

# State Actions in Organized Markets

*States Strive to 'Fix' Markets and Retain Base Load Generation*



September 2016

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## Executive Summary

***Base load power from coal-fired and nuclear generation is exiting wholesale power markets, and no organized market is immune.*** Coal and nuclear base load power are exiting -- or threatening to exit -- ISO New England, NYISO, MISO, PJM, and ERCOT. The loss of base load generation raises serious concerns about the electric reliability and fuel diversity in at least some organized markets. This is a multi-market problem in search of a solution.

***States have and continue to be creative in developing ‘around market’ solutions.*** The various state strategies fall into three camps: (1) the maintenance fee (*i.e.*, the backdoor capacity payment), (2) the prescriptive replacement capacity approach, and (3) vertical reintegration, or reregulation. Efforts to keep valuable embedded capacity afloat in the markets have thus far fallen into the first two categories, but the third category is part of the conversation.

***A policy preference for markets must consider ancillary factors.*** The policy intuition of preferring market institutions, where feasible, is sound. But that intuition must recognize the susceptibility of those market mechanisms to “taxation by regulation” and other rent-seeking pressures where the price system is sacrificed to other goals.

***Beware the simple answer, because the states appear to disagree.*** One answer to the coal and nuclear exit phenomenon is: Markets are doing exactly what they were designed to do. Coal and nuclear are exiting because they should exit. The market in the near-term signals a preference for gas and renewables. But it is clear that states are not seeing it that way, as reflected by their actions. One state with a legislative electricity policy proposal might be a one-off, but at this point it is a definite trend.

***Capacity exits are not only resulting in ‘around market’ capacity proposals, but open talk of re-regulation and against restructuring.*** Ohio utilities are openly talking about re-regulation and re-integration of the electric market, and Michigan opponents of restructuring/deregulation cite the capacity exits in organized markets as a key reason to oppose restructuring.

***A key question facing states and federal regulators is how markets work with long-lived capital assets.*** The notional quest here is for regulatory policy that creates a two-part market that sustains incentives for large capital assets to stay in and even enter the market through capacity payments, and instills the discipline and efficiency of short-term energy markets. At its best, this is what state ‘around market’ solutions are grasping for -- to give generators the ability to “earn” back their fixed investments, and avoid the perceived short-term opportunism of an energy market that does not sufficiently value that capacity.

***The tentacles of this ongoing issue affect efforts to achieve a decarbonized future.*** The exit of nuclear power from wholesale power markets has and will have ripple effects beyond just the markets themselves. These exits have impacts on existing carbon markets and will have significant impacts if the Clean Power Plan is ultimately upheld by the U.S. Supreme Court. Some states like Massachusetts can act to procure zero-emission base load power to replace existing nuclear. But for most, in the words of New York Public Service Commission Chair Audrey Zibelman, the exiting nuclear “in all likelihood will be replaced by the attributes of expanded fossil fuel base generation ... [and] [t]his will impair our ability to achieve our environmental goals.”

## I. Introduction

Base load power from coal-fired and nuclear generation is exiting wholesale power markets across the country. States, regulators, market participants and market-makers are scrambling to understand the root cause of the loss of megawatts and remedy perceived failures in organized wholesale markets.<sup>1</sup> This ongoing development has received little attention compared to the more publicized Clean Power Plan rule.<sup>2</sup> However, the fundamental issues lurking beneath these market exits may have a more significant impact on the immediate future of the electric grid -- regionally and nationally -- than does EPA regulation or any international climate agreement.

That base load power is exiting wholesale power markets is an established fact.<sup>3</sup> The question is whether this stems from a market design problem, or whether the market signal leading to these exits is efficient. Though controverted by some, there is general consensus that base load capacity and fuel diversity are inherently valuable to consumers from both an economic and reliability perspective.<sup>4</sup>

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<sup>1</sup> By “organized markets,” we mean not only the FERC regulated RTOs/ISOs, but also ERCOT in Texas, which is facing a similar dilemma.

<sup>2</sup> The Clean Power Plan was finalized by the Environmental Protection Agency (EPA) and stayed by the U.S Supreme Court. *See*, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (October 23, 2015). This issue has also received little attention as compared to the Paris Agreement coming out of the COP 21 UN climate change conference. Paris Agreement, COP 21, *available at*: <https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>.

<sup>3</sup> SNL Energy, *More than 21 GW of coal, gas and nuclear capacity 'at risk' of retirement* (2016).

<sup>4</sup> *See, e.g.*, IHS Energy, *The Value of US Power Supply Diversity*, at 5 (July 2014) (“Engineering and economic analyses consistently show that an integration of different fuels and technologies produces the least-cost power production mix....A diversified portfolio is the most cost-effective tool available to manage the inherent production cost risk involved in transforming primary energy fuels into electricity”) *available at*: <http://www.energyxxi.org/sites/default/files/USPowerSupplyDiversityStudy.pdf>

This white paper addresses that question, and explores ways to address these potential market design problems. It documents state strategies to mitigate base load power exits from wholesale power markets -- actions we term ‘around market’ solutions -- and describes the difficulties states have encountered trying to implement their responses. The determination shown by states and affected entities in crafting and supporting these ‘around market’ solutions, despite encountering barriers at almost every judicial, legislative and regulatory level, illustrates that the continued loss of base load power will remain at the forefront of energy policy.

We come to this question neither as proponents nor detractors of organized wholesale markets. As an abstract matter, where markets are workable, we favor them as better protectors of social welfare and more resistant to special interest rent-seeking than second- (or third-) best regulatory solutions. That said, market structures in network industries are inevitably fragile and depart from neoclassical models of market behavior. As Alfred Kahn observed: “[i]f competition is to work well, it requires a great variety of governmental interventions to remedy imperfections and market failures....”<sup>5</sup> Kahn, of course, also observed that deficiencies of regulation can swamp its supposed benefits.<sup>6</sup>

Thus, the purpose here is not to condemn or defend markets; rather, it is to catalog and identify a now pervasive trend of states responding to perceived market failures. One state acting to promote base load capacity can be viewed as an eccentricity. Multiple states doing so is a confirmed and growing trend. Put simply, the states are showing dissatisfaction at the outcomes from wholesale power markets as currently designed.<sup>7</sup>

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<sup>5</sup> *Deregulation: Looking Backward and Looking Forward*, 7 Yale J. on Reg. 325, 340 (1990).

<sup>6</sup> “A central part of the case for deregulation is the severe deficiencies of regulation – deficiencies of information, wisdom, and incentives, along with a strong inherent tendency to suppress competition.” *Id* at 341.

<sup>7</sup> It is also a peculiar locution to counterpose “markets” against “regulatory” wholesale structures. In truth, both organized wholesale markets and more vertically-integrated

Numerous factors contribute to the current state of play where embedded base load capacity is proving uneconomic under current market designs across the country. Capacity markets have proven inadequate to the task of keeping base load units profitable. In fully-restructured markets, where the unwinding of vertical integration is the product of legal mandates, there is severe difficulty in retaining sufficient capacity in the current resource mix. Additional intermittent wind and solar resources exacerbate the stress on wholesale markets in the near-term. Market distortions such as tax and price preferences for renewable resources ripple through the wholesale markets. Ever more stringent air quality regulation is a factor as well.

