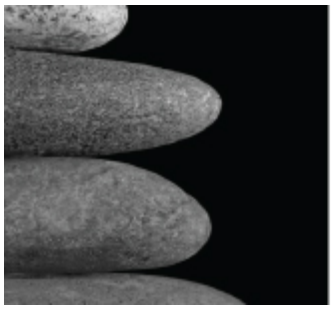

EVOLUTION MARKETS

The Intersection of Energy, Environment, and Finance™

MARKET INSIGHT

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ITC/PTC Extension: What does it mean for 2016 and beyond?

- Longest renewable energy tax credit extension in recent history
- Phases out PTC and ITC by 2023 (Solar ITC at 10% thereafter)
- Provides industry the opportunity to address integration issues

As 2016 begins, we have entered a new stage in the maturation of the U.S. renewables industry. On December 17, 2015 President Obama signed into the law an omnibus spending bill that includes a long-term extension – and phase out - of the production and investment tax credits.[1] This extension will support the development of wind and solar projects that come online as late as 2023. For an industry that has gotten accustomed to short-term, patchwork extensions, this certainty will provide an opportunity to address some of the challenges that stand in the way of a lasting transformation of the nation's electricity industry.

This extension comes as the industry faces a number of countervailing forces. On the one hand, the evolution of the regulatory landscape appears supportive. In the U.S., many state renewable portfolio standards (RPS) continue to ramp up and some states, such as California and New York, are making efforts to increase their RPS targets. Globally, the 2015 Paris Climate Agreement suggests that the problem of global warming is broadly recognized and renewables will likely need to be a big part of the solution. [2] When set against the rapid expansion in renewables over the last decade, these factors suggest the industry is poised for continued and even accelerated growth.

On the other hand, the rapid growth of renewables has exposed systematic challenges related to grid integration, cost-allocation, and market structure. Historically low natural gas prices have placed additional economic pressure on renewables, as the industry strives to compete with wholesale power prices. These challenges could stem the growth of renewables, particularly in the near term, in spite of the strong tailwinds.

Setting aside this uncertainty, which arguably should be expected in a growth business, the long-term extension of the PTC/ITC is likely to have a number of specific impacts on the trajectory of the U.S. renewable energy industry. A few of these impacts are summarized below.

Solar Gains the Upper Hand

As costs have declined, the economics of utility scale solar have begun to catch up with those of wind. This is particularly true in the Southwest and Southeast U.S. where solar resources tend to be strong relative to wind. The structure of the ITC/PTC extension will give solar an additional leg up. The table below highlights how the ITC extension provides solar with more support, and for longer, than the PTC extension provides for wind. There are number of factors at work when determining the long-term power price needed to finance a project. However, using reasonable assumptions, the extension provides solar with as much as a $20 per MWh advantage versus wind. This advantage is most pronounced in the 2019-2023 period.

[1] http://docs.house.gov/billsthisweek/20151214/CPRT-114-HPRT-RU00-SAHR2029-AMNT1final.pdf
[2] http://ec.europa.eu/clima/policies/international/negotiations/future/index_en.htm

Relative Impact of PTC & ITC Extensions

	Start of Construction Deadline (12/31)					
	2016	**2017**	**2018**	**2019**	**2020**	**2021**
Wind Production Tax Credit [1]	100%	80%	60%	40%	0%	0%
Solar Investment Tax Credit [2]	100%	100%	100%	100%	87%	73%
Solar's Tax Advantage (approx. $/MWH) [3]	*$ -*	*$ 5.00*	*$ 10.00*	*$ 15.00*	*$ 20.00*	*$ 16.00*

[1] 2015 = $23/MWh, IRS guidance suggest project have 2 years to comeonline to avoid scrutiny;
[2] 2015 = 30% of eligible basis, must be online by end of 2023
[3] Levelized Cost of Energy (LCOE) deviation driven by differentiation in tax credit phase-out schedule (ceteris paribus)

Glide Path to Grid Parity

First and foremost, the extension of the ITC and PTC will give the industry a chance to plan ahead. While this might not necessarily result in immediate capex or levelized cost of energy (LCOE) declines (arguably, it could have the opposite effect in the short-term as the time pressure is removed), it may allow the industry to make the investments in R&D, supply chain, and human capital needed to improve competitiveness in the long term.

