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Implementation of Renewable Portfolio Standards in the United States

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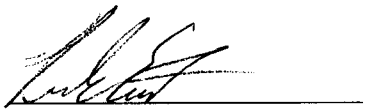

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Luke J. L. Eastin

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1. Abstract

One particular environmental policy tool, original to the states, and only recently developed in the last few decades, has become widely discussed and is now one of the most commonly adopted environmental policies among the states: Renewable Portfolio Standards (RPS). However, one facet of this policy that has had little to no scholarly attention is implementation. In this thesis I attempt to partially fill in this gap. Furthermore, this study attempts to explain why some states seem to be implementing RPS faster than others and what factors are capable of explaining these differences in RPS implementation. The findings of this analysis support the central assertions made by policy implementation scholars, most notably the substantive significance of both the political environment and policy design. More specifically, higher levels of both GSP and legislative professionalism are linked to more successful RPS implementation. Moreover, the more REC trading that is allowed and the stronger the non-compliance penalty is the greater the likelihood of full RPS compliance by the target date.

2. Introduction

State policy innovation has been thriving in the modern polarized federal system. This is true even more so in the environmental policy arena which has recently become one of the policy strongholds of the states. One particular environmental policy tool, original to the states, and only recently developed in the last few decades, has become widely discussed and is now one of the most commonly adopted environmental policies

among the states: Renewable Portfolio Standards (RPS). The central foundations of RPS have been examined many times throughout the years by several scholars (Berry 1994, Mintrom 1997, Rabe 2004, 2006, Huang et al. 2007, Matisoff 2008, Wiser and Barbose 2008, Yi 2010, Lyon and Yin 2010, Yi and Feiock 2012, Carley and Miller 2012, Heeter and Bird 2013). However, one facet of this policy that has had little to no scholarly attention is implementation. Specifically, why do some states seem to be implementing RPS faster than others and what factors are capable of explaining these differences in RPS implementation? How to effectively measure and analyze the implementation of a relatively new policy is not easily accomplished, and consequently a gap exists in RPS research. In this thesis I attempt to partially fill in this gap.

To begin, a terse review of RPS is necessary for understanding the context of this research. As described by Rowlands (2010), RPS are created to "reserve a portion of the broader electricity market for renewable resources by obliging market participants to ensure that a predetermined share of their total electricity supply is provided by renewable electricity facilities." Simply put, RPS are state regulations that require a specific percentage of all electricity come from renewable energy resources. The first RPS policy was enacted in Iowa in 1983, and although it is now three decades old, its policy objectives are still synonymous with even the most recent RPS policies. RPS did not become popular until the 1990s when seven states adopted it, followed by a spike of 22 more in the 2000s. In addition to the 30 mandatory RPS policies, seven states have adopted voluntary versions of RPS.

The increased popularity in RPS adoption in the last three decades may derive from the ample flexibility that RPS policies allow for, including variations in policy

structure, application, and size. Despite these varying differences, nearly every RPS policy shares three distinct characteristics as summarized by Carley and Miller (2012): (1) defined targets for the share of electricity that must come from renewable energy, (2) the ability to attain these targets through either direct renewable energy production or tradable renewable energy credits, and (3) a specific year in which the RPS targets must be achieved. These shared features make state RPS policy especially suitable for research. Yet, research regarding RPS performance and implementation has been somewhat slow to develop. Through both quantitative and qualitative analysis I will explain why certain states are implementing their RPS policy goals faster than others, and discuss the specific factors that explain these patterns. This analysis should help indicate the feasibility of RPS policy and if it is on track for successful implementation in those states that have adopted it.

The remainder of this chapter examines the extant research regarding policy implementation and RPS, with a focus on how this research project fits in with the current scholarly literature. Following this review of literature, I discuss the data collected, how it is being utilized for this analysis, and then discuss this study's methodology. Next I propose several hypotheses regarding the implementation of RPS that will be tested through quantitative and qualitative analysis.

The second chapter begins by discussing and presenting the results of the quantitative analysis, including testing a set of hypotheses while setting the stage for qualitative analysis. With this foundation established, case studies of four RPS states are presented and evaluated, hopefully garnering evidence either in support of or against the previous findings of the quantitative analysis.

Lastly, the third and final chapter will compare and contrast the results of the analysis and discuss the subsequent conclusions that can be drawn from the findings. Indications of the factors that seem to lead to improved RPS implementation will be provided, followed by a discussion of what these findings are suggesting as they pertain to policy implementation. I then close with a short discussion of what future research should attempt to ascertain regarding RPS policy.

3. Public Policy Implementation

There has been more than a fair share of social science research devoted to public policy, with the subfield of policy implementation as one of the scholarly interests within the larger set of public policy scholarship. This subfield, however, has experienced a diversity of outlooks on matters such as its focus, direction and even its contributions. Several seminal books including Pressman and Wildavsky's implementation study (1973, 1979, 1984) and Hargrove's social policy implementation evaluation (1975), suggested that policy implementation is a rather neglected field of public policy, and as Hargrove stated, is the missing link in public policy research (Hargrove 1975). However, in the years that have followed, public policy scholars have begun to disseminate many detailed implementation studies in a variety of policy areas including social policy (Bullock and Lamb 1984, Burkhauser 1989, Mead 2012), transportation policy (Humphrey 1981, Stich and Eagle 2005), education policy (McLaughlin 1987, Odden 1991, Spillane et al. 2005), and most relevant to this research, environmental policy (Harris 1989, Travis et al. 2004, Sharp et al. 2011). Even with the exponential growth in policy implementation research

in the last few decades, some scholars still view implementation research as either lacking the necessary uniform conceptual framework to make accurate analysis possible (Lester, et al. 1987, Robichau and Lynn, Jr. 2009) or as requiring a predictive theory of implementation that is unnecessary and will never be fully attained (deLeon 1999). These two critiques of implementation research are rather gainsaying, and seem to form the central discrepancy among public policy implementation scholars. Due to this apparent inconsistency, further examination of this issue deserves continued attention.

Many scholars have stated that theory building is the next phase for implementation research (Sabatier and Mazmanian 1980, Lester et al 1987, Robichau and Lynn, Jr. 2009). However, the difficulty of theory building is no more obvious than when we examine the attempts made in the public policy implementation literature. Despite several efforts over recent decades at creating a policy implementation theory, no uniform paradigm has been accepted. Instead it appears that scholars are simply adding conceptual frameworks, models, and other testable theories into the pot and seeing what sticks (e.g. see Van Meter and Van Horn 1975, Rein and Rabinovitz 1977, Sabatier and Mazmanian 1980, Robichau and Lynn, Jr. 2009). Nevertheless, collectively these works do find some common ground, specifically the need to examine policy objectives and structure, compliance incentives, and economic resources, but the discords between the frameworks are still nearly immeasurable. These large inconsistencies make it difficult to continue to build implementation theory, and the sum of these incongruities might have led in part to the noticeable departure of many distinguished scholars from policy implementation research (deLeon 1999). The question that still remains is what direction

should policy implementation scholars go from here. Although rather basic, my answer presented here is twofold.

First, rather than continuing to focus on theory building, it may be more plausible for scholars to concentrate on explaining implementation one case or policy at a time. As inferred by deLeon (1999), although scholars should not be completely satisfied with a policy by policy analysis, this may be more suitable for implementation research because of the incredible variety of policies and programs that exist, and the continued growth of diverse actors at play in the implementation process. In other words, focusing solely on ascertaining a standalone implementation theory neglects to appreciate the array of policy and program differences that exist within the public policy sphere. Secondly, the exponential increase of implementation research that crosses disciplinary boundaries, as found by Saetren (2005), indicates that common conceptions stating that implementation research is declining are wholly inaccurate. Even though it may appear to be declining marginally in one discipline, it is simultaneously growing exponentially in another. Even though these multi-disciplinary approaches do not foster a uniform predictive theory, they do inspire new innovative ways of testing the implementation of policies from a multitude of diverse perspectives. In sum, scholars must be somewhat content with what we can explain about implementation for the time being, and allow theory to spawn from our individual analyses, rather than continue to obsess over prediction. Indeed the very weaknesses that have been shown to exist in implementation research may conversely be considered the strengths, or pillars if you will, of policy implementation that will buttress creative and active implementation research into the future.

This particular research does not attempt to adopt any singular aforementioned implementation framework. Rather it draws from these frameworks collectively and uses several individual features of each framework in some way. Although no specific framework is used as the sole foundation for this research, the following test of state RPS implementation should indicate several variables that are significant to the implementation of public policy. Therefore, the results of this analysis are expected to help further implementation theory development at least in part by indicating variables that appear to be the most salient when exploring policy implementation at the state level.

4. Renewable Portfolio Standards

Current scholarly research on RPS has focused almost wholly on why states adopt RPS, and the extant research has found several different factors linked with the adoption of RPS. Rabe (2004) found that several factors predict RPS adoption, but state economic development benefit is the predictor that is most in conjunction with other scholarship. Similarly, Matisoff (2008) found that economic internal determinants, rather than regional policy diffusion, are more accurate predictors of state RPS adoption. When looking more broadly at state policy diffusion research, scholars have found evidence that both supports and denies the significance of state policy diffusion, leaving public policy scholarship with unreliable conclusions (Berry 1994, Mintrom 1997, Stoutenborough and Beverlin 2008, Chandler 2009).

