Congress' Clean Energy Plans Carry Major Market Implications

By **George Cannon and Andrew Phillips**

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A recent flurry of congressional activity has further spurred the debate on the extension and expansion of federal support for clean energy initiatives. The introduction of the Renewable Electricity Standard Act[1] and Renewable Energy Extension Act[2] supplemented a proposed plan[3] within the House Committee on Energy and Commerce for comprehensive legislation to achieve a 100% "clean economy" by 2050.

A national renewable electricity standard paired with an extension of the energy investment tax credit, if enacted, would encourage the growth of renewable energy investment and installation. Moreover, many states continue to implement and refine their own policies to encourage renewable resource deployment. Today, 29 states and the District of Columbia have implemented renewable portfolio standards, and another eight states have nonbinding renewable goals.[4]

In addition, all top 2020 Democratic candidates have introduced climate action plans with the inclusion of renewable energy incentives.[5] And public support for clean energy technologies continues to grow.[6] Such facts highlight the inevitable: Despite Republican efforts to roll back many environmental regulations, renewable energy deployment will continue to grow and have significant effects on the operation of the electricity grid and its surrounding institutions, both private and public.

High market penetration by variable renewable energy, or VRE, resources will necessitate significant changes to existing regulatory structures, as well as to the operation of wholesale electricity markets across the United States. Such changes will require consideration and forward planning by all industry participants, including investors.

Renewable Electricity Standard Act

Introduced by Sen. Tom Udall, D-N.M., on June 26, the Renewable Electricity Standard Act would amend the Public Utility Regulatory Policies Act of 1978 to establish a national standard intended "to achieve at least 50 percent renewable electricity nationwide" by 2035.[7] Beginning in 2020 with a required 1.5% increase in renewable electricity generation, the proposed standard would require annual increases by retail electricity providers, ultimately ramping up to 2.5% in 2035.

Each kilowatt-hour of added renewable generation would result in the receipt of a federal renewable energy credit, or REC, that generators could trade, sell or bank to meet future compliance requirements. Credits would be issued only to eligible generators: those that are not under contract to receive state RECs and that use equipment that "comes online" in 2020 or later, among other "small exceptions."[8]

Such requirements would spur new deployment of and investment in renewable generation after 2020. States with existing renewable standards set at or above the federal level may

opt out of the mandate.[9]

Renewable Energy Extension Act

On July 25, Rep. Mike Thompson, D-Calif., joined by Reps. Paul Cook, R-Calif., and Brian Fitzpatrick, R-Pa., introduced the Renewable Energy Extension Act.[10] Sen. Catherine Cortez Masto, D-Nev., introduced companion legislation in the Senate.[11]

The legislation would amend Section 48 of the Internal Revenue Code[12] to extend the expiration date for tax credits across a range of clean energy investments.[13] Certain credits, currently set at 30%, are scheduled to phase out this year before expiring in 2021.[14] While a 10% credit for solar and geothermal energy remains after 2021, this legislation would extend the 30% credit for all eligible resources until the end of 2026.[15]

House E&C Committee Announcement

On July 23, House E&C Committee Chairman Frank Pallone Jr., D-N.J., together with Reps. Paul Tonko, D-N.Y., and Bobby L. Rush, D-Ill., announced a new plan to attain a "100 percent clean economy by 2050."[16] Citing a need for greater federal leadership in combating climate change, Pallone indicated the committee's intention to "produce comprehensive legislation" to meet this target.[17]

On July 24, the committee held the first of a number of hearings dedicated to discussing potential policies intended to decarbonize all sectors of the U.S. economy.[18] Future hearings will cover the reduction of industrial or transportation emissions, among other topics.[19]

Implications

Despite the uncertainty of their passage, these draft pieces of legislation, paired with state initiatives and growing public support for clean energy, require industry consideration of potential regulatory changes accommodating greater market penetration of VRE resources.[20]

Regulatory battles have already begun at the Federal Energy Regulatory Commission on the impact state clean energy policies have on the operation of wholesale markets. More recently, FERC delayed PJM Interconnection LLC's scheduled capacity auction as the agency continues to deliberate changes to PJM's minimum offer price rule.[21] Federal action incentivizing state support for clean energy initiatives, or the implementation of federal standards, could have a significant effect on future rulings from FERC and utility commissions across the country.

