higher-level governments can learn (i.e., PLD) (Brandeis 1932). The 50 U.S. states are particularly ripe for dynamics of PLD. U.S. states face many of the same policy problems, exist under one Constitutional system with the same federal constraints placed upon them, and thus have similar policy options. This context allows for comparisons between policy results. Lessons are drawn horizontally (i.e., state to state) and vertically (i.e., between states and the federal government.)

Bulmer et al. (2007, 1), exploring the diffusion of utility regulations between E.U. member-states, provides a more articulate description that certainly applies to other federal systems, like the U.S.:

> The European Union creates optimal conditions for policy ideas to travel. Dynamic interaction between the EU and member states draws national actors into a common policy milieu that transcends territoriality and renders domestic policy systems permeable to external influence.

The early quarter of the 20th century provides an example of vertical PD. During the conservative Hoover administration in the 1920s, states experimented with liberal social

programs. When the liberal Roosevelt administration came to power, these state policies were emulated at the federal level (Frederickson, et. al. 2011; Nathan 1993). In the opposite direction, Shipan and Volden (2006) explore vertical diffusion from cities to state government. Using the case of local antismoking policies, they find strong evidence that many state policies drew from local "laboratories."

Policy can also diffuse like the knight piece in chess—vertically and horizontally. In the early 1990s, the federal government broadened access to interstate distribution lines in an effort to encourage more states to deregulate their electricity markets. It worked, and as of 2010, sixteen states have deregulated electricity markets (EIA 2010). Gilardi (2005), looking at the growth of increasingly powerful administrative agencies in European countries during the last quarter of the 20th century, finds evidence of diffusion in all directions. Mossberger (1999) describes the diffusion of "enterprise zones." Enterprise zones are distressed, financially unattractive areas where government incentivizes development. The policy initially emerged in the U.K. during the early 1980s. From there, they diffused to 40 U.S. states. In 1993, after drawing lessons from the states' experiences, Congressed passed a federal law creating their own enterprise zones.

Krause (2011) asks an important question: Which is more significant, horizontal or vertical diffusion? In the case of U.S. municipal climate policies, she finds that policies more often diffuse horizontally than vertically. She concludes that state governments do not significantly influence the existence of local policies, while local-level factors are particularly significant. More specifically, factors influencing adoption of a climate mitigation plan include: higher city populations, education rates, median incomes and tax revenues per capita; a liberal-leaning political ideology; strong mayoral governance structures; and the absence of a sizable manufacturing industry. Krause also finds that a city's signage of the Mayor's Climate Protection

Agreement, a non-binding resolution by cities to reduce their GHGs, is significantly influenced by whether neighboring cities are signees.

Regardless of which is more important, and despite PLD occurring in all directions, the PD literature (and the DOI literature) primarily examines horizontal diffusion between co-equal governments. Some studies are global. Simmons and Elkins (2004) find that competition, influential cultural norms, and learning between nation-states each contributed to the global diffusion of liberalized economies. Jordana, Levi-Faur, and Marín (2011) reach a similar conclusion regarding the increasing reliance on administrative agencies to make policy in nation-states across the world.

Other studies explore diffusion between two nation-states. Rochefort and Goering (1998) explore diffusion of mental health policies from the U.S. to Canada. They conclude:

> [despite a cultural] hostility toward things American, many also have been willing to monitor U.S. developments in search of ideas and practices that could prove useful in a Canadian context... such borrowings have included federalist governmental organization, a national park system, and a legal charter of individual rights. (Rochefort and Goering, 1998, 124)

Others explore diffusion between local governments. Bingham (1978) examines diffusion of policies between housing authorities, school districts, public libraries, and municipal governance structures. He concludes that 'process' innovations (e.g., computerizing housing authority management) are more likely to diffuse than 'product' innovations like new construction materials for public housing. He attributes this to products incurring a cost without a significant countervailing incentive. Even relatively minor costs, Bingham argues, impede adoption of a seemingly advantageous innovation from elsewhere. In the case of computerization, they already had the computer, so the only expense was time spent inputting the information. And the incentive was the great deal of time saved in the future. Whereas with the new construction materials, although more cost-effective in the long-run, it was not clear how it

made their jobs any easier. (Of course, they had to buy the computer—a product—at some point, so I am not sure how meaningful this distinction is, or how good the example is.)

It is important to note that horizontal and vertical diffusion is not necessarily directly from one government official to another. Lubell and Fulton (2008) survey 400 fruit growers in California, and find that they are much more likely to cooperate in a watershed management program if they belong to an agricultural policy network. That is: the California legislature created a watershed management program, and information regarding this program diffused between policy network actors (i.e., implementing officials and fruit growers.) To use two examples from above: Shipan and Volden (2006), analyzing diffusion of antismoking policies from the local to the state level, observe that diffusion also relies on a strong advocacy coalition which is able to push the debate from the local to the state level. Similarly, Mossberger (1999, 36), in exploring how federal policymakers learned from state "enterprise zone" policies, credits lobbying by policy advocates for bringing the issue to Congress in the first place.

Much if not most of the PD literature concerns diffusion between U.S. states, and more recently, E.U. member-states. For the same reason that subnational governments in federal systems act as natural experiments from which policymakers can learn, they also provide natural experiments from which PD scholars can learn. "Laboratories of democracy" share similar policy contexts, making it possible to construct more valid and generalizable studies. This practical consideration surely enters into the decisions of PLD scholars (as it did for many of the examples above.) In short: federal systems, are particularly ripe for PD dynamics, and for PD studies.

'Innovativeness'

Initial PD studies sought to rank governments (particularly U.S. states) by their general propensity to be early policy adopters—their 'innovativeness.' Although Gray (1973) and others criticize this approach for reasons to be shown below, there is a reasonable amount of

consistency between these studies. McVoy (1940) concluded that New York, California, Wisconsin, and Michigan were states whose policies were most often emulated. Walker (1969) examined the diffusion of 88 policy programs between U.S. states, and also found that New York (1st), California (3rd), Wisconsin (10th), and Michigan (5th) were among the most innovative. (Massachusetts ranked 2nd.) Boehmke and Skinner (2012), performing a similar analysis of 180 policy programs, find that the rankings of innovativeness were similar to Walker's. For the most part, states in the top 10, middle 30, and bottom 10 remained there.

Gray (1973) classified multiple state policy programs into 'civil rights,' 'welfare,' and 'education' typologies, and concluded that "'innovativeness'is issue- and time-specific at best." Gray (1973, 1185). Although some states adopted multiple civil rights policies at significantly higher rates than others, as Gray observes, most of these laws were coupled together, and were passed contemporaneously, obscuring who led who. Agreeing with Gray, more recent literature has moved away from a sole focus upon 'innovativeness.' The PD literature now identifies four primary causes of diffusion: coercion or persuasion from a higher level of government; competition between co-equal levels of government; influential external norms; and policy learning (Berry and Berry 1999; Simmons, Dobbin, and Garrett 2007).

The following three sections look at the first three of the causes listed above. Learning is reviewed separately later in the chapter.

Coercion or Persuasion?

Coercion or *persuasion* cause diffusion when a higher-level of government (e.g., the federal government) influences policy at lower-levels (e.g., U.S. states.) (Simmons, Dobbin, and Garrett 2007). In an example of persuasion without much coercion, in the early 1990s, the federal government broadened access to interstate distribution lines in an effort to encourage more states to deregulate their electricity markets. It worked, and by 2010, sixteen states deregulated their in-state electricity markets (EIA 2010).

Other times whether a higher-level government is "coercing" or "persuading" a lower-level government is a matter of perception, so the literature often refers to them together. (Simmons, Dobbin, and Garrett 2007). One example: The federal government offers millions of dollars in highways funds to the states if they enact a drinking age of 21. All 50 states comply. Note the use of the word 'comply.' I could have said that the states 'accept the federal government's offer.' Is the federal government coercing states by withholding the money if the states have a younger drinking age? Or are they simply persuading them?

Whether higher-level governmental actions are coercion or persuasion is a particularly salient debate in both the U.S. and the E.U. Kuhlmann (2001) conclude that E.U. member-states seldom follow the directives of Brussels regarding innovation policies unless it happens to be in line with their preferences (Kuhlmann 2001). In the U.S., there is a different calculus because there are mechanisms (i.e. courts) that can force states to follow a federal directive, such as *Massachusetts v. EPA* (2006), where the court held that the EPA can regulate carbon dioxide at the state level, thereby affecting in-state power production, which would otherwise be under sole state jurisdiction.

The difference between coercion and persuasion is not just relevant to PD studies—it bears on the Constitutional relationship between the federal and state governments. For example, the Affordable Care Act initially required states to expand Medicare eligibility to the uninsured or they would lose the federal funding they were already receiving for Medicare. In *National Federation of Independent Business v. Sebelius* (2012), the Supreme Court held this was unconstitutional because the requirement, although technically offering a choice, and thus had no Constitutional basis.[7]

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[7]The power of this holding is subject to debate. http://volokh.com/2012/07/02/what-did-the-court-hold-about-the-commerce-clause-and-medicaid/

Welch and Thompson (1980) assess the diffusion (and in a rare case for PD studies, the non-diffusion) of 57 wide-ranging state policies. Roughly half of the policies included federal incentives for states who complied, and roughly half did not. As one might expect, the first group diffused faster, and between more states, than the second group.

Allen, Pettus, and Haider-Markel (2004) takes a narrower but deeper approach, focusing on three diffused state policies, each of which involved a different signal from the federal government. In the case of criminal parole reform, Congress passed a law providing financial incentives to states that passed legislation making parole requirements more stringent. Like in Welch and Thompson (1980), most states chose to accept the federal government's offer, and they did so quickly. In the 1990s, President Clinton vetoed a ban on so-called 'partial birth' abortions, drawing the ire of Republicans in Congress, and receiving much media attention. In the veto's wake, many states with Republican-majority legislatures took it upon themselves to ban such late term abortions. In this case, two signals came from the federal government: one from President Clinton's veto and one from the law passed by Congress. The states chose which was more persuasive. Their third case is hate crimes legislation: The federal government required the Federal Bureau of Investigation to compile statistics on state crimes against marginalized groups, but did not require states to provide this information. The law's request for data, rather than a mandate or incentive, resulted from a highly publicized compromise between the bill's supporters and opponents in Congress. This mixed signal did not encourage diffusion. These findings suggest that contradictory signals can encourage diffusion, while mixed, indecipherable signals do not. Karch (2006) adds a fourth type of federal signal: a clear statement without carrot or stick. Congressional language encouraged state adoption of anti-poverty laws, but adoption was not required or rewarded. Nevertheless, Karch (2006) finds that it did contribute to state adoptions.

Competition

Perhaps the most obvious and well-known form of policy diffusion is *competition* between governments. Governments often create policies to gain an advantage—economic or otherwise—over each other. Famous examples of diffusion-by-competition include the Cold War and the Race to the Moon between the U.S. and the U.S.S.R. A contemporary example, which I also quoted in the Introduction is offered by John Brennan, at the time a national security adviser to President Obama:

> as our nation uses [armed drones], we are establishing precedents that other nations may follow, and not all of those nations... share our interests or the premium we put in protecting human life, including innocent civilians. (Entous 2012)

As the U.S. and China engage in a 'trade war,' one of their disagreements, described by Vincent (2014), regards the manufacturing and global sale of solar panels. Both the U.S. and China accuse the other of violating international agreements. (And, indeed, each probably is violating World Trade Organization agreements.) China subsidizes both domestic manufacturing and exporting of solar panels. In retaliation, the U.S. raised the tariffs on imports of solar panels from China.

Many argue that regional neighbors are the most likely to compete with each other—particularly for economic advantages (Berry and Berry 1999). An oft-cited example comes from Berry and Berry's (1990) analysis of the diffusion of state lottery programs between 44 U.S. states. States were much more likely to adopt a public lottery if a bordering state did. This makes perfect sense—when a citizen purchases a lottery ticket in another state, that's money that won't be spent (and taxed) at home. Two of the six states without state lotteries have no regional competitors—Hawaii and Alaska. And the other four have their own reasons: Alabama, Mississippi, and Utah cite moral objections, and Nevada's casinos do not want competition from a public lottery (Grimes 2015; Johnston 2015).

Competition for lottery players is consistent with other types of economic competition. Currently, all but a handful of states offer tax credits to those making films within their state, and there is little doubt why (Fitzgerald and Enrich, Peter 2010). Currently, Foxwoods Casino in Connecticut is lobbying the legislature to exempt it from state laws that ban liquor sales after midnight—largely in reaction to Massachusetts' plan to build casinos, which might be able to serve liquor until 2 A.M. (FOX Business 2014).

There is a sizable literature on how states "race to the bottom" or "race to the top" to distinguish their policies from other states and gain an advantage over them. Many of these studies test the hypothesis that states "race to the bottom" by reducing Aid to Families with Dependent Children (AFDC) benefits in order to avoid attracting out-of-staters seeking more generous benefits. According to the hypothesis: if State A has more generous benefits than State B, it is more likely to reduce its benefits to, or below, State B's level (Brueckner 2000; Saavedra 2000).

A similar hypothesis exists in environmental policy. As Saleska and Engel (1998, 55) observe:

> A central rationale for placing primary responsibility for environmental protection with federal authorities—as opposed to state or local authorities—is the long-standing belief that, in the absence of federal regulation, state governments will engage in a welfare-reducing "race to the bottom" in environmental standard-setting for the purpose of attracting and retaining mobile industries.

Evidence of such a "race to the bottom" is mixed. Woods (2006), and Saleska and Engel (1998), find that U.S. states relax environmental restrictions after a neighbor does so, presumably in order to prevent businesses from moving to the more lax state. Konisky (2007a; 2007b) argues that the "race to the bottom" thesis misses out on important dynamics within environmental policymaking. For one, it is private firms who are the primary drivers in the race to the bottom, not environmental regulators. And second, while some states race to the bottom,

others do not, perhaps because of a mitigating race to the top (e.g., states and businesses promoting themselves as "green.")

Like Konisky, Potoski (2002) finds little evidence for a race to the bottom. He argues that environmental regulators are not the key actors, and that there is actually an under-appreciated race to the top for more and better environmental regulation between the states. The race to the top, he argues, is not a mitigating force—it is the primary force. Fredriksson and Millimet (2002) reach a similar conclusion regarding increases in pollution abatement costs, concluding that the higher costs attracted businesses from other states, and ultimately improved the economy.

Cai and Treisman (2006) present a different variety of diffusion-by-competition. Analyzing diffusion of policies between subnational governments in China, they conclude that what looks like co-equal subnational governments 'one-upping' each other actually results from competition *within* the national government. Competing factions within the national government formed alliances with subnational governments. Thus competition was both horizontal and vertical. I include this example not to suggest the U.S. has similar dynamics (although it might), but instead to make the point that the dynamics of diffusion-by-competition are much more complex than these government vs. government examples suggest.

External Norms

Policy also diffuses because of the influence of societal *norms*. (Some use the term 'constructivism' to refer to the same concept.) (Simmons, Dobbin, and Garrett 2007). The basic premise is that a widely-held belief (a norm) affects policy outputs in multiple jurisdictions (Meyer et al. 1977).

Simmons, Dobbin, and Garrett (2007) conceptualize five types of (overlapping) mechanisms of norm-inspired policy diffusion:

(1) Emulation of others based on perceived success (also a form of policy learning.)

(2) Trans-jurisdictional advocacy groups or epistemic communities of policy experts spread a belief until it becomes a commonly-held norm.

(3) Jurisdiction perceives itself to be similar to another, so it becomes susceptible to the norms of the other jurisdiction.

(4) Influence by regional neighbor.

(5) Fear of being the "laggard," and seeking legitimacy.

Due to unprecedented global interconnectedness, influence extends far beyond regional neighbors. Mansfield (2013) discusses the role of tourists in spreading norms regarding the tipping of restaurant servers. The federal government and most U.S. states allow restaurant servers to be paid less than the minimum wage because customers generally tip them. The tipping norm, and resultant policies, have diffused to other nation-states via tourists bringing the norm back home with them.

Norms are difficult—if not impossible—to precisely define or capture empirically. Partly for this reason, as Gilardi (2012) observes, most studies look retrospectively at a widely-diffused morality policy and presume that adoption resulted from a change in normative values. Tews (2005), for example, concludes that, because internal conditions and demographics within nation-states did not predict whether or not a public schooling program would be adopted there, norms must have been the driving force. Reviewing literature that for the most part makes these same assumptions, Simmons, Dobbin, and Garrett (2007) conclude that norms are a significant predictor (and perhaps the most significant predictor) of how widespread diffusion will be. Likewise, Biesenbender and Tosun (2014) find that international pressure significantly affects how stringent a nation's emission standards will be (or whether they exist at all.)

Intertwined and Intractable

Of course, policies do not diffuse for singular, discrete reasons, and it is impossible to completely extricate them. A critique of existing studies, made by Berry and Berry (1990) and repeated by others, is that PD studies too often search for only one cause of PD, rather than seeking a more dynamic perspective, and too often find what they were looking for, suggesting selection bias. I offer another possibility: there might simply be traces of coercion, persuasion, competition, external norms, and learning in most cases of policy diffusion.

Take the example of former national security adviser Brennan's warning, described above, that the U.S.'s use of armed drones might set "precedents that other nations may follow, and not all of those nations... share our interests or the premium we put in protecting human life[.]" (Entous 2012). If his fear came true, each of the four primary causes of PD are likely involved. Brennan's warning is of a shift in global norms. Proliferation of armed drone use would implicate competition, and perhaps also coercion/persuasion if the U.S.'s status as the global superpower is analogous enough to a 'higher-level government.' And surely militaries and intelligence agencies, before building and using their own drones, would engage in policy learning.

Much could be written about how intertwined coercion, persuasion, competition, and external norms are, but my focus here is on how learning is intertwined with the other causes. This is not just because of my dissertation topic, but because it is difficult to imagine learning not playing a part in the other types of diffusion.

Learning, for example, is likely to play a role whenever a government wishes to translate a norm into a policy ("who else did so?"), or compete with another government ("how can we do this better?") The literature typically identifies influential norms by using the adoption of a particular social policy as a proxy. That is: if a morality policy (e.g., abortion legalization, the death penalty, etc.) diffuses, then its underlying norm must have also diffused (e.g., pro-

choice, pro-life, anti-death penalty beliefs, etc.) Implicit in this presumption is that when an external norm is absorbed, policymakers or policy advocates look to other governments that share the norm to see how they actualized it into policy (i.e., policy learning.)

Lee and Strang (2006) analyze the diffusion of public sector downsizing in 26 nations, and conclude that policies from elsewhere were only emulated when they fit a preconceived normative viewpoint. Those who viewed downsizing as favorable only drew lessons from nations where downsizing appeared successful. Less successful policy models were ignored.

Likewise, it is difficult to imagine Massachusetts competing with Connecticut for gambling dollars without first learning about Connecticut's casino policy. And few state policies are made without some sort of signal from the federal government, even if only tacit.

The prevalence of learning in the diffusion process might explain statements that seem to equate learning and diffusion. Examples include Dolowitz and Marsh's definition of 'policy transfer' as:

> the process by which knowledge of policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system. (Dolowitz and Marsh 2000, 5).

Similarly, Karch states that: "diffusion implies a process of learning or emulation during which decision-makers look to other cities states or countries as models to be followed or avoided in other words, diffusion occurs when the existence of a policy innovation in jurisdiction a significantly affects the likelihood that it will be adopted in jurisdiction B." (2007, 193).