We do not pretend -- and certainly do not endeavor -- to have all the answers to this problem, which is rooted in a complex, and contradictory, web of energy policies. We do seek, however, to raise the questions and contribute to the discussion of how best to address and mitigate the problem of preserving base load power in wholesale power markets, while also considering the repercussions of this effort. To that end, this white paper describes various ‘around market’ solutions, followed by a brief synopsis of some of the impediments that these solutions have met at varying political and legal levels. It then looks at the root causes of the base load power exit issue, followed by a theoretical flight on contract theory that gets to the gist of the theoretical conundrum.<sup>8</sup> It closes by looking at how these issues interrelate with efforts to regulate carbon emissions from the power sector.

## II. The State of Play

Few, if any, restructured regions of the country

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bilateral wholesale markets partake of a great deal of regulation. The institutional means are different, but there remains a great deal of regulatory superintendence under both systems.

<sup>8</sup> The remainder of this White Paper, we hope, can be profitably read with or without this section, as a catalog of state actions and regulatory pressures. We include this section because we believe it crystallizes the regulatory policy questions and dilemma.

have proven immune to the problem discussed in this white paper. This section briefly recaps some of the exodus of base load power from markets we have seen to date and state reactions to these exits. It is followed by a discussion of ‘around market’ modules brought forward to address, retain or replace the base load resources.

### a. *An Incomplete Inventory of Base Load Power Exits*

The notion of an incomplete inventory is an oxymoron but represents reality in undertaking any effort to catalog the ongoing loss of base load power in wholesale power markets. Shutdowns of coal-fired and nuclear plants are occurring with disquieting frequency and therefore a full inventory is infeasible. With that caveat, below is a sample of recent base load power exits and announcements:

- *ISO New England.* In the ISO New England footprint, Entergy shuttered the 604 MW Vermont Yankee nuclear power plant in December 2014, relegating the facility to the annals of administrative law textbooks where it lives on in *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*.<sup>9</sup> The Pilgrim nuclear power plant will soon follow suit.<sup>10</sup> Entergy has announced the 680 MW nuclear facility in Plymouth, Massachusetts, will cease operations on May 31, 2019.<sup>11</sup>

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<sup>9</sup> Jess Bidgood, *Vermont Yankee Nuclear Plant Begins the Slow Process of Closing*, New York Times (Jan. 4, 2015), available at:

[http://www.nytimes.com/2015/01/05/us/vermont-yankee-nuclear-plant-begins-slow-process-of-closing.html?\\_r=0](http://www.nytimes.com/2015/01/05/us/vermont-yankee-nuclear-plant-begins-slow-process-of-closing.html?_r=0).

<sup>10</sup> See, e.g., David Abel, *Costs lead officials to pull the plug on Pilgrim*, Boston Globe (Oct. 13, 2015), available at:

<https://www.bostonglobe.com/metro/2015/10/13/entergy-close-pilgrim-nuclear-power-station-nuclear-power-plant-that-opened/fNeR4RT1BowMrFApb7DqQO/story.html>

<sup>11</sup> See, e.g., ISO New England, *ISO New England's Response to Pilgrim Nuclear Power Plant Retirement Request* (Oct. 31, 2015) (“When a generating resource located within New England submits a retirement request, ISO New England conducts a study to see how the retirement will affect the overall reliability of the region’s bulk power system. If the

- *NYISO*. Exelon has stated it may close the Ginna (610 MW) and Nine Mile (1,761 MW) nuclear plants in northern New York. Entergy already plans to close the FitzPatrick nuclear plant (850 MW) in the same area in 2017.<sup>12</sup> However, Exelon is in discussions with Entergy about acquiring the Fitzpatrick plant and New York has brought forward a plan to save the plants, as discussed below.
- *PJM*. In a much publicized and ongoing process, the future of select coal and nuclear plants in the PJM footprint owned by FirstEnergy and American Electric Power (AEP) Ohio remains subject to debate.<sup>13</sup>
- *MISO*. Both coal and nuclear continue to exit MISO as well. DTE Energy recently announced plans to shutter eight coal-fired units in Michigan.<sup>14</sup> Dynegy will close three coal-fired units totaling more than 1,800 MW at the Newton and Baldwin facilities in southern Illinois.<sup>15</sup>

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ISO New England study determines that power system reliability will be affected, ISO New England can ask the retiring resource to remain online. If the resource owners agree to do so, the generating resource would receive an out-of-market payment. Regardless of the outcome of the study, the ISO does not have the authority to prevent a resource from retiring”), available at: [http://www.iso-ne.com/static-assets/documents/2015/10/20151013\\_pilgrim\\_retirement\\_request.pdf](http://www.iso-ne.com/static-assets/documents/2015/10/20151013_pilgrim_retirement_request.pdf).

<sup>12</sup> Robert Walton, *New York regulators outline subsidy plan to save upstate nuclear plants*, UtilityDive (July 12, 2016), available at: <http://www.utilitydive.com/news/new-york-regulators-outline-subsidy-plan-to-save-upstate-nuclear-plants/422429/>.

<sup>13</sup> See, e.g., Ted Caddell & Michael Brooks, *All Eyes on AEP, FirstEnergy with Ohio PPAs in doubt*, RTO Insider (May 1, 2016), available at: <http://www.rtoinsider.com/aep-firstenergy-puco-ohio-ppas-25803/>.

<sup>14</sup> Robert Walton, *DTE to retire 8 Michigan coal units*, UtilityDive (June 9, 2016), available at: <http://www.utilitydive.com/news/dte-to-retire-8-michigan-coal-units/420625/>.

<sup>15</sup> Valerie Volcovici, *Dynegy to shut money-losing Illinois coal power units*, Reuters (May 4, 2016), available at: <http://www.reuters.com/article/us-usa-coal-electricity-idUSKCN0XV280>.

Environmental groups claimed credit for these closures, but the headline says it all: “Dynegy to shut money-losing Illinois coal power units.” Indeed, a Dynegy spokesperson said the closures are “all about economics, not environmental reasons.”<sup>16</sup> After the failure of legislation in Illinois to save nuclear units, Exelon announced it will close the Clinton (1069 MW) and Quad Cities (1871 MW) nuclear power plants, also in the southern part of the state for economic reasons.<sup>17</sup> And, all of this comes as MISO projects a generation shortfall of 300 MW, 800 MW, and 1.2 GW in parts of Michigan, Missouri, and Illinois, respectively.<sup>18</sup>

- *ERCOT*. In Texas, the debate continues among ERCOT, the Public Utility Commission, and other stakeholders over the creation of capacity markets to address capacity issues exacerbated by the influx of large intermittent resources in energy-only supply auctions.<sup>19</sup> Without a capacity market, utility companies are forced to make real time, seasonal decisions about their fleet. Furthermore, with current incentive structures, intermittent power supply is up, which pushes base load power

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<sup>16</sup> *Id.*

<sup>17</sup> *Exelon details plans to close Clinton and Quad Cities nuclear plants*, Chicago Tribune (June 2, 2016), available at: <http://www.chicagotribune.com/business/ct-exelon-closing-nuke-plants-0603-biz-2-20160602-story.html>.