On another note, both legislative and citizen ideology have been found to be significant predictors of state RPS adoption (Huang et al. 2007, Lyon and Yin 2010, Yi

2010, Carley and Miller 2012). Lyon and Yin's study (2010) quantitatively examined RPS adoption and suggests that political ideology, specifically a strong Democratic presence in the legislature, is a significant positive predictor of state RPS adoption. In essence, a more Democratic state legislature equates to a higher probability of RPS enactment. Carley and Miller (2012) discovered that citizen ideology, particularly citizen liberalism, is an accurate predictor of state RPS adoption. This indicates not only the influence that citizens can have on state policy making, but this finding also fits with the political ideology result from Lyon and Yi that showed government liberalism generally points toward RPS adoption. Citizen ideology's significance can be extended even further into the analysis of specific renewable energy policies, as Wiener and Koontz (2010) also found that citizen liberalism was a central predictor of small-scale wind energy policy adoption.

There also has been substantial effort to research the effectiveness of RPS (Rabe 2006, 2008, Wiser et al. 2004, 2007, Bushnell et al. 2007, Fischer 2010, Carley 2011). However, much of the previous research has concluded that more data on RPS compliance and outcomes are needed to achieve a full and accurate measurement of RPS effectiveness. Since this lack of data makes any attempt measuring RPS effectiveness difficult to say the least, the policy design features and market context of the RPS are the best predictors of success (Yin and Powers 2010, Carley 2011). Fischer (2010) found that RPS can lower overall energy prices, but it varies depending on the elasticity of the electricity supply from both fossil fuel and renewable energy resources. In other words, developing a model to evaluate the role RPS play in lowering energy costs is complex and dependent upon several external factors.

4.1 RPS Structure Variation

Although the shared central characteristics of all RPS policies generate the possibility for testing its current implementation progress, the varying differences between states' RPS are important to consider. The policy design variances among state RPS are numerous and are best summarized by Carley (2012). These differences include renewable energy percent mandate; whether renewable energy credits (REC) are allowed; whether the energy must come from in-state production or if it can come from out-of-state REC purchases; which energy resources are eligible to be used; whether specific energy resources are required; and the penalty or lack thereof for compliance failure. Two of these regulatory policies, REC and non-compliance penalties, deserve more attention because of their critical importance to and vast variation in RPS policies across the states.

REC are dynamic policy mechanisms that introduce the opportunity for market trading of renewable energy certificates both in-state and out-of-state, similar to the trading mechanism in a cap-in-trade policy (e.g., see Berry 2002, Holt and Wiser 2007, Gillenwater 2008a, b). REC can be bundled with or completely separate from physical electricity (unbundled) and sold on electricity market. Allowing utilities to sell unbundled REC bypasses the difficulties and complexities associated with the electricity grid (Fischlein and Smith 2013). Using unbundled REC may also provide incentive for states to exceed the mandatory RPS compliance goal, because additional credits could be sold to other states or renewable utilities for a profit. Most RPS states have employed some form of REC trading; specifically 22 RPS states use some form of unbundled REC.

Eighteen states permit its usage altogether while five states, California, Kansas, North Carolina, and Oregon have put a cap on the amount of unbundled REC trading that is allowed. Arizona, Nevada, and Wisconsin are the only states that completely forbid unbundled REC, while Illinois and New York have developed their own individual procurement mechanism. Iowa is the odd one out, but only because it has a renewable energy capacity goal rather than a generation goal (Fischlein and Smith 2013).

The second regulatory policy, non-compliance penalties, was enacted by the vast majority of RPS states for rather obvious reasons. Specifically 25 RPS states have authorized some variation of a non-compliance penalty. The five states that have neglected to enact a non-compliance penalty include Arizona, California, Michigan, New Mexico, and New York (Fischlein and Smith 2013). Just as the way in which REC trading fluctuates greatly among RPS states, so does the usage of penalties. RPS states can employ non-compliance penalties in one of two ways, either a straightforward fine given to the electricity utility, used by ten states, or an alternative compliance penalty (ACP) that also relieves the utility from their renewable energy requirement, utilized by 17 states (Wiser et al. 2007, Stockmayer et al. 2012, Fischlein 2013). Since an ACP eliminates the utilities' renewable energy requirement, this penalty is normally set quite high to prevent deterring the utility from deploying the renewable energy. However, as displayed by Fischlein (2013), in several cases the ACP is a lower cost option than buying renewable energy.

Every state with a RPS policy has a different policy structure containing some or all of the abovementioned policy regulations. Accounting for each and every policy design difference would eliminate the possibility for accurate implementation testing, and

therefore the subsequent research design finds some important similarities among the varying RPS policies, and uses them as the foundation for testing RPS implementation.

5. Research Design

This study includes 29 states with mandatory RPS policies. The states that have adopted voluntary RPS policies are excluded in order to assess RPS policy implementation through states that have non-compliance enforcement policies. Iowa is omitted from the sample for two reasons: Iowa's RPS policy was adopted over a decade prior to any other state making its relevance unsuitable for this research; and Iowa's policy structure is based upon renewable energy capacity rather than generation, making its comparability to other RPS policies incongruous. One obvious difficulty and possible critique of this research design is the small sample size. However, in order to assess the implementation of a specific state policy, such as RPS, the sample is limited to those states that have adopted the policy, and in this case only 29 states have adopted mandatory RPS, making this sample size rather difficult to increase.

A review of the extant literature on RPS indicates a salient discrepancy that must be noted. Several research studies studying RPS policies have chosen states that clearly have voluntary RPS rather than mandatory. For example, some research includes the District of Columbia and Utah in their analysis (e.g. see Fischlein and Smith 2013). However, because the District of Columbia is nationally recognized as a federal district, and Utah's RPS law is considered a renewable goal and more specifically states that the

RPS should only be pursued when it is "cost effective" (S.B. 202 2008), they are not included in this particular RPS analysis.

5.1 Data and Methodology

For each RPS state, data are collected from year of RPS adoption through 2010 and further analyzed in order to calculate the measures for implementation. Using both the Database of State Incentives for Renewables and Efficiency (DSIRE), funded by the U.S. Department of Energy, and the U.S. Energy Information Administration (EIA) I am able to determine states' RE generation, RPS target goals, current RPS percent, and ultimately each state's RPS current progress towards implementation. I then apply a model utilizing binary logistic regression to assess the current condition of RPS implementation. The results of the regression model will then be used as a guide to carry out case studies of four RPS states to shed more light on the context of which RPS implementation takes place.

A central limitation to this data is its sole focus on renewable generation. This measurement is unable to account for other aspects of renewable development such as renewable energy sales or REC buying and selling. However, when attempting to include those measurements of RPS, what becomes apparent is the lack of data availability across the states. This particular assessment therefore estimates RPS implementation conservatively, possibly underestimating slightly some aspects of renewable energy development. So in this case a conscious choice was made in favor of

the availability of data rather than the specificity of data, in order to ensure that the most comprehensive data available are utilized.

5.2 Implementation Measurement

RPS implementation is defined through a two-step process. First the yearly implementation score is calculated by dividing the 2010 RPS percent total by the amount of years since RPS adoption. Dividing the 2010 RPS percent by the years since RPS adoption provides a yearly implementation score that is impartial to the year a state adopts a RPS policy, and as a result creates a good balanced foundation for analysis. The central limitation to this measure is that it does not account for rapid shifts in implementation from year to year. For example, during the first year of RPS adoption electric utilities may be focusing solely on renewable energy investment rather than actual implementation of the RPS, causing their renewable energy percent to be much lower the first year than in subsequent years. Thus, the implementation measure used here is unable to account for these possible RPS variations. Furthermore, this measure does not estimate for success or failure of RPS implementation, but rather describes which states are producing better results on a yearly basis. Due to the need to estimate success or failure, and in order to ascertain accurate findings regarding implementation, this measure must be taken one step further.

The yearly implementation score established above is then used to determine whether the RPS target percent will be successfully reached by the target year. This is calculated by considering how many years it would take for the target percent to be

reached based upon the yearly implementation score, and then determine whether or not that falls within the RPS polices' target year time frame. Coded as a dummy variable, 1 for successful RPS implementation (when the RPS target percent is met by the target year), and 0 for failed RPS implementation (when the RPS target percent is not met by the target year), this measure will give an early estimate of whether full implementation will occur by the target year if the current rate of yearly RPS growth stays constant.

5.3 Predicting Variables

The independent variables employed in this research were selected because of their comparability to many of the factors discussed in the seminal implementation frameworks reviewed earlier (e.g. see Van Meter and Van Horn 1975, Sabatier and Mazmanian 1980). These predictors can be summarized into three groups, (1) state dynamics, (2) external actors, and (3) policy design. Albeit some of the variables within these groups are policy specific, at a more generalized level the following variable groups make up policy implementation predictors that have been found to be quite salient in extant literature. A descriptive summary of these independent variables can be seen below on Table 1.

5.3.1 State Dynamics

Within this group there are four independent variables, the first measures the economic resources of each state through gross state product data, the second considers

Table 1: Descriptive Statistics

Variable	Description	Mean	Std. Dev.	Min.	Max.
GSP	Total gross state product, in thousands of millions	$.363 \times 10^3$	$.408 \times 10^3$	36.52	1845.25
Political Culture	Presence of a moralistic subculture	.38	.49	0	1
Legislative Professionalism	Ordinal scale from part-time (1) to full-time legislatures (5)	3.10	1.11	1	5
Renewable Energy Potential	Summation of wind and solar potential in gigawatts	3.41	4.48	.03	22.79
Interest Group Activity	% of RPS interest's contributions out of total interest group contributions	2.53	2.34	.25	7.92
Interest Group Conflict	Pro-RPS contributions minus anti-RPS contributions	78.67	$.238 \times 10^3$	.14	1178.19
Non-Compliance Penalty	Non-Compliance Penalty Intensity scale from no penalty (0) to ACP (2)	1.31	.81	0	2
REC	REC scale from no trading allowed (0) to (2) trading fully permitted	1.59	.73	0	2
Stringency[a]	Weak RPS (0) or Strong RPS (1)	.48	.51	0	1

Note: This table displays one measure of central tendency (i.e. the variable mean), and three measures of dispersion (i.e. the minimum and maximum values of each variable, and the standard deviation, or variance from the average, of each variable).

