

Green Energy Laws and Republican Legislators in the United States
By Jonathan S. Coley and David J. Hess

Citation. Coley, Jonathan S., and David J. Hess. 2012. "Green Energy Laws and Republican Legislators in the United States." *Energy Policy* 48(1): 576-583.

This is a pre-publication version. The version of record is available at the journal's web site.

Note: There is a correction for the web page title for the United States Energy Information Administration citation.

Abstract

The policy context for green energy laws in the United States has changed over the past few years, because the Republican Party has increasingly opposed renewable electricity and other green energy policies. In this study, we draw on a database of 6,073 votes on RPS (renewable portfolio standards) and PACE (Property-Assessed Clean Energy) laws by individual state legislators in the United States to examine the circumstances shaping Republican votes for green energy laws. We find that votes on these laws are indeed increasingly partisan, with Republicans supporting green energy laws less than Democrats. However, Republicans' support for these laws is higher in states with weaker fossil fuel industries. Furthermore, Republicans tend to support the laws where median household income is lower, environmental organizations are weaker, labor-environmental coalitions are absent, and the proportion of Democrats in the legislature is lower, suggesting a reactive effect against green energy policies in more progressive settings.

Keywords: Renewable portfolio standards (RPS); Property-Assessed Clean Energy (PACE); green energy laws

Introduction

Since the election of Barack Obama, debates over green energy legislation in the United States have become especially characterized by political partisanship. At the national level, both Republican and Democratic candidates for President in 2008 supported legislation for climate change. However, Republicans running for Congress in 2010 opposed a bill in the Senate that would have given the country a cap-and-trade regime for carbon emissions and a national renewable portfolio standard for electricity. By 2012, Presidential candidates for the Republican Party were opposed to further climate change reforms. Some expressed skeptical or denialist views about climate change science, and some who had been relatively supportive of green energy legislation as governors shifted their position to support fossil fuels.

At the state government level, there is also evidence that Republicans have become more firmly opposed to green energy policies. Prior to the election of Barack Obama, Republican governors such as Arnold Schwarzenegger of California, Tim Pawlenty of Minnesota, George Pataki of New York, and John Huntsman of Utah supported several green initiatives. Even Rick Perry, the governor of Texas who ran for president in 2012 as a climate science skeptic, supported wind energy development in Texas as part of an "all of the above" energy strategy that also included support for the state's oil and gas industries. However, in 2011, the governor of New Jersey withdrew from the Regional Greenhouse Gas Initiative, a carbon trading program, and the governor of Maine and the legislature in New Hampshire attempted to withdraw. In Ohio and Pennsylvania, there have been efforts in state legislatures to repeal the renewable portfolio standard (RPS, a mandate for utilities to produce a percentage of their electricity from renewable energy before a deadline). And in Florida, Maine, New Mexico, New Jersey, Ohio, Pennsylvania, and Wisconsin, Republican governors who replaced green Democrats in 2010 have adopted positions in opposition to green energy legislation. Such opposition to green energy legislation by Republicans is in stark contrast to the consistent and pervasive support for green energy laws among Democrats. Democratic governors in California, Colorado, Connecticut, Maryland, Massachusetts, New York, Oregon, and Washington have continued to support and sign green-energy laws even after the wave of anti-green candidates was elected in 2010 (Hess, 2012).

Part of the negative reaction of the Republican Party to green energy legislation might be explained by a general strategic decision by Republican leaders to oppose the Democratic president on all issues to reduce his popularity. A measure of votes in Congress showed that party unity had increased from a range of 51 to 62 (out of 100) in previous Congressional sessions to 79 in the second session of the 111th Congress (Weiss, 2010). On energy issues, Democrats had used the "green jobs" frame to neutralize the old "jobs versus environment" frame and also link green energy policy to solutions to the economic problems after the financial crisis of 2008. In contrast, Republicans responded with a focus on government overspending and the deficit, which enabled them to portray energy legislation as an undue financial burden on households and businesses. The right-wing Tea Party movement popularized the frame of blaming the economic recession on government spending, and Tea Party supporters were also strongly anti-green. A survey of Tea Party supporters showed that they did not believe in anthropogenic forcing of global warming, rejected the need for carbon regulation, and opposed even a modest renewable electricity standard of twenty percent. In contrast, Democrats, independents, and mainstream Republicans held opposite views (Leiserowitz et al., 2011).

Support for Tea Party political candidates and opposition to green energy legislative reforms has also been linked to donations from some wealthy industrialists representing oil and gas companies. Funding from a network of political donors associated with the fossil fuel industries channeled support mostly to Republican candidates (Anderson, 2011; Fang, 2010; Weiss et al., 2010). Overall, lobbying expenditures from the oil, gas, and electric utility industries increased after the election of President Obama and reached \$500 million in 2009 and 2010.

In this study, we evaluate such explanations for voting patterns on green energy laws in the United States using a unique database of 6,071 state legislator votes on RPS laws in 16 states and PACE (Property-

Assessed Clean Energy) laws in 22 states. We focus most of our analysis on a subset of 2,707 Republican votes because there is considerable variation in Republican support for green energy laws – as we show, Republican votes across state legislatures range from a low of 0% to a high of 100%, with overall levels of support around 75%. In comparison, Democratic support for green energy laws remain very high, with overall levels of support around 97%. (The Republican Party and Democratic Party represent the overwhelming majority of state legislators in the United States today. The Republican Party is broadly aligned with right-wing, conservative causes associated with business interests, while the Democratic Party is aligned with more liberal causes.)