Because learning is so intertwined with the other factors, up-close studies, such as this one, have much to offer insofar as they can explore how various factors contribute synergistically to PD in a way that large-N retrospective studies cannot, even when they try to. For example, Boehmke and Witmer (2004) attempt to disentangle the role of learning and competition in the

diffusion of casino gaming laws. Like most PD studies, they use the date of adoption as the dependent variable. They presume that adoptions by neighboring states implies that learning or competition occurred between them. Their second dependent variable is the timing of post-adoption revisions to casino gaming laws (which, in all cases, is additional compacts signed between states and Indian nations.) They presume that this second variable does not imply that learning occurred because states no longer have a need to learn from others—they now have their own experience to draw from. Policy revisions, they argue, imply economic competition. Boehmke and Witmer (2004) conclude that competition between states leads to both adoption and expansion, and that learning between states leads to adoption but not expansion.

Policy Learning

What Is It?

Although the concept of *policy learning* preceded Heclo in some fashion, his articulation has stuck. Observing policymaking in Britain and Sweden, Heclo observed that:

> Politics finds its sources not only in power but also in uncertainty–men collectively wondering what to do... Governments not only 'power'... they also puzzle. Policy making is a form of collective puzzlement on society's behalf; it entails both deciding and knowing... Much political interaction has constituted a process of social learning expressed through policy. (Heclo 1974, 305-306)

As above quote implies, ‘puzzling’ (i.e. policy learning) involves a conscious decision to reduce uncertainty by learning from others (Rose 1993; 2005). As Marsh and Sharman (2009, 34) put it:

> learning implies a 'rational' decision by governments to emulate foreign institutions and practices to the extent that these measures produce more efficient and effective policy outcomes than the alternatives.

These definitions are helpful but are missing a few important elements in the policy learning process. Prior to lesson-drawing, a policymaker must choose *from whom* to draw the

lesson. Between initial lesson-drawing and effectuated policy change, policymakers assess the normative and practical values of the policy model from elsewhere. And lessons can be applied in several different ways, ranging from emulation *in toto* to mere inspiration to 'negative' diffusion (Mossberger and Wolman 2003; Rose 1993; 2005).

It is important to distinguish this definition of learning from conceptions in other disciplines. The "policy" variety of learning is decidedly narrower. Anthropologists, biologists, psychologists, and neuroscientists use a broader definition which includes "unconscious" learning or lessons that are stumbled upon (Hoppitt and Laland 2014). Another difference involves the actors involved in the learning process. Whereas most conceptualize PL as one 'student'-government learning from one 'teacher'-government, other conceptions of learning are broader. They often include arrangements such as:

learning from multiple sources;

learning from a source who previously learned from another source;

multiple actors learning from one source;

multiple actors learning from multiple sources;

and multiple actors learning from each other.

In two important respects, however, PL is similar to the more general definitions. Learning, policy or otherwise, need not result in observable change. In the case of public policy, this means that learning need not result in actual policy change. (Simmons and Elkins 2005, 43). And policy learning, like other forms of learning, is not a wholly rational or systematic process. Policymakers—and other types of learners—tend not to appreciate the uncertainty they face, and unknowingly fill their knowledge gaps with "irrational" beliefs. As Boushey (2010, 35) observes:

> Researchers across disciplines have noted how cognitive heuristics, emotional reasoning, or the influence of prejudice and bias short-circuit the linear process of problem definition,

evaluation, solution, and implementation in both individual and organizational decision making.

Cognitive heuristics are 'mental shortcuts' such as relying on anecdotal, easily-available, or flimsy evidence to make decisions (Kahneman 2013). Emotional reasoning is when a mistaken belief is actualized (e.g., a "self-fulfilling prophecy.") (Beck, Emery, and Greenberg 2005). Biases are largely unconscious beliefs formed without sufficient evidence, but viewed as objective truth (Cain and Detsky 2008).

Conceptual Clarity

Beyond the description above, there is little conceptual consensus about what policy learning looks like in practice. In my Introduction, I gave the following definition: policy learning is a process in which a policymaker actively seeks policy ideas, experiences, or knowledge from another governmental entity to reduce uncertainty and inform decision-making. However, this abstract definition does not easily lend itself to actualization in a conceptual framework or research method.

In this section, I review four works that informed my research design. The first, Bennett and Howlett (1992), argues that scholars are conceptualizing policy learning inconsistently, impeding theoretical development. They parse the literature, asking of each work: *Who learns? From whom* do they learn? And *what is the effect?* They conclude that the term is being used to describe three different—but related—processes, which they identify as 'lesson-drawing,' 'government learning,' and 'social learning.'

In 'lesson-drawing,' policy actors (governmental or nongovernmental) learn from others in their policy network, which results in learning how to better achieve policy goals. The important takeaway here is that policy actors already have an *end*, they're just seeking a better *means.* 'Government learning' predicts that government officials, because of a change in sociopolitical conditions and/or accrued knowledge, learn from officials and organizations

elsewhere, which ultimately affects institutional, organizational, or process-based change. The distinctive elements here are that an external force initiates the process, and only governmental actors are involved. In the third variation, 'social learning,' members of advocacy coalitions learn from members of other advocacy coalitions, which changes an actor's policy goals.

Although these terms, as defined, have seldom been used since Bennett and Howlett's article was published, their call for more nuance has been repeated many times. Interestingly, they conclude by proposing a new definition that incorporates the three PL processes described above:

> [policy] learning is in fact a complex, multi-tiered phenomenon which can affect either decision- making organizations and processes; specific programs and instruments used to implement policy; and/or the ends to which policy is developed... the agent of each type of learning will be different... [This definition] draws on the strengths of each of the theories examined above, while minimizing their weaknesses." (289)

While I agree that theory-development is impeded when scholars use the same term to apply to different processes, I am not sure how their definition "minimizes... weaknesses." At the onset, they argued that existing conceptions of PL lacked nuance. After adding nuance, they take it back. Perhaps this is why, according to Google Scholar, their article has been cited 724 times, but their re-definition has yet to be.

Nevertheless, Bennett and Howlett's main point that conceptual confusion impedes theory-development was an important one. Rose (1993; 2005), Heikkila and Gerlak (2013), and Wolman and Page (2002) represent three more recent attempts to add conceptual clarity.

One of the seminal PLD theorists, Rose (1993; 2005), views policy learning as a three-stage process:

(1) A policymaker reviews policies elsewhere, choosing them based on geographic proximity, perceived policy success, perceived policy failure, perceived leader in a relevant policy domain; and by serendipity (e.g., running into somebody at a conference, or pressing

Random Search on Google.)

(2) The policymaker creates a causal model of one (or more) of the policies reviewed.

(3) The policymaker assesses the model normatively ("should we do this?") and practically ("can we do this?")

Rose (1993; 2005) also hypothesizes multiple ways policy lessons can be applied. At one end of the spectrum is *photocopying* of the program. At the other end of the spectrum is *negative diffusion*, when a policymakers learns what *not* to do based on a lesson learned. Between these ends of the spectrum are:

copying: most but not all of a policy program is emulated

adaptation: the policy program is emulated but customized in order to be used at home

hybridization: elements from two policy programs from different governmental entities are combined

synthesis: elements from three or more policy programs from different governmental entities are combined

selective imitation: an aspect of a policy program from a governmental entity is emulated where a less significant portion is applied

inspiration: lessons drawn are not specific enough to be applied, but nonetheless encourage diffusion

Heikkila and Gerlak (2013) make an important contribution by focusing on the role of the individual in what most describe as more of an organizational learning process. They draw attention to the fact that organizational and network learning—and resulting policy diffusion—comes by way of a series of individuals acquiring, interpreting, and choosing to disseminate

information to others. This is particularly helpful in the case of change agents and other sole individuals who significantly influence a policy process. Unlike policymakers, change agents might not be associated with a particular organization, and thus have no obvious proxy. A strictly organizational perspective would miss these dynamics. In this respect, they offer a conceptual means of understanding the micro-scale steps that culminate in macro-scale diffusion.

Heikkila and Gerlak view policy learning as a three-stage process: (1) an individual acquires a lesson, (2) interprets the lesson, and (3) disseminates the information into his or her organization or policy network. This dynamic differs from other understandings of PLD in two important respects: Their PLD process begins with an individual's intention to learn but also includes an individual "stumbling upon" a lesson. And second, information "diffuses" into the learner's organization or policy network, and does not necessarily cross jurisdictional borders. Their framework does not ask what effect the disseminated information has on subsequent policy outputs. As such, it is more a theory of policy learning alone than of policy learning *and* diffusion.

While Bennett and Howlett (1992), Rose (1993; 2005), and Heikkila and Gerlak (2013) clarify conceptual confusion in the PLD literature, none test their theories. Citing this fact, Wolman and Page (2002) draw on the organizational learning literature to propose a new framework *and* they apply it to a particular case: PLD between local officials in the U.K. They propose a stages model similar to Heikkila and Gerlak's, except that it focuses on dissemination across jurisdictional borders, rather than into an organization. Importantly, however, their framework is geared towards understanding how policymakers *generally* use lessons from elsewhere in their decision-making, and how effective they perceive policy learning to be. As such, they are primarily concerned with the quantity and perceived quality of policy learning, not the actions and events leading from one stage to another.

My goal, explored in Chapter 4, is to build upon these causal models by combining the best of each: the targeted questions approach of Bennett and Howlett, the "up-close" conception offered by Heikkila and Gerlak, and the applied theory approach of Wolman and Page.

Laboratories of Democracy?

> It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country. (Brandeis 1932)

Presumably, the point of PLD research is (at least in part) to improve policy learning, thereby improving decision-making, and ultimately policy itself. Or in other words: to move closer to the “laboratories of democracy” ideal. However, realizing this aspiration means that policy learning must be important enough relative to other influences on policymaking to make a difference.

The literature firmly demonstrates that policy learning occurs, and that it ultimately influences policy outcomes. And there is little reason to expect PLD's prevalence to decrease any time soon. As Boushey (2010, 50) observes:

> Modern advances in communication technology have made it easier for decision makers to acquire and evaluate information about new policy innovations. The proliferation of radio, television, Internet, and mass-communications technology permits the rapid flow of information, making positive feedback cycles and the rapid diffusion of innovations more common in the modern era.

Aside from the studies cited so far, we also know about the prevalence of PLD from the horse’s mouth. Freeman (1985), surveying U.S. state legislators, finds that most knew of energy policy innovations in other states. Konisky (2007) reaches the same conclusion about state environmental regulators. Likewise, Wolman and Page (2002), surveying local officials in the U.K., find that 40% always or often use PL in decision-making and 50% do so occasionally.

Others emphasize that certain types of policies inspire learning more than others.

Mooney and Lee (1999), studying the diffusion of state death penalty statutes, and Nicholson-Crotty (2009), analyzing the diffusion of 57 different state policies, argue that policies that are low-on-the-radar and technically complex inspire learning more than those that are politically charged and technically simple (e.g., the death penalty.) They attribute this to policymakers responding to electoral realities instead of going with their first instrinct: to engage in authentic information-seeking. Boushey (2010) makes a similar point, but emphasizes the end-result: technically complex policies such as environmental regulations are less prone to rapid "outbreaks" of diffusion. He attributes this to the decreased role played by electoral politics, and the increased role played by policy experts and mid-level officials who are shielded from the whims of the public.

So PLD is prevalent, with advances in technology it is becoming more prevalent, and certain types of policies may inspire it more than others. Less evident (and less subject to empirical verification) is how important PL is relative to other influences on policy, and whether it can actually improve policy outcomes.

Freeman (1985), in the study of energy PLD described above, found that lessons learned played an important role in decision-making. Berry and Wechsler (1995) offer a different perspective. They survey 283 officials from state agencies on their decisions to adopt ‘strategic planning initiatives.’ Only 3 cited another state’s experience as most important in the decision to adopt, 21 said it was an important factor, 18, said it was neither, and 61 said it was not important. According to those surveyed, much more consequential was whether an agency head previously adopted a similar measure elsewhere; if the governor mandated creation: and whether a consultant recommended it.

Karch (2007) analyzes the diffusion of numerous state policies—senior prescription drug programs, medical savings accounts, individual development accounts, electoral time limits,

and family caps for welfare benefits—and concludes that:

> [e]xperimentation and institutional learning play a relatively minor role at various stages of the policy-making process, while time constraints and electoral considerations have an especially profound impact. (204)

Nohrestedt (2005, 1056) makes a similar criticism in his analysis of Sweden's policy reaction to the Three Mile Island nuclear accident:

> [A]ctors may sell out policy core beliefs in order to escape temporary strategic problems and safeguard short-term political interests... Given some shocks and certain political conditions, the fear of losing political capital (e.g. level of support, credibility, political survival) will override ambitions to advance policy core beliefs.

Of course, even Justice Brandeis would agree the "laboratories of democracy" analogy is not to be taken literally. However where it lies on the spectrum between aspiration and realization is subject to debate. Policymaking could never match the rigors of the scientific method used in traditional laboratories. Policy problems, solutions, and evaluations are matters of perception and often subject to vigorous debate (Stone 2011). And experiments cannot be controlled because of contextual differences between "laboratories."

Walker (1969, 898) assumed that PLD was a good thing. He lamented that: "the isolation of some state capitols from the major cosmopolitan centers of the country is a major obstacle to the adoption of new ideas." According to Mooney and Lee (1999), later adopters improve innovation by avoiding the mistakes, and copying the successes, of earlier adopters (at least for low-on-the-radar, technically complex policies.) Speaking more generally, Boushey (2010) argues that:

> [i]f a social system is substituted for the individual in the learning curve, it seems reasonable to expect that the experience with the innovation is gained as each successive member in the social system adopts it. Each adoption in the social system is in a sense equivalent to a learning trial by an individual. The process of incremental learning leading to policy diffusion mirrors the process of trial-and-error learning in individuals.

Weyland (2005, 295) offers a more pessimistic view:

> Above all, people overinterpret short stretches of success as proof of the intrinsic superiority of the new mode. Jumping to conclusions, they rush to emulate a seemingly successful policy scheme, giving rise to the upsurge of diffusion that is captured in the S-shaped curve....[because of] specific characteristics of their own country[,] [t]hey confine modifications to peripheral aspects and retain the innovation's design principles.

A classic example of the dynamics described by Weyland is Wildavsky and Pressman (1973). Assessing economic development policy failures in Oakland, they conclude that a primary reason for failure was that implementation lessons drawn from Appalachia were carelessly applied in Oakland. Similarly, Goodman (1944), assessing why cities in western states had ineffective governance structures, concluded that the states were drawing the wrong lessons about municipal governance structures in the eastern states.

And even when there are several "laboratories" to draw lessons from, Mossberger and Wolman (2003) argue that policymakers often learn from too few sources to appreciably inform decision-making. Or, as Mossberger (1999) points out, policymakers sometimes have too many examples to learn from. In the case of "enterprise zone" policies, she finds that federal policymakers drew broad and superficial lessons from state experiments. This led to unsupported generalizations, and adversely affected policy designs.

According to Karch, the "diffusion of policy innovations is an inherently political process" (2007, 204). This might be a false dichotomy however. Politics do not necessarily stand in opposition to PLD. Volden (2006), studying the diffusion of state children's health care programs, concludes that states emulated those programs that proved most successful in raising the proportion of poor children covered. The incentive for decision-makers was the election-seeking behavior of politicians.

There are other reasons why Karch's conclusion might be overstated. (In fact, part of my motivation in this study is to test how generalizable his claim is.) Karch only looks at

learning after a policy has diffused among many states. Further, his focus is on the adoption of policy, not subsequent implementation. He argues that the five policy areas he analyzes—senior prescription drug programs, medical savings accounts, individual development accounts, electoral time limits, and family caps for welfare benefits—fairly represent state policies so to make his study generalizable. However, I am not sure how OSW energy policy—or any technology-based policy—is represented here.

Causal Mechanisms

The PLD literature "has increasingly moved beyond the problem of whether policies diffuse to the question as to *why* this is the case and through what *causal mechanisms* diffusion occurs." (Starke 2013, 562). (italics mine) Yet much work remains.

So how can we move the ball up the field?

One way is to seek out causal mechanisms through the use of "process-tracing."

Causal mechanisms are the sequence of actions and events that link a condition or cause (e.g., policy learning) with a purported outcome or effect (e.g. policy diffusion.) (Bennett and George 2005).

Process-tracing is a qualitative method in which researchers seek "empirical traces" of the actions and events that constituted the causal process of interest. (Bennett and George 2005; Starke 2013, 574).

Single process-tracing case studies cannot validly determine types and degrees of variables, and how important each was. They may not be able to show which variables were necessary or sufficient, but they can identify which variables contributed to the outcome. Or as George and Bennett (2005, 25) put it: "One 'last straw' may be necessary to break a camel's back, but it does not contribute as much to the outcome as the bales of straw that preceded it."

Rather than testing the relationship between a purported cause and its purported effect, process-tracing studies presume causation, and seek to discover the actions and events that led from the cause to the effect. “The point[,]" according to Hall (2008, 28) "is to see if the multiple actions and statements of the actors at each stage of the causal process are consistent with the image of the world implied by the [theories.]”

The term “causal mechanisms,” like the term “policy learning,” is not used consistently by the literature. Some argue, like Mahoney (2001), that mechanisms function as theories and must be generalizable. So if a mechanism does not work in a particular context, the mechanism must be eliminated or modified accordingly. Others, like Falleti and Lynch (2009, 1148-1150) disagree, and argue mechanisms can exist even if they do not guarantee a particular outcome. Some mechanisms, they argue, are general and portable to different—but not all—contexts. Falleti and Lynch emphasize the interplay of mechanisms and the context in which they play out. Both the process, and its surrounding context, play equal roles in the outcome. Because public policymaking is highly contextual, on-the-ground mechanisms of PLD would not pass Mahoney’s test.

Governance

In order to provide the context that Falleti and Lynch (2009) call for, I now turn to other bodies of work that fill some of the conceptual gaps in the PLD literature.

Policy Implementation

Policy implementation is not so easily defined. Ripley and Franklin (1982, 5-6) define it as “what happens after laws are passed authorizing a program, a policy, a benefit, or some kind of tangible output.” DeLeon (1999, 314-315) views it as “what happens between policy expectations and (perceived) policy results[.]” For O’Toole (2000, 273) it is “[w]hat happens between the establishment of policy and its impact in the world of action.” Or, put even simpler,

Bardach (1977) says implementation is what happens "after a bill has become a law."

Sabatier and Mazmanian (1989, 4) define it as:

> those events and activities that occur after the issuing of authoritative public policy directives... This definition encompasses... the behavior of the administrative body which has responsibility for the program and...also the web of direct and indirect political, economic, and social forces that bear on the behavior of all those involved... [in] the program.

These amorphous definitions lead to the same conclusion that U.S. Supreme Court Justice Potter Stewart came to when trying to define obscenity: "I know it when I see it" *Jacobelis v. Ohio* (1976).

Implementation is perhaps easier to define relative to the other stages of the policymaking process. Under the 'conveyor belt' model of policymaking, policy implementation occurs after agenda-setting, formulation, and adoption stages, and before an evaluation stage (Stewart Jr, Hedge, and Lester 2007, 8-9). Perhaps the greatest and fairest criticism of the conveyor belt model is that it neglects the implementation stage—widely recognized as a critical element of what constitutes 'public policy' and as a forum for political "powering." (Matland, 1995). In the 'conveyor belt' model, it is the adopters for whom the agenda is set, and it is the adopters who formulate and evaluate. The model treats implementation as 'after-the-fact' rather than as a fact unto itself. This perspective is reflected in the purposes of the first implementation studies: to evaluate how well implemented policy matched the intentions of the policy adopters (McLaughlin 1987).

Initially, as their definition of policy implementation above suggests, Sabatier and Mazmanian (1983) subscribed to a top-down approach. Sabatier and Mazmanian (1989, 39-41) synthesize the implementation literature, and compile factors purported to contribute to a successful implementation process. They divide the factors into three categories: 'tractability,' 'statutory,' and 'non-statutory.' (For simplicity's sake, I place tractability factors with the non-

statutory factors since they, too, are not elements of the enabling statute.) Those particularly relevant to PLD are given more detail in Chapter 4.