When considering potential regulatory changes that may be required to accommodate greater VRE penetration, it is important to understand the impact an increase in variable generation has on pricing mechanisms, dispatch and resource adequacy requirements. A high penetration of VRE resources introduces both downward pressure on, and greater volatility to, average locational marginal prices.[22]

These effects, stemming from the near-zero marginal cost of these technologies, and their natural uncertainty of generation, have a significant influence over conventional thermal generators operating in the market. Conventional thermal generators, unable to compete with the inherently low marginal cost of renewable resources, are pushed farther back in the merit order, and may be forced to sell less energy at lower or even negative prices.[23][24]

Unable to rely on energy markets to meet revenue requirements, these generators must depend upon capacity markets to remain viable. However, capacity market payments are notoriously unpredictable and would likely fall short of the revenue needs of such generators.[25] A failure to earn sufficient revenue in these markets can result in the early retirement of higher cost conventional generators, or require significant out-of-market payments.[26]

Moreover, lower electricity prices depress investment in future capacity, and introduce concerns over resources adequacy.[27][28] If generators are unable to rely on capacity markets or scarcity pricing to encourage investment, reserve margins needed to ensure grid stability can fall to dangerous levels and threaten system operations, as was witnessed during the recent Texas heat wave.[29] These facts could necessitate considerable changes to market operations, as regions see resource adequacy concerns grow, potential suppression of capacity investment levels and a greater need for system flexibility.[30]

As discussed above, falling revenues for conventional generation may result in the early retirement of resources needed to ensure regional electricity needs are met in the long term.[31] Threats to the revenue sufficiency of such generation facilities have the potential to lead to federal or state legislative action in order to support generators facing an increasingly unfriendly economic landscape.[32][33] Support for these plants can take a variety of shapes. Tax breaks, direct subsidies, and rate hikes for residential and commercial customers each have the potential to be implemented in such scenarios.

While some regions may opt to support the continued operation of conventional generators, others may use the opportunity to support greater deployment of new renewable generation through similar forms of out-of-market payments. Such plans would require considerable administrative preparation in order to adjust markets, grid operations and capacity planning requirements to the unique effects of substantial VRE penetration.

Of significant concern in such a scenario is short-term system flexibility.[34] In areas with high levels of solar power, greater generation during the sunny hours of the day, alongside decreased generation and increased demand in the evenings, leads to what is colloquially referred to as the “duck curve”.[35]

In order to adapt the grid to high ramp speeds in the evening as demand increases, a region may require the implementation of energy storage technologies, such as battery storage, in order to smooth the demand curve.[36] While the levelized cost of lithium-ion batteries continue to fall, necessary increases of deployment of such technology may result in legislative mandates as part of new or evolving renewable portfolio standards across the country.[37][38]

Higher penetration of VRE generation, alongside increasing public support for clean energy, has brought traditional electricity market operations to a critical juncture. As electricity market participants look to the future, they must work to anticipate the breadth of regulatory changes that may be implemented in order to better accommodate the unique characteristics of VRE generation.

These accommodations may take the shape of more central planning, out-of-market payments, advanced resource adequacy requirements or even the introduction of new market products designed to ensure system stability. Although often difficult to predict, modifications to the exiting regulatory regime will affect most every aspect of electricity markets, and the biggest changes may be yet to come.

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[1] Renewable Electricity Standard Act, S. 1974, 116th Cong. (2019).

[2] Renewable Energy Extension Act, H.R. 3961, 116th Cong. (2019).

[3] Press Release, H. Comm. on Energy & Commerce, E&C Leaders Announce Bold New Plan to Achieve a 100 Percent Clean Economy by 2050 (July 23, 2019), https://energycommerce.house.gov/newsroom/press-releases/ec-leaders-announce-bold-new-plan-to-achieve-a-100-percent-clean-economy-by ("E&C Press Release").

[4] https://www.eia.gov/todayinenergy/detail.php?id=38492.

[5] https://blogs.ei.columbia.edu/2019/08/29/2020-candidates-climate-change/.

[6] https://www.pewresearch.org/fact-tank/2017/01/23/two-thirds-of-americans-give-priority-to-developing-alternative-energy-over-fossil-fuels/.

[7] See Press Release, U.S. Sen. Tom Udall, Udall, Senators Introduce Renewable Electricity Standard Legislation (June 26, 2019), https://www.tomudall.senate.gov/news/press-releases/udall-senators-introduce-renewable-electricity-standard-legislation.