Drawing a range of economic, social/demographic, and political variables from existing literature on state adoption of environmental legislation, we arrive at findings that seem to confirm a Republican backlash against Democratic initiatives on green energy laws, as well as the increasing alignment of Republicans with the fossil fuel industry. Specifically, we find that fewer Republicans vote for green energy laws when they lack control of state legislative chambers and when liberal interests are dominant in their states; fewer Republicans vote for green energy laws when those laws are framed as creating new tax burdens; and Republican support for green energy laws in states is lower in states with stronger fossil fuel industries. Nevertheless, as we discuss in the conclusion, these findings do suggest certain conditions under which Republicans will still vote for green energy laws. Before we elaborate on these results and conclusions, we first outline our hypotheses on Republican support for green energy legislation, based on existing literature, below.

The Influence of Economic, Social/Demographic, and Political Factors on Support for Green Energy Legislation

Previous literature has highlighted the importance of economic, social/demographic, and political factors in influencing the adoption of green energy laws at the state as well as local level. However, existing literature has generally not analyzed the votes of individual state legislators and has thus not identified differences in support for green energy laws between Democrats and Republicans. We discuss this literature below and derive hypotheses that we will test in regards to Republican votes on green energy laws. We also suggest a fourth factor that might influence support for green energy laws: characteristics of the legislation under consideration.

Economic factors

Several previous studies have established that state as well as local legislators and voters take economic factors into account when voting for green energy laws. For example, a study of environmental ballot propositions by Dell (2009) finds that extractive industry strength, along with the number of ballot propositions, has a negative effect on the adoption of pro-environmental laws. Similarly, a study by Portney (2002) examined sustainability initiatives by 24 cities and found that cities that rely less on manufacturing for jobs are more supportive of sustainability initiatives. This finding is not consistent across the literature – Vachon and Menz (2006) find that industrial strength (such as fossil fuel industry strength) is not a significant predictor of RPS adoption when controlling for various social and political interests – but theoretically the finding makes sense: if legislators believe that a potential law will destroy jobs (for instance, in industries which pollute), it seems likely that fewer legislators would vote for that legislation. Furthermore, given the importance of economic issues to Republicans and the dominance of economic messaging among Tea Party supporters (as discussed above), we expect concerns about job destruction will influence Republicans. We thus arrive at a first hypothesis:

Hypothesis 1a. As the level of fossil-fuel industry employment in a state increases, Republican support for green energy laws decreases.

A shortcoming of existing literature is that most studies have not examined the impact of growing clean energy industries on support for environmental legislation. The strength of clean energy industry would presumably increase support for green energy legislation because it would increase jobs in those industries. We thus also offer a hypothesis about clean energy industries:

Hypothesis 1b. As the level of clean-energy industry employment in a state increases, Republican support for green energy laws increases.

Social and demographic factors

A second set of explanations for why legislators and citizens vote for green energy legislation centers around social and demographic factors. Specifically, variables such as education and income have commonly been associated with more progressive attitudes toward environmental legislation. Thus, the study of RPS legislation by Vachon and Menz (2006) finds that “social interests” (a variable including both education and income) positively predicts votes on RPS legislation. Similarly, a study of RPS legislation by Huang et al. (2007) finds that education (percent of population over age 25 with a bachelor’s degree) positively predicts RPS law adoption, and a study of RPS legislation by Chandler (2009) finds that disposable personal income positively predicts passage of RPS laws. Finally, a study by Agthe et al. (1996) finds that income per capita strongly predicts spending on the environment; Ringquist’s (1994) book on state environmental responses to water and air pollution finds that state wealth had mixed influence on policy adoption; and a study of cities’ agreement with the United States Mayor Climate Protection Agreement by Boyle (2009) finds that both education and income predict agreement.

These studies convince us of the importance of economic factors in support for green energy laws, and thus we include income as a variable in this study. (Because income and education are highly correlated, at the .85 level, we do not include a variable related to education.) However, because income has its effect in part because of its correlation with liberal attitudes, we believe that income will have a negative effect on Republicans, who oppose such attitudes. We thus present the following hypothesis:

Hypothesis 2. As the median household income in a state increases, Republican support for green energy laws decreases.

Political factors

Research on the impact of political factors on the approval of green energy laws is perhaps least developed and has often focused on relatively amorphous concepts such as political culture (Clark and Allen, 2004; Boyle, 2009) rather than more easily interpretable variables. For instance, because previous literature has generally not examined the individual votes of Republicans and Democrats state legislators, the effect of individual legislators’ party affiliation on support for green energy legislation has not been established. Based on the previously discussed evidence of Republican opposition to pro-environmental legislation, we offer the following hypothesis on political affiliation:

Hypothesis 3a. Republican party affiliation will have a negative effect on state legislator support for green energy laws.

Previous literature has also generally not examined the effect of having a Republican or Democratic governor. Because of the previously discussed trend toward party unity and Republican opposition of Democratic initiatives (Weiss, 2010), we offer this hypothesis:

Hypothesis 3b. The presence of a Democratic governor in a state will have a negative effect on Republican support for green energy laws.