[a]See Carley and Miller (2012) for further RPS stringency measurement discussion.

the political culture of each individual state, the third takes into account each state government's level of legislative professionalism and the final variable examines each state's RE potential. To begin, state affluence, measured predominantly as gross state product (GSP), has been considered an important independent variable when examining RPS by several scholars (Huang et al. 2007, Chandler 2009, Wiener and Koontz 2010, Carley and Miller 2012). These data were collected from the U.S. Department of Commerce's Bureau of Economic Analysis for the year 2010 and indicate each state's affluence in the final year that the implementation data was collected. Since RPS are not normally seen as a state policy obligation, it would be interesting to see whether or not there are any correlations between GSP and RPS implementation. Extant research has shown that GSP has a positive statistically significant relationship with both RPS adoption and RE adoption (Matisoff 2008, Wiener and Koontz 2010, Carley and Miller 2012). Therefore this variable is expected to achieve the following result:

H1: States with a higher gross state product will be more likely to implement their RPS policy by the specified compulsory target year.

Secondly, this group includes the political culture of each RPS state (e.g., see Elazar 1966, Sharkansky 1969, Reese and Rosenfeld 2008, Lieske 2010). Using Lieske's (2010) updated version of regional subcultures, I will assess whether or not the political culture of the state is affecting the implementation process. To do so I will create a dichotomous predicting variable that examines states with moralistic cultures, coded as a 1 contrasted against the four other regional subcultures described by Lieske,

individualistic, pluralistic, bifurcated, and separatist, coded as a 0 for no moralistic culture present (Lieske 2010). As described by Elazar and continued by many others, the moralistic culture will be in favor of government intervention on policies that increase the common good and "enhance the community" (Elazar 1966). Among the five regional subcultures Lieske described, it can be inferred that the moralistic culture would be most in favor of environmental policy or in this case RPS, because of their inherent wish to increase the well-being of community they live in. If the assumptions of a moralistic culture are correct than this variable should result in the following:

H2: Those states with the presence of a moralistic regional subculture will be more likely to implement their RPS policy by the specified compulsory target year.

The third predictor from this group will consider the legislative professionalism of each RPS state. The data for state legislature professionalism come from the National Council of State Legislatures (NCSL), which provides a five category assessment of state legislatures: blue, light blue, white, light red, and red, equaling part-time legislatures to full-time legislatures respectively. This color scheme is recoded on a ranking scale from one to five, with part-time legislatures equating a one and full-time legislatures equating a five.[1] Previous research on legislative professionalism has shown that increased professionalism is linked to more time developing legislation and policy alternatives, more policy expertise, and more responsive polices (Rosenthal 1996, Maestas 2000, Kurtz et al. 2006, Squire 2007). It can then be argued that more policy expertise can lead to better policy development therefore increasing the likelihood of full policy

implementation. From this, legislative professionalism is expected to have the following effect:

H3: As the level of state government legislative professionalism increases, so will the likelihood of the state implementing its RPS policy by the specified compulsory target year.

The final state dynamics variable considered is each state's level of renewable energy potential. Across previous literature renewable energy potential has been operationalized in many different ways including wind potential (Matisoff 2008, Lyon and Yin 2010), solar potential (Matisoff 2008, Jenner et al. 2012), and the summation of both wind and solar potential (Carley and Miller 2012). This analysis operationalizes renewable energy potential as the summation of both wind potential (onshore and offshore potential) and solar potential (urban, rural, and rooftop potential) in gigawatts, as measured by the National Renewable Energy Laboratory in 2012. There are mixed results as it pertains to renewable energy potential and its effects on RPS. Some research suggests that renewable energy potential is a meaningful predictor of RPS, but others have suggested the contrary, finding no statistically significant relationship between renewable energy potential and RPS (Matisoff 2008, Lyon and Yin 2010). However, as it relates to the implementation of RPS, the following result is expected:

H4: The larger the state's renewable energy potential, the more likely it is to implement its RPS policy by the specified compulsory target year.

5.3.2 External Actors

In this particular group several possible actors could be measured and analyzed including non-governmental organizations, the bureaucracy, or the policy implementing agencies. The external actors selected here focus on the influence of relevant interest groups. Interest groups have been shown to have enormous influence over policy adoption and implementation at the state level (Nownes and Freeman 1998, Nownes 2000, Yackee 2009, Ozymy 2013). This influence can come from interest group cooperation (Robbins 2010), interest group conflict (Nownes 2000, Yackee 2009), or more simply interest group activity (Nownes and Freeman 1998, Yackee 2009). To take into account interest group influences, two discrete interest group variables are analyzed: interest group conflict and interest group activity. Using state level data on interest group financial contributions from the Institute on Money in State Politics, I am able to assess the influence of interest groups—as other scholars have done before (e.g. Lowery et al. 2005, Yackee 2009). These data are available for every state biennially and are collected from either two or three years prior to RPS adoption, depending on whether the RPS was adopted in an even or odd year, in order to ascertain the interest group environment just before RPS adoption through 2010, the final year of implementation data availability.

First I test for interest group activity, drawing in part from the variable used in Yackee's (2009) analysis of medical malpractice reform. In order to assess activity, I examine what percent of the total interest group financial contributions to the state came from the interest groups relevant to RPS. Then a measurement examining each year of data will provide me with an average percent of total contributions from RPS interests

which can then be evaluated for each state. This can then be used to determine which states seem to have higher interest group activity and whether that affects the implementation process. The specific interests that are measured in this case include electricity utilities, oil and gas interests, energy production and distribution, alternative energy production and services, and pro environmental policy interests.

Again using Yackee's (2009) variable measurement as the foundation, I measure interest group conflict by taking the absolute value of the pro-RPS interest's contributions minus the anti-RPS interest's contributions. In this interest group variable, electric utilities had to be excluded from consideration because of the difficulty in determining whether state electric utilities are pro-RPS or anti-RPS. The number of electricity utility providers in each state can reach into the twenties, and trying to estimate whether or not they would be for or against RPS adoption would not engender an accurate representation. Therefore, although this may be seen as a limitation to this variable, any attempt at including electricity utilities in an interest group conflict variable would most definitely create skewed results. The interest group variables are expected to result in the following:

H5: The higher the level of RPS interest group activity in the state, the more likely the state is to implement its RPS policy by the specified compulsory target year.

H6: The higher the level of interest group conflict in the state, the less likely the state is to implement its RPS policy by the specified compulsory target year.

5.3.3 Policy Design

The intrinsic structure of a public policy is also important to take into account when examining the policy's implementation (Sabatier and Mazmanian 1980). So in order to accurately depict RPS implementation, the policy design group includes three predicting variables, (1) REC, (2) non-compliance penalties, and (3) RPS stringency. The foundations of the data for the first two variables are drawn from the research completed by Fischlein and Smith (2013), but DSIRE was also used to ensure the validity of Fischlein and Smith's data collection. The REC variable is coded into three categories, a 0 for those states who do not allow REC trading, a 1 for those that cap the amount of REC, and a 2 was assigned to states that permit REC trading without any cap. Non-compliance penalties were dealt with in a similar fashion, with a 0 given to states without penalties, a 1 assigned to states that assess a straightforward fine for non-compliance, and lastly a 2 was assigned to states have a ACP. Although some research has indicated that paying the ACP may be more cost-effective than complying with RPS (Fischlein and Smith 2013), in general the ACP is designed to be the most influential non-compliance deterrent. These two policy variables are expected to effect RPS implementation in the following manner:

H7: The more REC trading allowed by a state, the more likely the state is to implement its RPS policy by the specified compulsory target year.

H8: The harsher the RPS non-compliance penalty, the more likely the state is to implement its RPS policy by the specified compulsory target year.

The final variable in this group is RPS stringency. Several scholars have recently begun to consider the effects of RPS stringency on several RPS outcomes including, RPS adoption, RE generation, among several others (Wiser and Barbose 2008, Fischlein 2010, Carley and Miller 2012). So far these scholars have found that increased RPS stringency tends to lead to improved policy outcomes. In the present analysis stringency is operationalized in the same manner as Carley and Miller (2012). They measured stringency through the development of a basic equation considering RPS target percent goals, RPS percent at time of adoption, the number of years from RPS adoption to ultimate target year, and finally the percent a state's electrical load that is actually covered by RPS regulation. Using data from Carley and Miller's analysis and extending it further to two more states, Kansas and West Virginia, stringency is measured as a dummy variable with a zero denoting a weak RPS and a one denoting a strong RPS. From here we expect RPS stringency to be significant in the following way:

H9: Strong RPS states are less likely to implement their RPS policy by the specified compulsory target year than are weak RPS states.