<sup>18</sup> MISO, *2016 OMS-MISO Survey Results* (June 1, 2016), available at:

<https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Workshops%20and%20Special%20Meetings/2016/OMS-MISO%20Survey/2016OMS-MISOSurveyResults.pdf>; see also Jeffrey Tomich, *MISO survey sees Midwest generation deficit possible by 2018*,

EnergyWire (June 13, 2016) (“Within MISO, areas such as Michigan’s Lower Peninsula and eastern Missouri are expected to have capacity shortfalls of 300 and 800 MW, respectively. And southern Illinois could face a 1.2 GW shortfall. All three areas will depend on capacity imports.”)

<sup>19</sup> See, e.g., Rich Heidorn Jr., *Lawyers Take an Economics Class: Capacity Markets vs. Scarcity Pricing* (June 13, 2016), available at: <http://www.rtoinsider.com/capacity-markets-vs-scarcity-pricing-27702/>.

out of the market. For example, NRG mothballed all units at its Bertron Natural Gas Plant and Unit Five at its Greens Bayou natural gas plant, amounting in a loss of 1098 MW this summer. In addition, the Aspen Lufkin (45 MW) biomass plant has been mothballed for the summer, due to economic reasons.<sup>20</sup> Coal-fired units are impacted as well due to the influx of green energy and depressed gas prices.<sup>21</sup> CPS Energy announced that both units at the J T Deely (840 MW) power plant will be mothballed in 2018. And Luminant has been seasonally mothballing Unit 1 at its Martin Lake coal power plant since October 2015.<sup>22</sup>

#### *b. The States' Struggle for a Solution*

States are addressing the loss of base load power in creative ways. Each state action is tailored to the various interests at play in a given state and therefore is distinct. However, all these efforts amount to 'around market' solutions, or at the very least, back door capacity payments to keep -- from a state perspective -- valuable embedded capacity afloat in the markets. Despite the different state tactics, their strategies share a common goal: Each seeks to retain base load capacity in their market.

At the risk of oversimplification, the various state strategies fall into three camps:

- (1) the maintenance fee (i.e., the backdoor capacity payment);
- (2) the prescriptive replacement capacity approach; and
- (3) vertical reintegration, or reregulation.

Efforts so far have fallen into the first two categories, but the noises made about the third category appear sincere and to have staying power.<sup>23</sup>

#### 1. The 'Maintenance Fee' Module

The 'maintenance fee' model comes in many shapes, sizes, and regulatory jurisdictions. There is the state utility commission model used in Maryland, New Jersey, New York and Ohio. There is also the state legislative model, deployed unsuccessfully in Illinois. The premise of this module is simple in concept and complicated in practice.

Taking Maryland and New Jersey first, these states sought proactively to address a potential generation shortfall caused by the retirement of coal-fired generation. The U.S. Supreme Court succinctly summarizes the issue as follows:

Concerned that the PJM capacity auction was failing to encourage development of sufficient new in-state generation, Maryland enacted its own regulatory program. Maryland selected, through a proposal process, petitioner CPV Maryland, LLC (CPV), to construct a new power plant and required LSEs to enter into a 20-year pricing contract (called a contract for differences) with CPV at a rate CPV specified in its proposal. Under the terms of the contract, CPV sells its capacity to PJM through the auction, but—through mandated payments from or to LSEs—

<sup>20</sup> *Aspen can mothball Lufkin biomass power plant: ERCOT* (April 8, 2016), available at: <http://www.platts.com/latest-news/electric-power/houston/aspn-can-mothball-lufkin-biomass-power-plant-21239871>

<sup>21</sup> *The Trouble with Texas: The Lone Star State's waning coal consumption* (May 22, 2016), available at: [http://trib.com/business/energy/the-trouble-with-texas-the-lone-star-state-s-waning/article\\_98fba2c5-2f29-5847-8aa5-f6fd5e18122e.html](http://trib.com/business/energy/the-trouble-with-texas-the-lone-star-state-s-waning/article_98fba2c5-2f29-5847-8aa5-f6fd5e18122e.html). Stated by Mike Pickens.

<sup>22</sup> According to the SARA reports for 2016, while demand is low in fall and spring, Unit 1 goes offline and 805 MW leaves ERCOT's capacity. But in the summer, when demand increases, the plant is revived and contributes 805 MW to ERCOT's capacity.

<sup>23</sup> Particularly if (when) the Clean Power Plan is overlaid the wholesale markets, there will be a strong incentive for vertical reintegration. Indeed, the very architecture of the Clean Power Plan encourages such structure.

receives the contract price rather than the clearing price for these sales to PJM.<sup>24</sup>

New Jersey was implicated by the Court's consideration of the Maryland Public Service Commission's plan by virtue of having adopted a similar one. The U.S. Court of Appeals for the Fourth Circuit determined "that Maryland's scheme impermissibly intrudes upon the wholesale electricity market, a domain Congress reserved to FERC alone." The U.S. Supreme Court unanimously affirmed the appellate court decision. In rejecting Maryland's approach, the U.S. Supreme Court held "that Maryland's program sets an interstate wholesale rate, contravening the [Federal Power Act's] division of authority between state and federal regulators." The Court took specific issue with the fact that Maryland's program guaranteed CPV a rate different from the ultimate clearing price for interstate sales of capacity by PJM. This resulted in an adjustment of the interstate wholesale rate, according to the Court, and thus "invades FERC's regulatory turf."<sup>25</sup>

In Ohio, FirstEnergy and AEP Ohio sought approval from the Public Utilities Commission of Ohio (PUCO) of an income guarantee through eight-year power purchase agreements for seven coal-fired power plants and one nuclear power plant. PUCO ultimately approved the plan, noting that it effectively operated as a form of rate insurance. Customers would pay a charge through a rider if energy market prices stayed low, but would receive a credit through the rider if and when prices increased. The RRS, or retail rate stabilization rider, in essence created a capacity payment to keep certain plants producing electricity in the market. The plan and associated PUCO order attempted to stabilize rates for customers by ensuring these nine power plants continued operating.

FERC saw the Ohio proposal differently, blocking the proposal and rescinding the affiliate sales waivers for both AEP Ohio and FirstEnergy, thus subjecting them to FERC's affiliate abuse review under *Edgar*.<sup>26</sup> The two FERC orders, for now at the very least, serve to block execution of the PPAs and implementation of the PUCO order approving the 'around market' solution.

Illinois provides yet a third example of the 'maintenance fee' module. Exelon Generation and Commonwealth Edison worked with stakeholders to develop the Next Generation Energy Plan (NGEP). The NGEP was introduced this spring in the Illinois Legislature as Senate Bill 1585.<sup>27</sup> The NGEP provided for increased energy efficiency, and significant investments in solar resources and low-income energy assistance. The centerpiece of the legislation, however, was the implementation of a Zero Emission Standard (ZES). The ZES is an 'around market' solution to preserve the Clinton and Quad Cities nuclear power plants, which combined have a nameplate capacity of nearly 3 GW. The legislation would have established "make whole payments," designed to cover any shortfall between revenues and operating costs. The ZES would therefore allow these power plants to stay online. The legislation, however, failed to pass the Illinois General Assembly. Shortly afterwards, it was announced that the power plants would be closed.