Previous literature has shown that legislatures dominated by Democrats tend to pass green energy laws while legislatures dominated by Republicans do not (Huang et al., 2007). However, because these studies have not examined the votes of individual legislators, they do not tell us how individual Republicans and Democrats would respond to party dominance of legislative chambers. In the judicial system, there is some evidence of “panel effects” in the votes of judges (Sunstein et al., 2006). As a result of the previously discussed national trend toward party unity and Republican opposition of Democratic initiatives (Weiss, 2010), we offer this hypothesis:

Hypothesis 3c. As the proportion of Democrats in a legislative chamber increases, the odds of Republicans supporting green energy laws decreases.

Because our study includes legislation through 2011, we are able to test for yet another effect not examined in previous literature – the effect of the election of President Barack Obama, which coincided with the emergence of the right-wing Tea Party movement. Given the negative views of Tea Party supporters toward environmental legislation (Leiserowitz et al., 2011) and the association among Tea Party candidates, fossil-fuel funding, and the Republican Party (Anderson, 2011; Fang, 2010; Weiss et al., 2010), we offer the following hypothesis:

Hypothesis 3d. The election of President Barack Obama will have a negative effect on Republican support for green energy laws.

A few studies have examined the effect of interest groups on support for green energy legislation. For instance, Vachon and Menz (2006) find that degree of membership in environmental organizations positively predicts support for RPS laws (though information about environmental membership was combined in a variable with education and income). A study by Hays et al. (1996) also found that strong interest groups predicted state commitment to the environment. The literature thus seems to suggest that the presence of strong environmental interest groups positively predicts support for green energy laws (though see Ringquist, 1994), but again we would not expect this to be true for Republicans, given that these groups are often perceived as liberal. We offer the following two hypotheses about membership in the Sierra Club (the largest environmental organization in the United States) and the presence of alliances between labor and environmental groups:

Hypothesis 3e. As membership in Sierra Club per capita increases, the odds of Republicans supporting green energy laws decreases.

Hypothesis 3f. The presence of a Blue-Green Alliance will have a negative effect on Republican support for green energy laws.

Characteristics of legislation

We finally examine whether the type of green energy legislation under consideration has an effect on state legislators’ votes. Recent systematic studies of state green energy legislation have generally focused on the passage of one type of law and have not established whether some types of green energy laws receive more votes than others. The best we can do is to examine different studies focusing on different types of laws. For instance, a study by Clark and Allen (2004) examined less controversial “everyday environmental policies,” such as state purchases for environmentally friendly goods, and found that variables such as a state’s liberal leanings or Democratic control of the state legislature had no impact on the passage of such policies. However, because of the framing of Democratic legislation as too expensive in a time of economic crisis, we expect that Republicans will be especially sensitive to green energy laws that potentially impact

industries or tax policy. In our case, PACE laws would seem to be less controversial in economic terms than RPS laws—PACE laws do not require a revenue commitment from the state or increased costs for consumers—and new or first-time RPS laws would seem to be less controversial in economic terms than expanded RPS laws. We thus offer the following hypotheses:

Hypothesis 4a. The presence of RPS provisions (rather than PACE provisions) in a law will have a negative effect on Republican support for green energy laws.

Hypothesis 4b. The presence of expanded RPS provisions (rather than first time or new RPS provisions) in a law will have a negative effect on Republican support for green energy laws.

In sum, previous research has supported the idea that economic, social/demographic, and political factors all influence the adoption of controversial state environmental legislation. In this study, we include variables for all of these factors that previous research has shown to be significant. However, as discussed, we make a contribution by taking the vote of individual legislators as the dependent variable, which allows us to examine the effect of variables such as party affiliation more precisely, and to focus specifically on the circumstances that shape Republican support for green energy laws. We also include variables not previously examined in any or most studies of green energy laws, such as the effects of the changing place of green energy policies in the Republican Party (what we think of as a “Tea Party” effect) and differences among types of green energy laws (specifically, RPS vs. PACE laws and expanded RPS vs. new RPS laws).

Data and Methods

In the sections below, we analyze a database of 6,071 state legislature votes on green energy laws to describe the factors influencing votes on RPS and PACE laws in the United States. Because we are mostly concerned with Republican votes for RPS and PACE laws (there was not significant variation in Democratic support for green energy laws), we focus our analysis on a subset of 2,707 Republican votes. We use descriptive statistics and especially binary logistic regression as methods of analysis, the latter because our dependent variable is dichotomous. All coefficients in our logistic regression analyses are standardized.

We performed collinearity checks and sensitivity analyses on our database to prevent multicollinearity and ensure no outliers existed. As previously mentioned, because education ($r=.85$) was highly correlated with median household income, we did not include this variable in our analysis. Similarly, variables such as state votes for Democratic presidential candidates (one measure of “liberal attitudes”) were not included because of high correlation with several variables. We discuss the operationalization of our dependent, independent, and control variables below.

Dependent variable

The dependent variable was the yes or no vote of an individual state legislator (yes = 1) for two types of laws -- RPS (Renewable Portfolio Standard) laws and/or PACE (Property-Assessed Clean Energy) laws -- during the five-year period beginning in January 2007 and ending in December 2011. We used data from all states for which it was possible to find data from the online databases of state legislatures. We were not able to obtain information on individual votes for Hawaii, Indiana, Kentucky, and Massachusetts.

We limit our collection of votes to laws passed between 2007 and 2011 because the first PACE laws were not passed until 2007 and we wanted to control for the general time period in which the laws were passed. Furthermore, several studies have examined the passage of RPS laws in years prior to 2007 (Vachon and Menz, 2006; Huang et al., 2007; Chandler, 2009) but have not examined the passage of RPS laws more recently, especially after the election of President Obama and the broader Republican backlash against environmental legislation.