Statutory factors include:

consistent objectives (analogous to the federal government's 'signals' to state governments described earlier);

a well-developed causal theory connecting the policy output with the intended outcome;

explicit decision-making rules and procedures;

other parties invited into the decision-making process;

financial and other resources of the implementing agency;

the hierarchical integration of the agency;

and the number of "veto points" which must be passed.

Non-statutory factors include:

a non-diverse "target group;"

low percentage of population-at-large in "target group;"

attitudes and resources of "target group;"

lack of technical obstacles;

favorable socioeconomic conditions;

percent of population in the target group;

public support;

ongoing support from policy adopters;

and the commitment and leadership of agency officials.

In later works, Sabatier and Mazmanian modified their view to incorporate "bottom-up" policymaking. This revised conception was partly inspired by Simon (1973), Wildavsky and Pressman (1973), Lipsky (1978), Hjern (1982) and others who advocated a more 'bottom-up' approach to studying implementation (Matland, 1995). They argued that the existing literature under-appreciated the fact that street-level bureaucrats often wield significant discretionary authority, and it was the exercise of this authority that most citizens experienced as public policy (Lipsky 2010). (Most know that lines at the Registry of Motor Vehicles are long, but few know anything about RMV regulations.) Rather than starting from the enabling law and seeing how it was implemented, this new wave of literature started with street-level bureaucrats, and worked their way up, more interested in how policy was implemented than how it was intended to be implemented. Although they accepted the major premise of the bottom-uppers, Mazmanian and Sabatier (1989) and Sabatier and Jenkins-Smith (1993) argue that an overemphasis on the 'bottom-up' approach risks missing the roles of important 'macro' level factors. For this reason, they propose that the Advocacy Coalition Framework (ACF), coupled with the bottom-up method used by Network Governance theorists, as a means of investigating implementation. (Each is briefly described below.)

In many ways, the implementation literature, by expanding to include so many policy actors (including non-implementers), has bled into a more broadly-conceived 'governance' literature. Consider this definition of public administration offered by Frederickson et. al. (2012, 13):

> The "public" in public administration is to be broadly defined here. Public is used in its pregovernmental meaning to include governments and nonprofit, not-for-profit, nongovernmental, parastatal, and other organizations having a clear public purpose other than what is generally understood to be commerce or business.

Governance and the Advocacy Coalition Framework

The term 'governance' is used several different ways (e.g., "good governance,"

“energy governance,” “global governance, etc.”) (Rhodes 1996). Today, 'governance’ typically refers to policymaking that results from the decisions and interactions of several policy actors at all levels of government, as well as a broad range of private actors (Frederickson, et. al. 2011), paraphrasing Peters and Pierre (1998), offer three defining characteristics of modern governance: (1) an amorphous group of actors have influence, necessitating negotiation and compromise in order to get things done, (2) public and private actors must rely on each other to obtain resources they can’t get without the other, and (3) the use of multiple, unpredictable, and perhaps conflicting, policy instruments. Part of the reason that policy instruments are unpredictable is that influential actors have different policy goals, and they are often operating in different policy domains. This conception is much broader than the "Iron Triangle" of Adams (1984) and others, and broader than the initial description of his Advocacy Coalition Framework's (ACF) "policy subsystem" (Sabatier and Jenkins-Smith, 1993; Szarka 2010).

ACF is one of the foremost theories of governance. It purports to explain why, and how, policy changes over long periods of time. According to its creator, ACF addresses three problems with much of the policy literature: (1) The conveyor belt model of policy was too simplistic. (2) Top-down approaches to policy implementation miss street-level actions, and bottom-up approaches miss the context in which street-level actions occurred. And (3) studies too often ignore how *empirical and technical information* influence policy change (Weible, Sabatier, and McQueen 2009; Sabatier and Jenkins-Smith 1993).

Under ACF, policy outputs result from “a broad set of... actors [comprising a 'policy subsystem'] that not only include more than the traditional iron triangles’ members but also officials from all levels of government, consultants, scientists, and members of the media” (Weible, Sabatier, and McQueen 2009, 122). Subsystem actors, united by shared beliefs, form *advocacy coalitions*. *Policy brokers* mediate disputes between competing coalitions (sometimes

objectively and other times not) and attempt to maintain equilibrium within the subsystem. This equilibrium creates relatively stable policy regimes that last decades or more.

The deeper a belief is held by a coalition, the greater a change in beliefs will have upon policy. *Deep core beliefs*, as the name suggests, are the most fundamental underlying and motivating principals of a policy actor, and rarely, if ever change. They are not policy-specific, but they guide how an actor will view a particular policy. *Policy-specific beliefs*, which are not as closely-held, still seldom change more than once a decade. *Secondary beliefs* are means-based, and the most subject to change, and include a broad range of beliefs, from political strategy, to interpretation of data and judicial doctrines, to how budgets should be allocated. A change in a secondary belief does not alter a coalition's overall posture.

Zafonte and Sabatier (1998) provide a broader view of policy change, focusing on how subsystems interact with each other. (In effect, this moves his 'subsystem' closer to a 'network.' The distinction is drawn below.) They offer two types of interaction: competitive and symbiotic. An example of a competitive arrangement might be fossil fuels versus alternatives. Litfin (2000) provides an example of a symbiotic relationship between climate change subsystems: domestic subsystems must act within the boundaries of the international climate subsystem, and beliefs and information travel between them.

More recently, Sabatier modified ACF again, emphasizing the role of subsystem types in determining the likelihood of beliefs—and policy—changing. According to Weible, Sabatier, and McQueen (2009), relationships between coalitions involve degrees of both conflict and collaboration, and maintain an emphasis on one or the other for a decade or more. In conflictual subsystems, neutral knowledge-sharing forums will not change beliefs, and there will be little if any policy learning between coalitions. Competing coalitions also accuse each other of having “malicious motives... [and] behaviors,” paint themselves as weaker than their opposing coalition,

and use *empirical and technical information* as “political salvo” (Weible, Sabatier, and McQueen 2009, 139). The wider the gulf between the coalitions' goals, the more exaggerated these claims will be. Conversely, in less conflict-ridden subsystems, learning is more likely to occur between coalitions, *empirical and technical information* is viewed more objectively, and beliefs are more subject to change.

Initially, ACF seemed like a perfect fit for this study. It places policy learning as central to policymaking, is frequently applied to energy and environmental policymaking, and it emphasizes the importance of implementation in determining policy outputs (Weible, Sabatier, and McQueen 2009). For these reasons, this study draws on aspects of ACF. However, for two primary reasons, ACF could not provide the sole framework for this study. ACF’s version of policy learning-‘policy-oriented learning’ or ‘social learning’— is markedly different from this study's conception of policy learning. Sabatier’s version emphasizes learning that effectuates policy change over time periods of a decade or more—closer in concept to the PLD studies whose methods I seek to do the opposite of. Further, his version is conceptualized as the accumulation of individual learning processes, rather than learning in a specific, singular instance.

Two energy-related ACF studies provide other reasons why the ACF might not be well-suited for this study. Studying the wind energy subsystems in Denmark, Szarka (2010) finds that deep core beliefs only united some members of the wind proponent and opponent coalitions—other actors joined a coalition because of economic interests. He concludes that "[t]his coalition line-up does not constitute a 'Danish exception,' but has also emerged in other European countries" (Szarka 2010, 841). Nohrestedt (2005, 1056) makes a similar criticism in his analysis of Sweden's policy reaction to the Three Mile Island nuclear accident: "[A]ctors may sell out policy core beliefs in order to escape temporary strategic problems and safeguard short-

term political interests."

Network Governance Theory

Acknowledging that their proposed framework offered little guidance on how to identify the actors and coalitions within a given subsystem (particularly because policy implementers are not highly-visible), Mazmanian and Sabatier (1989, 299) suggest use of the network governance theory (NGT) methods of Hjern and Hull (1982) to discern the key actors and interactions within a subsystem (or network.) Although the ultimate goal of NGT is to manage policy networks and 'steer' policy in a normative direction ('good governance,') Mazmanian and Sabatier (1989) argue the NGT research method can identify and characterize a policy subsystem or policy network regardless of intent.

NGT conceptualizes public policy as the accumulated results of interactions between actors and coalitions within a broad, inter-governmental and extra-governmental policy network (Klijn and Koppenjan 2000; 2004). They distinguish their policy network from Sabatier's policy subsystems by arguing that networks are larger, encompass multiple subsystems, and overlap with each other. Interactions between network actors take four forms: Actors and coalitions can be *dependent* upon other actors in order to achieve their goals. Actors and coalitions can *cooperate* with each other out of mutual interest with different sets of goals. If they share goals, actors and coalitions can *collaborate* with each other. Or interactions can involve *conflict*.

Van Bueren, Klijn, and Koppenjan (2003, 193) convincingly argue that the NGT method is particularly helpful for analyzing "wicked problems." Public policy always involves some degree of uncertainty, but wicked problems (like alternative energy development) are particularly "complex and contested and... [they] involve great uncertainty with regard to the nature and the extent of the risks involved for individuals and society at large[.]" Levin, et. al. (2012) provides more specificity, distinguishing wicked problems from others, emphasizes three characteristics: The window in which solutions can be effective is closing. There is no central

authority who can create a solution. The human bias to discount the future is creating irrational policy. For this reason, I use NGT theory here to help discern the key actors, actions, and events that constituted the OSW policy implementation network in Massachusetts.

As this chapter describes, no single theory or conceptual framework readily applies to the context of U.S. OSW policy development. In the following chapter, I describe my solution to this problem, a synthesis of various concepts described above. Taken together, they may shed light on how mechanisms of PLD operated during OSW policy implementation.

Chapter 4: Discerning Mechanisms of Policy Learning and Diffusion

Conceptualizing Policy Learning and Diffusion

This chapter presents this study's conceptual framework, research method, and analytic approach. The goal is to shed light on this question:

> Through what causal mechanisms did policy learning inform the decision-making of state and federal policymakers crafting first-in-the-nation OSW policies from 1997-2006?

The goal was not to find the most significant or representative causal mechanisms of PLD, but simply to identify and explore those that emerged from the data. OSW policy developed throughout the 1997-2006 period, presumably creating countless PLD mechanisms involved. Different sources of data would reveal different combinations of mechanisms. Further, existing theory does not provide a means to validly identify the most significant or representative PLD mechanisms. Thus, I used concepts from various literatures to identify and explore a few PLD mechanisms that emerged from the data.

I used two stages of data collection and analysis. In the first round, I used exploratory, open-ended interviews and archival research to identify opportunities for PLD within the policy network. Interview subjects came from various state and federal agencies, as well as quasi-public and nongovernmental organizations, listed in Appendix E. In total, there were 11 interview subjects. Six causal mechanisms emerged from the first round of data collection and analysis. In the second round, I collected additional data from more in-depth, semi-structured interviews with key policy actors, in addition to archival data and contextual information. Sometimes PLD would be obvious, such as when a public document mentioned a policy model from elsewhere, or when interview participants immediately identified why, what, when, and how they learned. Other times, it was less obvious, and inferences were made based on triangulated information.

I conceptualized PLD as a four-stage, causal process, wherein policymakers, faced with uncertainty, seek, acquire, interpret, and apply lessons drawn from the ideas, experiences, and knowledge of other governmental entities, as shown in Figure 4.1.[8] To guide my search for "empirical traces" of these stages, I asked secondary research questions related to each, also shown in Figure 4.1. The answers to these questions were applied to factors from the literature to assess which, if any, help explain the causal mechanism connecting policy learning with policy diffusion.

To explore the emergent causal mechanisms, this study uses the 'process-tracing' approach. Causal mechanisms are the sequence of actions and events that link a condition or cause (e.g., policy learning) with a purported outcome or effect (e.g. policy diffusion.) (Bennett and George 2005). In the same vein, process-tracing is a qualitative method in which researchers seek "empirical traces" of the actions and events that constituted the causal mechanisms between a purported cause and its purported effect (Starke 2013, 574).

Limitations and Risks

This study, like all single-N case studies, carries weaknesses that cannot be entirely mitigated. The initial focus upon MTC officials, and primarily those they identified, risks effects from selection bias. Many important actors in the MA OSW implementation process were not interviewed, risking selection bias. And further, unknowable sub-conscious processes play an important role in learning, creating an incomplete evidentiary record. In addition, not all available relevant evidence and contextual information could be collected and analyzed because of time and resource restraints.

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[8]I conceptualized "application" of a particular policy lesson as *policy diffusion*, the end of the PLD causal process. Therefore, I did not explore subsequent "evaluation" of policy lessons. However, I include it here as it highlights the iterative nature of PLD--PLD processes often lead to subsequent PLD processes.

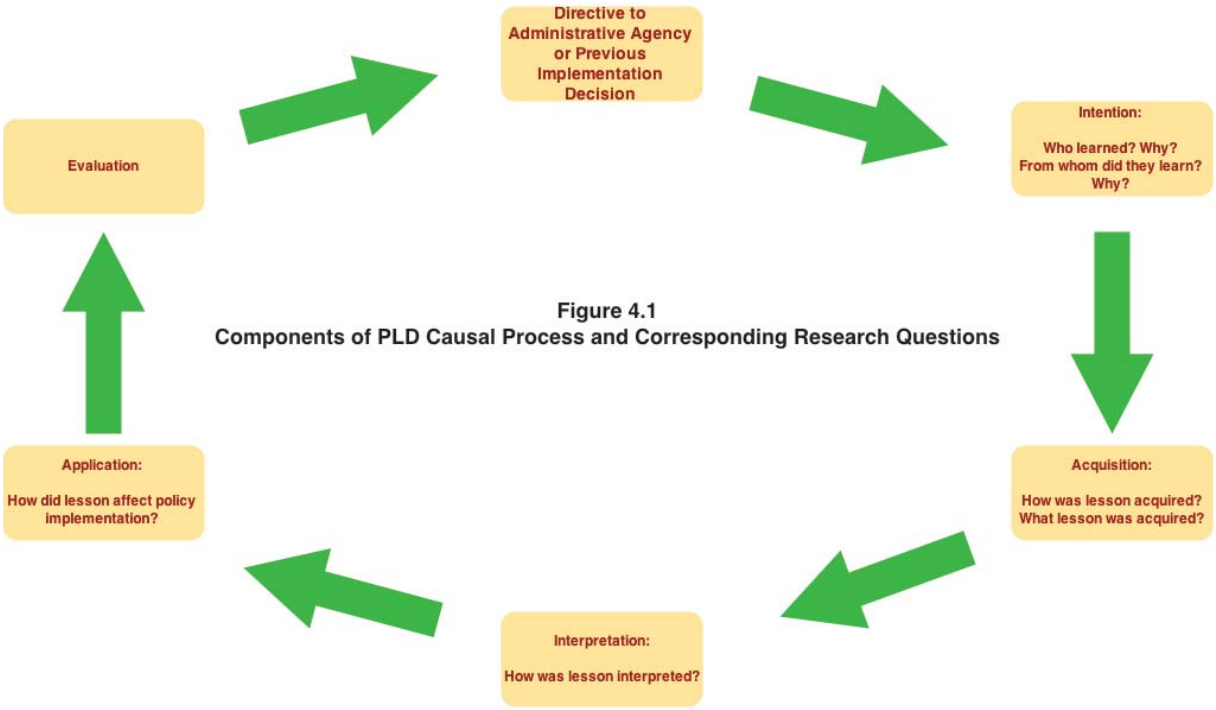

Figure 4.1
Components of PLD Causal Process and Corresponding Research Questions

Adapted from Bennett and Howlett (1992), Heikkila and Gerlak (2013), Rose (1993; 2005), and Wolman and Page (2002).

In addition, interview questions were not written to obscure the study's purpose. It is difficult to ask how someone learned without asking them how they learned. As such, participants may have been overeager to recall incidents of PLD. This may have led to either them (and thus, me) overstating the centrality of PLD in the implementation process.

Single-N process-tracing studies also present data analysis challenges. This method allows for inferences of how causal factors contributed to an outcome, and for exploration of case-specific nuances. However, because causal factors cannot be easily measured, studies such as this one cannot always precisely determine their importance relative to each other.

To the extent possible, this study mitigated the above risks by triangulating sources and types of data. Sources included interviews with policy actors at various levels of perceived

causal significance and from different organizations. Data also included archival data in the form of laws, regulations; administrative reports; energy resource data; media reports; and public statements. However, even inferences drawn from triangulated data can be misleading (Miles and Huberman 1994).

Discerning the Policy Implementation Network

Under the NGT framework, policy networks are defined and characterized by their key actors, formal and informal rules of governance, and the types of interactions between actors and coalitions. Normally, NGT studies first identify the central actors involved in a given policy area, and then define the 'rules' of governance. Because this study is of policy implementation, it is not obvious who the central actors unless the 'rules' of governance, (e.g., Massachusetts' combination of deregulation, financial incentives, and RPS) are known first, so I reversed the order here. When possible, actors and interactions were characterized by factors shown in Table 4.1 and 4.2 below.

Table 4.1. Factors Characterizing Actors in the Policy Implementation Network

Factor		Description
Status		
	Change agent	Actively seeks to change implementation practices
	Opinion leader	Holds influence over other policy actors
	Policy broker	Mediates disputes between advocacy coalitions
	Gatekeeper*	Decides whether external policy ideas will enter policy discourse
Perceptions		Actors' view of policy domain and other actors
Goals		What actors hope to achieve regarding implementation process
Challenges		Major obstacles towards achievement of goals
Strategies		Methods policy actors use to overcome challenges and achieve policy goals
Decisions		Involvement in changing implementation practices or maintaining status quo

Adapted from Klijn and Koppenjan (2000; 2004), Rogers (2010), and Weible, Sabatier, and McQueen (2009)

Table 4.2 Factors Characterizing Interactions and Relationships Between Network Actors

Factor	Description
Contacts	Amount and type of interactions with other policy actors
Arenas	Locations where actors interact and/or where important decisions are made
Coalitions	Policy actors sharing resources to achieve similar policy goals
Dependencies	Policy actors or coalitions whose options are constrained by others
Cooperation	Coalitions working together to achieve a similar objective, but which maintain separate goals
Conflict	Coalitions whose goals and strategies put them at odds.

Adapted from Klijn and Koppenjan (2000; 2004) and Weible, Sabatier, and McQueen (2009).

Exploring the Role of Other Convergence Factors

As explained in Chapter 3, learning is seldom, if ever, the sole cause of policy convergence or diffusion. Convergence typically results from several intertwined (and often intractable) internal and external factors. It is important to note that 'internal factors' can be interpreted two ways. If jurisdictions share particular characteristics, this may ‘coincidentally’ create similar policies, or such characteristics may make jurisdiction more likely to learn from each other. This study explores the roles of both possibilities. Potential contributory factors are shown below in Table 4.3.

Stage One: Intention

Drawing on Dolowitz and Marsh (1996) and Stone (2004), I categorized sources of policy lessons as either: other agency officials, elected officials, interest groups, policy entrepreneurs, experts, non-governmental institutions, consultants, policy brokers, and other stakeholders (i.e., residents of Massachusetts who are not part of a definable interest group.) In addition to one-on-one learning arrangements, I also explored the role of other arrangements involving multiple ‘teachers’ and/or multiple ‘students.’

Table 4.3 Internal and External Factors Contributing to OSW Policy Convergence

Internal		External	
Factor	Description	Factor	Description
Political and socioeconomic conditions	Level of support for OSW and alternative energy, energy costs, etc.	Competition	Jurisdiction sought economic or other advantage over another jurisdiction
Governmental Structure	Existence and sophistication of supportive OSW policy		
Capacity	Financial, legal, and other resources of implementers	External Norms	Policy affected by a widely-held belief that originated elsewhere
Discretion	Amount of latitude granted to implementers by the policy's adopters		
Adaptability	Ability of implementers to respond to changes in circumstances	Coercion/ Persuasion	Actions taken by a higher-level government to mandate or incentive preferred behavior
Expertise	Knowledge and/or experience related to energy or related policies		
State Resources	Type and amount of energy-related resources, natural and infrastructural	Policy Learning	Policymaker seeks policy ideas, experiences, or knowledge from another governmental entity
Geographic Characteristics	Population densities and access to coastlines, etc.		