This discussion illustrates that 'around market' solutions generally -- and the maintenance fee module specifically -- have encountered impediments at every level, from state legislatures to the FERC to the U.S. Supreme Court. Despite these setbacks, it is a testament to their perseverance that states remain undeterred, continue to craft solutions to preserve base load power, and have recently have gained a small measure of success.

<sup>24</sup> *Hughes, Chairman, Maryland Public Service Commission, et al. v. Talen Energy Marketing, LLC, fka PPL EnergyPlus, LLC, et. al.* 578 U.S. \_\_\_\_\_ (2016).

<sup>25</sup> *Id.*

<sup>26</sup> *Boston Edison Co. re: Edgar Electric Energy Co.*, 55 FERC ¶ 61,382 (1991).

<sup>27</sup> Senate Bill 1585, available at: <http://www.ilga.gov/legislation/BillStatus.asp?DocNum=1585&GAID=13&DocTypeID=SB&SessionID=88&GA=99>.

For example, the New York Public Service Commission (NYPSC) and Governor Andrew Cuomo continue to advance a proposal to keep three New York nuclear power plants online through its Clean Energy Standard (CES). The CES was approved by the NYPSC on August 1, 2016 and establishes a system of zero emission credits (ZECs) through 2029.<sup>28</sup> The price is fixed for the first two years and then will be reviewed every two years through 2029. The value of ZECs -- and by extension the payments to the nuclear facilities -- are calculated based upon the social cost of carbon developed by EPA,<sup>29</sup> as opposed to being based on the difference between prices NYISO and the cost of service of the facilities. Based on this calculation, ZECs are worth \$17.48/MWh for the first two years of the program for a total of approximately \$965 million in these two years.<sup>30</sup> The Fitzpatrick, Ginna, and Nine Mile facilities are included in the plan, though there is a plan in place to close Fitzpatrick unless Exelon acquires the plant.<sup>31</sup>

Former EPA Administrator Carol Browner (now a spokesperson for Nuclear Matters) has pointed to the NYPSC action as a blueprint for other states to keep nuclear online.<sup>32</sup> Exelon has

unsurprisingly been very supportive of the CES but recently expressed concern that the implementation of the ZEC system beyond 2019 appears to be conditioned on the closing of the Fitzpatrick facility. Exelon has sought clarification on this issue from the NYPSC.<sup>33</sup>

In any event, the NYPSC is charging forward, notwithstanding the PUCO result at FERC or the Maryland (and by extension New Jersey) setback at the U.S. Supreme Court. Speculation regarding legal challenges is underway, with groups such as the National Energy Marketers Association arguing the ZEC system is contrary to the U.S. Supreme Court decision in *Hughes v. Talen*.<sup>34</sup> Others reading the Court's decision more narrowly believe the ZEC system may be upheld.<sup>35</sup> But challenges may come before the NYPSC, New York courts, FERC, or all three. Exelon, among others, acknowledges that the challenges are coming.<sup>36</sup> Indeed, an owner of small hydropower facilities in New York has already sought rehearing before the NYPSC, asserting in part that "[a]n unexplained sharp departure from the Commission's prior orders supporting a competitive electricity market is *per se* arbitrary and capricious under New York administrative law."<sup>37</sup>

<sup>28</sup> Hannah Northey, *N.Y. Oks ambitious climate plan to boost renewables, nuclear*, Greenwire (Aug. 1, 2016).

<sup>29</sup> EPA, Social Cost of Carbon Fact Sheet, available at: <https://www3.epa.gov/climatechange/Downloads/EPAactivities/social-cost-carbon.pdf>.

<sup>30</sup> William Opalka, *New York Adopts Clean Energy Standard, Nuclear Subsidy*, RTO Insider (Aug. 1, 2016), available at: <http://www.rtoinsider.com/new-york-clean-energy-standard-nuclear-subsidy-29816/>.

<sup>31</sup> The Exelon acquisition was conditioned on implementation of the CES. Following the NYPSC order approving the CES, Exelon stated "those negotiations can continue now that the CES has been approved, providing an opportunity to prevent the plant from being shut down." Robert Walton, *With Clean Energy Standard, New York looks to save nukes, skirt legal challenges*, UtilityDive (Aug. 4, 2016).

<sup>32</sup> Bill Loveless, *Nuclear power gets a boost in New York*, USA Today (Aug. 2, 2016) (quoting Browner as stating "New York has been able to figure out a way to both create all of the important opportunities for renewables, like wind and solar, and for energy efficiency, but also keep existing nuclear plants on-line. That's very helpful to states as they think about these issues.")

<sup>33</sup> Saqib Rahim, *New York: Exelon balks at state's reactor subsidy condition*, EnergyWire (Aug. 23, 2016).

<sup>34</sup> Keith Goldberg, *NY Nuke Plant Subsidies Will Likely Face Legal Battle*, Law360 (Aug. 2, 2016), available at: <http://www.law360.com/environmental/articles/824211/ny-nuke-plant-subsidies-will-likely-face-legal-battle>.

<sup>35</sup> *Id.* ("Stinson Leonard Street LLP partner Harvey Reiter says the key sentence in Justice Ginsburg's opinion might actually be the last one: 'So long as a state does not condition payment of funds on capacity clearing the auction, the state's program would not suffer from the fatal defect that renders Maryland's program unacceptable .... That's very narrow, and I think the state would argue that there's nothing in their program that would fund generators for clearing the auction,' Reiter said.")

<sup>36</sup> Jeffrey Tomich & Saqib Rahim, *Exelon girds for challenges to Cuomo's N.Y. nuclear subsidy*, EnergyWire (Aug. 19, 2016).

<sup>37</sup> Saqib Rahim, *Challenge looms for state's clean energy standard*, EnergyWire (Aug. 24, 2016). According to EnergyWire, other renewable developers are also sending signals of dissatisfaction with the outcome. *Id.* ("Some comments in response to the July staff proposal suggested to



Similarly, in Ohio, utilities have come back to the PUCO with a modified proposal, with FirstEnergy and AEP Ohio now joined by Dayton Power & Light (DPL).<sup>38</sup> The new proposals are devised to keep the proposed bill riders within the PUCO's jurisdiction and avoid the previously encountered issues with FERC.

Generally speaking, the bill riders are designed to involve adjustments only to retail rates in an effort to keep the proposals in front of the PUCO. Moreover, the modified proposals have a more limited scope. For example, First Energy's proposal involves 2580 MW of coal and nuclear power, compared to 3300 MW under the RRS. AEP Ohio's scope is even more limited, dropping from 3100 MW under the initial proposal to 440 MW under the current proposal. In addition, AEP Ohio's proposal involves only noncompetitive units. Finally, DPL has added six coal-fired power plants totaling 2200 MW to the mix. The PUCO has yet to rule on these requests, and environmental groups may bring the proposals before FERC again. In any event, 'around market' solutions remain very much alive in Ohio as the state and its utilities grapple with the viability of capacity under current market rules.

The current state of play in Ohio and New York illustrate that states remain focused on addressing the issue of how to retain base load power in organized markets despite the U.S. Supreme Court and FERC rebukes of around market solutions generally.