Independent variables

Type of Law. We coded the type of law, RPS or PACE, as a dummy variable (PACE = 1). RPS laws set a goal of a specified increase in the state's electricity. (For recent studies on the popularity and effectiveness of RPS laws see Shrimali and Kniefel (2011) and Buckman (2011).) We found RPS votes for 16 states: CA, CO, CT, FL, KS, MD, MI, MN, MO, NH, NC, OH, OR, PA, VT, WV. For each state, there was a vote on one RPS law, except Colorado, which held separate votes to expand the RPS in 2007 and 2010. PACE laws enable the state and/or local governments to support weatherization and in some cases solarization projects with government bonds. The laws were very popular until the Federal Housing Finance Agency ruled against them in 2010, because they resulted in a primary lien on a residential mortgage. The ruling did not affect PACE programs for commercial property and second-lien programs. (One PACE law was passed in 2011.) We found PACE votes for laws from 22 states: CA, CO, FL, GA, IL, LA, ME, MD, MI, MN, MO, NH, NY, NC, OH, OK, OR, TX, VT, VA, WI, WY. There was one vote for each state, except California and Colorado, which respectively held different votes on three and two different occasions. We used information found in the text of the bills on the state legislature websites to decide whether a bill was an RPS or PACE law; two bills (SB 1243 in Connecticut and SB 358 in Nevada) contained both RPS and PACE provisions, so we dropped those bills from our dataset.

Expand RPS (renewable portfolio standard). For RPS laws only, we coded the type of RPS law (new or expanded) as a dummy variable (New RPS = 1), using information found in the text of the bills on the state legislature websites. Eight states passed new RPS laws from 2007 to 2011 – CA, CO (twice), CT, MD, MO, OR, PA, and VT -- whereas 8 states passed expanded RPS laws from 2007 to 2011 – FL, KS, MI, MN, NH, NC, OH, and WV.

Fossil fuel industry strength. We include the employment figure for the fossil fuel industry in each state, controlling for the size of each state, based on two statistical sources (Independent Petroleum Association of America, 2010; United States Energy Information Administration, 2010.)

Clean energy industry strength. We include the employment figure for the clean energy industry in each state, controlling for the size of each state, based on one statistical source (Pew Charitable Trusts, 2009).

Median household income for the state. We include the median household income for each state as a variable using data from the 2010 Statistical Abstract from the U.S. Census Bureau. We used median household income rather than mean income, because the median is more resistant to outliers.

Party of Legislator. We coded the party of the legislator, either Democrat or Republican, as a dummy variable (Democrat = 1), using information from state legislature websites. There were extremely few independents or non-Republicans/Democrats in each state legislature (in most cases, none), so we dropped these state legislators from our database.

Party of Governor. We coded the party of the governor, either Democrat or Republican, as a dummy variable (Democrat = 1), using information from state government websites. None of the states we examined had governors registered as independents or as members of other political parties at the time of these bills' passages.

Proportion of Democrats in the legislative chamber. We include the proportion of Democrats in each House or Senate chamber as a variable using data from the state legislature websites.

Party of President. We test for the effect of the election of President Obama, which coincided with an anti-green “backlash” in the Republican Party, using a dummy variable, in which laws passed in 2009, 2010, and 2011 are coded “1,” and laws passed in 2007 and 2008 are coded “0.” We obtained the date when each bill was passed from the state legislature websites.

Blue-Green Alliance. We coded the presence or absence of a labor-environmental coalition in the state as a dummy variable (present = 1), based on analyses of web sites for the Blue-Green Alliance and Apollo Alliance Project.

Membership in Sierra Club per person for each state. We include the number of members in the Sierra Club in 2010 for each state, controlling for the size of each state, as a variable. State membership numbers were provided to us by the Sierra Club. We obtained information on the size of each state using the 2010 Statistical Abstract from the U.S. Census Bureau.

Control variable

Size of legislative chamber. We include the number of legislators in each House or Senate Chamber as a control variable using data from the state legislature websites, so that states with higher numbers of legislators do not have disproportionate influence on the final results.

We present our analysis in the sections below. Some of the variables described above are dropped for certain subsets in our analysis. For instance, when we analyze only Republican votes, Republican Party affiliation of the state legislator is not included as a variable; or, when we analyze RPS or PACE laws separately, type of law is not included as a variable. Furthermore, because only one state with an expanded RPS law had a Republican governor, we only included party of the governor when analyzing PACE laws.

Results

Descriptive statistics results

Table 1. Overall Votes of Individual Legislators by Party and Law Type, N=6073

	% Republicans in Favor	% Democrats in Favor
All Laws	75.51%	97.18%
PACE Laws	73.55%	98.18%
All RPS Laws	78.61%	95.66%
Expanded RPS Laws	64.49%	95.87%
New or First-time RPS Laws	87.82%	95.40%

Descriptive summary statistics are presented in Tables 1-3; we discuss these descriptive statistics to demonstrate clearly the differences in green energy law support between Republicans and Democrats and to provide a basic feel for our data. Table 1 shows the percent of Republicans and Democrats voting in favor of all laws, PACE laws only, all RPS laws, expanded RPS laws, and new RPS laws. We calculated these percentages by dividing the total number of Republican or Democratic “yes” votes divided by the total number of Republicans or Democrats in our database. Compared with Democratic support, Republican support is lower for all laws and lowest for expanded RPS laws. Republican support was stronger for new (or “first-time”) RPS laws than for PACE laws, but the new RPS laws were all passed prior to 2010. Using a Chi-squared significance test of proportions, we confirmed that the difference between Republican and Democratic support across all categories of laws was statistically significant at the .001 level.