Adapted from Berry and Berry (1999), Bingham (1978), and Boushey (2010).

Table 4.4 shows factors from the literature purported to explain why policymakers decide to draw a policy lesson, and why they choose a particular "source" from which to learn.

Table 4.4 Factors Contributing to the Decision to Draw Policy Lessons and Choose Sources of Lessons

Decision to Draw Policy Lesson		Choose Sources of Lessons	
Factor	Example	Factor	Example
Change in socioeconomic conditions	recession or high energy prices	Perception of leadership	California often considered a leader in environmental policy
Change in power	agency given new directive	Perception of success	California's film tax credits and the existence of Hollywood
Indirect changes from other policy domains	changes to an environmental law affecting the policy options of an energy agency	Intuitiveness	New Orleans was hit by Hurricane Katrina so they may have coastal policies worth learning from
No availability of information	Google search returns no helpful results	Length of time	Denmark has been the leader of onshore wind energy since the 1970s
Presence of change agents	power producers lobbying on behalf of particular regulation	Serendipity	stumble across policymaker from another agency at a conference
Inability to measure efficacy	feedback is far-removed from actions	Past	offshore energy agencies applying oil and gas practices to offshore wind
Ineffectiveness of established behavior	existing municipal water policies are not preserving water supply	Comfort	New York and New Jersey looking to each other based on previous relationship
High cost of asocial learning	helpful information exists, but uncovering it will require significant resources	Geography	Massachusetts and Rhode Island sharing ocean boundaries
Dissatisfaction with status quo	percentage of renewable energy remains at 12%	Observability	Many nations have installed solar energy capacity but Germany's is most publicized
		Regional	New England states looking to each other
		Ideologic similarity	Massachusetts and California learning about each other's climate change policies
		Information cascade	Receive information secondhand
		Consideration of many	Choose one object of learning after reviewing multiple candidates

Adapted from Bennett and Howlett (1992), Berry and Berry (1999), Rogers (2010), Rose (1993), Rose (2004), Sabatier and Mazmanian (1989).

Stage Two: Acquisition

Drawing from Rose (1993, 2004) and Stone (2010), this framework conceptualizes multiple overlapping types of lessons policy implementers can acquire from elsewhere. These are what is initially received, prior to a thorough individual or organizational interpretation (which follows in the next stage.) Lessons can be based on knowledge, experience, or even mere conjecture. Because lessons can take so many forms, I did not create discrete categories. Rather, I looked for combinations of *empirical and technical information, policy ideas, administrative processes and procedures, implementation instruments,* and *policy goals.*

Stage Three: Interpretation

This study primarily used Rose's (1993; 2005) concept of interpretation. First comes an assessment of the normative quality of the policy from elsewhere, (i.e., "Should we do this?") If it passes that test, the next assessment is of its practical feasibility, (i.e., "Could we do this?") Table 4.5 lists factors purported to affect normative ("Should we?") and practical ("Could we?") assessments of lessons drawn from elsewhere.

Table 4.5 Factors Contributing to Normative and Practical Assessments of Policy Lessons by Policymakers

Normative		Practical	
Factor	Description	Factor	Description
Relative advantage	Degree to which an innovation is perceived as better than the idea it supersedes	Presence of change agents	Influence decision to adopt in preferred direction
Ability to 'hedge bets'	Degree to which risk can be spread between various options	Presence of other adopters	Observations of previous adopters' experiences
Existing knowledge	Familiarity with innovation before adoption decision	Presence of advocacy coalitions	Subsystem actors, united by shared beliefs
Trialability	Potential for experimentation and 'learning-by-doing'	Providers and users	Regulators and stakeholders can meet
Cause & effect	Understand specific causal factors	Social networks	Actors are within large social networks making information accessible
Compatibility	Degree to which an innovation is perceived as consistent with existing values, experiences, and needs	Simplicity	Extent of difficulty for innovation to be understood and effectively used
		Path dependency	Past decisions limit future options

Adapted from Rogers (2010), Rose (1993), Rose (2004), Sabatier and Mazmanian (1989).

Stage Four: Application

This framework categorizes possible ways a lesson can affect a policy output—in other words, possible ways PL can result in PD. This list is not intended to be exclusive, and these are not discrete categories. They are a conceptual starting point.

'Negative': a lesson teaches a policy maker what *not* to do.

Empirical and technical information: policymakers adopt data produced or used by policymakers elsewhere

Inspiration: policy makers view the policy from elsewhere favorably, but only draw general lessons

Selective Imitation: policy makers emulate a few aspects of a policy from elsewhere.

Synthesis: policy makers emulate aspects of several different policies.

Hybridization: policy makers emulate much of a few different policies.

Adaptation: policy makers emulate significant aspects of a policy from elsewhere, but have substantially modified it to fit their context.

Copying: policy makers emulates most of a policy from elsewhere.

Photocopying: policy makers emulate nearly an entire policy from elsewhere.

Paradigm shift: fundamental policy goals change because of a policy lesson from elsewhere.

(Rose 1993; Rose 2005; Sabatier and Jenkins-Smith 1993)

Discerning PLD mechanisms requires a comprehensive understanding of the OSW energy policy context in Massachusetts. The next chapter describes this context through an overview of Massachusetts energy governance, the OSW policy implementation network, and the possible roles played by competition, persuasion/coercion, and external norms in the diffusion of OSW policy.

Chapter 5: The Context of Offshore Wind Energy Policy in Massachusetts

Overview

This chapter describes the context in which OSW policy was implemented in Massachusetts from 1997-2006. My goal in this chapter is to provide just enough contextual detail so that Chapter 6 is accessible without being redundant. First, I describe basic characteristics of Massachusetts. Second, I offer my conception of the OSW policy implementation network, the 'rules' that define it, and the actors that constitute it. Third, I consider OSW policy diffusion generally, and explore what roles, if any, were played by contributors to PD other than learning.

Basic Characteristics

Massachusetts is located on the northeastern coast of the U.S., bordering the states of Vermont, New Hampshire, Rhode Island, and Connecticut. These five states, along with Maine, constitute the New England region of the U.S. Among the six New England states, Massachusetts has the 2nd largest area, is the most populated, and has the highest Gross Domestic Product. Boston, Massachusetts' capital is the metropolitan center of New England.

Among all fifty states, Massachusetts has the 12th highest GDP. The state has the 7th smallest area, but is the 14th most populated with an estimated 6.1 million residents (in 1998.) As a result, it is the 3rd most densely populated state. And further, of the state's 14 counties, the 5 most dense—Suffolk, Middlesex, Norfolk, Essex, and Bristol—are in the eastern third of the state, along the coast. These five counties are home to about 70% of the population. Barnstable County, Duke's County, and Nantucket County, the three counties surrounding Nantucket Sound, constitute about 5% of the state's total population (U.S. Census Bureau 2015).

Massachusetts is generally considered one of the most liberal and reliably "blue" states in the U.S. (Perks 2014). Registered Democrats outnumber registered Republicans 3-to-1.

(Secretary of the Commonwealth 2015). The Massachusetts legislature—officially the General Court—has a Senate of 40 members and a House of Representatives with 160 members. Democrats have held significant majorities in both houses for over 50 years. The state's Republican Party has had better luck with the governor's office, and have held it more times than Democrats over this same time period (Mayhew 2014; Randon Hershey and Beck 2015). Since 1980, Massachusetts has sent only one Republican to the Senate, and since 1992, it has only sent two Republicans to the House of Representatives.

Massachusetts is divided into fourteen counties, but only six of them--Barnstable, Nantucket, Dukes, Bristol, Norfolk, and Plymouth--have formal governmental structures, and their power is relatively weak. (Cape Wind, if built, would be seen off the coasts of Barnstable, Nantucket, and Dukes counties.) Massachusetts also has thirteen based regional planning agencies, such as the Cape Cod Commission.

Massachusetts as Innovator

As Gray (1973, 1185) observed, it is difficult—if not impossible—to empirically demonstrate that a state is generally more 'innovative' than another. That said, it is not difficult to find examples of Massachusetts—or its citizens—innovating. In 1644, an iron-making furnace was invented in Massachusetts, and its use spread throughout the colonies, and across the Atlantic (Nye 1998). The two seminal PD studies mentioned in Chapter 3—Walker (1969) and Gray (1973)— found that Massachusetts was one of the most 'innovative' states in multiple policy domains, a conclusion Boehmke and Skinner (2012) supported in a more recent work. Massachusetts was the first state to legalize same-sex marriage, the first to have near-universal health care, and it was among the first to pursue a carbon trading compact. And, of course, it was the first to pursue OSW development. (On the other hand, Massachusetts recently became the last state to allow motorists to use a clip to hold the pump in place while filling their tanks.)

History of Energy Use

Starting with European settlement, and until the early 20th century, most in Massachusetts burned wood (biomass) to heat homes and cook food. As the Massachusetts colony expanded (the population of the American colonies doubled every 25 years), so too did demand for wood. Wood was the preferred fuel over its alternatives—lard, turpentine, corncobs, and dried manure, among others. Increasing demand contributed to deforestation throughout the U.S. (Nye 1998).

Steam-powered engines were a second major contributor to deforestation, although the New England states were the laggards in adopting them. In the early 19th century, water mills were used throughout the U.S., particularly in New England. The mills grinded grains into flour, cut wood, and created nails, wire, paper, dyes, and textiles. By 1812, there were 23 water mills operating on the Charles River. Over the course of the next few decades, more energy-efficient steam engines began replacing water mills. Wood was burned to heat water, creating steam power that could be transported in pipes, allowing for improved manufacturing processes and greater transportation distances. By the middle part of the century, steam engines and water mills had equal market shares. By the 1870s, steam power was the largest source of power in the United States, except in New England. New England held onto water power longer than most other northern states because of greater access to water and more existing water mills than other states. However, by 1890 each source was used equally, and by 1900 steam use in New England outnumbered water use 2-to-1. Even Lowell, Massachusetts, an industrial powerhouse situated at the congruence of two major rivers, transitioned to steam power by the last decades of the 19th century (Nye 1998; Temin 1966).

The use of steam power allowed for the growth of cities in Massachusetts that were not on bodies of water, like Fall River and Worcester. Steam power also allowed for the growth of railway transportation, linking Boston with other major cities in the eastern United States. The

newly constructed railway systems added transportation as a new end-use for energy, further increasing demand, and creating a need for alternatives to biomass (Norberg-Bohm 2000).

Fossil Fuels

During the 19th century, gas produced from burning coal was used for lighting in heavily-populated areas in the U.S., including in Boston, Massachusetts. Gas lighting was largely unregulated and prone to accidents. The Great Boston Fire of 1872 killed over 3,000 people, and much of the city burned to the ground. For such reasons, within a few decades, they were replaced with much less dangerous, but more expensive, incandescent lamps. These lamps were powered by electricity, generated from burning coal. In addition to providing safer lighting, electricity also allowed for industrial automation and assembly lines. These increased efficiencies suddenly made it cost-effective to develop and manufacture all sorts of goods, (e.g., the automobile) (Carr 2008).

Massachusetts Today

Because Massachusetts lacks significant fossil fuel resources, it imports most of its electricity-generating fuels via pipeline. The percentage of imports remained at about 75% from 1998-2014. However, over the past 16 years, Massachusetts' energy mix changed dramatically. In 2014, Massachusetts generated 66% of its electricity from imported natural gas and 10% from imported coal and petroleum. (In-state nuclear power provides 15%. Biomass, hydropower, solar, and wind constitute the rest.) In 1998, imported natural gas represented only 7% of the total, with coal and petroleum contributing 70% (EIA 2000; 2014).

Massachusetts has one nuclear power plant (Pilgrim Nuclear Power Station), and five "major"[9] non-nuclear electricity generating plants: one hydropower, three oil and gas plants, and one plant that uses oil, gas, and coal (EIA 2014). In 1997, Massachusetts had the 8th highest

[9] According to: http://www.eia.gov/state/print.cfm?sid=MA

average electricity prices in the U.S. Massachusetts also faced congestion in its transmission infrastructure—in fact, from 1999-2001, Massachusetts' eastern seaboard had the highest amount of congestion in the U.S. (Vajjhala and Fischbeck 2007).

OSW Policy Implementation Network

Typically, the NGT framework calls for policy actors as the starting point for purposes of defining a policy network. Because this study focuses on policy implementation, I instead begin with the legislation that enabled implementation. In this case, the Massachusetts legislature's 1997 'policy trifecta,' and in particular, creation of the RETF, served as the starting point. From here, I sought other important rules, and the actors that constituted the implementation network. This section describes those local, state, and federal rules that most significantly affected the implementation network. The next section describes the network's actors.

Network Rules

In 1997, Massachusetts became the 7th state to pair a renewable portfolio standard (RPS) with a public benefits fund—RETF ("DSIRE" 2014). The RPS required power providers to include a percentage from alternative sources. Eligible sources included wind, solar, hydropower, methane, tidal, geothermal, and certain types of biomass. The RPS is administered by the Department of Energy Resources (DOER). RETF was administered by MTC. MTC was given a great deal of discretion to award over $100 million in grants, loans, or bonds to encourage the development and use of alternative energy. Recipients could include nearly any renewable energy generating technology or project that would, or could, benefit the state's grid (Watson et al. 2005)

Massachusetts also became the first state to couple those policies with deregulation of its retail electricity market, allowing independent power producers to compete with the existing utilities. This policy trifecta served as the major impetus of OSW development in Massachusetts and at the federal level.

As explained in more detail in Chapter 6, the Massachusetts Ocean Sanctuaries Act legally forbade Cape Wind's installation in state waters, and the developers relocated the proposed area to federal waters. Most critical to the federal approval process was the National Environmental Protection Act (NEPA) and the Rivers and Harbors Act. NEPA requires federal agencies to conduct environmental assessments of all actions that might adversely affect the environment. The Rivers and Harbors Act gives jurisdiction to the Army Corps of Engineers over all construction projects on the Outer Continental Shelf. Although their authority was limited only to construction permits, it was the only federal agency with any direct authority over OSW. As such, the Corps had to take on a federal leadership role they were ill-equipped to handle. Later, the federal Energy Policy Act of 2005 (EPA2005) made the Minerals Management Service (MMS) the primary agency with authority over OSW, and they took over as lead agency.

Table 2.1 lists these rules, alongside many others, that played a role in the Cape Wind permitting process.

Network Actors

My conceptualized OSW policy implementation network includes four central actors and several other peripheral actors. The four central actors are MTC, Cape Wind Associates, the Corps, and the Alliance. The legislation appointed MTC as the RETF's administrator, making it the gatekeeper. Without MTC's willingness to consider Cape Wind and OSW more generally, the story would have ended there. Of course, but for Cape Wind Associates's proposal in 2001, MTC

may never have seriously considered OSW at all. Cape Wind was to be located in federal waters, making the Army Corps of Engineers lead agency for federal environmental permitting. And the Alliance was responsible for stymieing (and perhaps terminating) the Cape Wind approval process.

Although they had no particular energy policy expertise, MTC officials believe they were entrusted with RETF because of "the lack of successful [state alternative energy policy] models elsewhere," and because:

> the Legislature wanted a fresh, independent approach to renewable energy that would not be constrained by past alliances with particular stakeholders—whether they be utilities, environmental groups, or electricity generators[.] [They] wanted to ensure that strong consideration would be given to the economic development potential of renewable energy... [and because of] the lack of successful models elsewhere, and [our] general modus operandi which emphasized... consultation with diverse stakeholders...
>
> [We] conducted extensive discussions with government agencies, power generators, distribution companies, aggregators, renewable energy companies, consumer groups, and others. We hired several consulting firms to research renewable energy technologies, implementation strategies, and potential partners.

As the latter part of the quote demonstrates, MTC was responsible for bringing many—if not most—of the important actors together. This makes them a prototypical policy broker. MTC was accused by Cape Wind opponents as being biased in favor of Cape Wind—in effect arguing it was a change agent more than a policy broker (Watson and Courtney 2004). The charge is not entirely without merit. Key actors from MTC and consultants they hired went onto become (and still are) members of a principal pro-OSW advocacy group (U.S. Offshore Wind Collaborative 2014).

A MTC official offered this:

> But I think in terms of policy, we were in this uncomfortable position of being [in charge of] the Renewable Energy Trust [Fund.] [B]ecause of the politics, we had to carve out a role for ourselves and we primarily [did so] by having these information sessions. [We] got all the parties together, not to seek consensus but to frame the issues and to make sure we

we’re public as much, unbiased as much. That was key[.]

Cape Wind Associates was clearly a change agent in addition to being a central actor. As a MTC official said, in response to a question regarding who was most responsible for OSW development in Massachusetts:

> [President of Cape Wind Associates] Jim Gordon. There was no question. Here is a independent power producer who had produced the cleanest combined cycle natural gas facilities. He was focused on New England. He wanted to continue to do that... If he hadn’t come on the scene, it is uncertain when offshore wind it would’ve been launched in the United States.

The Corps was legally obligated to consider issuance of two permits critical for Cape Wind’s approval. And as the only federal agency with permitting authority, they became the lead agency. As mandated by NEPA, the Corps hosted their own series of public meetings that ran concurrently with MTC's.

The Alliance to Protect Nantucket Sound was (and is) the primary, most-organized, and well-funded opponent of Cape Wind. The Alliance formed almost immediately after the Boston Globe and others began reporting about a pending proposal for an OSW farm in Nantucket Sound. The group combined local opposition—the Cape Cod Chamber of Commerce, wildlife advocates, and fishing communities, among others—with national interest groups. (Although it very much presented itself as the former more than the latter.) William Koch, founder of the Oxbow Group, a global fossil fuels firm, served as chief financier and board member of the Alliance (Ebbert 2008; Whitcomb and Williams 2007)

Of the Alliance, a study participant (who transitioned from objective facilitator to advocate) said:

> [i]f you look at the opponents, the organized opponents, the Alliance to Protect Nantucket Sound, there was no interest ever [in objectively considering Cape Wind], and that continues to this day... where learning was not the issue, you're not gonna change minds.

Between 2001 and 2007, the Alliance spent more than $10 million opposing Cape Wind. Dismissing the 26th lawsuit against Cape Wind (or against a permitting agency involved in Cape Wind decisions), the U.S. District Court for the District of Massachusetts said:

> There comes a point where the right to take legal action becomes an annoying abuse of the democratic process. For this reason, I have handled this matter as soon as possible. (Bindslev 2014)

There were several peripheral actors in the network at the national, state, and local level. The captain of the peripherals is the EPA, who had to approve of the Corps' (and then MMS') environmental review process. (There is a fair argument for making them a 'central' actor.)

Elected officials played important roles. This list includes Mitt Romney, governor of Massachusetts from 2003-2007, and Senator Ted Kennedy, each of who opposed the project. National environmental groups like Greenpeace supported Cape Wind, but they were never unified under one umbrella like the Alliance was, and they were far less influential. General Electric, whose interest in OSW turbine construction coincided with the Cape Wind proposal, also played a role in disseminating technical knowledge. At the state level, a pro-Cape Wind group Clean Power Now generated support—even organizing a trip to Denmark for citizens and other stakeholders—but they, too, were overshadowed and outspent by the Alliance. At the local level, the Cape Cod Times, the most-circulated Cape Cod newspaper, was adamantly opposed to the project. A less-read competitor, the Cape Codder, took the opposite approach, and actually sent reporters to Europe to learn about OSW before offering support for the project (Leggett 2003)

A study participant provided this quote:

> There were three classes of people. There were opponents. There were parties who are really nervous about this but were open-minded. But then there were people who supported it no matter what… [but] there are questions... There were both people who were in the

> room, direct stakeholders, who learned a lot, who became more supportive. There was a lot of public who were opposed, who over the years, not solely based on that stakeholder process, that as they learned, became supportive, and others haven't.