Based upon these hypotheses and the rationale for including these particular variables in the analysis, the operationalization of this model of RPS implementation can be expressed as:

$$\text{IMPLEMENTATION}_t = \beta_0 + \beta_1(\text{GSP}) + \beta_2(\text{Political Culture}) + \beta_3(\text{Legislative Professionalism}) + \beta_4(\text{RE Potential}) + \beta_5(\text{Interest Group Activity}) + \beta_6(\text{Interest Group Conflict}) + \beta_7(\text{REC}) + \beta_8(\text{Non-compliance Penalty}) + \beta_9(\text{Stringency}) + \text{ERROR}$$

6. RPS Implementation Findings

To begin, several basic implementation findings are worthy of discussion and these findings are displayed on Table 2. Of the 29 states that have adopted RPS, 15 are estimated to succeed in complying with their RPS targets, leaving 14 states projected to fail to reach their requirements at the current rate. This initial assessment is not optimistic for the future of RPS implementation, with just over half of that states expected to comply; however, this early evaluation can be altered if states increase their RPS growth as they close in on the compulsory target year. So far yearly RPS compliance has been over 90%, with only Texas and Connecticut imposing penalties (Wiser and Barbose 2008). However, this research suggests that as RPS target goals become more difficult to achieve there will likely be a dramatic increase in assessed penalties, barring any abrupt changes in the current advancement of RPS. A closer look at each state's yearly implementation score indicates which states are implementing their RPS faster irrelevant to the year of adoption. The top two states in this category are Oregon and Washington respectively, both with measures of yearly implementation well beyond the norm. This finding provides more statistical evidence to the conventional

Table 2: RPS Implementation Statistics

State ID	RPS Adoption Year	Target RPS %	Target Year	Implementation Score (RPS %)	Implementation Compliance
Arizona	2001	15.0	2025	.73	1
California	2002	33.0	2020	3.20	1
Colorado	2004	30.0	2020	1.44	0
Connecticut	1999	27.0	2020	.28	0
Delaware	2005	25.0	2025	.42	0
Hawaii	2004	40.0	2030	1.10	0
Illinois	2005	25.0	2025	.43	0
Kansas	2009	20.0	2020	3.60	1
Maine	1999	40.0	2017	3.90	1
Maryland	2004	20.0	2022	.73	0
Massachusetts	1997	15.0	2020	.38	0
Michigan	2008	10.0	2015	1.20	0
Minnesota	1997	25.0	2025	.99	1
Missouri	2008	15.0	2021	.90	0
Montana	2005	15.0	2015	5.85	1
Nevada	1997	25.0	2025	.91	1
New Hampshire	2007	24.8	2025	3.05	1
New Jersey	2001	20.4	2020	.13	0
New Mexico	2002	20.0	2020	.63	0
New York	2004	29.0	2015	3.16	1
North Carolina	2007	12.5	2021	1.33	1
Ohio	2008	12.5	2024	.27	0
Oregon	2007	25.0	2025	16.00	1
Pennsylvania	2004	18.0	2020	.41	0
Rhode Island	2004	16.0	2019	.27	0
Texas	1999	10,000	2025	915.42	1
Washington	2006	15.0	2020	14.48	1
West Virginia	2009	15.0	2025	1.45	1
Wisconsin	1999	10.0	2015	.59	1

Note: Texas' RPS is measured through renewable energy capacity in megawatts (MW). Texas' yearly implementation score is measured as amount of MW capacity per year. Implementation compliance is coded 0 for non-compliance and 1 for compliance.

wisdom that Oregon and Washington are two of the top states in pro-environmental policy development. On the opposite end of the spectrum, the two states on the low end of the yearly implementation score are New Jersey and Rhode Island. One obvious commonality between these two states is their relative small size compared to most U.S.

states. Further analysis displays a clear pattern that associates smaller populated states with the lowest yearly implementation scores. There are apparent outliers to this pattern such as Illinois and Pennsylvania, but the association between small states and lower levels of implementation cannot be overlooked. It is difficult to determine from these statistics why this pattern is occurring, although several theoretical assumptions could be made. The most likely relates to the size of these smaller states' economies. Smaller states tend to have lower GSP levels, therefore decreasing the amount of funds these states have to spend on policies such as RPS. It may be that these states are focusing their financial resources on other arguably more essential policies. Continued analysis may begin to indicate why patterns such as this one are occurring and further identify specific factors producing these policy relationships.

6.1 Logit Results

The results of the logit analysis are displayed below on Table 3. First, the logit model Chi-Square indicates the overall significance of this regression equation, and in this case this model is found to be statistically significant relative to RPS implementation. Two pseudo R square values are also displayed, and although these R square values must be interpreted with caution because they are only approximations of a linear regression R square, both the Cox and Snell measurement and the Nagelkerke measurement indicate that a substantial amount of variance in RPS implementation is explained through this logistic regression equation. Further analysis of the regression equation displays a 71%

Table 3: Logit Model of RPS Implementation

Hypotheses	Variable	Logit Coefficients	Wald Statistic
State Dynamics	GSP	.10***	2.371
		(.006)	
	Political Culture	1.667	1.264
		(.483)	
	Legislative Professionalism	3.739**	4.970
		(.677)	
	RE Potential	.12	.002
		(.281)	
External Actors	Interest Group Activity	-.346	.571
		(.458)	
	Interest Group Conflict	.003	.041
		(.013)	
Policy Design	REC	2.126**	3.821
		(.088)	
	Non-Compliance Penalty	1.842***	2.149
		(.244)	
	Stringency	.851	.278
		(.614)	
	Chi-Square	21.532*	
	Cox and Snell R Square	.524	
	Nagelkerke R Square	.699	
	Proportional Reduction of Error	.714	

Standard errors are in parentheses. *p ≤ .01; **p ≤ .05; ***p ≤ .10

reduction in error when predicting RPS implementation based on the inclusion of the predictors used in this analysis. Even though this is only a measure of association, this proportional reduction of error (PRE) statistic indicates a rather substantial decrease in predicting error that is at the very least noteworthy.

Of the predictors examined in this particular analysis, several are found to be significant predictors of RPS implementation compliance. Specifically, two predictors of

state dynamics are found to be salient to RPS implementation. The first is GSP, which is found to be positively significant at the 10% level. In practical terms this means that states with higher levels of overall wealth are more likely to comply with the RPS target goal. This finding supports Hypothesis One and provides additional evidence to extant findings that the wealth and resources of a state has a significant impact on policy outcomes while also encouraging innovative policy development and implementation (Matisoff 2008, Carley and Miller 2012). This GSP result also indicates evidence that supports the pattern mentioned earlier that smaller states tend to display lower rates of RPS implementation than larger states. If a larger GSP equates to better implementation, then smaller states are at a disadvantage before the implementation process even begins. Furthermore, prior research has shown that the economic benefits of RPS are one of the central predictors of RPS adoption (e.g. Rabe 2004, Matisoff 2008). In order to attain that economic benefit, financial resources must first be invested into the policy's implementation. Therefore, smaller states that do not have a surplus of financial resources may not be able to supply enough initial funding to the RPS policy to see the economic benefit come to fruition.

The second state dynamics predictor found to be significant at the 5% level is the amount of legislative professionalism in the state. As conjectured in hypothesis three, the higher the level of legislative professionalism in the state, the more likely the state is to comply with the ultimate RPS target goal and year. Legislative professionalism, as it was measured in this research based on the NCSL framework, considers three predominant factors, (1) time on the job, (2) compensation, (3) and staff size. Two of these factors, time on the job and staff size, are especially important to policy development and policy

expertise. Therefore it can be argued that in the case of RPS implementation, states that have higher levels of legislative professionalism also have increased policy expertise as well as a larger timetable to develop sound RPS policies that can be fully implemented by the compulsory target year.

The final two implementation predictors found to significant are two policy design variables. As suggested in hypothesis seven, the more REC trading allowed within the state does appear to increase the likelihood of RPS implementation by the target year. One inference that can be drawn from this finding is that allowing the buying and selling of REC on the market increases RPS flexibility, and therefore creates a separate pathway to compliance other than through renewable energy generation. The REC system allows states to perform both in-state and out-of-state REC trading, not only increasing the likelihood of RPS compliance, but also raising the possibility for further economic benefit through the sale of unused or surplus RE. It then makes logical sense that the more tools, such as REC trading, that are allowed to be used toward RPS target completion, the more likely the state is to comply.

The last variable found to have significant influence in the above analysis is the severity of the penalty for non-compliance. Although most states do have some form of penalty for non-compliance, the strictness of those penalties fluctuates, and as posited in hypothesis eight, that penalty variation has a significant impact on whether a state fully implements its RPS. More specifically the logit analysis indicates that the harsher the penalty for non-compliance, the more likely the state is to comply with the RPS compulsory target. Although this may be a finding that some deem rather commonsensical, the threat of a penalty may not always encourage policy compliance.

For example, several RPS states (e.g. Pennsylvania and New Jersey) have adopted non-compliance penalties that are quite vague and leave non-compliance consequences unspecified (Wiser et al. 2005). Consequently, rather than being a compliance incentive, these particular non-compliance penalties do little to encourage RPS implementation. However, in this case it does appear that a strong non-compliance penalty does promote RPS compliance and implementation, and as more penalties are assessed, the likelihood of compliance may also increase due to a growing threat of punishment for non-compliance.

The other policy predictors that were included in the logit regression analysis but showed no signs of a significant relationship to RPS implementation also present several possible inferences. Although political culture has been found to be an important policy predictor in past research, it does not appear to affect the implementation of a policy, at least in this case. It may be said that since the political culture of a state refers to the culture of the citizenry more than those actors involved in policy implementation, it is a stronger determinant of policy creation and policy development, rather than the final implementation stage of the policy process. Undoubtedly political culture will impact, at least to some level, the beginning stages of the policy process when new policy ideas are initially formed and discussed on a public forum. However, it appears from this research that once a policy is passed into law, political culture will no longer have an important influence on the outcome of implementation.

Secondly, both interest group variables were not found to have a statistically significant relationship to the implementation of the RPS. This could be caused from several different factors, but two are most likely. Either interest groups, like political

culture, have a stronger impact on earlier stages of the policy process, or the interest group measurements included in this research are not accurately determining the impact of RPS interest groups. Interest groups unquestionably impact the policy process at the state level in many ways, but this research suggests that interest groups are not important implementation actors, at least when it pertains to RPS. Another second possible conclusion is that the operationalization of the interest group variables in this analysis does not precisely depict their impact. Although the interest group activity variable measures all RPS related interests, it does not control for interest group differences among the states. Specifically, it does not delineate between larger states, who receive more by way of financial contributions from interest groups, and smaller states, who generally receive less. As for the interest group conflict variable, it does not account for pro-RPS electrical utilities and anti-RPS electric utilities because of the shear difficulty of separating the hundreds of utilities across the U.S. However, if a solution to this measurement problem could be found, there could be changes regarding the impact of interest groups on implementation.