Table 2. Voting Record for Laws in Support of New or Expanded Renewable Portfolio Standard

State	Law Name	Law Type	Party of Gov.	Date	Percent Republican Vote	Percent Democrat Vote	Percent Dems in Legislature
CA	SB X1-2	Exp RPS	D	2011	S25 H18	S92 H98	S63 H67
CO	HB 1281	Exp RPS	D	2007	S43 H76	S100 H100	S60 H68
CO	HB 1001	Exp RPS	D	2010	S0 H0	S100 H97	S60 H55
CT	HB 7432	Exp RPS	D	2007	S80 H82	S96 H100	S72 H71
FL	HB 7135	N RPS	R	2008	S100 H100	S100 H100	S35 H36
KS	HB 2369	N RPS	D	2009	S97 H 99	S86 H61	S23 H37
MD	HB 375	Exp RPS	D	2008	S8 H31	S97 H98	S79 H73
MI	PA 295	N RPS	D	2008	S74 H52	S100 H100	S45 H53
MN	SF 4	N RPS	R	2007	S91 H79	S98 H100	S67 H64
MO	SB 795	Exp RPS	D	2010	S78 H100	S82 H100	S32 H45
NH	HB 873	N RPS	D	2007	S 100 H NA	S100 H NA	S58 H NA
NC	SB 3	N RPS	D	2007	S100 H90	S100 H94	S62 H57

OH	SB 221	N RPS	D	2008	S100 H98	S100 H100	S38 H47
OR	SB 838	Exp RPS	D	2007	S33 H41	S100 H97	S63 H50
PA	HB 2200	Exp RPS	D	2008	S90 H96	S100 H100	S42 H50
VT	SB 209	Exp RPS	R	2008	S57 H98	S100 H100	S77 H62
WV	24-2F-1	N RPS	D	2009	SNA H30	SNA H97	SNA H72
Average					S67 H68	S97 H96	
Stand. Dev.					S35 H34	S6 H10	

N RPS= New Renewable Portfolio Standard, Exp RPS = Expanded Renewable Portfolio Standard, R= Republican, D= Democrat, S= Senate, H= House.

Table 2 provides a more disaggregated view of RPS laws without descending into the full data set of votes. For the RPS laws, only expanded laws have data for 2010 and 2011. The average ratio of the percent of Republicans to the percent of Democrats in favor of each expanded RPS law (from Table 2 statistics) is 60 in 2007 and 62 in 2008, whereas there were no cases for 2009, and the ratio declines to 24 and 22 in 2010 and 2011. Thus, the descriptive statistics suggest declining relative Republican support for expanded RPS laws, but the pattern should be interpreted with caution, because the statistics are based on four votes in 2010 and two in 2011. In one of the cases, Missouri, there was high bipartisan support for an expanded RPS.

For new RPS laws, the average ratio of Republican to Democratic support is 93 in 2007 and 87 in 2008, indicating that support for new RPS laws was higher than for expanded RPS laws in those years. In 2009, the ratio is 103, but the data include the anomalous case of Kansas, in which more Republicans than Democrats voted for the RPS law. The reversal of Republican and Democratic Party support occurred because the final law included provisions that weakened clean air regulatory authority and supported the construction of a controversial coal-fired electricity plant. There were no cases for new RPS laws for 2010 and 2011.

In summary, the statistics in Table 2, lacking controls, suggest that a first-time or new RPS standard has higher support among Republican legislators compared with expanded RPS standards (although still mostly lower than among Democrats) and that there is declining support for expanded RPS laws after 2009. The absence of new (or “first-time”) RPS laws in 2010 and 2011 also suggests that there is a diminishing opportunity to pass additional first-time RPS laws in the states that have not yet passed them. It is possible that after 2009 even new RPS laws were considered to be cost burdens, and that the change in framing of RPS laws affected the capacity for additional states to pass first-time or new RPS laws. This interpretation is consistent with the attempt by Republicans in 2011 in some state legislatures to repeat existing RPS laws. The data therefore provide a more detailed picture of the general perception that Republican Party support for green-energy initiatives has weakened considerably after 2009. One might think of the effect as a “Tea Party” effect, but it also indicates a general strategic decision by Republican leaders to adopt an anti-green strategy to diminish support for the green jobs policies of Democrats.