Policy Diffusion

As I discussed in Chapter 3, policy convergence and policy diffusion are distinct but overlapping concepts. The first refers to contemporaneous and similar policies in different jurisdictions; the second refers to a policy in one place affecting a policy elsewhere. Policy convergence is relatively easy to prove because it only requires finding policy similarities between governments. Diffusion can take many forms, and is thus more difficult to identify.

From 1997-2006, there was OSW policy convergence between Denmark, the U.K., and Massachusetts insofar as they each implemented policies to develop OSW. However, as Chapter 6 details, the specifics of these policies were quite different, so convergence was primarily of policy goals, not policy instruments or implementation procedures. As a result, Massachusetts' OSW policy is a true melting pot of internal and external forces.

When asked why Massachusetts was the first to seriously pursue OSW, one study participant said:

> Well... we had a program and a goal. The fact that we had established decent, deregulated electricity and had this fund... to promote increased production and consumption of renewable energy. So that was a prime mover. The question was what would it be? And the fact that we had some of the highest electricity prices, and this untapped resource, if it was oil or gas that was untapped, people would say 'go get it.' I think it was a combination, a convergence of a number of things, primarily we had developed this program with incentives that was attractive to a lot of people, but you had at least one entrepreneur who saw this as an opportunity and in again, sort of this climate, this appetite for renewable energy, global climate change, people sort of incentivize to figure out how we could reduce our dependence on fossil fuels. For our electricity. So I think those things combined, and here we are.

Another participant said:

> [W]ell, I think Jim Gordon proposal came here for a number of different reasons. The site, particularly at that point of time, shallow waters, fairly close to shore reducing

> transmission. Not a protected area, not great wave action. The ideal place. And very very good winds in a high energy cost market. And in the state with a renewable portfolio standard. So there were policy signals in place in Massachusetts that provided financial incentives, well [Gordon] thought it would be—and it should have been—a good political climate. So I think all these things came together to make Massachusetts first.

Can we attribute any of the convergence to diffusion via competition, persuasion, coercion, or influential external norms? Were this a study of the diffusion of legislation, not implementation, it would be easier to answer this question. The legislature wanted Massachusetts to generate more of its own electricity rather than importing it from elsewhere, and wanted it to be at the forefront of emerging technology sectors (i.e.,, competition.) The federal government's deregulation of interstate transmission contributed to Massachusetts' decision to deregulate (e.g., persuasion.)

But my study is of implementation, not adoption. So did policy implementers seek to compete? Were they persuaded or coerced? Were they influenced by external norms?

Competition

No evidence shows that interstate competition played a critical role in implementation from 1997-2006. To some degree, the lack of competition is because energy policy cooperation is often in the self-interest of states, particularly on a regional basis. As one participant put it:

> A regional approach [to transmission of electricity] is advantageous to avoid duplicate effort, to be more competitive for federal grants, and to really deploy at scale because the benefits are purported to be regional. It is in everyone's interest to identify ways that working regionally to move that along.

And further, Massachusetts officials were not racing against OSW policy implementers in other states—it was the only state seriously pursuing OSW development. So was Massachusetts first because it wanted to be? No. Cape Wind Associates and proponents argued that 'Massachusetts as innovator' was an important reason for Cape Wind, but this was primarily a marketing slogan. And to the extent it was an actual aspiration of proponents, it was not shared by officials:

> 'Race to be first' is more rhetorical than anything because Gordon and others know sometimes 2nd 3rd and 4th easier, and the technical knowledge is out there, it is not like anyone is racing to find out how to do this.

Persuasion/Coercion

Federal persuasion or coercion played no role in the initial decision of MTC to consider CW. If anything, it was the *absence* of a federal role that encouraged policymakers to look to Denmark and the U.K. (Perhaps, then, federal inaction ought to be considered a form of persuasion/coercion in the same way that the absence of a policy is still a form of policy.)

Later in the 1997-2006 time period, persuasion/coercion did play a role. In the first instance, it was not persuasion/coercion from a higher-level government to a lower-level government; instead, it occurred between two technically 'lateral' federal agencies. As discussed in detail in the next chapter, the EPA rejected the Corps' Draft Environmental Impact Statement (DEIS), and in doing so, advised them to draw policy lessons from successfully approved projects in other policy domains. The EPA's decision also affected Massachusetts agencies involved in the Cape Wind approval process, although less directly.

External Norms

The influence of external norms is unclear. Shared norms with Denmark and the U.K. do not appear to have played a significant role in Massachusetts' (the 1997 Acts) or the federal government's initial *adoption* of OSW policies (via EPA2005.) These governments adopted policies for purposes of economic development, not to actualize a normative belief into policy. Today, there exists a global norm that the effects of climate change must be mitigated. In many ways, this norm drives discussions of alternative energy development, and surely contributes to the decisions of policy adopters today. But from 1997-2006, this was not the case.

Norms, however, may have been more influential during *implementation*. Norms may have motivated implementing officials, thereby contributing to diffusion. One study participant reported that climate change was "kind of ancillary but there was a recognition... that climate

change is a thing, that we have to pay attention to.“ Another participant gave climate change more credit, saying, “[o]ne of our major arguments was climate change[.]”

One topic during the 2002 MTC-hosted public engagement meetings (described in more detail below) was climate change, but it is not clear how decisive it was. The Corps included the effects of climate change in its cost-benefit analysis of Cape Wind, and later, the Offshore Wind Collaborative—consisting of state and federal officials—mentioned climate change as a reason for supporting OSW.

An official from the Clean Energy Center, the agency who now administers the RETF, attributes growing awareness of global climate change as one of the main reasons why Cape Wind—although delayed—will ultimately succeed: “I think one of the things that is really important in all of this is folks who are connecting renewable energy to climate change. Folks have been talking more about that lately.”[10]

This chapter described the context of OSW energy policy in Massachusetts. The next chapter narrates six PLD mechanisms that emerged out of this context.

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[10] This interview happened in 2013 when Cape Wind looked like it might actually go into operation.

Chapter 6: Offshore Wind Energy Policy Innovation, Learning, and Diffusion

In this chapter, I describe the causal mechanisms of PLD that emerged from the data. I begin with background information and describe how changes to Massachusetts' energy policy in 1997, and the subsequent proposal for Cape Wind, spurred policy learning. Next, I present each of the six PLD mechanisms that emerged from the data, first summarizing which factors from Chapter 4 were present, and then narrating the implementation process in which PLD occurred. I then show how PLD continues as Massachusetts, other states, and the federal government further develop OSW policy.

Background

In 1997, Massachusetts became the 7th state to pair a renewable portfolio standard (RPS) with a public benefits fund—RETF ("DSIRE" 2014). Massachusetts also became the first state to couple those policies with deregulation of its retail electricity market, allowing independent power producers to compete with the existing utilities. This policy trifecta served as the major impetus of OSW development in Massachusetts and at the federal level.

RETF was administered by MTC. MTC was given a great deal of discretion to award over $100 million in grants, loans, or bonds to encourage the development and use of alternative energy. Recipients could include nearly any renewable energy generating technology or project that would, or could, benefit the state's grid—including the conducting of studies and the hiring of consultants (Watson et al. 2005)

In 1999, Brian Braginton-Smith, a Cape Cod resident and entrepreneur, went public with an idea to construct a combined offshore wind and aquaculture farm 3 miles off the coast of Massachusetts. He even met with Clinton administration officials. Except for an article in the

Boston Globe, the proposal received much less attention--and opposition--than would the project proposed by Cape Wind Associates (Allen 1999).

Braginton-Smith and EMI's Gordon independently determined that the area around Horseshoe Shoals was an ideal location for an offshore wind farm. Describing how they began working together, a study participant said:

> [Bragington-Smith] and students from Worcester Polytechnic Institute were out on the boat, and they were surveying and they were around Horseshoe Shoal. Another boat pulls up around the same time, and it was Jim Gordon. Literally. They both confirm this. 'What you doing here?' 'What you doing here'? Long story short, it became a partnership. They teamed up.

The same participant, describing why Jim Gordon's proposal received more attention, said:

> Because of who Jim was, and he was [a] wealthy, independent successful energy producer, all of the sudden it became, not that it was not necessarily serious before but it took on a new dimension when Jim Gordon says 'I'm interested in building an offshore wind farm'... [and] they had a potential site.

Initial Implementation

> Analysis: The first PLD mechanism I describe occurred during MTC's first forays into OSW policy learning. *Unavailability of information* and the *presence of change agents* contributed to MTC's acquisition of lessons from elsewhere. Lessons initially came indirectly via an *information cascade*, and consisted of basic *empirical and technical information* regarding OSW models in Europe (via CWA.) Subsequent lessons came directly from *policy instruments* in Europe and from Texas. Because MTC had significant *discretion*, MTC was able to *copy* a policy instrument from elsewhere.

MTC staff had no expertise—or even experience—with energy policy. However, they were experts in *innovation* policy. MTC began in the late 1980s as the Massachusetts Microelectronics Center to spur the state's computer and defense industries. In 1994, its mission broadened to include economic development of technology industries generally, particularly in newly emerging sectors such as high-speed Internet in the 1990s, and broadband today

(Massachusetts Technology Collaborative 2015).

At the time, no comprehensive study of Massachusetts' alternative energy options existed. To reduce uncertainty, MTC officials first sought to learn from others in the state about energy policy and electricity infrastructure generally. They spoke to officials from other state agencies, power producers, alternative energy advocates, and consumers. Knowing this wouldn't sufficiently reduce uncertainty, they sought to 'learn by doing.' This meant they would 'hedge bets' on various innovations at various stages of development, assess results, and adjust their approach as necessary (Massachusetts Technology Collaborative 2009).

One of MTC's first moves was to hire three consulting firms to research the state's most promising options for investment, and to suggest how their policies be implemented (MTC 2009). The firms—Arthur D. Little, Bain and Company, and Nexus Associates—focused on biomass, solar, and onshore wind, the most established of the existing alternatives in the U.S. They determined that biomass, solar, and onshore wind were not feasible on a commercial-scale in Massachusetts, primarily because of transmission costs. Available land was in the western part of the state, most of the population was in the east. Fuel cells and energy efficiency initiatives were the only worthwhile investments, they concluded (MTC 2009, 15). (The hired firms, when later asked, said they thought OSW was too “theoretical” to be comprehensively considered at the time.)

EMI, an independent power producer primarily involved in natural gas, saw a profit opportunity in MA’s ‘policy trifecta.’ The firm conducted its own study of Massachusetts' options, and reached the same conclusions as before, except for one critical difference: it performed a comprehensive review of OSW. Company officials learned of the existing OSW projects in Denmark and visited there. They also learned an earlier-stage project in the U.K. EMI also researched the work of William Heronemus, a professor at University of Massachusetts-

Amherst who wrote of OSW in the 1970s (Heronemus 1972, 1974; Heronemus et al. 1974). Much of his work regarded the state's offshore waters—particularly those off of Cape Cod—had perfect conditions for OSW development. He had argued—nearly thirty years before—that MA had no other option for sustainably generating its own electricity.

EMI became convinced that OSW off the coast of Cape Cod was not only technically feasible, but that it would prove politically popular. Cape Wind Associates (CWA)—a subsidiary of EMI—was born. Reflecting back 10 years later, EMI's president, Jim Gordon, gave three reasons for his optimism at the time: Massachusetts' rich history of windmills, the state's pro-alternative energy leanings, and its reputation as an innovator (Northeastern University 2013).

Before proposing the project, Cape Wind Associates officials met informally with MTC officials to inquire about what the OSW state approval process would entail. MTC was unsure. Officials were vaguely familiar with OSW projects in Europe, but the option had never appeared in the consulting firms' reports. Prompted by the meeting, MTC set out to investigate Cape Wind's feasibility. They hired a coastal policy consulting firm, Good Harbor Consulting, with whom they had worked before. As a consultant stated:

> [An MTC official] called me and said 'let's have coffee. I need to talk to you about this energy project... So we looked at it, and [our] first reaction was: 'is this real?' Because a lot of projects proposed over the years—and I've worked as a regulator—a lot of things come and go. It looks big and promising, or it looks big and scary, but it isn't real. So we really had to do some homework and see.

According to the same participant, MTC and Good Harbor Consulting "started learning about the history [of OSW] and hearing Cape Wind's pitch." Their pitch had three prongs:

First, Cape Wind Associates demonstrated the technical feasibility of OSW by pointing to three existing projects in Denmark, and one in the UK. Denmark built two 5 mega-watt (mW) pilot projects in 1991 and 1995: Vindeby and Tuno Knob. At this time (in 2001),

Denmark had just built a much larger 40 mW project, Middelgrund, which would be visible from Copenhagen. Denmark also had two other OSW projects on the horizon: Horns Rev slated for 2002 and the Nysted project slated for 2003, each with an installed capacity of about 160 mW, which would make them the first commercial-scale projects. (As a point of reference, this is about half the size of most modern offshore wind farm capacities.) At the time, the U.K. had one OSW farm, Blyth, which was about the same size as Denmark's pilot projects. However, plans were in the works for two 60 mW projects for 2003 and 2004: North Hoyle and Scroby Sands (Higgins and Foley 2014). Cape Wind Associates could not claim that either Denmark or the U.K.'s models were policy successes, since they were so new, but they could show that OSW was more than just "theoretical."

Second, Cape Wind Associates showed *empirical and technical information* regarding Cape Wind's potential. Their proposed project could supply about 75% of the electricity for Cape Cod and the islands of Nantucket and Martha's Vineyard. Wind speeds in Nantucket Sound average 19.75 miles an hour—nearly ideal for the existing OSW technology at the time—and winds are at their highest during peak energy demand (Watson and Courtney 2004)

Third, Cape Wind Associates made the argument that the legislative mandate for alternative energy development, combined with the fact that OSW was the only commercial-scale option, effectively meant that resources must be spent investigating the feasibility of OSW off Cape Cod.

Persuaded in part by this argument, in 2002, MTC allocated funds for OSW-specific feasibility studies, and for the Cape & Islands Offshore Wind Public Outreach Initiative (described in greater detail later in the chapter.)

Around the same time, they came to two important realizations.

First, there had been some debate between state officials regarding whether OSW

should be pursued in Nantucket Sound, or off MA's coast at all. MTC, Coastal Zone Management (CZM), and the state energy department held 'policy coordination' meetings. There, some believed "offshore wind might be a fruitful avenue. But then there were all these other [environmental] policy concerns coming out of [offshore] oil and gas development in the 70s." Officials quickly determined that MA law prohibited energy development in state waters off Cape Cod. Although intended to prohibit fossil fuel and nuclear energy development, the statute was not source-specific. As a result, OSW could only be developed in federal waters, so MTC would need to inquire about the federal process.

Second, it became clear to MTC over the next few years that alternative energy development in MA (Cape Wind or otherwise) would only be possible with incentives to encourage long-term financing. Private investors were hesitant to offer long-term financing, and policies (and thus prices) were unpredictable. Without long-term financing, projects would lack the required start-up capital. This was the same problem faced by Denmark, the U.K., and other governments trying to promote alternative energy. Denmark's solution was not a policy model MTC could emulate. Since the late 1980s, Denmark had offered generous capital grants for the installation of onshore and offshore wind energy farms: 30% for several years, then 20%, and 10%. MTC could theoretically give capital grants, but they feared opening up the floodgates to multiple projects when it was still in the process of considering the first. Besides, RETF funds would not allow them to make such generous grants as Denmark. Smaller grants might not be enough to incentivize financiers.

MTC could emulate another model however. At this time, the U.K., and Texas were using green certificates (described in Chapter 2), and other E.U. member-states and U.S. states were considering them (Komor 2004; Resch et al. 2005). (Of note, the Netherlands actually invented the policy device a few years earlier, but it is not clear if lessons were ever drawn from

them.) In 2003, MTC created the Green Power Partnership. In 2003, and again in 2005, MTC gave certificates to would-be alternative energy developers, and guaranteed a price at which they would buy back the certificate after a project was commissioned (if there wasn't a private market offering a higher price.) (Massachusetts Technology Collaborative 2009, 9-10).

Pinball Federalism

> Analysis: This mechanism occurred during the Corps' initial involvement in Cape Wind's approval process. In the *presence of change agents*, the Corps learned of policy models elsewhere via an *information cascade*. Because of *pre-existing knowledge*, the Corps did not need to apply lessons learned from elsewhere in their consideration of whether or not to give a permit for constructing a data tower. However, this same information would prove important during their consideration of Cape Wind itself, described later in this chapter.

As described above, MTC, along with several other state agencies, held coordination meetings in 2001 after Cape Wind Associates inquired about OSW. As noted earlier, they quickly determined that the state's Ocean Sanctuaries Act prohibited energy development in state waters. Thus, Cape Wind would have to be in federal waters, at least 3 miles offshore. Except over the transmission cables running along the state's ocean bottom, the federal government had jurisdiction.

Under the National Environmental Policy Act (NEPA) and regulations issued by the Council on Environmental Quality, a single agency had to take the lead on an environmental assessment before any "major federal action" can be undertaken. Approval of energy projects is clearly a "major federal action," and because Cape Wind was unprecedented, a lead agency would have quite a challenge before it (Utzinger 2004).

But the question remained: *which* federal agency, if any, could approve the Cape Wind project? When asked by Cape Wind Associates, MTC did not know.

At the policy coordination meetings, the state's Coastal Zone Management (CZM) office initially suggested to MTC that the federal Minerals Management Service (MMS) might

have authority. MMS was the lead agency for offshore oil and gas development, so it seemed the logical candidate for lead agency in OSW development. Indeed, they themselves thought they could do it well (Kaplan 2004). However, MMS's enabling statute specifically authorized only oil and gas.

CZM next suggested the Army Corps of Engineers (the Corps). Under the Rivers and Harbors Act of 1899, the Corps must review and approve of all projects on the Outer Continental Shelf that could obstruct navigation. This, however, was the extent of their authority. Unlike MMS, they could not lease the ocean bottom to power producers, or conduct a comprehensive assessment of possible development sites other than the area proposed. While the Corps was not an ideal lead agency in the eyes of anybody, it was the only agency with any clear and direct permitting authority. The Corps had no choice but to take the lead.

The first proposal before the Corps was for construction of a data tower in Nantucket Sound to gather more information about wind speeds and directions, as well as possible effects upon wildlife and the environment. The second was for Cape Wind itself: 130, 426-foot turbines located over 26 square miles in Nantucket Sound, a 750 square mile body of water between Cape Cod, Nantucket, and Martha's Vineyard (Watson and Courtney 2004, 263-264). If built, the 460 mW project would be the largest capacity OSW in the world. (If built at the time, Cape Wind would have about the same capacity as the world's largest OSW wind farm today, the London Array in the U.K.) This section covers the data tower decision. A later section covers the project itself.

As the lead federal agency, the Corps was required to analyze possible environmental effects of both the data tower and the project itself, possible alternatives, and how harms could be mitigated. Based on an initial evaluation of effects and alternatives, the Corps was to issue either a Categorical Exclusion, Environmental Assessment (EA), or an Environmental Impact

Statement (EIS) to the EPA.

Categorical Exclusions are rare. They only apply when policy actions (1) do not cause significant adverse effects on the environment and (2) another federal agency already made a determination that there were no such effects (40 CFR § 1508.4). Obviously, this did not apply to Cape Wind.

An EA is used when an agency after an initial analysis, makes a Finding Of No Significant Impact (FONSI) on the environment. An EIS requires a much more rigorous process, public participation, and a document of hundreds or thousands of pages. EISs are required when an EA is not sufficient (40 CFR § 1508.11).

