Evaluating Renewable Portfolio Standards for In-State Renewable Deployment: Accounting for Policy Heterogeneity

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Executive Summary

In this paper, we evaluate a key dimension of the political feasibility for the most prominent sub-national renewable energy policy in the United States, state-level renewable portfolio standards (RPS). Specifically, we evaluate whether the RPS policies have increased the level of in-state renewable energy generation relative to non-RPS states, accounting for the heterogeneity in RPS policy design. RPS policies mandate a specific fraction of electricity is derived from renewable sources. However, flexibility in the ways through which firms can

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comply with an RPS – particularly whether they can receive credit for out of state renewable generation, makes it feasible for actors to comply with an RPS without increasing their in-state renewable energy generation. This is potentially troubling for RPS advocates, as these policies have gained political support through linking the issues of local renewable energy deployment and local economic benefits.

We develop an econometric model to explain observed in-state renewable energy deployment utilizing a panel of enacted RPS policy features, enacted complementary energy policies, energy market characteristics, and state characteristics of all U.S. states from 1991-2010. The prior literature utilizing similar models provides contradictory evidence for whether RPS policies increase or decrease the level of in-state RES-E deployment. Articulate modeling of policy variety has been largely lacking from past studies and is essential for accurate econometric analysis of heterogeneous energy policies. In our implementation of several econometric models of varying sophistication, we reconcile previous results from the literature and find that after properly controlling for variation in the design of states' RPS policies, increasing the stringency of an RPS policy does in fact significantly increase in-state renewable electricity generation.

By refining our comparisons to condition on a detailed set of features, we find a positive and statistically significant effect of RPS stringency on renewable energy capacity. Specifically, our results imply that every 1 percentage point increase in RPS stringency, as measured by the incremental renewable energy deployment required by an RPS in a year, is associated with an approximately 0.28 – 0.29 percentage point increase in renewable energy's share of capacity. We also discuss the relevance of several of the individual RPS policy design feature variables.

Together, this shows that RPS stringency and some specific design features have in fact historically had a positive impact on in-state renewable energy deployment on average, but this relationship is only apparent once other conflating factors are controlled. This suggests that RPS policies are effective in stimulating local renewable energy generation and that basing political support for RPS policies on local economic co-benefits may be effective.

In the United States, individual states and regions play an important role in providing laboratories to experiment with new policy approaches. This has led to a diversity of policy designs, but makes proper evaluation difficult. This is particularly true in the case of energy policy, where states and regions have taken the lead in many areas in developing novel policy approaches, such as the cap-and-trade systems in California and New England or state-level tax credits for biofuels. Properly evaluating these policies cannot be accomplished by collapsing their rich diversity to a single-dimension. Future research evaluating RPS policies and other sub-national energy policies should account for the heterogeneity in policy design and state- and region-level conditions.