Table 3. Voting Record for Laws in Support of Property-Assessed Clean Energy

State	Law	Party of Governor	Date	Percent Republican Vote	Percent Democrat Vote	Percent Dems in Legislature
CA	AB 811	R	2008	S72 H48	S95 H100	S63 H60
CA	AB 474	R	2009	S36 H42	S100 H100	S63 H64
CA	SB 77	R	2010	S100 H57	S100 H100	S64 H65
CO	HB 1350	D	2008	SNA H95	SNA H100	SNA H67
CO	HB1328	D	2010	S7 H0	S100 H97	S61 H58
FL	HB 7179	R	2010	S82 H100	S100 H100	S33 H37
GA	HB1388	R	2010	S100 H99	S100 H100	S38 H36
IL	SB 583	D	2009	S100 H100	S100 H100	S63 H59
LA	SB 224	R	2009	S100 H100	S100 H100	S51 H43
ME	LD 1717	D	2010	S100 H100	S100 H100	S57 H62
MD	HB 1567	D	2009	S85 H100	S100 H100	S70 H73
MI	HB 5640	D	2010	S77 H15	S100 H93	S41 H61
MN	HF 2695	R	2010	S90 H73	S98 H91	S67 H66
MO	HB 1692	D	2010	S96 H99	S90 H85	S32 H47
NH	HB1554	D	2010	S NA H4	SNA H97	SNA H56
NY	S 66005	D	2009	S100 H100	S100 H100	S53 H73
NC	HB 1389	D	2009	S100 H68	S100 H100	S60 H57
OH	SB 232	D	2010	S75 H85	S92 H100	S38 H51
OK	SB 668	D	2009	S100 HNA	S95 HNA	S46 HNA
OR	HB 2626	D	2009	S75 H100	S100 H100	S60 H60
TX	HB 1937	R	2009	S95 H45	S100 H93	S39 H47
VT	H 446	R	2009	S0 H2	S75 H96	S73 H62
VA	SB 1212	D	2009	S100 H100	S100 H100	S53 H46
WI	AB 255	D	2009	S47 H76	S100 H100	S55 H53
WY	HB 0179	R	2011	S96 H88	S100 H100	S13 H17
Average				S80 H71	S98 H98	
Stand. Dev.				S30 H36	S6 H4	

R= Republican, D= Democrat, S= Senate, H= House.

Table 3 provides information about Republican and Democratic votes for PACE laws. Only two states passed PACE laws in 2008 (with an average ratio of positive votes of Republicans to Democrats of 73), and only one state passed PACE-enabling legislation in 2011 (with a ratio of 92 percent). In 2009, the average ratio of Republican-to-Democrat support was 77 across the 23 votes, and in 2010 the average ratio of support was 74 across 17 votes (based on the statistics in Table 3). Note also that ratio of Republican to Democratic support for PACE laws in 2008, 78, is higher than that for expanded RPS laws (60 and 62 in 2007 and 2008), but it is lower than the relative support for new RPS laws (93 and 87). The results are consistent with the interpretation that some green-energy law types, especially ones that are not perceived to create a cost burden for either consumers or governments, can gain bipartisan support even

amid increasing partisanship. However, the relatively higher level of support for new RPS laws in 2007 and 2008, which one might expect Republicans to tend to reject as causing a cost burden for consumers, in comparison with PACE laws in 2009 and 2010 is also somewhat surprising. It suggests that even relatively bipartisan PACE laws had more trouble gaining support across the political aisle in 2009 and 2010. Other than Kansas, the only point of comparison for 2009 is the new RPS law for West Virginia, for which the ratio of Republican to Democrat support was only 31, that is, a much lower level of support than the average for PACE laws in 2009.

Logistic regression results

Table 4. Logistic Regression of Republican and Democratic Votes for RPS and PACE Laws

	All Legislators (both Democrats and Republicans); N= 6,071			Republican Legislators Only; N=2,707			Democratic Legislators Only; N= 3,364		
	Both PACE & RPS Laws	PACE Laws Only	RPS Laws Only	Both PACE & RPS Laws	PACE Laws Only	RPS Laws Only	Both PACE & RPS Laws	PACE Laws Only	RPS Laws Only
Intercept	1.77*** (.11)	2.47*** (.33)	2.12*** (.26)	2.31 *** (.13)	2.91*** (.35)	3.4*** (.38)	3.55*** (.21)	4.27*** (1.14)	.19 (1.15)
Fossil Fuel Industry	-.48*** (.05)	-.64*** (.09)	-.36** (.13)	-.72*** (.07)	-.91*** (.12)	-.33* (.15)	0.18 (.18)	0.52 (.33)	2.38** (.75)
Clean Energy Industry	.05 (.07)	.2* (.09)	-.12 (.16)	.04 (.07)	.14 (.1)	.13 (.19)	.12 (.21)	.42 (.25)	-4.29*** (1.02)
Median Household Income	-.21*** (.05)	.18* (.09)	-.56*** (.14)	-.2*** (.06)	.04 (.09)	-.32* (.16)	-.22 (.14)	1.47*** (.38)	0.38 (.61)
Party of Legislator (D=1)	2.93*** (.12)	3.72*** (.19)	2.44*** (.17)	NA	NA	NA	NA	NA	NA
Proportion Dems	-.41*** (.06)	-.37*** (.1)	-.66*** (.16)	-.53*** (.08)	-.35** (.12)	-1.3*** (.22)	.07 (.14)	-.46 (.28)	.59 (.39)
Party of Gov (D =1)	NA	.89*** (.15)	NA	NA	.89*** (.17)	NA	NA	1.43* (.59)	NA
Party of President (D=1)	-1.09 ***(.13)	-1.44*** (.32)	-.56* (.23)	-1.2*** (.15)	-1.72 ***(.35)	-.46 (.32)	-1.29*** (.34)	-.04 (1.13)	-9.34*** (2.2)
Sierra Club	-.62*** (.08)	-.93*** (.1)	.01 (.22)	-.74*** (.08)	-.97*** (.11)	-.32 (.24)	.1 (.23)	-.42 (.27)	5.36*** (1.26)
Blue-Green Alliance	-.6*** (.11)	-1.34*** (.17)	-.94*** (.29)	-.73*** (.12)	-1.38 ***(.18)	-2.03 ***(.35)	.00 (.28)	-1.32** (.49)	9.71*** (2.58)
Type of Law (PACE=1)	.65*** (.12)	NA	NA	.49*** (.14)	NA	NA	1.77*** (.31)	NA	NA
New RPS (Y= 1)	NA	NA	-.21 (.4)	NA	NA	-.31 (.36)	NA	NA	5.46** (1.72)
Size of Chamber	-.48*** (.05)	-1.12*** (.08)	.38*** (.09)	-.57*** (.06)	-1.25 ***(.09)	.67*** (.12)	-.1 (.11)	-.61* (.29)	-.09 (.19)
Chi-Squared	1205.1 1***	1028.6** *	410.64* **	592.01* **	510.5** *	336.37* **	44.05** *	35.52** *	93.65***
Nagelkerke	0.34	0.45	0.31	0.29	0.39	0.43	0.06	0.10	0.23
% correctly classified	91.14%	91.38%	90.39%	83.15%	83.07%	78.9%	97.18%	98.18%	95.66%