The Corps initially learned about OSW from MTC, other state agencies, and Cape Wind Associates. Yet none of this data was needed for the Corps to approve the data tower. The Corps and other federal agencies had experience with construction of offshore data towers for other purposes. They issued an EA for the data tower, finding No Significant Environmental Impact. How the Corps drew and applied policy lessons is difficult to answer. Because offshore data towers are relatively routine, the policy experiences of MA agencies, MMS, Denmark, and the U.K. may not have directly contributed to this decision.

Despite data towers being relatively common and regarded as benign, opponents of Cape Wind argued that an EIS was necessary because approving the data tower would effectively approve the project itself. The Alliance again sued, arguing the data tower was a proxy for Cape Wind itself, necessitating an EIS. Isaac Rosen, executive director of Cape-based alliance, argued "[t]his data rig is a Trojan Horse. If the data-gathering rig is allowed to be built, the private developer will no doubt claim the precedent has been set for the entire project" (Leaning 2002).

The court granted an injunction, halting construction for three weeks until a higher court decided not to renew the order, but allowed the case to continue. In August, 2003, a federal

court ruled on the merits, and held the data tower was procedurally severable from the project itself, common in other offshore projects, and did not pose significant environmental harms, thus making an EA sufficient (Protect Nantucket Sound, Inc. v. US Dep't of the Army 2003).

Dipping Toes in Offshore Water

> Analysis: This section narrates the MTC-funded Cape & Islands Offshore Wind Public Outreach Initiative from October, 2002 to March, 2003, during which many of the OSW policy implementation network actors engaged in PLD simultaneously. Participants in the Initiative *lacked information* and *asocial learning* was restricted. Based on a *perception of leadership*, they cooperatively gathered *data* and *procedural factors* from policy models elsewhere. Actors interpreted these lessons differently. Although the Initiative lacked any formal decision-making authority, many actors gained a *causal understanding* of how OSW energy generation worked, and ultimately increasing MTC's support for CW and OSW generally. Other actors believed lessons from elsewhere were not sufficient for understanding OSW energy generation in the specific context of Nantucket Sound.

The Outreach Initiative process, described in Table 6.3, ran concurrently with the Corps' process with many of the same participants, and each agency often attended meetings hosted by the other. In fact, the initiative's timeline was based on the Corps' statement that they might be done with their draft EIS by spring of 2003. (As it turned out, this was overly optimistic. As we'll explore later, their draft was not completed until the end of 2004.) There are two important differences, however. MTC voluntarily created the public outreach initiative whereas the Corps was obligated under NEPA. And second, neither MTC nor the Initiative had any decision-making authority regarding Cape Wind. The Corps, on the other hand, could decide not to approve of the project based on what happened at the meetings.

The Alliance—which had already organized by then—argued MTC was biased in favor of Cape Wind, and should not be organizing the stakeholder process. Others also had reservations too. Cape Wind Associates thought the MTC stakeholder campaign might be redundant with the Corps' NEPA process and would provide opportunity to broaden what an EIS would require and ultimately lengthen the approval process. Even the Corps had concerns about

the parallel process, thinking it might result in criticism or compromise its own process (Watson and Courtney 2004).

MTC invited several federal, state, and local agencies to participate including the Corps; the Massachusetts Environmental Policy Act Office, the Cape Cod Commission, the Martha's Vineyard Commission, the Nantucket Planning and Economic Development Commission, and boards from affected towns and even local schools. MTC also invited engineers from General Electric (GE), whose wind energy division (recently acquired from Enron during bankruptcy proceedings) had its eye on an OSW industry in the U.S (*The New York Times* 2002). MTC hired Raab Associates, a mediation and consulting firm specializing in energy and environmental policy, to administer the process. Meetings generally consisted of a panel of invited guests, followed by a Q&A session (Watson and Courtney 2004).

One participant, involved before, during, and after the stakeholder process, said:

> [The] goal with the stakeholder process was to get this group to agree on the questions that needed to be asked, and [what] the credible sources of information [were]... the point was not to build consensus about this project, because we didn't yet know enough about offshore wind to know if it was something that we should be promoting at that time… At that point people [did] not even understand the way the electricity system works. And where electricity comes from. People were not too engaged. There were a lot of basics that needed to be covered. [Each participant] was involved on a huge learning curve.

To educate stakeholders, MTC and other organizers said they:

> brought in all sorts of people... We were basically setting up panels of people to come and talk about, to address the questions, so there were scientists, [state, federal, and local] policymakers, utilities... [we] got the opponents [who] had organized by then at the table with those who are promoting it, and brought regulators [in]…

Interestingly, invited panelists primarily consisted of both proponents and opponents, rather than those with "no opinion yet" (Watson and Courtney 2004, FN93). This is likely because of the difficulty the two sides would have in choosing who, if anyone, could be conceived as truly unbiased and undecided. Meetings were public and minutes were available,

but there was limited space and little opportunity for observers to contribute. The hope was that participants would speak with the other members of the groups they represented (Watson and Courtney 2004, 279).

All participants were learning from one another, and it is impossible to discern who learned exactly what and from whom. Officially, stakeholders were the primary participants, and governmental officials were secondary, but over the course of the six meetings, lines became blurred (Watson and Courtney 2004, 276).

Table 6.1 Cape & Islands Offshore Wind Public Outreach Initiative Meeting Dates and Topics

Date of Meeting	Topics of Meeting
October 10, 2002	Overview of current studies
	EIS Process
	Identification of highest priority informational needs
October 30, 2002	Electricity basics
	Denmark and U.K. studies regarding effects on birds and marine life
November 21, 2002	Existing projects in Denmark and U.K.
	Technical feasibility
December 12, 2002	Aesthetics and other negative effects in Denmark
January 30, 2003	Alternatives to Cape Wind
March 12, 2003	Climate change's effect upon Cape Cod
	Offshore oil and gas regulation

While the design of analogous outreach initiatives in Denmark had similarities, they were largely different. Middelgrund, the recently-installed 40 mW OSW farm near Copenhagen, Denmark, was installed after a much lengthier public outreach process, 1997-1999. As stated above, MTC based their timeline on the Corps' statement that they might have their EIS drafted by the spring of 2003, so it was on an expedited schedule. Denmark's hearings focused on aesthetics and environmental effects, as well as lessons learned from the two pilot projects, Vindeby and Tuno Knob. One important difference between the initiatives is that the U.S. stakeholder processes (both by MTC and the Corps') came after the proposal was made. By law, public hearings in Denmark must be held *prior* to formal application (Global Wind Energy Council 2012). Another critical difference between the two initiatives was that opposition was still sizable at the end of MTC's initiative, whereas Denmark's three-year outreach initiative apparently contributed to widespread support. Although this is due in no small part to a pre-existing familiarity with, and cultural acceptance of, onshore wind, the process did appease the project's few critics (Zea et al. 2012).

Much of what was presented during the Initiative's meetings came via an extensive review of the existing literature. Describing this literature review, one participant said:

> We were googling and PDFing like crazy. The library that we had of documents that we gleaned from the UK [and Denmark], nobody was going to say we reinvented the wheel. Technical work there from issues like radar and others. People ask questions. For instance, yet it design these things around the impact these turbines would have, scouring, there were things in terms of foundation. People asked you know what the impact on the seafloor? Well clearly they'd already done some work there. We had not done it. The turbines that had been developed for offshore wind were employed there.

Among the early questions was:

> people asked, 'what [is] the impact on the seafloor? There were clearly questions about the the impact on marine mammals, fish, and avian impacts. Nonetheless, in terms of citing, construction, what's the noise impact? Did it impact whales? Or marine mammals? How fast does the seabed floor recover?

Among the most important sources of information was Denmark's 1997 *Action Plan for Offshore Wind Farms in Danish Waters*, published by its national energy agency, and an ongoing environmental monitoring study undertaken by Denmark. Denmark had already spent $15 million on studies of OSW's effects on sea bottom fauna and flora, fish, electromagnetism, birds, porpoises, and seals. At the time, there tentative conclusion was that the only significant effect was on porpoise habitats, and even that was subject to debate (Danish Energy Agency 2005). An academic study, Soker et al. (2000), also provided insight about environmental effects in Denmark and the U.K.

Overall, policymakers were very impressed with the planning undertaken by the U.K., and in particular, Denmark. As one participant said:

> And by the way, they were very good, very thorough, they did very comprehensive planning. Sometimes you wonder how could they were it possibly have written on this, but they were exhaustive in how they did it.

Regulatory Gap

> Analysis: The mechanism I trace here occurred during the Corps' drafting of an EIS for Cape Wind, and highlights how different the Corps' authority was from analogous "lead agencies" in Denmark and the U.K. With *asocial learning* restricted, the Corps gained *empirical and technical information*, and learned of *implementation procedures* from elsewhere. Information from elsewhere informed the Corps' decision-making, and implementation procedures were viewed favorably, but the Corps lacked the *authority* and *discretion* to emulate them, and was stymied by the *path dependency* of federal energy policy. These differences made it impossible for the Corps to devise procedures like those agencies. Instead, it had to operate despite a substantial "regulatory gap."

The Corps considered both the data tower and the Cape Wind proposals simultaneously. As the Corps considered whether to issue an EA for the data tower, it was also deciding whether to issue an EA or EIS for the proposed Cape Wind project itself. Under the Rivers and Harbors Act of 1899, the Corps must review and approve of all projects on the Outer Continental Shelf that could obstruct navigation. This, however, was the extent of their authority.

Unlike MMS, they could not lease the ocean bottom to power producers, or conduct a comprehensive assessment of possible development sites. As suggested earlier, while the Corps was not the ideal agency to take the lead, it was the only agency with any supervisory authority on such projects. It thus had no choice but to take the lead.

Uncertainty was high. As a Corps member stated:

> Staff remembers well [when Cape Wind Associates submitted their two proposals.] [T]he consultant dropped off a box of reports about 5pm the day before Thanksgiving in 2001.[We] [r]ealized immediately that this was something very different than what we were accustomed to permitting[.]

Another participant, a member of MTC, remarked: "[the Corps] understood that there were real limits to what it was able to do. And as a matter of fact, it was an awkward position."

As with the data tower, the Corps learned about Denmark and the U.K.'s policy experiences from MTC, other state agencies, and Cape Wind Associates. In addition, the Corps spoke with MMS officials to draw lessons from how they permitted oil and gas development. However, comparable lead agencies in Denmark and the U.K. had far greater jurisdiction over OSW, and MMS' jurisdiction over oil and gas was far greater than the Corps' jurisdiction over OSW. In short, they couldn't 'policy learn' their way out of it.

At the time the Corps was reviewing Cape Wind, Denmark had pre-designated, pre-vetted areas laid out for OSW development, and the U.K. was beginning a strategic assessment plan. Zeelenberg (2006) credits such predesignation as the primary reason why they were the only two European countries—or countries anywhere—with commercial-scale OSW. The Corps had no authority to predesignate areas. Besides, Cape Wind's proposal was for a specific area.

Denmark's energy markets were deregulated, but beyond this, there were few similarities between existing energy policies in Denmark and the U.S. Although both markets were deregulated, most power producers in Denmark were locally-owned cooperatives, not

private firms (IRENA, 30 Years). Denmark also had the two pilot projects from which to draw lessons. Based on these lessons, in 1997, Denmark published it's *Offshore Wind Turbine Action Plan for Danish Waters*, in which it designated particular areas based on several factors—OSW potential, environmental effects, and aesthetics, among others (Group and others 1997). Such predesignation was precisely what the Corps wished it had the power to do.

In 1999, Denmark created a "one stop shop" for OSW permitting—the Danish Energy Agency. In addition, there was only one "veto point" for OSW approval: an appeals board with a standing threshold that made it ineffective for project opponents (DONG 2006). In contrast, the U.K. had a "three stop shop," the Crown Estate (which, despite the name, is actually controlled by Parliament) grants leases, the Department of Business and Regulatory Reform gives permits related to navigation (analogous to the Corps), and the Marine and Fisheries Agency performs a regulatory and permitting function similar to the EPA (Snyder and Kaiser 2009).

A striking difference among the three nations is that power producers in Denmark perform their own environmental assessments. Importantly, localities in both Denmark and the U.K. have no "veto power" over offshore projects, whereas in the U.S., the 'public trust doctrine' grants substantial power to states and localities in their offshore waters (DONG 2006). This is particularly interesting in the case of the U.K. as the U.S.'s public trust doctrine is derived from English common law (Motta 2014).

The Corps did not have the jurisdiction to emulate any of these elements of Danish and U.K. policy. That would take an Act of Congress, discussed later. They could not lease the ocean bottom, or conduct a comprehensive review of OSW generally. All they could do was review the environmental and other effects of installing Cape Wind. The Cape Wind project itself was a much more complicated issue than the data tower had been. That decision had been much easier. Data towers were quite typical. Offshore wind was quite atypical. Cape Wind clearly met

the “precedent criteria,” and they knew enough to know they didn't know enough. An EIS was necessary.

However, as a study participant stated:

> We were concerned about being the lead federal agency and needing to do an EIS because there were many other issues that the public wanted addressed which we had little to no control over.

As will be explored in the next section, the EPA ultimately rejected the draft EIS. Although the agency recognized the “regulatory gap” that made the Corps’ job difficult, the EPA deemed inadequate both the Corps' public stakeholder process and their environmental analysis.

All Politics is Local?

> Analysis: The following PLD mechanism occurred in response to Cape Wind’s political opposition. Due to the *ineffectiveness of established behavior*, OSW proponents--both governmental and nongovernmental--created a framework for how future OSW project proposals should be considered. Although the extent of policy emulation is unclear, policies from elsewhere clearly informed the document’s drafters. Moreover, the document highlights the importance of effective PLD going forward.

Technical, environmental, and regulatory uncertainty was great, but political opposition was (and is) by far the greatest impediment to Cape Wind's approval. Local elected officials were quick to oppose the project. From 2001 onwards, members of the Barnstable town council passed multiple resolutions, even before details were known, arguing that Cape Wind would cripple the Cape’s port, shipping, fishing, and tourism industries. Before a specific site location was made, they argued the turbines would be visible from twenty miles away during the day, and would require hundreds of bright lights to warn aircraft traffic at night. Other initial project opponents included Cape Cod Chamber of Commerce, the Humane Society, the Barnstable Land Trust, as well as members of the port, shipping, and fishing communities. The editorial board of the *Cape Cod Times*, the most-circulated Cape Cod newspaper, was also

opposed to Cape Wind.[11]

The Alliance formed almost immediately after the *Boston Globe* and others began reporting about a pending proposal for an OSW farm in Nantucket Sound. The group combined local opposition, including many of the interests noted above, with national advocacy groups--although it very much presented itself as the former more than the latter. William Koch, founder of the Oxbow Group, a global, global fossil fuels firm, served as chief financier and board member of the Alliance. Koch is also a primary financier of Tea Party political groups, and an outspoken climate denier (Ebbert 2008; Whitcomb and Williams 2007).

Although many of the Alliance's arguments were exaggerated, there were legitimate issues raised by environmentalists and other groupss. Paramount of these concerns was the project's possible adverse effects upon marine life, birds, and bats. As the process unfolded over 2001 and 2002, additional criticisms, which MTC officials and others agreed with, included the "regulatory gap" and concerns that Nantucket Sound should have been open to a competitive bidding process (Watson and Courtney 2004, 264).

Legal Challenges

The opposition's primary tool of choice was the courtroom. Even going back to 1997, well before Cape Wind or OSW was on the radar, six residents sued the state, arguing that the RETF was unconstitutional. Although the plaintiffs lost the case, they were able to delay MTC's administering of RETF for nearly a year (Massachusetts Technology Collaborative 2009; Watson et al. 2005).

As I described earlier, the Alliance sued after the Corps approved installation of the

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[11] Another newspaper, the Cape Codder, sent reporters to Denmark to learn about OSW before offering support for the project (Leggett 2003).

data tower without issuing an EIS, arguing the data tower was a proxy for Cape Wind itself, and thus necessitating an EIS. Isaac Rosen, executive director of Cape-based alliance, argued "[t]his data rig is a Trojan Horse. If the data-gathering rig is allowed to be built, the private developer will no doubt claim the precedent has been set for the entire project[.]" Rosen said the Alliance was:

> not against exploring new and clean energy sources. But we are against private development that threatens the environment, despoils the scenic beauty of a state and federally designated marine protected area, and gives away federal lands.

This argument was made despite the fact that the proposed area was not in a marine protected area (Leaning 2002).

The court granted an injunction, halting construction for three weeks until a higher court decided not to renew the order, but allowing the case to continue. In August, 2003, a federal court ruled on the merits, and held the data tower was procedurally severable from the project itself, common in other offshore projects, and did not pose significant environmental harms, thus making an EA sufficient (Protect Nantucket Sound, Inc. v. US Dep't of the Army 2003).

Dismissing the 26th lawsuit against Cape Wind, the U.S. District Court for the District of Massachusetts said:

> There comes a point where the right to take legal action becomes an annoying abuse of the democratic process. For this reason, I have handled this matter as soon as possible. (Bindslev 2014)

State and National Issue

The Alliance received support from elected federal and state officials. In 2002 Mitt Romney was elected governor. Part of his platform was to stop Cape Wind development. However, without the support of the state legislature, there was little he could do. Even so, in the

summer of 2004, the Romney administration made a clever, if legally untenable, move. During low tide, rocks in Nantucket Sound appeared above the surface of the water and dried. The administration argued that the rocks constituted the true 'coastline' of Massachusetts. And because states control three miles out from their coastline, this ruling would put a significant part of the proposed site in state waters, subjecting it to the Ocean Sanctuaries Act, and thus preventing Cape Wind's development (Kaplan 2004; Williams and Whitcomb 2007).

Rather than become entangled in another lawsuit, Cape Wind Associates offered to move the turbines further offshore, placing the proposed area entirely in federal waters even with this new 'coastline.' However, rather than accept the concession, Governor Romney wrote a letter to the Energy Facilities Siting Board (EFSB), unsuccessfully arguing that they should delay further review of the project until courts decided the jurisdictional border issue. At the same time, the Alliance was making a similar argument, warning that over 20 other OSW projects were being proposed elsewhere on the east coast, and that a moratorium was necessary until a federal framework was devised (Kaplan 2004).

Cape Wind became a national issue very early in its application process in no small part because it was opposed by key members of the state's congressional delegation, most notably Senator Edward Kennedy—who summered in the famous Kennedy Compound, overlooking Nantucket Sound. His Senate counterpart, John Kerry, was initially opposed as well.) On the House side, Rep. Delahunt—who represented Cape Cod, Nantucket, and Martha's Vineyard—proposed a bill granting review authority to the Department of the Interior and National Oceanic and Atmospheric Administration within it and requiring the Cape Wind review process to begin again. On another occasion, Representative Delahunt proposed a bill to amend the Coastal Zone Management Act, giving federal approval authority to the Secretary of

Commerce, who would oversee a lengthy scientific studies of offshore wind resources throughout the U.S., and upon completion, would oversee competitive proposal process. In effect, this bill would prevent Cape Wind development for years, if not forever. H.R. 1183 And on a third occasion, he proposed that localities be given near-veto power over OSW development—even if entirely in federal waters.

To the EPA, at least some of the opposition's challenges were legitimate. EPA deemed the Corps' draft EIS inadequate (Varney 2005). EPA made four primary criticisms, stating each would need to be addressed in the final version of the EIS:

1.) *the scope of the environmental analysis was too narrow, and should not have incorporated feasibility studies conducted by Cape Wind Associates or Cape Wind proponents;*

2.) *the harm mitigation plan did not cover an adequate amount of space surrounding the turbines;*

3.) *the public stakeholder process was not inclusive enough;*

4.) *and too few project alternatives were considered.*

According to EPA, an adequate final EIS would require more comprehensive studies of the effects upon fish, mussels, crabs, and birds not just in direct proximity to the turbines, but in all of the areas surrounding and between them. The EIS would need a harm mitigation plan more sensitive to the timing of installation so to minimize effects upon bird flight patterns and commercial fishing. The mitigation plan would also need a longer-term view with a more comprehensive and specific habit restoration plan. Finally, the decision process should be more inclusive of other agencies with marine know-how.