[8] See id.; see also U.S. Sen. Tom Udall, S. 1974 Bill Summary 1 (2019) ("While some small exceptions apply, most existing renewable electricity generation is not eligible for federal RECs"), https://www.tomudall.senate.gov/imo/media/doc/Udall%20RES%20summary%20FINAL.pdf.

[9] S. 1974 Bill Summary 2.

[10] Press Release, U.S. Reps. Mike Thompson, Thompson, Cook, Fitzpatrick Introduce Renewable Energy Extension Act (July 25, 2019), https://mikethompson.house.gov/newsroom/press-releases/thompson-cook-fitzpatrick-introduce-renewable-energy-extension-act ("Renewable Energy Extension Act Press Release").

[11] Press Release, U.S. Sen. Catherine Cortez Masto, Cortez Masto Introduces Renewable Energy Extension Act (July 25, 2019), https://www.cortezmasto.senate.gov/news/press-releases/cortez-masto-introduces-renewable-energy-extension-act.

[12] 26 U.S.C. § 48.

[13] See Renewable Energy Extension Act Press Release.

[14] Cong. Research Serv., IF10479, The Energy Credit: An Investment Tax Credit for Renewable Energy (2018), https://fas.org/sgp/crs/misc/IF10479.pdf.

[15] See id.; see also Renewable Energy Extension Act Press Release.

[16] E&C Press Release.

[17] Id.

[18] Building America's Clean Future: Pathways to Decarbonize the Economy: Hearing Before the Subcomm. on Env't & Climate Change of the H. Comm. on Energy & Commerce, 116th Cong. (2019), https://energycommerce.house.gov/committee-activity/hearings/hearing-on-building-americas-clean-future-pathways-to-decarbonize-the.

[19] E&C Press Release.

[20] See generally Thomas Jenkin et al., Nat'l Renewable Energy Lab., NREL/TP-6A20-65491, Capacity Payments in Restructured Markets under Low and High Penetration Levels of Renewable Energy (2016), https://www.nrel.gov/docs/fy16osti/65491.pdf.

[21] PJM Statement on FERC Capacity Auction Ruling, PJM Inside Lines (July 25, 2019), http://insidelines.pjm.com/pjm-statement-on-ferc-capacity-auction-ruling/.

[22] A 2018 study by the Lawrence Berkley National Laboratory, for example, found that greater VRE penetration would result in lower electricity prices as well as greater price volatility throughout the day. See Joachim Seel et al., Lawrence Berkeley Nat'l Lab., Impacts of High Variable Renewable Energy Futures on Wholesale Electricity Prices, and on Electric-Sector Decision Making (2018), http://eta-publications.lbl.gov/sites/default/files/report_pdf_0.pdf.

[23] https://www.nrel.gov/docs/fy14osti/61765.pdf.

[24] https://www.bloomberg.com/news/articles/2018-08-06/negative-prices-in-power-market-as-wind-solar-cut-electricity.

[25] https://www.nrel.gov/docs/fy16osti/65491.pdf.

[26] https://www.nrel.gov/docs/fy14osti/61765.pdf.

[27] https://www.energy.gov/eere/wind/articles/winds-near-zero-cost-generation-impacting-wholesale-electricity-markets.

[28] https://www.nrel.gov/docs/fy16osti/65491.pdf.

[29] https://www.utilitydive.com/news/ercot-reserves-drop-below-2300-mw-forcing-texas-grid-to-call-for-energy-e/560833/.

[30] https://www.nrel.gov/docs/fy14osti/61765.pdf.

[31] https://www.nrel.gov/docs/fy14osti/61765.pdf.

[32] https://www.nytimes.com/2019/04/19/climate/court-trump-coal-mining-setback.html.

[33] https://www.cleveland.com/open/2019/07/nuclear-bailout-bill-passes-ohio-legislature.html.

[34] https://www.nrel.gov/docs/fy14osti/61765.pdf.

[35] https://www.energy.gov/eere/articles/confronting-duck-curve-how-address-over-generation-solar-energy.

[36] https://www.energy.gov/eere/articles/confronting-duck-curve-how-address-over-generation-solar-energy.

[37] https://www.nrel.gov/docs/fy19osti/74184.pdf.

[38] https://www.cell.com/joule/fulltext/S2542-4351(18)30583-X?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS254243511830583X%3Fshowall%3Dtrue.