The dependent variable is the yes or no vote of individual state legislators. Coefficients and standard errors (in parentheses) are provided.

* indicates $p < .05$; ** indicates $p < .01$; *** indicates $p < .001$.

Results from binary logistic regression are presented in Table 4. The tables include analyses of all 6,071 Democratic and Republican votes of state legislators in favor of PACE and RPS laws. However, given the wider variations in Republican support for PACE and RPS laws, and the relatively high levels of Democratic support for all laws, as described above, we focus the following analysis on a subset of 2,707 Republican votes for both PACE and RPS laws, PACE laws only, and RPS laws only. Although some of the findings are statistically significant for Democrats, the Nekelgerke statistic is low, which suggests that there is not much explanatory power, given the fact that Democrats voted in favor of the laws at an average rate of approximately 97%. All of our interpretations below should be understood as controlling for all other variables.

Our first set of hypotheses considers economic factors shaping Republican support for green energy laws. The strength of fossil fuel industries has a significant, negative effect on Republican support for both PACE and RPS laws. However, clean energy industry strength does not predict Republican support for any category of green energy laws. We thus find Hypothesis 1a supported and Hypothesis 1b not supported, suggesting that Republicans are much more concerned with the impact of green energy laws on fossil fuel industries than clean energy industries. This is possibly due to the greater lobbying resources available to fossil fuel industries compared to clean energy industries.

Our second hypothesis is concerned with social/demographic factors shaping Republican support for green energy laws. Median household income has a significant, negative effect on Republican support for all green energy laws considered together, though not PACE laws considered separately. Thus, Hypothesis 2 is partially supported, providing some evidence for Republican backlash against liberal attitudes that high income often represents.

Our third set of hypotheses examines political factors shaping Republican support for green energy laws, with the first two hypotheses specifically dealing with the effect of the party affiliation of the legislator and governor. As hinted by descriptive statistics, Republican Party affiliation has a significant and negative effect on state legislator support for all green energy laws – in fact, in our models that include all legislators, party affiliation is the strongest predictor of support for green energy laws – so Hypothesis 3a is supported. Surprisingly, we find that the presence of a Democratic governor has a significant *positive* effect on Republican votes for PACE laws, so Hypothesis 3b is not supported. (As previously noted, the limited number of Republican governors involved in the approval of RPS laws prohibited us from analyzing the effect of the party of the governor on Republican support for RPS laws.)

The next two hypotheses that relate to political factors test the effect of Democratic dominance in a legislative chamber as well as the effect of having a Democratic President (which coincided with the emergence of the “Tea Party” movement). We find that as the proportion of Democrats in a chamber increases, the odds of Republican support for RPS and PACE laws decreases. Hypothesis 3c, then, is supported. The presence of a Democratic President has a significant, negative effect on Republican support for RPS and PACE laws considered together, though not RPS laws considered separately. As a result, Hypothesis 3d is partially supported.

The two other hypotheses that relate to political factors examine the effect of interest groups on Republican support for green energy laws. We find that as the proportion of Sierra Club members per capita increases, Republican support for RPS and PACE laws decreases, except when RPS laws are considered separately, so Hypothesis 3d is partially supported. We also find that the presence of a Blue-Green Alliance in a state has a significant, negative effect on Republican support for RPS and PACE laws. So, Hypothesis 3e is supported. These findings about political factors shaping Republican support for green energy laws provide evidence for a Republican backlash against liberal attitudes or interests in a state. We interpret the positive effect of a Democratic governor on Republican votes on PACE legislation to mean that a Democratic governor might exert pressure, either through political deals or public opinion, for Republicans to consider green energy legislation in the first place.

Our final set of hypotheses relates to the type of legislation under consideration. With respect to Republican legislators, PACE laws do seem to receive more support than RPS laws, though the distinction between new RPS laws and expanded RPS laws does not seem to matter. Thus, we conclude that, controlling for other variables, Hypothesis 4a is supported while Hypothesis 4b is not supported.

Discussion and Conclusion

The data from votes in state legislatures during the period 2007-2011 suggest that there has been a decline in support among Republicans for green energy legislation attributable in large part to the influence of fossil fuel industries and a strategy by Republicans to oppose all initiatives by President Obama and the Democratic Party. However, there may still be grounds for bipartisan agreement – indeed, Republicans still vote for green energy laws about 75% of the time. Republicans often vote for green energy laws when their states depend less on fossil fuel industries. Furthermore, more Republicans vote for green energy laws when they are in control of their legislatures and when liberal attitudes or interests are less dominant in their state, although a Democratic governor contributes to the willingness of Republicans to consider green energy legislation. Finally, more Republicans vote for green energy laws when those laws are not framed as adding new tax burdens -- i.e., more Republicans vote for PACE laws than RPS laws. (Note that the effect is similar for Democrats – other than party affiliation of the President, the type of green energy law under consideration is the only significant predictor of Democratic support when RPS and PACE laws are considered together).