While EPA recognized and sympathized with the "regulatory gap" in which the Corps had to work, it argued that "under NEPA, the Corps has an obligation to ensure that the EIS fully

addresses the project's impacts [regardless.]" (Varney 2005). In effect, the EPA said that the Corps lacked legal authority to do what it was legally obligated to do. Despite the EPA's response, the draft EIS convinced previously neutral environmental groups like the Union of Concerned Scientists that Cape Wind would not pose a significant threat (Donovan 2005). By contrast, the Massachusetts Audubon Society would not formally reach this conclusion until 2013 (Clarke 2013).

Study participants felt the opposition's arguments were given more weight than they were due by the EPA:

> [I]f you want to delay a project, you can say there's a difference between the sea ducks. There is a little bit of the chauvinism there, just because they did [a study] in Europe and [you] can't harm the sea ducks there, you got to show that they won't be hurt here in the United States.

Two former directors of EPA New England's Office of Environmental Review said it is unusual for the agency to give an "inadequate" rating to a draft EIS. One of the directors had filed a comment to the draft EIS in favor of Cape Wind. He argued that there is nothing to "suggest that there are environmental issues that can legitimately be said to be so significant as to warrant disapproval of a project that in and of itself, as well as symbolically, has so much environmental benefit." (EV World 2005)

EPA's determination letter provided an example of an offshore natural gas pipeline that was approved in Massachusetts. The comparison to the natural gas pipeline environmental review process is apt for a few obvious reasons reasons: It is offshore. It involves energy. And its draft EISs were not deemed adequate. There are important differences however. Most interesting: the EPA did not rule the pipeline's DEIS 'inadequate,' as it did with Cape Wind's DEIS. Instead, the agency just stated that there was 'not enough information' to reach a conclusion, despite the fact that the proposed gas pipeline would extend roughly 30 miles offshore from Beverly to

Weymouth, and included a lateral pipeline to Deer Island in Boston Harbor. In total, the pipeline would affect nearly 140 wetlands or other bodies of water, including complete conversion of 13. In total, *7800* acres of land or ocean bottom would be affected either directly or indirectly from the pipeline.

In addition to the suggestion that the Corps learn from the natural gas pipeline project, the EPA also provided the example of an approved sewage runoff plan. Sewage is a NIMBY issue if there ever was one. The Massachusetts Water Resources Authority (MWRA), when creating a sewage runoff plan, created a technical advisory group that included experts as well as stakeholders from affected communities. The aim of the group was not to decide where the sewage would go, but rather to come up with a way to quantify effects and trade-offs between different locations. In doing so, MWRA's decisions would be more objective, or at least less open to criticism.

Soon, the Corps would no longer be lead federal agency, so the EPA's words were seized upon by two sets of actors: OSW proponents, including officials from MTC, and federal officials, particularly in Congress and MMS. I examine the response of OSW proponents in this section, and the response of the federal government in the subsequent section.

In order for EPA to approve the final EIS, the public participation process would need to be made more transparent and inclusive. And if there was any hope for an OSW industry, better strategies for public support were needed. These two goals were intertwined—if the public process appeared more transparent and inclusive, the politics would be better; and if the politics were better, the public process would be held to less scrutiny. To these ends, OSW proponents—which at this time included MTC officials—most of the major national environmental groups, as well as federal agencies and General Electric—came together to form the Offshore Wind Collaborative, and publish the Framework for Offshore Wind Energy Development in the United

States in 2005.

OWC's own description of their formation tells the story best:

> The US Offshore Wind Collaborative has its roots in an informal partnership that emerged shortly after the nation's first offshore wind farm proposal, Cape Wind, brought this new renewable energy opportunity to the nation's consciousness in 2001. After exploring Europe's decade-plus experience with wind energy in the marine context, learning about the potential of our domestic offshore wind resources, and gaining first hand experience in the initial permitting process around Cape Wind, the Massachusetts Technology Collaborative joined with the US Department of Energy (DOE) and GE Wind Energy to consider the question: *what would it take to build an offshore wind industry here, and do it right?* ("US Offshore Wind Collaborative | A Brief History of the US Offshore Wind Collaborative" 2014)

Acknowledging Cape Wind's political opposition (at this time, 50% of Cape Cod residents still opposed the project), the Framework argued that public support would be greater if more was understood about why environmental benefits outweigh "potential, perceived, and actual environmental impacts" and if the benefits of OSW, such as its lack of emissions, were somehow quantified in cost-benefit analyses (Watson et al. 2005, 16-17). In many ways, the Framework was a means of catching up to Denmark and (to a lesser extent) the U.K. Years before the first commercial-scale OSW project was proposed in Denmark, the government had convened government officials, citizens, scientists, and industry to establish guidelines for the OSW approval process. The U.K.'s analogous Best Practice Guidelines did not precede the first proposal, but they were devised quickly after a few starts and stops in developing their own pilot projects. In the U.S., as we know by now, OSW policy was not created to foster growth of a sector; it was created in reaction to an actual proposal.

However, even if a framework had been established earlier, it is likely Cape Wind still would have been contested. Much of the support for OSW in Denmark results from the fact that most OSW energy is produced by locally- and citizen-owned cooperatives. Moreover, onshore wind turbines had been commonplace there for decades. When Denmark's Middelgrund project

faced opposition, it was short-lived, and affected fishermen are paid compensation by the national government (DONG Energy 2006; Soerensen et al. 2003). In the U.K., there was initially resistance to OSW development, but within a few years, it had more installed capacity than anywhere in the world.

In its letter to the Corps, the EPA suggested that the Corps draw lessons from the U.S. Forest Service's EIS process, lauded as a successful model (Mohai and Jakes 1996; Selin et al. 1997). Although OSW and forestry policy domains are clearly distinct, they both deal with similar resource conflicts. The EPA, because it must approve environmental reviews conducted in multiple policy domains is in a unique position to draw analogies where others may not see them. In a 1995 self-assessment, the USFS articulates its challenges, but it could just as easily be articulating the challenges of OSW:

> Early involvement by the public gives the agency the opportunity to identify and, when possible, reduce or eliminate conflicts by considering public values and opinions when making decisions. The effectiveness of this approach is constrained, however, by the wide divergence of public opinion on resource issues, incentives for the public to utilize administrative and judicial review to alter decisions, and by limitations imposed by federal law (e.g., FACA).]

I cannot say with any certainty that OWC or others drew lessons directly from USFS, or that EPA's suggestion impacted the Framework in any significant way. Interestingly, however, OWC did hire the mediation firm Resolve, Inc. to consult with them regarding the stakeholder process—the same firm used by the USFS just a year prior (RESOLVE, Inc. 2001). To be fair, Resolve, Inc. was also involved in fisheries, wetlands, and onshore wind policy prior to consulting with OWC, so it may very well be coincidental (RESOLVE, Inc. 2015)

The Framework does express the general sentiment that lessons should be drawn from successful models elsewhere:

> Pathways to success also rely on leveraging the knowledge resident in marine research and engineering disciplines, including the offshore oil and gas industry, which has built and

> maintained offshore structures for decades. Also, engagement with the international offshore wind industry will provide invaluable lessons learned from offshore projects while the experience base is establishing itself in the United States[.] (OSWC, 13)

Acknowledging the role of uncertainty going forward, the Framework states that "[t]here are limits to the ability to predict impacts absent actual experience with offshore installations; initial developments must be used effectively as learning laboratories to reduce uncertainty."

To address such uncertainty:

> Lessons from other offshore developments—for example, oil and gas drilling facilities—could be useful... [OWC should also] [i]nclude oil and gas industry representatives on offshore wind technology task groups... Mitigation techniques in use by other offshore ocean industries and in Europe should be assessed. Where relevant, these methods should be applied to the development and modification of offshore wind energy systems in the United States... High priority should be placed on developing protocols for incorporating lessons learned into future facility design (17)

The Framework also discusses limitations to application of lessons learned:

> [despite lessons learned], new techniques and methods will be needed that apply directly to wind facilities. This will require coordination among academic institutions, public and non-governmental organizations, and the private sector...

And, reflecting upon the Cape Wind process, the Framework calls for preemptive consideration of other potential ocean energy sources: wave, current, and tidal power.

Re-inventing the Wheel?

> Analysis: EPA2005 fundamentally altered OSW policy at both the federal and state level, and served as the impetus to MMS engaging in PLD. MMS anticipated having authority over the Cape Wind approval process and federal OSW policy, and so learned from the Corps, and ultimately chose to begin reviewing Cape Wind anew rather than building upon the work of the Corps.

From the beginning, there was near-universal consensus that the regulatory path for an OSW project—in Nantucket Sound, or anywhere else in the U.S.—was nowhere near ideal.

Members of the 107th and 108th Congresses introduced several bills governing the use of federal offshore resources for renewable energy projects. MMS seemed like a logical choice given its experience with offshore oil and gas development (Kaplan 2004). Others argued that the lead agency should not be an energy agency, but a marine environmental agency, like the National Oceanic and Atmospheric Administration or the National Marine Fisheries Service (Utzinger 2004). One legal scholar argued that the federal government should apply its laws on cellular phone tower laws to offshore wind turbines (Hayden 2005).

In the previous section, I looked at how OSW proponents reacted to the EPA's criticisms of the public participation process. Here, I look at the Energy Policy Act of 2005 (EPA2005) and its attempt to fill in OSW's "regulatory gap." In many ways, EPA05 speaks directly to the EPA's criticisms.

EPA2005 made MMS, an agency within the Department of Interior, lead agency for OSW projects in federal waters. As stated previously, MMS oversaw offshore oil and gas energy development, and were an obvious candidate from the get-go. MMS felt well-prepared for the task, given the similarities with oil and gas development on the Outer Continental Shelf (Kaplan 2004). It clearly had a much different posture than MTC or the Corps had.

Under EPA05, MMS was to create a competitive process for the awarding of OSW leases, except in the case of Cape Wind, which was exempted. MMS also had to devise a more direct and inclusive permitting process. Although EPA05 had exempted Cape Wind from the competitive process that would be required going forward, it was to MMS' discretion whether to revise the Corps' DEIS, or whether to scrap the draft entirely and start anew.

Prior to passage of EPA05, federal legislators were talking with the Corps about their experiences, and to MMS about the potential of expanding their leasing authority to renewable energy projects. When it became apparent that EPA05 would grant MMS this authority, it began

learning from Corps officials. (Which meant it was also learning indirectly from Gordon, MTC, the U.K., and Denmark.)

After months of consideration, MMS chose to begin the process anew. MMS drafted their EIS in early 2008, inviting 18 agencies to participate (a few more than the Corps before them), and published their final EIS in January, 2009.

Past as Prologue

Ten years after the passage of the 1997 Acts, Massachusetts again made sweeping changes to its energy policy. First, the state's newly-elected--and Cape Wind-supporting--governor, Deval Patrick, combined several energy and environmental agencies into a new Executive Office of Energy and Environmental Affairs (EEA), making Massachusetts the first state to combine energy and environmental executive functions in one department. EEA, led by a governor-appointed secretary, includes the Departments of Energy Resources, Agricultural Resources, Conservation and Recreation, Environmental Protection, and Fish and Game, along with the state's Environmental Policy Act Office. The Department of Public Utilities, a semi-adjudicatory body, is also under the EEA umbrella.

The following year, the *Boston Globe* reported:

> Anyone at the State House for the close of the recent legislative session likely noticed the lanky guy exclaiming: 'First in the nation! First in the nation!' The excitable man wasn't a triumphant lobbyist or an exuberant politician; rather he was [the state's first] Secretary of Energy and Environmental Affairs Ian Bowles. 'I plead guilty. You've got to be enthusiastic about your job,' Bowles said of his antics. He was celebrating the passage of five 'green' bills, some in the final days and hours of the session. Bowles said the legislation puts Massachusetts at the forefront of energy and environmental policy in the United States, and perhaps even ahead of California, which is known for being environmentally progressive. 'I definitely think that this [legislative] package is so far reaching in breadth that there is no other state that has done as much,' Bowles said. 'In clean energy, the race is on and Massachusetts has just opened up a commanding lead.' (Ailworth 2008)

Speaking about the same five 'green bills,' House Speaker Salvatore DiMasi said: "We

are the envy of the nation" (Ailworth 2008). The five 'green bills' were: (1) the Green Communities Act, which promoted energy efficiency, (2) the Global Warming Solutions Act, which created goals and programs for GHG reduction, (3) the Clean Energy Biofuels Act created incentives for use of biofuel and biodiesel, (4) the Ocean Act set the stage for creation for the U.S.'s first comprehensive state ocean policy, and (5) the Green Jobs Act created financial incentives to encourage growth of a state alternative energy economy. The Green Jobs Act also created the Clean Energy Center, a quasi-public agency, and charged it with administering the state's various incentive programs, including RETF.

Meanwhile, in 2010, Cape Wind received its final federal approval (via the Bureau of Ocean Energy Management.) Soon after, the final state permit was issued. By the end of 2010, Cape Wind had signed a lease with the Department of Interior, and reached a power purchase agreement with National Grid, one of the state's two largest providers, for half of Cape Wind's power output. Although there were still a few lawsuits thrown its way, for the first time it appeared that Cape Wind was more likely to go into operation than not.

In 2012, Cape Wind reached agreements to sell the other half of its electricity. The firm used these agreements to secure the required financing to begin operations, and planned to be fully commissioned by 2016.[12]

Current Policy Network

CEC, by succeeding MTC as administrators of RETF, also succeeded them as central actors in the policy network. The current OSW policy implementation network in Massachusetts is broader than ever. State officials report consistent engagements with governments across the world. In addition to Denmark and the U.K., Massachusetts OSW policy actors maintain relationships with policy actors in Canada, Germany, Chile, and Colombia, among others.

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[12]In the final months of writing this dissertation, Cape Wind....

Regionally, Massachusetts is part of a carbon trading compact, the Regional Greenhouse Gas Initiative along with Connecticut, Delaware, Maine, Maryland, New Hampshire, New York, Rhode Island and Vermont.

Massachusetts and Rhode Island recently signed a Memorandum of Understanding to conduct joint feasibility and ocean planning studies off their shores. Both states' energy agencies also keep in touch on a regular basis regarding joint proposals for Department of Interior and DOE funding. On more than a few occasions, CEC has partnered with the University of Rhode Island to compete for DOE funding along with private companies like Siemens, a wind turbine provider.

Regarding Massachusetts' relationship with Rhode Island, a current CEC official stated:

> [W]e have a lot of direct communication. Based on mutual interest. And projects as well. You know, it is, our assumption is always been that it is a regional resource and the challenges are, we are facing a lot of the same challenges. A regional approach is advantageous to avoid duplicate effort, to be more competitive for federal grants, and to really deploy at scale because the benefits are purported to be regional. It is in everyone's interest to identify ways that working regionally to move that along.

Although the New England states frequently cooperate with each other, one participant emphasized that competition between the states is a significant hurdle to successful OSW deployment:

> In the UK, they created an industrial scale market that sends signal that if you build a plant here, the market will be there. We have states pushing for this, but the states are all competing with each other on the entire supply chain, to be the first.. We have states that are adjacent to each other indicating to the developers: 'if you come here, we want to see direct economic benefits, we want to see jobs that are going to be here'... That competitive nature in the policy arena is a disincentive for regional thinking necessary to build an efficient supply chain and to build deployment... it's really tough, it's tough, because it's expensive now, and we have a really short term view. Offshore wind, to really achieve the benefits of industrial scale, we need to take a longer-term view, to understand where it's in a fit into the larger energy transformation. And the jobs are not going to come at the scale people are looking for from an individual project. So competition among the states, market fragmentation among the states, and the lack of a consistent federal incentives for market

> building, has been a huge challenge... but I think the competition really has a negative impact... Where the states are looking for in order for jobs and economic benefits within their borders, it is not the most efficient way to build a supply chain.

Without the formation of a supply chain, widespread diffusion of large-scale OSW projects is unlikely. Here, competition is not diffusing policy—it is preventing it.

Learning is Ongoing

OSW policy learning is ongoing. Regarding infrastructure, a participant reported that:

> the Department of Energy and the BOEM really have gone after the European experience. They are, I know BOEM is having particular conversations with, I think it is Marine Scotland, that is the agency that does the leasing, because they seem to have some very efficient models. None of these things are secrets, just trying to figure out how to implement them within our structure.

CEC and EEA officials, along with Governor Patrick—seeking to develop an OSW commerce terminal in New Bedford—visited Denmark and Germany to look at their ports. Installation of multiple OSW projects will require a means of coordinating transmission for multiple alternative energy producers. CEC officials and others have drawn lessons from Europe regarding how they accomplish this—but like with other policies mentioned earlier in the chapter—their applicability has been limited. However, as one participant said: "even if not directly applicable, [learning] is certainly good for reference. [They're learning] very basic design principles... What is the design criteria? How is that constructed and operated? Very practical considerations."

The same was reported regarding specialized support vessels which would be deeded to install and maintain OSW farms, and transport crew and equipment:

> One [lesson] has been very specific opportunity around training workers to construct in-service offshore wind farms. There is a very particular curriculum developed in Europe over there.... [W]e face the challenge of having to draw on Europe for that very specific expertise.

Massachusetts Ocean Plan

With Massachusetts' Oceans Act, one of the five 'green acts' described above, the state became an innovator once again. The law created a task force which would have the authority to create a comprehensive ocean plan with the goal of "assur[ing] long-term protection and sustainable use of ocean resources" and planning sites for offshore renewable energy projects (Zezima 2008). Massachusetts would become the first state to publish such a plan. (Zezima 2008)

The statute required the task force to consist of individuals from several groups—including many involved in both sides of the Cape Wind debate, e.g., scientists and fishermen. The task force included: six legislators; designees of coastal zone management, marine fisheries, and environmental protection divisions; representatives from the commercial fishing community, an environmental organization, the Cape Cod Commission, the Martha's Vineyard Commission, the Merrimack Valley Planning Commission, metropolitan planning commission, and the Southeastern Regional Planning and Economic Development District; and an OSW expert. The plan, released in 2010 and revised in 2014, identifies areas well-suited to OSW development, sensitive habitats where OSW is prohibited, and areas that can be sited for OSW if certain standards are met. It also purports to enhance coordination between the EEA, regional planning commissions, ocean science experts, the public, and with the Northeast Regional Ocean Council, which is comprised of both state and local agencies.

The drafters of the Massachusetts plan drew lessons from far and wide, and from their experience with Cape Wind.

In some part due to the Cape Wind experience, the task force:

> spent an enormous amount of time making sure that things are public, that we were transparent, that we were not getting too far ahead of any public conversation, and using the advisory bodies we had, but also holding public meetings across the state in order to discuss it, to get public participation.

Initially, lessons were sought 'diagonally' from national governments: Australia's Great Barrier Reef plans, along with ocean plans from Germany, Norway, the UK, the Netherlands, and in particular Denmark. Although these policies were effective, their purposes were slightly different, and policy contexts were not analogous to the U.S.'s particular brand of federalism.

Although there have yet to be conflicts between state and federal ocean plans, one participant reported that:

> We saw some of that... when we were working through 'how do you define an area that is highly important to North Atlantic whales?' How do you define that?' As you know, the Mass. plan identifies areas designated for commercial scale wind development. In those areas, I do not think the federal agencies quite got as far as the Commonwealth would have liked, saying that 'yes we agree that these areas are more suitable for commercial scale wind energy development...' I think the test of that conflict will be borne out if and when a developer decides to propose something in those wind energy areas.

For example, the focus of the Australian plan was on which areas to protect and how to protect them. Massachusetts' plan also did this, but took it a step further by seeking to develop those areas that were not protected. In Europe, the case was often the opposite. Areas were sited for development but not for protection. The Massachusetts' plan intended to do both.