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us that advocates for other non-GHG-emitting electricity generating resources may wish to contend that they are unfairly left out of the nuclear zero emissions credit program and should qualify for the same or comparable ZEC due to similar environmental attributes,' Timothy Fox, vice president at ClearView Energy Partners LLC, said by email.")

<sup>38</sup> Robert Walton, *Eyeing FERC end-run, Ohio utilities keep pressing state regulators to support old plants*, UtilityDive (July 26, 2016). In the meantime, FirstEnergy posted a \$1.1 billion loss for the second quarter, due in large part to costs tied to five of the coal units included in the original proposal. Robert Walton, *Plagued by uneconomical coal plants, FirstEnergy posts \$1.1B Q2 loss*, UtilityDive (Aug. 1, 2016).

## 2. The Prescriptive Replacement Module

State legislatures also appear poised to continue to develop 'around market' solutions through legislative prescription. In this module, the state legislature intervenes to prescribe a replacement capacity mix to fill the void created by base load power exits. Replacement of zero emission electricity is also a consideration in this legislation to allow for or contribute to compliance with existing or prospective carbon markets.

For example, the Massachusetts General Court, the commonwealth's legislature, is moving forward with an approach that differs from the maintenance fee module but is an 'around market' solution nevertheless. Massachusetts provides the most pertinent, ongoing example of the prescriptive replacement module. The legislature recently passed H. 4568.<sup>39</sup> Gov. Charlie Baker signed the bill into law on August 8, 2016.<sup>40</sup> The new law will result in procurement of increased amounts of clean energy, with a specific emphasis on offshore wind (1600 MW) and hydroelectric power and other renewables (1200 MW).<sup>41</sup>

The timing of this legislation coincides with the Vermont Yankee closure and the pending closure of Pilgrim. H.4568 procures zero emission replacement capacity to substitute for exiting base load, zero emission power from nuclear plants. The legislature and the governor are reacting to the incongruences between the wholesale power market (in this case ISO New England) and the

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<sup>39</sup> H. 4568, *available at*:

<https://malegislature.gov/Bills/189/House/H4568>.

<sup>40</sup> Andrew Smith, *Mass. governor signs bill requiring utility contracts for hydro, offshore wind*, SNL (Aug. 8, 2016).

<sup>41</sup> See Robert Walton, *Massachusetts passes mandates for storage and 2.8 GW of offshore wind*, hydro, UtilityDive (Aug. 2, 2016); Emily Holden, *Mass. lawmakers pursue ambitious clean energy bill*, ClimateWire (July 5, 2016); see also Herman K. Trabish, *A 'transformational' mandate: Greens hail Massachusetts offshore wind, renewables bill*, UtilityDive (August 3, 2016) ("The other important energy procurement in the bill is for 9.45 TWh of 'clean energy generation.' It can come in three forms: hydroelectric generation, renewable resources, or renewables 'firmed-up' with hydro in blended contracts.")

carbon trading market (in this case the Regional Greenhouse Gas Initiative (RGGI)).

Facing a base load power exit and restrictions imposed by a carbon cap, Massachusetts has scrambled to find base load power that can replicate the zero emission attributes of nuclear power, which explains the emphasis on imported hydropower. H. 4568 exemplifies the ongoing and strenuous efforts by state legislatures to determine a replacement capacity mix that works within the confines (e.g., carbon markets) applicable to a particular state. Yet critics have claimed the new law “is the single biggest step away from a competitive electric market ever undertaken in New England” and forces utilities into above market prices for more than one third of Massachusetts’ electricity needs.<sup>42</sup>

### 3. The Reintegration Module

The reintegration module has not yet been pursued in earnest, but it is important to consider as a potential avenue for market participants or states that see it as the only remaining option to halt the exit of base load power. Ohio has been the focal point for this discussion. AEP Ohio and FirstEnergy have discussed the possibility of reintegration, or reregulation. On an earnings call after FERC stymied the PPAs approved by the PUCO, AEP CEO Nick Akins stated that AEP “will advocate for legislation in Ohio that would reregulate generation in the state or provide a mechanism for AEP Ohio to own and develop generation assets, including the plants included in the PPA and renewables.”<sup>43</sup> FirstEnergy echoed the possibility of reregulation in a Securities and Exchange Commission filing.<sup>44</sup>

Moreover, utilities in Michigan, where restructuring has been on the table, have seized on this issue to buttress their argument against deregulation (*i.e.*, a full restructuring of the Michigan electric market). Indeed, a Consumers Energy spokesperson recently stated that “Consumers Energy, DTE Energy and our allies here have been pointing out the dangers and concerns about electric deregulation for quite some time. Ohio’s abrupt reversal is really a poster child for why electric deregulation is a failed experiment and why states are returning to the safer and more predictable harbors of electric regulation.”<sup>45</sup>

It remains to be seen whether reintegration or reregulation will be pursued in Ohio, but AEP appears intent on bringing forward legislation in November that would transfer its generation assets from its de-regulated side to AEP Ohio, resulting in a partial reregulation of the Ohio electric market.<sup>46</sup> In discussing the potential legislation on

<sup>45</sup> Andy Balaskovitz, *Michigan utility says Ohio ‘bailouts’ make case against deregulation*, Midwest Energy News (Apr. 12, 2016), available at: <http://midwestenergynews.com/2016/04/12/michigan-utility-says-ohio-bailouts-make-case-against-deregulation/>.

<sup>46</sup> Tom Knox, *AEP to pursue partial restructuring of Ohio’s energy market*, Columbus Business First (July 28, 2016). AEP CEO Nick Akins provided more details regarding the potential legislation in the Q2 earnings call: “With FERC’s order essentially taking the Ohio PPA proposal approved by the Ohio commission of the table, which I discuss last quarter, AEP is addressing the situation by pursuing restructuring in Ohio. Note this is restructuring, not reregulation. Our proposal for legislation is now being discussed with various stakeholders and involves the ability or transfer existing generation and invest in new generation such as natural gas and renewables by AEP Ohio. The proposed legislation strikes a balance between our ability to invest and maintain generation in the state and the customers’ ability to choose generation suppliers. This overall process would allow AEP Ohio to move forward with the transition of generation resources in a responsible way that would benefit the State of Ohio and AEP and its customers. The legislation would address any potential FERC jurisdictional matters while allowing the state to take control of its own resources as well as any transition envisioned under initiatives such as the [C]lean [P]ower [Plan].” AEP Q2 Earnings Call Transcript, available at: <http://seekingalpha.com/article/3992877-american-electric-powers-aep-ceo-nick-akins-q2-2016-results-earnings-call-transcript?part=single>.

<sup>42</sup> Andrew Smith, *Mass. governor signs bill requiring utility contracts for hydro, offshore wind*, SNL (Aug. 8, 2016) (quoting Dan Dolan, president of the New England Power Generators Association).