The investment bank Lazard estimates that with subsidies the LCOE of utility-scale solar PV is in the $41-$57/MWh range, while utility scale wind is in the $14-$63/MWh range. The ranges for both technologies, which are of course debatable, account for differences in the resource as well as other economic factors including labor, land, and financing costs. These prices compare favorably to new coal which ranges from $65-150/MWh and new natural gas combined cycle, which ranges from $52-78 (assuming a long-term natural gas price of $3.50/MMBTU).[3] Notably, Lazard's LCOE estimates for *unsubsidized* wind and solar are $32-77/MWh and $50-$70/MWh respectively. These costs are still highly competitive with new coal and gas and suggest that the industry will successfully weather the tax credit phase-out.

It's important to recognize that renewables are often competing with existing coal, gas, and nuclear power plants, not just new ones. The marginal cost of power from existing resources is substantially lower than the LCOE from new resources and historically low natural gas prices, driven by the boom in shale gas extraction, will provide renewables with a formidable challenge. Nonetheless, the improving economic competitiveness of renewables combined with the demand for low carbon generation will support a meaningful increase in capacity during the term of the tax credit extension. Bloomberg New Energy Finance (BNEF) estimates that the tax credit extensions will contribute an additional 20GWs of solar and 19GWs of wind over the next five years versus a no extension scenario.[4] The extension also covers other renewable technologies, such as geothermal, which are likely to see a boost as well.

Integration Comes to the Fore

The short-term nature of previous extensions, particularly the PTC, has put disproportionate weight on the question of whether a project could qualify for the credit. This was sensible given the dramatic spread between the economics of a project with and without the credit. However, this initial screen meant that other factors, such as long-term transmission constraints, while certainly not ignored, have played less of a role than perhaps they should have. With a long-term extension, developers and utilities can more deliberately consider the long-term value and "fit" of a given project, without having their screening process dominated by the issue of tax credit eligibility. Projects that are sited in higher value energy markets or have access to less constrained transmission lines (or transmission lines under development) are likely to get more attention. Overall, this should lead to more strategic asset selection at a time when grid integration is becoming an increasingly critical variable in the growth of renewables. It will also put an emphasis on finding economical energy storage

[3] https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf
[4] http://www.bloomberg.com/news/articles/2015-12-17/what-just-happened-to-solar-and-wind-is-a-really-big-deal

solutions, which will ultimately be central to wide-scale adoption of intermittent renewables. Renewable resources with more predictable dispatch profiles are also likely to benefit.

Market Implications

The long-term extension better aligns federal tax policy with state RPS programs and, if ultimately implemented, the Clean Power Plan. This is because many RPS programs have met their interim targets, but continue to grow through 2025 and beyond. An expiration of tax credits at the end of 2016, or another short-term extension, would have put RPS obligated entities in the position of having to procure early in order to lock in lower prices. The extension may result in a more measured approach to procurement by long-term buyers (both bundled power purchase agreements and renewable energy credit transactions, depending on the market). This likely means fewer buyers coming to market in the immediate term, but more steady procurements over time. Also, the Clean Power Plan is scheduled to start in 2021. This extension allows projects driven by the program to be built late in this decade, or earlier in the 2020's, once the final structure of the program becomes clear.

The long-term extension may also erase any remaining doubt among utilities and state utility commissions that renewables are here to stay. This is likely to mean a more concerted effort is made to deal with the cost allocation issues associated with integrating renewables at both the distribution and transmission level. At the distribution level, for example, rooftop solar projects tend to shift the cost of maintaining the grid to non-solar customers. At the transmission level, intermittent renewables resource may require investments in quick ramping generation or transmission capacity that are currently borne by other market participants. While these issues may not always be resolved in favor of renewables, resolving them is critical to the long-term success of the industry.

The tax credit extensions mean that in 2016 the industry can transition away from the jarring, stop-and-go pattern that has come to define it over the last decade and proceed down the path to sustainable competitiveness in the U.S. power sector.

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Evolution Markets' Structured Transaction group works with renewable energy project developers to attract project financing, execute long-term power purchase agreements, and hedge RPS market exposure. We have helped foster the creation of new markets by educating stakeholders, structuring new products, and arranging transactions across the full spectrum of counterparties. This unique commitment has positioned us as the leading agent and advisor in the U.S. renewable energy markets. For more information on our renewable energy markets services, please contact our Structured Transaction group at greenpower@evomarkets.com or +1 914.323.0257.

Evolution Markets Inc.
10 Bank Street
White Plains, NY 10606
www.evomarkets.com

Peter Toomey
Director, Structured Transactions
T: +1 914.323.0257
E: ptoomey@evomarkets.com

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