Regarding applicability in Massachusetts, a participant said:

> Well, no place has the same set of existing regulations that Massachusetts does... Once you got down into it a few levels, you found out the way Massachusetts environmental regulations are written are fundamentally different than other places.

Task force members then asked researchers to find a policy domain in which there was a relationship between the state and federal governments analogous to ocean policy. This was "because we knew that would be something we would need to tackle, how to work with the federal folks."

One potential source of information was federal land management in the western U.S., particularly Utah and Nevada, in which much of the land belongs to the state, but is managed by

the federal Bureau of Land Management.

However, the task force concluded that:

> [t]he differences really matter... ultimately, the answer was there really is no great existing model from that type of perspective... In some ways it goes all the way back to Constitutional issues. But it is real. And we never really found any good parallels elsewhere for that... There was no one single place that we found that was a great, a model that we built Massachusetts upon. That did not happen.

As this chapter demonstrates, PLD was (and is) prevalent during the OSW policy implementation process in Massachusetts and at the federal level. The next chapter discusses my results and their implications for PLD theory and practice. First, I infer a more general mechanism from the processes described above, and then I evaluate the efficacy of OSW PLD in light of the fact Cape Wind may never go operational, and what this means for the energy transition overall. I conclude with suggestions for future studies.

Chapter 7: Discussion and Conclusion

In this study, I explored emergent causal mechanisms of PLD that informed the decision-making of state and federal policymakers crafting first-in-the-nation OSW policies. Causal mechanisms can vary in their level of abstraction (Falleti and Lynch 2009, 1140). The six mechanisms I described in the previous chapter are specific to individual actors and organizations. In this chapter, I describe a more general mechanism that I infer from those six mechanisms. I then consider this general mechanism in the context of the existing literature, and I conclude by discussing implications for policy learning in theory and practice.

A More General Mechanism

Intention: Although statutes like the 1997 Acts and EPA2005 obviously created much of the impetus to PLD by agency officials, there were other dynamics at work. But for the *presence of change agents* (CWA), MTC and the Corps would not have engaged in PLD, or even become OSW policymakers in the first place.

Acquisition: *Information cascades* via other policy implementation network actors was often the initial source of information from policies elsewhere. When contextual differences and political realities limited applicability of lessons drawn, policymakers conducted a broader search for potential policy lessons. Lessons were drawn from policy models that were analogous in less obvious ways, (e.g., USFS's public participation process, and Australia's Great Barrier Reef policy program.) Much of what was sought and learned was *empirical and technical information*.

Interpretation: Policy lessons were drawn with the understanding that policy programs from elsewhere could not be emulated *in toto*. Nevertheless, "some of the basic questions were

answered."

Application: *Empirical and technical information* constituted much of what was "applied" or "diffused." Importantly, however, the very existence of OSW farms elsewhere served as an *inspiration* to policymakers.

As discussed at length in Chapter 3, Bennett and Howlett (1992) convincingly argue there are three general causal mechanisms of PLD. Of them, 'lesson-drawing' is the best description of what happened during OSW policy implementation. 'Lesson-drawing' involves actors (e.g., MTC officials) learning from others in their policy network in order to more effectively achieve policy goals, (e.g., how to develop an alternative energy industry.) This is a more apt description than 'government learning,' in which changes in sociopolitical conditions or accrued knowledge initiate the PLD process. (Although this may have been the impetus for Massachusetts legislators, it was not for implementers.)

Bennett and Howlett's third mechanism, 'social learning,' may apply to the Initiative I described in Chapter 6. In 'social learning,' members of advocacy coalitions learn from members of other advocacy coalitions, resulting in a change in policy goals. Many seemingly neutral administers of the Initiative would go on to become Cape Wind and OSW advocates. As Sabatier (1988, 137-138) describes: "The distinction between 'advocate' and 'broker,' however, is a continuum. Many brokers will have some policy bent." Sabatier also notes that *empirical and technical information* can change the views of a policy broker, pushing them towards the viewpoint of one coalition over another's. This was certainly the case here. Some of the key brokers are now key advocates.

Powering or Puzzling?

In addition to the 'puzzling' described above, 'powering' also played a critical role in the crafting of OSW policy from 1997-2006. Indeed, a maneuver (and an effective maneuver) of the opposition was to mask powering *as* puzzling. As one study participant described it:

> If you look at the opponents, the organized opponents, the Alliance to Protect Nantucket Sound, there was no interest ever [in objectively considering Cape Wind], and that continues to this day... where learning was not the issue, you're not gonna change minds.

What do the results of this study tell us about the ongoing energy transition towards alternatives? The most obvious answer is that it is not a good sign for other alternative projects. Opposition was substantial. Permitting was lengthy and expensive. And, despite eventually gaining the required state and federal permits in 2010, Cape Wind may never go operational. In late 2014, National Grid and NSTAR both cancelled their power purchase agreements with Cape Wind, putting the project in doubt (O'Sullivan 2015). This lends credence to Karch's (2007, 204) argument that the "laboratories of democracy" analogy is a misnomer because the "diffusion of policy innovations is an inherently political process." Perhaps we are indeed "locked in" to fossil fuels as Unruh (2000) argues.

I would argue, however, that regardless of whether Cape Wind goes operational, or OSW ever develops in U.S., this case study demonstrates the presence of genuine, good-faith policy learning. Although it is fair to argue that the non-existence of commercial-scale OSW capacity in the U.S. is a *policy* failure, it was not a policy *learning* failure.

A Methodological Problem and Solution

Although this study offers some hope for the *practice* of policy learning, that may not be the case for the *study* of policy learning. As this study shows, not only did policy diffuse across jurisdictional borders, it diffused across policy domain borders.This reality creates methodological problems for PLD studies (and for DOI studies generally.) How can we design

large-N studies of PLD when what diffuses is not clear? How far back does a researcher track back a lesson? If the nugget of brilliance that makes a policy diffuse widely originated in an entirely different policy domain, then how can we validly differentiate *inventors* from *emulators*? What constitutes a policy *innovation*? Rates of diffusion, amounts of "innovativeness," and other conclusions of DOI studies might be presumptuous.

Given how permeable policy lessons might be, can we even meaningfully study PLD dynamics?

If scholars only use retrospective, large-N studies that take place years after the dynamics of PLD occurred, the answer may be no. While large-N PLD studies have their place, bottom-up, real-time studies are the only way that the complexities of PLD can be discerned in still-emerging policy areas in which policymakers might draw lessons across policy domain borders.

Suggestions For Future Studies

There is ample opportunity for studies to build upon this research. An obvious follow-up would look at how other early adopting states learned from Massachusetts' OSW policy experiences as they implement their own offshore wind energy policies. Another obvious follow-up study could more comprehensively examine OSW PLD in Massachusetts from 2007 onwards. However, OSW energy development is but one of many modern examples of policymakers facing unprecedented amounts of uncertainty. There are innumerable opportunities for studying PLD dynamics in such a context. Offshore water is not the limit—the sky is.

An expanded agenda could include additional studies of wicked problems and their innovative solutions. Such studies could further explore how the federal government learns from policy experiences at the state level, 'diagonal' learning between state governments and foreign

governments, as well as how policies cross domain borders. Additional process-tracing studies will likely reveal other PLD dynamics worthy of closer inspection. Cumulatively, these studies may shed light on the new normal: *governance in the face of substantial uncertainty.*

Modifications for Future Studies

Although my framework proved useful, future studies should "draw lessons" from my study, and modify accordingly. Doing so will better capture the dynamism of PLD in still-emerging policy domains.

Network Governance Theory

This study used NGT to discern the policy implementation network and potential opportunities for PLD. It was effective. True to NGT's assumptions, in the case studied here, policy networks indeed overlapped, and consisted of actors from multiple levels of government, and many actors outside of government. Learning often involved many 'students' and 'teachers.' A purely 'policy subsystem' or 'iron triangle' perspective would not have shed much light for the purposes of this study. Future studies can develop a conceptual understanding of how PLD occurs within and between networks, and how policy networks "overlap" more generally.

New Contributor to Diffusion

Future studies can also explore a cause of diffusion that has emerged in recent years: *federal inaction*. Coercion/persuasion implies a positive action undertaken by a higher level of government forcing or convincing lower levels of government to create a particular policy, which has the effect of diffusing similar policies across multiple co-equal governments. In some ways, policy makers felt *compelled* to act because of federal inaction. As described towards the end of Chapter 6, state policymakers have acted in part because the federal government has not meaningfully created policy to mitigate climate change. Participants expressed frustration with federal inaction, and would prefer the federal government to have taken the lead from the get-go.

As one participant said, regarding creation of the OSWC:

> "One of our major arguments was climate change, and Congress was not too keen on middling climate change as an issue. So there are those sorts of challenges. Even more reason [for states,]... going up against those sorts of odds,... we had to band together so that we were unified."

Limitations

Process-tracing studies inevitably run into problems that cannot entirely be mitigated. Data collection and analysis necessitates the subjective inclusive and exclusion of particular data, risking selection bias. Process-tracing case studies draw inferences from "empirical traces" to understand the role of particular causal factors in an outcome. However, because factors cannot be easily measured, studies such as this one cannot determine relative importance, or whether a factor is necessary or sufficient. At best, evidence can show whether a factor is present or absent, not whether it is necessary or sufficient. Mechanisms are largely invisible processes, so evidentiary records are complete. This is particularly true for the day-to-day decisions of agency officials which are not often part of a public record.

To the extent possible, studies can mitigate these risks by triangulating sources and types of data. Sources can include interviews with policy actors at different levels of perceived causal significance and within different institutional contexts. Interviews and follow-up questions can be staggered. Evidence can be drawn from laws, regulations, administrative reports, energy resource data, media reports, and public statements. However, data triangulation does not guarantee increased validity. Even trianguled evidence can lead to competing inferences. And even when a single inference is particularly strong, spurious relationships are still possible (Miles and Huberman 1994). For these reasons, future studies ought to, if possible, use cross-case analyses.

Policy Learning and Diffusion Framework

In addition to methodological changes, the results of this study suggest a few ways future studies can alter the conceptual framework. For example, because Massachusetts and federal policymakers were “guinea pigs” for OSW policy design, others in the U.S. were looking to them for lessons (Watson and Courtney 2004, 271). Participants suggested that this provided additional pressure to do a thorough job, thus encouraging PLD. As one stated: “no one was going to accuse us of re-inventing the wheel.”

Another factor that emerged is a form of "anticipatory governance." The term "anticipatory governance" is generally used to urge governments to anticipate future scenarios, and to craft policy accordingly (Quay 2010). Likewise, "anticipatory PLD," as I conceptualize it, occurs when a policymaker anticipates a future scenario and engages in policy learning to prepare for it. This occurred when OSWC, in their 2005 Framework, thought ahead to wave, current, and tidal energy. Another example is MMS officials speaking with Corps officials in anticipation of EPA2005 granting them jurisdiction over OSW.

As the world grows increasingly interconnected, regional proximity may play less of a role in PLD. Such was certainly true for the case here. In addition, the factors of *perception of leadership* and *success,* for example, apply to those who are leaders or successes within the same policy domain. These concepts should either broaden to include leaders or successes in other policy domains, or more nuanced concepts should be introduced.

Future studies should consider other ways in which policy lessons can be applied. For example, any lesson drawn from a non-analogous policy area, or ‘diagonally,’ will require 'adaptation,' and will be impossible to 'photocopy.' The concept of a ‘hybrid’ lesson does not, but should, include lessons combined together that are drawn from entirely different policy domains.

If, as I assume, the ultimate goal of PLD studies is to improve policy decision-making and move us closer to the “laboratories of democracy” model, then a deeper and wider

understanding of PLD in all its flavors is a necessary first step. Indeed, it will take numerous studies, and much theory-development, before PLD scholars can offer meaningful advice to policymakers facing unprecedented amounts of uncertainty.

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Appendix A: List of Abbreviations and Definitions

Abbreviation	Definition
1997 Acts	Massachusetts' 1997 enactment of a renewable portfolio standard, deregulation of electricity market, and creation of RETF
Alliance	Alliance to Protect Nantucket Sound
BOEM	Bureau of Ocean Energy Management, Regulation, and Enforcement
CE	Categorical Exclusion
CEC	Clean Energy Center
Corps	Army Corps of Engineers
CZM	Coastal Zone Management
DEIS	Draft Environmental Impact Statement
DOE	U.S. Department of Energy
DOI	Diffusion of Innovations
EA	Environmental Assessment
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPA2005	Energy Policy Act of 2005
EU	European Union
FERC	Federal Energy Regulatory Commission

GW	Gigawatt
Gwh	Gigawatt-hour
FONSI	Finding of No Significant Impact
Initiative	Cape & Islands Offshore Wind Public Outreach Initiative
MMS	Minerals and Management Service
MTC	Massachusetts Technology Collaborative
NEPA	National Environmental Protection Act
NREL	National Renewable Energy Laboratory
OSW	offshore wind energy
OSWC	Offshore Wind Collaborative
PD	policy diffusion
PL	policy learning
PLD	policy learning and diffusion
RETF	Renewable Energy Trust Fund
RPS	Renewable Portfolio Standard
U.K.	United Kingdom
U.S.	United States

Appendix B: Open-Ended Interview Protocol

Note: Not all questions were asked of each participant. This list does not include follow-up questions.

Introductory

Can you please state your name, current position with (organization), and briefly explain your day-to-day duties in that position?

Have you held any other positions, either inside or outside of government? Could you briefly explain what those positions' duties entailed?

Understanding PLD and OSW

Do you recall any time in which you or a colleague searched for policy experiences from another state or foreign government?

Do you remember approximately when you first learned about offshore wind, either when it was still "theoretical," or when it was actually realized in practice?

In what capacity has, or is, offshore wind energy part of your position with (organization)?

Do you think developing offshore wind energy in Massachusetts is important? Why or why not?

What do you think led to Massachusetts being the first state to pursue commercial-scale offshore wind energy?

Do you recall any reluctance about pursuing this policy because no other state had attempted to do it?

Do you recall any time in which you or a colleague searched for experiences related to offshore wind from (other governmental entity's policy)?

Learning From Elsewhere

How did you learn about (policy elsewhere)?

Did you ever talk to people from (other governmental entity)?

Did you or anyone else from (organization) travel there?

Do you know if any colleagues spoke to people from (organization)?

Turning Anecdotes Into a Model

What was your assessment of (policy elsewhere)?

Was any element of (policy elsewhere) useful for making policy here in the U.S.?

What changes needed to be made to the (policy elsewhere) for it to be emulated in the U.S.?

Concluding

What is the most important thing you think I should know that I have not asked about yet?

Who else should I be speaking to?

Appendix C: Consent Form

Northeastern University, Law and Public Policy Program
Name of Investigators: Christopher Bosso, Principal Investigator; Michael Julius Motta, Jr., Graduate Student Researcher
Title of Project: Policy Learning and Offshore Wind Energy in Texas, Massachusetts, and Rhode Island: A Comparative Case Analysis

Request to Participate in Research
We would like to invite you to take part in a research project. The purpose of this research is to investigate policy innovation and policy learning in offshore wind energy policy implementation. **You must be at least 18 years old** to be in this research project.

The study will take place either in person at a location of your choosing or over phone, and will take about one hour. If you decide to take part in this study, we will ask you to answer questions relating to your position as a government official working on offshore wind energy policy implementation. The interview will be audio-recorded for transcription and analysis purposes only and will be destroyed when the study is completed. If necessary, a brief follow-up interview may need to be scheduled.

There are no foreseeable risks or discomforts to you for taking part in this study. There are no direct benefits to you for participating in the study. However, your answers may help us to learn more about policy learning in offshore wind energy policy implementation.

As a public figure, we hope that you will consider speaking on the record about your experiences related to offshore wind energy policy, meaning that your name will be attributed to your comments. If you choose to have your name attributed to your comments, identifying information such as name, occupation and location may be identified and quoted in reports and publications based on this research. I will provide you with a draft copy of the transcript of the interview so that you can review its content and add any clarifications and corrections that you feel are necessary.

However, you may also specify that your name not be attributed to some or all of your comments and that your part in this study be handled in a confidential manner. If so, only the researcher will know that you participated and your responses will be coded and given a pseudonym. Any reports or publications based on this research will use only de-identified data and will not identify you or your organization as being of this project.

The decision to participate in this research project is up to you. You do not have to participate and you can refuse to answer any question. Even if you begin the study, you may withdraw at any time. If you do not participate or if you decide to quit, your information will not be included in the final analysis and report.

You will not be paid for your participation in this study.

If you have any questions about this study, please feel free to call Michael Julius Motta, Jr., Tel: 617-688-4255, Email: motta.m@husky.neu.edu, the person mainly responsible for the research. You can also contact Professor Christopher Bosso, Tel: 617-373-4398, Email: c.bosso@neu.edu, the

Principal Investigator.

If you have any questions about your rights in this research, you may contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University, Boston, MA 02115. Tel:
617.373.4588, Email: irb@neu.edu. You may call anonymously if you wish.

I agree to take part in this research. My preference regarding the use of my name is as follows:

___ I agree to be identified by name in any transcript or reference to the information contained in this interview.

___ I wish **NOT** to be identified by name in any transcript or reference to the information contained in this interview.

_____ _____
Signature of Person agreeing to take part in the research Date Printed Name

_____ _ _____
Signature of Researcher Date Printed Name

Appendix D: Recruitment Letter

Dear XXXX,

My name is Michael J. Motta, Jr. I wish to invite you to participate in a study I am conducting for my doctoral dissertation at Northeastern University. I am researching state policy innovation in offshore wind energy. Drawing from [website] or [reference], I believe you might be able to contribute.

The purpose of my study is to develop a better understanding of how policy makers, such as you, develop policy in the absence of state models elsewhere. In [Massachusetts/Texas/Rhode Island], offshore wind policy was created, and continues to develop, with no obvious U.S. predecessors to learn from. To date, no one has studied this phenomenon, and I aim to begin filling that gap.

During the course of this study, I will be conducting in-person interviews with people in Massachusetts, Texas, and Rhode Island who may be able to explain their processes as they craft policy. My intent is to interview you and have you share your experience with state offshore wind energy policy. Participation is completely voluntary. I hope you will consider participating in this research and be willing to speak on the record about your experiences. (You may also specify that your identity be kept confidential and that all or some of your comments be de-identified.)

Should you decide to participate, we would set up an interview at your office or another convenient location. [Alternatively: we would set up a time to speak over the phone at your convenience.] The interview will take about 1 to 1½ hours and will be audio recorded for analysis and transcription purposes only. Be assured this study has been reviewed and received ethics clearance through the Office of Human Subject Research Protection at Northeastern University.

If you feel you may not be an appropriate person to interview for my study, please let me know. Also, if someone you know may be interested in participating, they are encouraged to contact me using the contact information provided below. [I will be in Texas for the month of _____]. To let me know whether you are interested in participating, please contact me at 617-688-4255 or by email: motta.m@husky.neu.edu.

Thank you for your time and consideration.

Best,

Michael Julius Motta, Jr.
Ph.D. Candidate, Law and Public Policy
Northeastern University

Appendix E: Interview Participants

Interview participants were either current or former members of the following governmental, quasi-public, and non-governmental organizations. In total, there were 11 interview participants. Some participants belong (or belonged) to more than one organization.

Army Corps of Engineers, U.S. Department of Defense(http://www.usace.army.mil/)

Office of Coastal Zone Management, Commonwealth of Massachusetts (http://www.mass.gov/eea/agencies/czm/)

Department of Energy Resources, Commonwealth of Massachusetts (http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/)

Massachusetts Technology Collaborative (http://masstech.org/)

Clean Energy Center (http://www.masscec.com/)

Northeast Regional Ocean Council (http://northeastoceancouncil.org/)

Offshore Wind Collaborative (http://usoffshorewind.org/)

Good Harbor Consulting (*no website*)