<sup>43</sup> Ted Caddell & Michael Brooks, *All Eyes on AEP, FirstEnergy with Ohio PPAs in doubt*, RTO Insider (May 1, 2016),

<sup>44</sup> *Id.*

a July 28, 2016 earnings call, AEP CEO Akins pointed to market design issues as creating the need for the legislative fix:

I want to look at PJM website, [pjm.com](http://pjm.com)[,] to review the generation mix of the peak during the warm days we have been experiencing lately. The vast majority of capacity at the time of the peak is delivered by coal and nuclear resources that are not valued properly in the market construct. Moreover, these markets do not take in[to] account the other issues that are of State concern[] such as placing the generation, balance[d] portfolios, jobs, taxes and other state issues.<sup>47</sup>

The potential Ohio legislation is not full reregulation by any stretch, and the ultimate path taken may depend on the disposition of the most recent proposals by FirstEnergy, AEP Ohio, and DPL. But FirstEnergy made no secret of the potential for reregulation, albeit indirectly, in its July 29, 2016 earnings call, and CEO Chuck Jones stated as follows:

At this time ... we do not see any short-term solutions to the current challenging market situation. Longer-term, we do not believe competitive generation is a good fit for FirstEnergy and are focused [on] regulated operations. And we cannot put investors and our company at risk as we wait for the country and PJM to address the issues with the current construct. We will continue to seek opportunities both within the competitive realm and the states to further de-risk the business and convert megawatts from competitive markets to a regulated or regulated-like construct. In particular, we will monitor legislative efforts to maintain important base load generation in various states,

<sup>47</sup> AEP Q2 Earnings Call Transcript, available at: <http://seekingalpha.com/article/3992877-american-electric-powers-aep-ceo-nick-akins-q2-2016-results-earnings-call-transcript?part=single>.

including Ohio and New York .... As I've stated many times, FirstEnergy's earnings are now more than 80% regulated and our long-term goal is to operate as a fully-regulated utility company. We continue to expect our Competitive segment to be cash flow positive each year through 2018 and our generation team continues to look for cost savings given the current environment .... At the fossil fleet, market conditions will influence our capital investments, with current conditions favoring limited investments. *We do not intend to infuse additional equity into our Competitive business in order to support credit ratings.*<sup>48</sup>

The mere fact that reregulation is in the discussion illustrates that it is a realistic module -- perhaps one of last resort but a module nevertheless -- for states grappling with how to retain base load power in the market.<sup>49</sup> Further, as the earnings call statements indicate, capital threatens to sit on the sidelines of restructured markets until a more inviting environment develops.

### III. Root Causes of the Need for Around Market Solutions

State policy is reacting to a long-term problem. To sustain adequate capacity and hedge against price volatility, states in essence are coming up with 'around market' schemes notionally to enter

<sup>48</sup> FirstEnergy Q2 Earnings Call Transcript, available at: <http://seekingalpha.com/article/3993404-firstenergy-fe-charles-e-jones-q2-2016-results-earnings-call-transcript?part=single> (emphasis added).

<sup>49</sup> There is a fourth reaction happening *in markets*; namely, the proposal to add a capacity component to the energy-only ERCOT power auctions. The addition of capacity auctions with ERCOT has been controversial at the Public Utility Commission of Texas (PUCT) for some time. The Texas debate is worthy, especially in light of the mothballing of base load capacity within ERCOT and consistent demand growth in the same market. See, e.g., Sonal Patel, *ERCOT: Uncertainty Increased in 10-Year Outlook*, POWER Magazine (May 5, 2016). To date, proponents of a capacity auction have not been successful, but the issue is not going away.

into long-term capacity supply agreements with generators. It reflects a belief that prized capacity is not being valued in the short-term, and needs to be supported by a fixed capacity payment to keep the resources in the market. A final, but not plainly stated, concern is that the price system in the organized markets, and hence the ultimate market equilibrium, is distorted by intermittent resources and the subsidy conferred by the Production Tax Credit and the Investment Tax Credit.<sup>50</sup> Against this complicated backdrop, there are some broad threshold questions to address in the policy realm:

- Should the FERC be concerned at state ‘around market’ action?
- Are states developing creative solutions in the best interests of ratepayers, or are these rent-seeking proposals masquerading as state-level market solutions?
- Are current market institutions compatible with the initiatives pushed by environmental regulators to reduce carbon emissions from the power sector and Congressional action to create incentives for the deployment of intermittent resources?
- Can markets operate efficiently when the price system is manipulated by regulators and tax policy to achieve other social outcomes?

The policy intuition of preferring market institutions, where feasible, is sound. But that intuition must recognize the susceptibility of those closely-regulated market mechanisms to “taxation by regulation”<sup>51</sup> and other rent-seeking pressures. And whether the current problems amount to a market failure or a regulatory failure is beside the point. The fact that states are responding to perceived wholesale market inadequacies is the salient issue.

<sup>50</sup> Markets where the price system is sacrificed for some exogenous value (e.g., universal service, renewable energy), even if that value is “good,” suffer from inevitable distortions that skew outcomes and invite arbitrage.

<sup>51</sup> Richard A. Posner, “Taxation by Regulation,” 2 *Bell Journal of Economic and Management Science* 22 (1971).

The fundamental problem is not new to network industries: it is a short-term/long-term problem of large capital assets. The short-term marginal cost of energy production in the markets is being set by natural gas and, at times, renewable resources like wind and solar. These prices are not sufficient to keep coal and especially nuclear economically viable.<sup>52</sup> Hence, that capacity exits. Markets, in their logic and design, can be remorseless toward sunk costs. Further, the energy markets may or may not yield rents sufficient to build new capital assets, or, as we are seeing, sustain current capital assets.

One answer to the capacity exit phenomenon is simple: Markets are doing exactly what they were designed to do. Costly coal and nuclear are retiring because they are too expensive. The market in the near-term is signaling that a system of natural gas and renewables clears the auction and meets demand. But it is clear that states are not seeing it that way, as reflected by their actions. States are offering various ‘solutions’ to those problems. A single state with a legislative electricity policy proposal might be a one-off, but at this point it is a definite trend across the restructured markets that states think the “market” outcomes are sub-optimal. With the potential overlay of the Clean Power Plan, these pressures will only get more severe. How the FERC, the markets and the states respond will determine what market mechanisms, if any, survive the capacity exodus.

#### IV. Contracts and the Market Dilemma

A key question facing states and federal regulators -- related to the ongoing base load power exits -- is one of how markets work with long-lived capital assets. Traditionally, the whole electric system was regarded as an integrated “natural monopoly” where a single provider could most efficiently supply all demand. Later, as

<sup>52</sup> See, e.g., Rich Heidorn Jr., *Grid Execs Talk Cybersecurity, Renewables*, RTO Insider (Apr. 18, 2016) (addressing negative pricing in ERCOT and MISO and quoting ERCOT CEO Bill Magness as stating “[w]e’re seeing hours of negative pricing across the system in a way that’s relatively new. It used to be more isolated in the west zone.”)

regulatory errors compounded and the minimum efficient scale for generation declined, a consensus emerged that market mechanisms could work in electric power, with benefits to customers and overall efficiency.

Thus, two notional poles exist on how generation might work or, said another way, how expensive, long-lived generation assets can be (or whether they should be) supported.<sup>53</sup> First, customers and the generator could enter into a long-term contract covering the expected life of the asset, with some open terms for operations and maintenance of the plant and fuel costs. A generator in this long-term contract model had certainty of recovery of fixed costs; customers had certainty of long-term power supply. This is the traditional “regulatory compact” model, which was the favored institutional model until some remarkable failures lead to its rejection in certain regions of the country.