These results provide policy implications for lawmakers and environmental activists seeking to convince Republicans to support green energy laws. Given the finding about fossil fuel industries, economic framing would seem to be important for securing Republican votes on green energy laws; if Republicans view green energy laws as destroying jobs in fossil fuel industries, they may be less likely to vote for those laws. The strength of clean energy industries does not seem to have a positive effect, but this may be because clean energy industries are comparatively smaller. Environmental activists may need to emphasize the positive effects that growing clean energy industries could have on the economy. Indeed, a recent article by Wei et al. (2010) showed that more aggressive RPS laws and energy efficiency laws could generate over 4 million jobs-years by 2030. Our results also show that Republicans can be brought along to support these green energy laws when more liberal interests are less dominant in a state, suggesting that Republicans desire at least some degree of control over the direction of green energy laws and might be more likely to vote for such laws if they have a stake in the laws.

This study also suggests the value of a methodological approach that focuses on votes for green energy laws by individual state legislators rather than the simple adoption of a green energy law by states. Although previous research had shown, for example, that states with Democratic-controlled legislatures, strong liberal interest groups, and liberal attitudes are more likely to adopt green energy legislation, these same factors do not guarantee support for green energy laws from all state legislators, in this case Republicans. This kind of research was difficult until recently when state legislators began placing roll calls online. This line of research might also be taken further in future studies – for instance, future studies especially of individual states might consider the use of county-level independent variables that might better predict votes of individual state legislators.

References

- Agthe, D. E., Billings, B., Marchand, J., 1996. Socioeconomic and political determinants of state spending on environmental programs." *The American Economist*, 40, 25-30.
- Anderson, D., 2011. Koch-funded group mounts cut-and-paste attack on regional climate initiatives. *Grist*, www.grist.org.
- Boyle, P., 2009. Examination of US cities as forces in environmental policy. *Intersections Online*, 10, 181-198.
- Buckman, G., 2011. The effectiveness of renewable portfolio standard banding and carve-outs in supporting high-cost types of renewable electricity. *Energy Policy*, 39, 4105-4114.
- Chandler, J., 2009. Trendy solutions: Why do states adopt energy portfolio standards? *Energy Policy*, 37, 3274-3281
- Clark, B., Allen, D., 2004. Political economy and the adoption of everyday environmental policies in the American states, 1997: An exploratory analysis. *The Social Science Journal*, 41, 525-542.
- Dell, K. D., 2009. The grassroots are greener: Democratic participation and environmental policies in state politics. *Review of Policy Research*, 26, 699-727.
- Fang, L., 2010. Memo: Health insurance, banking, oil industries met with Koch, Chamber, Glenn Beck to plot 2010 election. *Think Progress*, thinkprogress.org.
- Hays, C., Esler, M., Hays, S. P., 1996. Environmental commitment among the states: Integrating alternative approaches to state environmental policy." *Publius*, 26, 41-58.
- Hess, D., 2012. *Good Green Jobs in a Global Economy: Making and Keeping New Industries in the United States*. Cambridge, MA: MIT Press.
- Huang, M-Y., Alavalapati, J. R. R., Carter, D. R., Langholtz, M. H., 2007. Is the choice of renewable portfolio standards random? *Energy Policy*, 35, 5571-5575.
- Independent Petroleum Association of America, 2010. 2009-2010 IPAA oil and gas producers in your state. www.ipaa.org.
- Leiserowitz, A., Maibach, E., Roser-Renouf, C., Hmielowski, J., 2011. *Politics and global warming: Democrats, Republicans, Independents, and the Tea Party*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communications. environment.yale.edu.
- Pew Charitable Trusts, 2009. *The clean energy economy: Repowering jobs, business, and investment across America*. www.pewcenteronthestates.org.
- Portney, K. E., 2002. Taking sustainable cities seriously: A comparative analysis of twenty-four U.S. cities. *Local Environment: The International Journal of Justice and Sustainability*, 7, 363-380.
- Ringquist, E. J., 1994. *Environmental Protection at the State Level*. New York: M.E. Sharpe, Inc.
- Shrimali, G., Kniefel, J., 2011. Are government policies effective in promoting deployment of renewable electricity resources? *Energy Policy*, 39, 4726-4741.
- Sunstein, C., Schkade, D., Ellman, L., Sawicki, A., 2006. *Are Judges Political? An Empirical Analysis of the Federal Judiciary*. Washington, D.C.: Brookings Institute Press.
- United States Energy Information Administration, 2010. Average number of employees by state and mine type. www.eia.doe.gov.
- Vachon, S., Menz, F. C., 2006. The role of social, political, and economic interests in promoting state green electricity policies. *Environmental Science & Policy*, 9, 652-662.
- Wei, M., Patadia, S., Kammen, D. M., 2010. Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US? *Energy Policy*, 38, 919-931.
- Weiss, D., 2010. *Anatomy of a senate climate bill death*. Center for American Progress. www.americanprogress.org.
- Weiss, D., Lefton, R., Lyon, S., 2010. *Dirty money: Oil companies and special interests spend millions to oppose climate legislation*. Center for American Progress, www.americanprogressaction.org.