In the case of renewable energy potential, it does not appear that prior renewable energy capacity is a significant predictor of more successful implementation. Therefore, although renewable energy potential may increase the possibility of RPS adoption and higher levels of renewable energy generation, it appears to have little to no effect on the outcome of RPS implementation. Even though increased levels of renewable energy potential pave the way for more renewable energy generation, RPS states are either not taking advantage of this potential or the renewable energy potential of RPS states is not large enough to have a substantial effect on the overall outcome of their RPS policy.

Either way it can be inferred from this research that the potential for renewable energy generation does not equate high enough levels of actual renewable energy generation to have a significant impact on the implementation of RPS.

The final predictor included in the logit model was RPS stringency. Although prior research has shown stringency to significantly impact many RPS policy outcomes including renewable energy generation and RPS adoption (e.g. Wiser and Barbose 2008, Carley and Miller 2012), when it comes to implementation, no significant relationship is found. Although particular policy design variables related to RPS stringency are found to be important predictors, including the level of REC trading and non-compliance penalties, this measure of stringency based upon separate parameters is not. It may be that this particular operationalization of stringency does not account for several arguably central characteristics such as REC or non-compliance, it does not truly measure the stringency of the entire RPS policy—but only certain facets of the policy that do not have a substantial influence over implementation.

6.2 Case Studies

In order to provide context to the quantitative analysis of RPS implementation, four case studies are presented: Montana, New Mexico, Maine, and Texas. Each of these states exhibit interesting characteristics related to RPS implementation, some that support the previous logit results, and others that appear to deviate quite substantially from the model described above. Although these states do provide context to RPS policy across the United States, they were specifically chosen to represent some of the most

unique features and problems associated with RPS implementation to date. These features include, (1) the prevalence of hydroelectricity investment, (2) RPS legal challenges, (3) apparent policy symbolism, and (4) RE electricity transmission difficulties. Albeit this discussion does not touch on every distinctive issue concerning RPS, it does provide a sufficient analysis of arguably the most essential aspects of RPS implementation.

6.2.1 Montana

Montana and renewable energy are usually not used in the same sentence. This is due to the well-known association between Montana and coal production. By the end of 2010 Montana held over one- quarter of the estimated recoverable reserve base of coal, and in 2011 Montana ranked sixth in the United States in overall coal production (EIA 2013). However, Montana also produces considerable amounts of hydroelectric power, a nationally recognized RE resource, due to its geographical proximity to several rivers flowing down through the state into the Rocky Mountains. As of 2010, just over 31% of their renewable energy production came from hydroelectricity, with wind energy coming in at a very distant second at about 3% (EIA 2013). So, although Montana is not particularly known for renewable energy production, it is a rather well-established practice that has been occurring for some time.

It was then no surprise in 2005 when Montana adopted a RPS policy with an RPS target of 15% by the year 2015. Montana's RPS policy is by no means the most stringent in the United States, and as Table 2 indicates, is actually tied for the third lowest RPS

target albeit in a relatively small timeframe for compliance. This comparatively low RPS target may be at least part of the reason why Montana is estimated to fully implement its RPS policy by the target year 2015. Although RPS stringency was not found to be a significant predictor in the previous logit analysis, it is logical to assume that an RPS that is more easily attainable may indeed be more likely to be achieved than one that is more stringent.

Following a continued examination of Table 2's implementation statistics, it should be noted that Montana has the third highest yearly implementation score just behind their Northeast region neighbors Oregon and Washington respectively. The commonality among these three states is their great reliance upon hydroelectric power, most notably due to geographical luck and obvious large economic investment into hydroelectricity practices. This particular pattern relative to hydroelectric power continues even further with Maine, California, New York, and New Hampshire all estimated to comply with their ultimate RPS target goal while at the same time substantially investing in and generating vast amounts of hydroelectricity (EIA 2013). So, although not examined in the previous logit analysis, it appears that geographical luck, or more specifically close proximity to an ocean or a large scale system of rivers increases the likelihood of RPS compliance.

Although in the case of Montana geographical luck appears to play a critical role in RPS implementation, a further assessment of the implementation variables shows several interesting deviations. Table 4 provides a summary of several of these notable implementation variables related to Montana's RPS policy. To begin, two obvious

Table 4: Montana's RPS Implementation Variables

GSP (Rank)	Legislative Professionalism	REC	Non-Compliance Penalty	RE Potential
36.521 (29)	Part-time	Permitted	ACP	5.36

Note: GSP is measured in thousands of millions of dollars; GSP rank is based upon descending levels of GSP; and RE Potential is measured in thousands of gigawatts.

deviations from the earlier developed logit model become evident. First, Montana's GSP in 2010 is the lowest of all 29 states examined in this analysis despite the finding that a higher GSP increases the likelihood of RPS compliance. This is a rather apparent deviation and indicates that although GSP is a critical predictor of RPS implementation, it can be overcome. The question that remains is how was this lack of financial resource availability overcome in Montana? Recent history suggests a quite plausible explanation. Since Montana's RPS adoption in 2005, four considerably large hydroelectric projects have been undertaken of which three have been fully completed. These projects not only create the possibly for growth in renewable energy generation, but as is evident with the most recent Noxon Rapids Dam project in northwest Montana, this renewable energy is also sold to nearby states including both Washington and Idaho (Montana Department of Commerce 2013). In return for selling this renewable energy Montana receives new out-of-state financial resources that can then be used for further investment in new renewable energy projects or the upkeep of existing projects. This shows that even those states with relatively low levels of GSP can indeed invest some resources to renewable energy projects and become successful producers of renewable energy on the national level.

A second deviation from the logit model is indicated by Montana's completely part-time state legislature. Part-time legislators, as measured in this research, are

estimated to be on the job about half the time of an average full-time job, make approximately $16,000 a year, and only have on average about one staff member (NCSL 2009). Although apparent, these descriptions of a part-time legislator are quite unattractive and do not exactly provide ample resources to conduct good policy making. Despite these conditions, Montana has still been able to produce seemingly good RPS policy, but how are they are able to be successful without high levels of legislative professionalism? This question cannot be answered fully in the research. However, a few theoretical questions can be put forth regarding this finding. Do higher levels of legislative professionalism lead to more partisanship? Do part-time legislatures tend to be less partisan and more centered on what is best for the state? Are part-time legislators more likely to compromise with the opposing party than full-time legislators? Concrete answers to these questions must come from future research on legislative professionalism, but from this particular case study, there appears to be some evidence corroborating these hypothetical conclusions. Both of the abovementioned aberrations are state dynamics variables, possibly indicating that in some cases the dynamics of a state that limit implementation can be overcome. This finding could arguably limit the logit model developed above, but on the other hand, it may also indicate the high level of importance of policy structure and design play in policy implementation.

Apart from the state dynamics deviations, there are also two strong congruencies with the logit model above regarding both REC trading and non-compliance penalties. First and foremost REC trading is fully permitted within the state of Montana, providing an alternate route to renewable energy generation in their attempts to comply with their RPS policy. Allowing this REC trading has opened up the opportunity to both buy and

sell REC from surrounding RPS states, including most notably Washington and Oregon. These REC can be bundled with or separate from the associated electricity (unbundled), and as noted earlier, unbundled REC bypass the complexities associated with the electricity grid therefore making it easier to conduct REC trading both in-state and especially so out-of-state (DSIRE 2013a). Secondly, Montana's enforcement of RPS compliance can be considered relatively strong. Montana uses an ACP to detract non-compliance, which forces the non-complying utility to pay a predetermined fixed amount of ten dollars per megawatt hour of renewable energy they failed to acquire (DSIRE 2013a). What makes Montana's particular penalty even stronger is that they are one of only two states, the other being Pennsylvania, that do not allow a utility that fails to comply with the RPS to recover the non-compliance penalty from ratepayers or customers (Cory and Swezey 2007). Ensuring that the utility cannot recover the penalty creates an RPS policy environment that strongly deters non-compliance by threatening the very livelihood of these electrical utilities: their financial resources.

Several factors appear to be important to Montana's RPS implementation, but most notably would the availability and use of hydroelectric power. Montana appears to have been successful thus far in implementing, despite their low financial resources and part-time legislature. From here it must be said that the policy design variables of REC and non-compliance penalties play a more critical role in RPS implementation than do the state dynamics predictors of GSP and legislative professionalism. Montana, if the current rate stays the same, will indeed fully comply with its RPS policy, and because they also have relatively high renewable energy potential, ranked fifth out of the RPS

states in this analysis, there is much more room for growth in renewable energy generation.

6.2.2 New Mexico

Similar to Montana, New Mexico is not known for their renewable energy generation as the state is ranked in the top 10 in the United States in both crude oil production and natural gas production, while in the top 15 in coal production. However, renewable energy resources are utilized in New Mexico, with just over 5% of the state's electricity coming from wind power (EIA 2013). What is most notable is that New Mexico has the fourth largest solar photovoltaic capacity in the United States, and is actually ranked third overall in renewable energy potential according to this research's measurement and indicated on Table 5. So even though New Mexico may not be thriving as a renewable energy generating state as of yet, the opportunity does exist. New Mexico's RPS policy was adopted in 2002 with the goal of 20% of their electricity coming from renewable energy by the year 2020. As Table 2 indicates, New Mexico is not estimated to comply with their RPS policy, and is well below the halfway point in regards to its yearly

Table 5: New Mexico's RPS Implementation Variables

GSP (Rank)	Legislative Professionalism	REC	Non-Compliance Penalty	RE Potential
77.686 (22)	Slightly Part-time	Permitted	None	7.61

Note: GSP is measured in thousands of millions of dollars; GSP rank is based upon descending levels of GSP; and RE Potential is measured in thousands of gigawatts.

implementation score. As of 2011 renewable energy only supplied just over 6% of total electricity generation (EIA 2013). According to the yearly implementation scores estimated in this research, New Mexico's 2011 RPS percent should be around the 11% mark. This indicates a drop of 5% from what is expected in order for New Mexico to obtain its ultimate target goal. This implementation failure could be due in part to the nonfulfillment of the high renewable energy potential that exists in New Mexico. Although renewable energy potential was not found to be a significant predictor of RPS implementation, this research does not assess directly the effects of unrealized renewable energy potential. Therefore this finding could conceivably be at least a partial indicator of New Mexico's implementation failure thus far.