At the opposite pole, instead of long-term contracts where the generator is assured of fixed cost recovery, a short-term energy spot market could be used, wherein all generators competitively bid in their energy and the market clears based on expected demand. This model uses competitive forces to enhance efficiency and hold rates low. It allocates business risk away from captive customers, as the regulatory compact model does, and toward the investors in generation.

Both regulatory failure and market failures have occurred at these poles. The regulatory compact model frayed in some places during the 1970s and early-1980s when spectacular malinvestment in nuclear units drove significant rate increases and certain utilities into

bankruptcy.<sup>54</sup> By the same token, the California energy crisis at the turn of the century and the design failure in wholesale markets that prohibited long-term capacity contracting and invited strategic manipulation gave markets a black eye that stopped further restructuring in its tracks.<sup>55</sup> Each pole of institutional design thus has its potential error costs and failures. This is because it is, quite simply, difficult to figure out how to pay for and maintain large capital assets over an extended time period. And incentives for opportunism – by regulators, customers and generators – abound. The goldilocks solution, where capacity is maintained in just the right amount, while the benefits of competitive markets are preserved, has proven elusive. This is particularly so when intermittent resources become such a large part of the market outcome.<sup>56</sup>

The present situation of base load exits, and state ‘around market’ solutions, represents an attempt to cover the fixed costs of large generation because markets will not. To be sure, some markets (e.g., PJM, NYISO, ISO-NE) have capacity auctions as well, but they are still short-term as compared to the decades-long lives of nuclear and coal units.

The notional quest here for regulatory policy then is to create a two-part market that sustains incentives for large capital assets to stay in and

<sup>54</sup> See, e.g., Frank Graves et al., *Rate Shock Mitigation*, Edison Electric Institute (June 2007) (prepared by The Brattle Group).

<sup>55</sup> See, e.g., James L. Sweeney, *The California Electricity Crisis: Lessons for the Future*, at 1, Stanford University (“California’s experience in electricity deregulation cast a pall on movements towards deregulation throughout the United States.”)

<sup>56</sup> For example, MISO has over 11,000 MW of wind in service and an additional 7,000 MW moving through the interconnection process. MISO, Renewable Energy Home Page, available at: <https://www.misoenergy.org/WhatWeDo/StrategicInitiatives/Pages/Renewables.aspx>. ERCOT has nearly 16,000 MW of wind installed according to its 2015 State of the Grid Report. See ERCOT, 2015 State of the Grid Report, at 22 (2015), available at: [http://www.ercot.com/content/news/presentations/2016/2015\\_StateoftheGridReport.pdf](http://www.ercot.com/content/news/presentations/2016/2015_StateoftheGridReport.pdf).

<sup>53</sup> One other solution to the natural monopoly/capital asset support problem is public ownership. Public power supplies around 14% of the customers in the U.S., and was the predominant ‘answer’ in Europe. Public ownership comes with its own set of institutional strengths and hazards that we do not need to address here.

even enter the market through capacity payments, and instills the discipline and efficiency of short-term energy markets. At its best, this is what state ‘around market’ solutions are grasping for -- to give generators the ability to “earn” back their fixed investments, and avoid the perceived short-term opportunism of an energy market that does not sufficiently value that capacity.

## V. Climate Overlay and Carbon Market Effects

As a final point, the exit of nuclear power from wholesale power markets has and will have ripple effects beyond just the markets themselves. These exits have impacts on existing carbon markets and will have significant impacts in the event that the Clean Power Plan is ultimately upheld by the U.S. Supreme Court, lifting the stay that is currently in effect.

In the Massachusetts law discussed above, we see one approach to addressing the exit of nuclear power: Prescribe the acquisition of new zero emission energy and take steps to ensure some portion of this new zero emission energy provides base load power. However, Massachusetts is uniquely situated in its ability to access hydropower, a replacement resource that (1) has no net emissions and (2) is able to serve as a base load resource. The new law is not without controversy, as previously discussed. New England Power Generators Association Inc. argues that this legislation puts two additional nuclear reactors in New England (Connecticut’s Millstone plant owned by Dominion Resources and the Seabrook plant in New Hampshire owned by NextEra Energy Resources) at risk of closure due to the potential increased renewable mandate that may be enacted as part of the bill.<sup>57</sup> These are the last two nuclear reactors online in New England, and create the possibility that the law will fill the zero

emission base load energy hole in part, but also create a regional emission deficit if these nuclear facilities outside of Massachusetts close as a result.

The Massachusetts situation illustrates the overlap between wholesale power markets and carbon markets. Contrary to the notion that organized markets and carbon markets are somehow invisible to one another, actions taken in one market necessarily spill over into the other market. For example, the Pilgrim nuclear unit provides 84 percent of the zero emission power in Massachusetts.<sup>58</sup> If the power provided by Pilgrim were replaced with gas-fired generation, it could result in a carbon emissions increase of approximately 2 million metric tons annually.<sup>59</sup> Given the RGGI cap is becoming more stringent, this creates a carbon market compliance problem unless there is another source of zero emission, base load power, such as nuclear or hydropower.

Many states and utilities do not have access to such replacement resources. Take Illinois, where a different conversation is underway. The replacement capacity for the Quad Cities and Clinton nuclear plants will come from fossil fuels, but which *type* of fossil fuel remains subject to debate. MISO predicts that gas-fired generation will backfill the lost base load power, while a study conducted by the Illinois Legislature estimated that the replacement capacity mix would be made up of 80 percent coal, 12 percent gas, and 8 percent renewables.<sup>60</sup> Exelon believes the “overwhelming majority” of replacement capacity will come from fossil fuels, though the utility has

<sup>57</sup> Jonathan Crawford, *Renewable Power Push Threatens Last Two Reactors New England Reactors*, Bloomberg (July 14, 2016) available at: <http://www.bloomberg.com/news/articles/2016-07-14/renewable-power-push-threatens-last-two-new-england-reactors>.

<sup>58</sup> David Abel, *Costs lead officials to pull the plug on Pilgrim*, Boston Globe (Oct. 13, 2015).

<sup>59</sup> Katie Woods, *Don’t Close Pilgrim Nuclear Power Station*, The Enterprise (Apr. 18, 2014), available at: <http://www.enterpriseneews.com/article/20140418/news/140416119>.

