

IMPACT OF POLICY UNCERTAINTY ON RENEWABLE ENERGY INVESTMENT: WIND POWER AND PTC

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Overview

It is generally understood that the pattern of repeated expiration and short-term renewal of the federal production tax credit (PTC) causes a boom-bust cycle in wind power plant investment in the U.S. This on-off pattern is detrimental to the wind industry, since ramp-up and ramp-down costs are high, and players are deterred from making long-term investments.

It is widely assumed that the severe downturn in investment during “off” years is evidence that wind power is unviable without the PTC. However, as this paper demonstrates, the volatility of investment associated with the PTC is unrelated to the underlying economics of wind; instead it is due to the dynamic of power purchase agreement (PPA) negotiations in the face of uncertainty.

The PTC is not the only means, existing or potential, for encouraging wind power investment. Various alternative policy incentives are considered and compared in terms of their perceived reliability for supporting long-term investment.

Methods

This paper relies on 1) a strategic negotiations model; and 2) a widespread survey of industry participants conducted in May 2006, together with targeted follow-up interviews. The survey was conducted via email invitation sent to approximately four thousand individuals who had attended conferences on wind energy during the past year, including the American Wind Energy Association (AWEA)’s WINDPOWER 2005 conference in Denver. Of the 420 people who clicked on the survey link, 338 continued past the first question,² and 272 reached the end of the survey. All questions were voluntary, with most questions getting about 300 responses, representing an overall response rate of 8-9%. Most questions were close-ended (multiple choice).

Results

In negotiating a price for wind PPAs, it is in the interest of utilities to know for sure whether the PTC will be renewed or not. In times of extension uncertainty, the lenders will not finance a PPA that optimistically assumes PTC renewal, since the risk of non-extension is too great for them to bear. Similarly, the utility offtakers will not sign a contract that pessimistically assumes no PTC renewal, since the independent power producer (IPP) will gain all of the value if the PTC is subsequently renewed (a windfall gain!). By waiting to resolve the extension uncertainty, the utilities expect to drive developers down to their marginal cost. This dynamic is demonstrated using a strategic negotiations model, which predicts a boom-bust pattern of wind project investment irrespective of fundamental economic viability (see Table 2).

Table 2: PPA Agreements Under PTC Certainty and Uncertainty

PTC?	Net cost to IPP	Why?	PPA price	Conditions for agreement
Yes	3¢	2¢ PTC	3¢	As long as value to utility \geq 3¢
No	5¢	No PTC	5¢	As long as value to utility \geq 5¢
Maybe	5¢	PTC not bankable	No deal	No matter how valuable wind is to utility

¹ This research was made possible through support from the Link Energy Foundation and from the Climate Decision Making Center (CDMC) located in the Department of Engineering and Public Policy. This Center has been created through a cooperative agreement between the National Science Foundation (SES-0345798) and Carnegie Mellon University.

² The first page of the survey, which caused the 20% drop from 420 to 338, was a “Consent to Participate in Research” (required by university regulations) describing the survey as confidential and voluntary.

These results are further supported with survey data, which indicate the reality of a no-PTC world may not be as dire as [people believe]: across the U.S., a third (33.3%) as many projects would go through compared to with the PTC in place (see Table 4).

Table 4: Respondents' Views of Wind Development in a No-PTC World

Question	Answer	% of Respondents (Number)	Mean Share of Projects (Respondents)
Any new projects? ³	No, none at all	8.7% (26)	
	Yes, at least some	91.3% (274)	
<i>What percent of projects?⁴</i>	<i>All projects in U.S.</i>		33.3% (226)
	<i>Respondent's own projects</i>		37.0% (128)

Optimism is even greater among those whose organizations have already been involved in wind projects. Developers estimate that 42% of their own projects—and utility off-takers 48% of theirs—would still be developed without the PTC. The fact that off-takers suggest they would go forward with almost half of their projects even without the PTC is significant, because they drive the requisition process.

Given the short-term nature of the PTC, it is useful to consider other types of policy incentives supporting renewable energy development that may have a longer planning horizon. Survey respondents were asked to compare a variety of types of renewable energy incentives in terms of their perceived stability in providing a long-term planning horizon for investment. Respondents consider renewable portfolio standards to be most likely to stay in effect—above favorable depreciation rules, production tax credits, production subsidies, and favorable pricing mechanisms.⁵

Conclusions

The wind industry – and renewable energy generally – needs stable policy supporting long-term investment. By showing how contract negotiations exacerbate investment downturns during periods of policy uncertainty, irrespective of any other factors motivating investment in wind projects, this paper can help us shift away from the paradigm of PTC-dependence and towards other, more productive ways of promoting and growing the industry.

Going forward, it appears that PTC uncertainty will have a reduced impact on new wind development. Support for a federal RPS is growing in Congress and a cap-and-trade policy is being considered to reduce carbon emissions. Both of these would enhance wind energy in a no-PTC world. Furthermore, IPPs are becoming less dependent on PPAs for financing, and utilities are demonstrating greater interest in owning wind plants, rather than just purchasing wind through PPAs. In 2006, only 42% of the wind capacity added was under PPA, which contrasts with the period from 1999 to 2005, during which 82% of new capacity was under PPA (Wiser and Bolinger, *Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2006*, LBNL, 2007).

Even if it plays a lesser role in the future, PTC uncertainty provides an interesting case study in how industry structure, and in particular the dynamic of contract negotiations, can amplify the impact of public policy uncertainty on corporate investment.

³ Exact question: *Suppose the federal production tax credit **no longer existed** and you knew it would **never** come back. Do you think **any new wind projects** would be planned and developed in the U.S.?*

⁴ The 274 respondents who answered “Yes, at least some” to the previous question were asked: *What percentage of **new** projects (i.e., not already under construction) do you think would go forward even **without** the PTC?*

- *Percent of **all** projects in U.S. (% capacity basis)*
- *Percent of **your** projects in U.S. (% capacity basis)*

⁵ Exact question: *How likely would you consider the following types of renewable energy incentives, once enacted, to **stay in effect** (i.e., law not likely to be reversed) long enough to influence long-term investment planning?* Percent responding “Likely” or “Very likely”: regional-level portfolio standards – 73%; national-level portfolio standards – 63%; favorable depreciation rules – 58%; production tax credits – 43%; favorable pricing or tariff mechanisms – 34%; production subsidies – 29%.