Another possible deterrent to the current progress of New Mexico's RPS policy may relate to how the policy was enacted. Rather than through the normal legislative process which most states use, New Mexico's RPS policy was enacted through regulatory action, instigating multiple legal challenges since its adoption (Wiser et al. 2005). One of these challenges, *New Mexico Attorney General v. New Mexico Public Regulation Commission* (2013) was just recently decided in August of 2013 after being first heard by the New Mexico Supreme Court in 2007. The question in this case considered whether or not the New Mexico Public Regulation Commission (PRC) is able to increase the electricity rates of its consumers to offset the costs encountered from the public utilities' energy efficient programs included in the 2005 RPS policy. The New Mexico Supreme Court held that yes this in fact was in compliance with current state law, and the discretionary authority of the PRC to set electricity rates was not abused. Although this

particular court challenge ended favorably for New Mexico's RPS policy, it may well have been a large distraction to the progress of its RPS policy.

Furthermore, other RPS states have had similar legal challenges to their RPS policy, including Arizona, California, Colorado, Maine, Michigan, and Missouri, although none to this point have ended in a "weakening" or elimination of their RPS (Wiser et al 2005, Barbose 2012). Among those states, Colorado, Michigan, and Missouri also are estimated to fall short of RPS compliance. This particular assessment is unable to identify any one specific link between RPS legal challenges and lower RPS implementation, but it is quite plausible that during a legal battle over a public policy of any kind the policy will be stagnant and discontinue the necessary growth rate to meet full compliance, such may be the case with RPS policy. Although this research cannot test this possible inference, the possibility cannot be disregarded and must be considered in future research. However, even if this theoretical inference is found to have empirical merit, one question that would remain is why Arizona, California, and Maine are counterintuitive to this claim? Albeit these states are facing legal challenges, they still appear to be successfully implementing their RPS. Yet again, only deeper analysis of the ramifications of legal questions regarding RPS policy will indicate why these trends are occurring.

Moving forward to look at New Mexico's specific implementation characteristics, what is first noticed is the state's relatively low GSP. Ranked 22 of the 29 RPS states in this analysis, New Mexico's GSP fits the previous logit model findings that indicate the importance of financial resources when implementing an RPS policy. It is inferred that due to relatively low available financial resources, New Mexico may not have the

financial capacity to invest as much money as would be necessary to fully comply with the RPS. This possible inference becomes more evident when looking at the unused renewable energy potential that New Mexico has available. One possible answer to why this renewable energy potential has gone unrealized could be directly related to the financial capabilities of the state, as well as its officials' willingness to invest in an environmental policy most likely viewed as unnecessary to the daily operations of the state.

The second predictor, level of legislative professionalism, also appears to be congruent to the logit model presented previously. The analysis suggests that a lack of policy expertise and time on the job, due to their slightly part-time legislature, have contributed to New Mexico's current progress toward RPS implementation—which to this point looks as if it will go unfulfilled. Montana did show that this particular state dynamic can be overcome, and in order for New Mexico to do the same, it must alter current RPS implementation strategies. One way of doing this could be investing in and developing the substantial renewable energy potential that exists within the state of New Mexico. New Mexico has succeeded in increasing its renewable energy capacity in recent years, especially solar and photovoltaic, but unless this capacity is transformed into renewable energy generation, the RPS policy target goals will remain untenable.

Turning now to the policy design variables, an interesting contrast between REC trading and non-compliance penalties exists. New Mexico does allow for full REC trading, just as Montana does, therefore increasing the possibly of RPS compliance through both renewable energy generation and in-state and out-of-state utility REC. This particular finding departs substantially from the logit model which found that REC was a

significant predictor of successful implementation, but when it comes to New Mexico this is not the case. The reasons could include low GSP, the low level of legislative professionalism, and possibly lack of a non-compliance penalty mechanism.

Even though New Mexico's RPS policy does allow for a non-compliance penalty to be assessed by the state's regulators, there is no predetermined amount of any kind on the books (Cory and Swezey 2007). The threat of a penalty is most useful in curbing non-compliance only when it is considered financially tangible and likely to the utility. Abstract phrasing that does not specify any explicit fines or penalties leaves much to be desired, and therefore cannot be considered a compliance incentive. What is apparent in the logit model is that the stronger the non-compliance penalty, the more likely the state is to achieve RPS implementation by the target year. So it goes without saying that weak penalties will most likely have a counter effect.

New Mexico's estimated implementation failure could be due to many different factors. It appears that although New Mexico does allow for REC, the lack of a non-compliance penalty and low levels of GSP and legislative professionalism have reduced the likelihood of RPS compliance. Of course this only considers New Mexico's current RPS rate, and as Montana shows, both the GSP and legislative professionalism variables can be overcome; however, it would appear that for New Mexico to do the same, it would need to continue its investment in capturing renewable energy potential and making it become a reality.

6.2.3 Maine

Maine's energy production is starkly different from that of Montana and New Mexico, both of whom focus most notably on fossil fuel manufacturing. Maine's electricity generation predominantly comes from renewable energy. Veritably, in 2011 about half of Maine's electricity generation came from renewable energy, 25% from hydroelectric power, 21% from wood, and 4.5% from wind (EIA 2013). As mentioned in the analysis of Montana, Maine appears to be in part successfully implementing RPS due to geographical luck, or close proximity to the Atlantic Ocean and Bay of Fundy. This success is shown quantitatively on Table 2 which indicates that Maine has the fourth highest yearly implementation score among the states in this study and is not only estimated to fully comply with their RPS target, but have actually already done so. What makes this full compliance even more surprising is that Maine is tied for first, with Hawaii, for the largest RPS percent target among the states in this study.

This tremendous implementation success could not be predicted accurately if the logit model was all that was analyzed because the state dynamics predictors seem to indicate that the odds are against full compliance. Yet again, it is apparent that high levels of hydroelectric investment and generation are strongly associated with successful RPS implementation and can overcome some of the shortfalls that the state dynamic predictors seem to indicate. Further analysis of the variables found to be significant in the logit model continues to suggest that the policy design features are better predictors of successful implementation than are the state dynamics variables. As shown on Table 6,

Table 6: Maine's RPS Implementation Variables

GSP (Rank)	Legislative Professionalism	REC	Non-Compliance Penalty	RE Potential
51.343 (27)	Slightly Part-time	Permitted	ACP	.82

Note: GSP is measured in thousands of millions of dollars; GSP rank is based upon descending levels of GSP; and RE Potential are measured in thousands of gigawatts.

Maine has the third lowest GSP and a slightly part-time legislature, both negative predictors of RPS implementation. However, just as it was with Montana, Maine still is estimated to fully comply with its RPS policy despite the obvious quantitative importance of state dynamics. Both expanded REC trading and stringent non-compliance penalties are present in Maine's RPS policy, indicating again that the policy design features may more accurately predict RPS implementation than state dynamics. Aside from this continued pattern of importance allotted to RPS policy design features, the next inquiry must be how Maine was able to achieve full RPS compliance well before the final RPS target year. It became evident after a brief examination of this question that Maine's RPS adoption in 1999 might actually have been a form of policy symbolism.

At the time of adoption, the RPS renewable energy percent requirement was actually lower than the already supplied percent (DSIRE 2013b). The question then is why would Maine adopt a RPS policy that is for all intents and purposes already achieved? It could be argued that this RPS policy was adopted for the specific purpose of promoting the environmental values and principles that Maine appears to exhibit. However, since this RPS really had no tangible effect on Maine's renewable energy

generation, excluding possibly a merge into the regional REC market, policy symbolism seems to be the most likely explanation.

Furthermore, two other states also have appeared to display RPS policy symbolism. Both Oregon and Washington adopted RPS policies in successive years with Washington coming first in 2006 and followed by Oregon in 2007. Similar to Maine, in both of these cases the RPS renewable energy requirement was significantly lower than the already achieved amount of renewable energy generation for electricity. A final consideration regarding this apparent policy symbolism is whether or not it has an effect on neighboring or regional states. Specifically, did the policy symbolism of Washington influence Oregon's adoption of a RPS policy, and if so are there other symbolic RPS policy adoptions that have encouraged other states to adopt a RPS? Although these research questions cannot be fully analyzed in this study, one other aspect of Maine's RPS policy may help determine whether policy symbolism is actually occurring.

Despite the observable success of Maine's RPS, one underlying factor that deeper analysis revealed is the RPS' failure to promote the creation and development of new renewable energy. As discussed by Wiser et al. (2005), Maine's RPS policy is structured so that "...no new renewable energy development will occur, and the policy will have no impact without fundamental redesign." Clearly now, the outward successes that this RPS policy has enjoyed is merely a guise for what in reality is an unproductive and exclusively symbolic policy. It is then no wonder that Maine's RPS policy has faced legal and legislative challenges on a yearly basis (Wiser et al. 2005). A policy built to promote renewable energy generation that has no tangible effect on actual renewable energy development and distribution is rather self-contradicting and consequently

achieves no palpable successes, but rather undermines the fundamental objectives of state RPS policies.