<sup>60</sup> Jeffrey Tomich, *Do at-risk Exelon reactors matter for Ill. compliance?*, ClimateWire (June 20, 2016); Illinois Commerce Commission, et al. *Potential Nuclear Power Plant Closings in Illinois: Impacts and Market-Based Solutions*, at 119 (Jan. 5, 2015) (Response to the Illinois General Assembly Concerning House Resolution 1146).

not put percentages around coal-fired generation versus gas-fired generation.<sup>61</sup>

In New York, the NYPSC appears to take a similar view. In approving the Clean Energy Standard (increasing the renewable standard to 50 percent and also providing for the nuclear payments discussed above), NYPSC Chair Audrey Zibelman stated “[i]f these plants close abruptly, they in all likelihood will be replaced by the attributes of expanded fossil fuel base generation. This will impair our ability to achieve our environmental goals.”<sup>62</sup> The NYPSC further quantified what would be necessary to replace the zero emission generation provided by the three nuclear plants at issue:

[I]t is not realistic to assume that sufficient additional renewable resources at a reasonable price or perhaps any price could be identified and implemented in sufficient time to offset the 27.6 million MWh of zero-emissions nuclear power per year. *For example, replacing all the 27.6 Million MWh of zero-emission energy with renewable resources would require 9,000 MW of onshore wind or 22,000 MW of solar deployment.* It is virtually impossible to deploy this magnitude of resources in the short-term.<sup>63</sup>

Deploying coal or gas as replacement capacity is a very different discussion than importing hydropower or massive renewable buildouts. Further, it becomes an even different conversation in a Clean Power Plan compliance world, where a significant uptick in carbon emissions will accompany the replacement capacity of nuclear regardless of whether it is coal, gas, or some combination thereof. To that point, FERC Commissioner Tony Clark recently enunciated his

concerns about the complex overlay of regional power markets and state efforts to meet Clean Power Plan requirements:

I think that there are definitely some threats to the proper functioning of markets, and a lot of that stems from the rub between how FERC has traditionally thought of markets, which is over a broader region, but having markets operated within the context of states being required on a state-by-state basis [to] plan for carbon emissions.<sup>64</sup>

Faced with carbon compliance issues (either now or post-Clean Power Plan) caused by resource decisions driven by dynamics in the wholesale power markets, states may look to the closure of the Diablo Canyon nuclear facility in California as a replacement capacity template. Under the Joint Proposal<sup>65</sup> crafted by Pacific Gas & Electric (PG&E), labor unions, utility workers and environmentalists, the utility will bring forward an electricity portfolio for approval by the California Public Utilities Commission that consists of renewables, energy efficiency, and energy storage (as well as a renewable portfolio standard commitment of 55 percent by 2031) to replace the Diablo Canyon generation. The Joint Proposal was formally filed with the California Public Utilities Commission on August 11, 2016.<sup>66</sup> This mixture of clean energy and distributed energy resources will overcome, according to PG&E, the 18,000 GWh generation gap created by the closure.<sup>67</sup> Moreover, per the terms of the Joint

<sup>64</sup> Eric Wolff, *Politico Morning Energy* (Aug. 9, 2016), available at: <http://www.politico.com/tipsheets/morning-energy/2016/08/gop-epa-chiefs-endorse-clinton-215782>.

<sup>65</sup> Joint Proposal, available at: <https://www.pge.com/includes/docs/pdfs/safety/dcpp/JointProposal.pdf>.

<sup>66</sup> PG&E, *PG&E, Labor and Environmental Groups File Diablo Canyon Joint Proposal with the CPUC* (Aug. 11, 2016), available at:

[https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20160811\\_pge\\_labor\\_and\\_environmental\\_groups\\_file\\_diablo\\_canyon\\_joint\\_proposal\\_with\\_the\\_cpuc](https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20160811_pge_labor_and_environmental_groups_file_diablo_canyon_joint_proposal_with_the_cpuc).

<sup>67</sup> Herman K. Trabish, *Anatomy of a nuke closure: How PG&E decided to shutter Diablo Canyon*, UtilityDive (July 7, 2016), available at:

<sup>61</sup> Jeffrey Tomich, *Do at-risk Exelon reactors matter for Ill. compliance?*, ClimateWire (June 20, 2016).

<sup>62</sup> William Opalka, *New York Adopts Clean Energy Standard, Nuclear Subsidy*, RTO Insider (Aug. 1, 2016).

<sup>63</sup> Order Adopting a Clean Energy Standard, at 127, Case Nos. 15-E-0302 & 16-E-0270 (Aug. 1, 2016).

Proposal, any replacement resource must be greenhouse gas (GHG) free, and “[a]ny resource procurement PG&E makes will be subject to a non-bypassable cost allocation mechanism that ensures all users of PG&E's grid pay a fair share of the costs.”<sup>68</sup>

The regulatory circumstances surrounding Diablo Canyon are different than many other nuclear retirements in the organized markets. However, setting these differences aside, the Joint Proposal provides a template for zero emission or “GHG free” replacement capacity proposals that could be adopted by state legislatures or state regulators. Further, Joint Proposal parties that are active in other jurisdictions, and stakeholders observing the outcome in California, will likely look to export the tenets of the Joint Proposal to other regions where base load nuclear is at risk. This may be a particularly attractive path in areas subject to carbon regulation but without easy access to zero emission replacement capacity like Massachusetts. A Diablo Canyon-like solution may look like the next best option.

## VI. Conclusion

There are only two established facts on the base load power exit issues. First, the exit of base load coal and nuclear power from wholesale power markets is happening and continues to happen, raising serious questions about electric reliability in organized markets. Second, states continue to develop ‘around market’ solutions despite the setbacks encountered at the FERC and the U.S. Supreme Court, using these outcomes as guidance to craft policies that provides incentives for base load power to remain in the markets. Of note are the recent and dramatic state efforts in Massachusetts, New York and Ohio. Uncertainties

abound, with the key question being why this is happening with increased frequency -- and as with all things policy, it depends who you ask.

The NYPSC’s ZEC system and the retooled proposals pending before the PUCO in Ohio represent the next frontiers as we watch whether any ‘around market’ solutions will survive or whether they will be rebuffed by the FERC, the courts, or another tribunal. Or perhaps the New York and Ohio programs will result in broader action to come up with a comprehensive solution, given that no region is proving immune to this problem. And these base load power exits cannot be viewed in a vacuum. Nuclear exits create compliance problems with any future carbon regulations unless states have access to another source of zero-emission base load power. For states that do not, the Diablo Canyon-style proposal (prescriptive renewable replacement capacity) or significantly increasing renewable portfolio standards to drive increased renewable energy adoption may be pursued as a quick fix. But it is too early to tell whether those approaches will further exacerbate the base load exits problem.

In sum, in our view the impulse to bailout nuclear alone is not the right response to this problem. Rather, stakeholders and policymakers need to develop institutional market structures that value and pay for carried capacity and account for reliability and diversity in the fuel mix. If such mechanisms cannot be developed, then ‘around market’ solutions will continue, with legislative resource plans or one-off, fuel-specific administrative bailouts becoming increasingly popular and attractive. But if regulatory and legal obstacles continue to foreclose these legislative or administrative actions, then the only remaining option is to vertically reintegrate. The momentum towards this result in Ohio should not be set aside as anomalous; rather, if ‘around market’ solutions continue to be impeded, reregulation may represent the rule rather than the exception and could cause the entire edifice of organized markets to crumble.

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<http://www.utilitydive.com/news/anatomy-of-a-nuke-closure-how-pge-decided-to-shutter-diablo-canyon/421979/>.

<sup>68</sup> PG&E External Communications, *In Step With California’s Evolving Energy Policy, PG&E, Labor and Environmental Groups Announce Proposal to Increase Energy Efficiency, Renewables and Storage While Phasing Out Nuclear Power Over the Next Decade*, News Release (June 21, 2016).



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