It is cases such as this that make policy implementation so difficult to analyze. In all policy analyses there will be exceptions to the rule, and in the case of Maine we see an RPS policy that quantitatively is being successfully implemented, but upon further investigation the exact opposite becomes true. Cases like this one emphatically demonstrate how critically important it is to consider not only statistical evidence, but also case study evidence. Attempting to evaluate a policy's implementation success will invariably have inaccuracies without both quantitative and in-depth case study analyses.

6.2.4 Texas

Texas' RPS policy is well-known as one of the most successful so far, although it is measured through renewable capacity rather than renewable generation. This altered measurement makes any quantitative comparison to other RPS states difficult; however, Texas is still worth discussion due to the obvious incongruities that exist within its energy sector. Texas is ranked first in the country in total energy production including most predominately crude oil, and natural gas (EIA 2013). Despite this obvious reliance on fossil fuel production, Texas has invested heavily into renewable energy, most notably wind power. Texas holds two of the world's largest wind farms, Roscoe Wind Farm and the Horse Hollow Wind Energy Center, with a combined installed capacity of 1522 megawatts (Texas Economic Development and Tourism 2010). The benefits of this investment do not come without costs however, and this is evident from the 2009

Residential Energy Consumption Survey conducted by the EIA which estimates that the annual electricity cost per Texas household is about $1,800, among the highest in the nation (EIA 2009). What can be inferred is that part of the success of Texas' RPS policy is the ability to pass on the costs of this renewable energy investment onto the electricity consumer. Although the vast majority of these costs may be shouldered by the electric utilities, at some level, even if small, the consumer is paying for this increase in renewable energy investment.

Moving now to the logit model variables, it becomes obvious that Texas fits the logit model almost across the board. As shown on Table 7, Texas is second among the states in this study in GSP and has a moderate level of legislative professionalism. The exceptionally large GSP indicates that renewable energy investment may be more likely to occur to due to the substantial monetary value that Texas is yielding. On another note, since Texas has a moderate level of legislative professionalism, it cannot be accurately used to appraise the likelihood of RPS implementation success. What can be said though is that legislative professionalism does not appear to either encourage or hinder RPS implementation growth in the case of Texas.

Moreover, when looking at the policy design variables of Texas' RPS, the amount

Table 7: Texas' RPS Implementation Variables

GSP (Rank)	Legislative Professionalism	REC	Non-Compliance Penalty	RE Potential
1226.714 (2)	Moderate	Permitted	ACP	22.79

Note: GSP is measured in thousands of millions of dollars; GSP rank is based upon descending levels of GSP; and RE Potential are measured in thousands of gigawatts.

of REC trading and intensity of non-compliance penalties are measured at the highest level. These two findings fit the logit model precisely and continue to indicate the strong association between permitted REC trading, stringent non-compliance penalties and successful RPS implementation. One unique characteristic of Texas' REC trading was to increase the value of non-wind REC. Since Texas' renewable energy market is predominately made up of wind energy, the Texas Public Utility Commission effectively doubled the RPS compliance value of non-wind REC with the specific purpose of increasing the development and production of non-wind renewable energy resources (DESIRE 2013c). Using incentive based programs, such as the REC trading system implemented by Texas, can encourage new renewable energy development, and further evidence of this is Texas' immense renewable energy potential.

Texas has the highest renewable energy potential in this study, and it is over twice the size of Kansas's renewable energy potential, which comes in second in this category. No doubt part of this vast renewable energy potential comes from the large amount of land area Texas contains, but even so, great investment still has to occur to reach the level of renewable energy capacity that Texas currently has. However, with widespread energy potential and generation comes the possibility of electricity transmission issues, which Texas has unfortunately faced. Since Texas' rural wind farms are so large and geographically dispersed, transmitting this electricity generation back to the state's load centers can be difficult and costly, and this problem is not one that Texas could avoid (Wiser et al. 2005). Specifically, both Roscoe Wind Farm and Horse Hollow Wind Energy Center are located in the western half of Texas, while the big cities that most require this renewable energy such as San Antonio, Houston, Dallas, and Fort Worth are

too far to the east for easy transmission to occur. Recent developments that are intended to improve the transmissibility of this renewable energy generated electricity, like extensions of the electricity grid westward, have helped the situation, but nonetheless transmission difficulties still do occur.

Another variable that appears to be positively impacting Texas' RPS is their stringent non-compliance penalties. As noted earlier, Texas is one of only two states, the other being Connecticut, that has imposed penalties on electric utilities thus far (Wiser and Barbose 2008.) Furthermore, Texas allows for quite stringent penalties, specifically penalties of up to five cents per kWh for any compliance deficit can be imposed depending upon the characteristics of the compliance shortage (Wiser et al. 2005). In this case, it is not just the threat of non-compliance penalties that provides a compliance incentive, but since one of these penalties has already been imposed on an electric utility, the motivation to fully comply may be even higher than in those states that have yet to impose a penalty.

In sum, despite some of the challenging electricity transmission issues associated with rural wind farms, Texas is not only estimated to achieve its RPS target goals, but has achieved these initial goals way ahead of time. This successful implementation most notably comes from Texas' large investment in wind energy, made possible by their immense GSP, along with their flexible REC trading program and stringent non-compliance penalties.

6.3 Sizing up the Four Case Studies

Looking more broadly at each of the four case studies together several conclusions can be made. First of all the policy design variables are better predictors of successful implementation than the state dynamic predictors. Although high levels of GSP do make renewable energy investment easier, as shown by Texas, specific investment in wind energy can overcome these shortcomings. Maine displayed that although the quantitative data may point toward RPS implementation success, broad conclusions cannot simply be based upon this evidence. Prior to drawing conclusions, a deeper assessment of every aspect related to a state's RPS policy is necessary. According to this research, factors such as rural renewable energy generation, RPS legal and legislative challenges, and the possibility of policy symbolism can all alter the effectiveness and success of RPS implementation.

7. Review of Findings

The results of logit regression model and the case study analysis point to several interesting conclusions that can be made about the implementation of RPS. Both the state dynamics and policy design variables were found to play an important role in the implementation of RPS according to the logit model. More specifically, higher levels of both GSP and legislative professionalism are linked to more successful RPS implementation. Moreover, the more REC trading that is allowed and the stronger the non-compliance penalty is the greater the likelihood of full RPS compliance by the target

date. However, the variables that explain the most variance in RPS implementation cannot be assessed from this model alone. Further case study analysis showed that under certain circumstances the state dynamics predictors (e.g. legislative professionalism and GSP) could be overcome through specific renewable energy investment while the policy design variables (e.g. REC and non-compliance penalties) remained to be important predictors exclusive from specific policy nuances. The organized interests involved in the RPS policy process, to the contrary, are found to have little impact on RPS implementation. So if the interest group measurement is accurate, then RPS implementation is either not affected by interest groups, or is affected but in such a way that interest group financial contributions do not correctly determine the degree of influence.

Analysis of Montana's RPS also indicated a strong association between states with high levels of hydroelectric power and high levels of yearly implementation scores. Those states, mentioned in the second chapter, are also estimated to fully implement their RPS by their corresponding target year, indicating that high levels hydroelectricity dramatically increase a state's likelihood of implementation. Most states do not have access to the bodies of water needed for such levels of hydroelectric power and therefore geographical luck appears to be an important facet of RPS implementation as well. If a state can access large river systems, oceans, or other easily accessible bodies of water then the possibility for hydroelectricity investment exists. In most states however this is simply not an opportunity that is available.

Moreover, the case study considering New Mexico's policy indicated that RPS legal challenges could impact the progress of RPS implementation and hinder full

compliance. Although this research is unable to fully assess this possibility, a deeper assessment of this potential inference may indeed suggest that legal challenges slow down the implementation process and impede upon the growth of the RPS policy. It is plausible to propose that legal challenges will lower implementation if for no other reason than its effects on the electric utility companies. For electric utilities to comply with an RPS policy, there must be substantial investment and further development of renewable energy potential and subsequent generation, even more so in states with little renewable energy resources at the time of RPS adoption. Due to these cost increases, electric utilities may be chary to fully invest its financial resources in an RPS policy if its legality is in question. This would then lower the state's yearly implementation scores and reduce the possibility for full compliance. Further in-depth analysis is needed to know for sure whether there is a correlation between RPS legal challenges and lower levels of RPS implementation, but the case study of New Mexico seems to indicate some association.

Maine's RPS policy showed that early perceptions of RPS effectiveness and success can be misleading without contextual analysis. Due to its ineffectiveness, Maine's RPS is in dire need of redesign in order to encourage new renewable energy development. However, if new renewable energy generation is not the ultimate goal of Maine's RPS policy than policy symbolism appears to be the only inference that can be drawn. This apparent policy symbolism has prompted yearly legislative challenges to their RPS policy that continue to threaten the policy's existence. Although the effectiveness of this policy symbolism to diffuse its environmental values to neighboring states cannot be assessed here, what can be noted is its misrepresentation of what RPS

policies are meant to achieve. The entire conceptual argument for the adoption of RPS policies is to promote the growth of renewable energy, and any RPS policy that does not attempt to achieve this goal is undermining fundamental goals of RPS policies. Maine's RPS policy displays the continued importance of RPS policy design features and its significant relationship to successful RPS implementation. If a RPS policy is designed with the target goal already achieved and without any mechanism to promote future renewable energy growth, then its implementation, no matter how successful it may appear to be on the surface, will have little to no tangible effect on renewable energy generation.

The final case study of Texas almost wholly provided evidence that supported the logit model developed earlier. Texas' immense GSP allows for ample renewable energy investment, and its RPS policy's flexible REC trading system and strong non-compliance penalties provides sufficient incentive to electric utilities to fully comply with their RPS requirement. Additionally, Texas' renewable energy potential, ranked number one in this study, is evidence of continued focus on renewable energy generation despite the energy sector's dependence on fossil fuel production. Aside from some cited electricity transmission problems due to rural wind power generation, Texas has been able to implement RPS policy quite successfully and produce on average nearly 1000 megawatts of renewable energy capacity each year according to their yearly implementation score developed previously.

8. Policy Recommendations

As of 2010 only 15 of the 29 RPS states in this study are estimated to comply with their final RPS target goals at the current rate. Despite this apparent failure of implementation, abrupt changes to the current course of RPS can alter these findings, and in most cases there is plenty of time to do so. Based on the results of RPS policies thus far, to be most productive and effective, states currently with an RPS policy or considering one should include the following three basic features:

8.1 Consistent and Flexible Policy Design

To ensure a greater likelihood of compliance, states should design their RPS policy to encourage the growth and development of new renewable energy. Using a flexible REC trading system, either in state, regionally, or both, can promote new renewable energy generation that then can be used for either RPS compliance, or if an electric utility has a surplus of renewable energy, in-state or out-of-state REC trading that would then provide an economic benefit for both the utility itself as well as the entire state. Furthermore, fostering new forms of renewable energy through compliance incentives, such as was done in Texas with non-wind REC, would give additional support to electric utilities, and ultimately increase the prospects of full compliance.

8.2 Distinct Non-Compliance Penalty Enforcement

To further decrease non-compliance, states should have stringent and clearly quantified penalties for electric utilities that fail to meet their renewable energy requirements. Failure to predetermine the costs of these penalties, as New Mexico has done, or completely leaving non-compliance penalties out of the policy design, as Arizona has done, leaves the RPS policy with an enforcement problem that can become detrimental to the policy's objectives and goals. Ensuring a stringent penalty for non-compliance will hold electric utilities accountable for their actions, or for that matter inaction, that causes RPS implementation failure.

8.3 Access to Renewable Energy

Although rather apparent, adequate access to renewable energy is critically important to the success of state RPS policies. Renewable energy potential and even generation may exist in great variety; however, if this energy cannot be efficaciously transmitted to the state's electricity load centers then the amount of renewable energy generation within the state becomes futile. Strong investment into electricity grid may be necessary if the renewable energy generation areas are rural or far from the state load centers.

9. A Fundamental Policy Implementation Framework

As discussed in chapter one, no singular uniform implementation theory exists, mostly due to the heterogeneous nature of public policy. However, policy scholars do have a firm grasp on many of the specific factors that influence policy implementation, and this particular policy implementation study continues this discussion. The results of the analysis indicated that both state dynamics and the structure of the policy are salient determinants of the implementation of RPS. These findings support the suggestions of many implementation scholars (e.g. Van Meter and Van Horn 1975, Sabatier and Mazmanian 1980), and show that policy implementation is most accurately understood through analysis of the political environment, such as the state legislature, and the design of the public policy. This study of RPS implementation calls into question the significance of interest groups, contradicting some implementation studies that find that organized interest do have a significant effect on policy implementation (e.g. Sharp et al. 2011). However, this research study cannot assert that interest groups do not matter in some or even most cases, but only that RPS implementation does not appear to be affected by external interest groups. With the central findings presented, the question that remains is how does this study aid in the continued search for a uniform implementation framework?

As discussed earlier in chapter one, a predictive theory of policy implementation cannot be developed easily due to the diverse nature of policy studies. However, it is important to attempt to create a basic framework that implementation studies should follow in order to encourage policy comparisons. This research alone cannot make broad

generalizations regarding implementation theory building, but in combination with other implementation studies what becomes most obvious is the need to examine five specific policy questions, (1) what is the policy and what are its central objectives, (2) what policy tools are available to achieve its policy goals and objectives (e.g. REC, non-compliance penalties, stringency), (3) what kind of political environment is the policy being implemented in (e.g. federal, state, or local dynamics), (4) who are the external actors and how are they involved (e.g. interest groups, bureaucracy), (5) and has the policy been fully implemented or is it likely to be fully implemented in the future.

Despite the multifarious nature of public policy and policy implementation studies this parsimonious framework is generalized to a point where it can be applied to nearly any policy implementation study and provides a fairly accurate description of the policy's implementation process. Although unsophisticated and rather simplistic, these policy questions get at the critical underpinnings of a public policy and indicate the foundations of the policy process most necessary to estimate policy success or failure. This is far from the first time these policy questions have been considered in implementation research. However, collectively these basic concepts have had little to no forthright discussion in recent extant literature and therefore needed to be reiterated and illustrated directly.

Policy implementation is unequivocally a multifaceted part of the policy process in which numerous actors work in concert towards the ultimate goal of full implementation. However, the study of policy implementation need not be considered so complex that accurate analysis is unattainable. Rather than attempting to dissect each individual actor or bureaucratic institution at play, reliance on conceptual realties such as

the impacts of policy design and the political environment provide a much clearer and broader understanding of policy implementation. There is a place for in-depth analysis of the individual actors involved in the implementation process, but if attempting to garner evidence to support the development of implementation theory, broader analyses examining these actors on a wider scale, as well as the policy's structural characteristics, are necessary. In sum, implementation research, although complex, can be more readily analyzed through the basic framework discussed above. This framework is not intended to explain the behavior of individual actors, but rather to understand how the characteristics of those actors combined with the impacts of policy design features affect the public policy implementation process.

10. Directions for Future Research

While this study has provided a thorough analysis of RPS implementation and has estimated state compliance, future research on RPS implementation could expand upon this particular study. Since this analysis is unable to predict abrupt changes and alterations in a state's RPS percent, further analysis of RPS implementation as final target deadlines draw nearer may indicate various changes regarding the likelihood of state compliance. On another note, this research does not consider the impacts of bureaucracy on RPS implementation. Bureaucratic influences on policy development and implementation are undeniably important. Also, although this research does take into consideration electric utilities' financial contributions, this may be an undervaluation and

a deeper analysis may provide important new insights relative to RPS policy implementation.

One final addition that could also prove useful is a discussion of how public opinion may affect RPS implementation. In order for successful RPS implementation to occur, strong state investment in renewable resources is needed. However, in many cases this necessary foundation of renewable energy capacity can be obstructed due to public opinion. For example, as found by Warshaw (2013), West Virginia has the second lowest public approval of RPS in the United States, under 50 %, despite their adoption of an RPS policy in 2009. Although West Virginia is estimated to fully comply with its RPS policy in this research, it is reasonable to expect that such low levels of public opinion would undoubtedly affect RPS implementation in multiple ways.

Several of the results found in this research also deserve further attention. First, deeper analysis of how legislation professionalism affects policy implementation is needed. Although legislative professionalism has been examined thoroughly at the state level, little to no research beyond this study has considered the impacts of legislative professionalism on the implementation of public policies. Secondly, despite the finding that interest groups do not have a significant impact on RPS policy implementation, an altered measurement of interest group influence beyond their financial contributions could provide different findings. One possible addition that would improve this measurement may be to include the perspective of electric utilities in the interest group conflict variable. Although the difficulty of doing so is extraordinary due to the vast number of individual state electrical utility companies, gauging how these electric utilities interact with RPS policies and whether they are in favor of or against its adoption

may reveal new insights into the RPS implementation process. Thirdly, further analysis of the apparent association between high levels of hydroelectric power and implementation compliance, as well as the possible connection between RPS legal challenges and non-compliance, may either dispute or support these preliminary linkages.

11. Conclusion

The vast bulk of policy implementation studies have focused on the influences of policy actors and policy design, and this study continues that trend through examination of state RPS policies. The logit model and case studies presented here attempted to simplify the study of policy implementation which is normally described as both complex and incomprehensible. In this study evidence is presented that supports the central assertions made by policy implementation scholars, most notably the substantive significance of both the political environment and policy design. Although interest group influence was found to be relatively insignificant, altering this research's operationalization of its variables may change this particular outcome. Moreover, as identified in the case study analysis, only considering quantitative evidence regarding RPS implementation can lead to inaccurate conclusions. Cases like Maine, in which the RPS policy really has no effect on new renewable energy development or production, can create false positives and misrepresentations of RPS implementation success.

A few states including Maine, Oregon, and Washington, also appear to provide evidence of RPS policy symbolism. Each of these three states adopted RPS policies that had renewable energy requirements which were already met prior to adoption, indicating

an apparent policy symbolism. Although this research alone cannot fully make certain that policy symbolism is occurring, there is strong evidence that suggests its existence in at least a few cases. If this preliminary finding is accurate, further research is necessary to understand the underpinnings of these purely symbolic policy actions and how they affect, if at all, RPS adoption and implementation at the state level.

Furthermore, the implementation approach used in this analysis certainly could be adapted to other policy implementation studies. Broadening the scope of the independent and intervening variables, as this research attempted to do, and the concluding implementation framework asserted, not only increases the generalizability of the findings, but also widens the opportunity for continued evolution of a predictive policy implementation theory. By no means is the research proclaiming that the basic framework considered will solve all implementation issues or even be adaptive to all policy studies; rather it is discussed only to reiterate the most salient policy questions to consider and provide a straightforward foundation from which future implementation studies can build upon.

In sum, this analysis of RPS implementation has indicated the current direction of RPS policies in the United States and has shown what factors appear to be affecting its progress.

Further analysis of RPS implementation in the future should generate new insights on RPS.

12. Notes

1. The coding scheme for legislative professionalism is as follows: (1) part-time, (2) slightly part-time, (3) half-time, (4) slightly full-time, and (5) full-time. The NCSL calculated legislative professionalism through a combination of three components, time on the job, compensation, and the number of staff members per legislator. The more time on the job, the higher the compensation, and the larger the number of staff members per legislator equates a higher level of legislative professionalism.

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