



Monitoring  
Analytics

## **Statement**

# **Establishing Nuclear Diversity Certificate Program**

**Bill No. 5330**

**Before the New Jersey Senate  
Environment and Energy Committee  
and the Assembly Telecommunications  
and Utilities Committee**

Joseph Bowring

The Independent Market Monitor for PJM

December 20, 2017

This page intentionally left blank.

I am the Independent Market Monitor for the PJM wholesale power markets. I do not speak for PJM. The role of the independent market monitor (IMM), as defined by FERC and included in the PJM tariff, is to help ensure that the PJM markets are competitive by proposing market rules that incent competition, by monitoring for the exercise of market power and by reporting on the markets to regulators and market participants. I support efficient, competitive wholesale power markets which bring clear benefits to customers as well as to suppliers of power.

The PJM Interconnection, L.L.C. (PJM) operates a centrally dispatched, competitive wholesale electric power market that, as of June 30, 2017, had installed generating capacity of 183,089 megawatts (MW) and 1,007 members including market buyers, sellers and traders of electricity in a region including more than 65 million people in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.

New Jersey and PSEG chose competition and markets over cost of service regulation in 1996 and 1997 as the new PJM markets were established and filed with the Federal Energy Regulatory Commission (FERC). New Jersey and PSEG chose competition and markets in order to reduce costs for New Jersey customers because competition would be more effective than regulation in ensuring efficient outcomes and providing incentives for innovation. In markets, investors take the risks associated with investing in and operating generating plants and investors receive the profits associated with investing in and operating generating plants. In markets, investors make the decisions about which generating plants to build and which generating plants to retire, based on market incentives.

The goal of competition in the wholesale power markets is to provide customers wholesale power at the lowest possible price, but no lower. The PJM markets work. The PJM markets bring customers the benefits of competition. The PJM markets have worked for New Jersey customers and generation owners. But the PJM markets face new challenges that threaten the viability of competitive markets, including the threat of subsidies to existing units. The proposed bill would create such a subsidy.

A benefit of competitive power markets is that they are dynamic, flexible and resilient. The PJM market has resulted in a reliable system despite significant changes in underlying market forces. Technical innovation and significantly lower gas costs have been key market forces. In PJM, there have been substantial unit retirements and there has been substantial new market entry as a result of market forces. In New Jersey, there have been both unit retirements and new market entry based on market signals. The PJM market design has worked flexibly to address both market exit and entry without preferences for any technologies. The result of new entry has been lower costs and increased reliability.

Particularly in times of stress on markets and on some generating technologies, nonmarket solutions may appear attractive. Top down, integrated resource planning approaches are tempting because it is easy to think that experts know exactly the right mix and location of generation resources and the appropriate definition of resource diversity and the appropriate definition of reliability and therefore which technologies should be favored through exceptions to market rules. Subsidies are tempting because they maintain existing resources and provide increased revenues to asset owners in uncertain markets. Cost of service regulation is tempting because guaranteed rates of return and fixed prices may look attractive to asset owners in uncertain markets.

But once the decision is made that market outcomes must be fundamentally modified, it will be virtually impossible to return to markets. The subsidy model is inconsistent with the PJM market design and constitutes a significant threat to PJM markets.

The issue of external subsidies continued to evolve in 2017. The Ohio subsidy proceedings and the Illinois ZEC subsidy proceeding originated from the fact that competitive markets result in the exit of uneconomic and uncompetitive generating units. The Illinois ZEC subsidy remains subject to legal challenge. The proposed subsidies in the proposed New Jersey legislation for specific PSEG nuclear plants are the latest proposed intervention in the PJM markets. Regardless of the specific rationales offered by unit owners, the proposed solution for all such generating units has been to provide out of market subsidies in order to retain such units. These subsidies were not requested to accomplish broader social goals. Broader social goals can all be met with market based mechanisms available to all market participants on a competitive basis and without discrimination.

The proposed legislation in New Jersey to subsidize specific nuclear power plants would result in a market intervention that would have a negative impact on PJM's competitive wholesale power markets and would provide subsidies to units that have not demonstrated that they are not financially viable.

Nuclear and coal plants face strong competitive pressures in the PJM markets as a result of low gas prices and efficient combined cycle units, including new combined cycle units in New Jersey. But there is no evidence that PSEG's nuclear plants are uneconomic and facing a retirement signal from the PJM markets. A plant is economic if it covers the annual expenditures required to operate the unit because it is more profitable to continue to operate the plant than to shut it down.

The proposed subsidies are a response to the success of the competitive PJM markets. Competition has resulted in low prices in PJM. Prices are not too low in PJM. There is no market design problem that requires subsidies.

In a market, investment and retirement decisions are made solely by private investors. PSEG has indicated that management may decide to shut down Hope Creek or Salem or both plants because management, on behalf of shareholders, does not believe that the units are economic and will not be economic in the future. PSEG has indicated that they

would like New Jersey customers to subsidize these plants by paying approximately \$300 million per year to PSEG and its shareholders. PSEG has not explained why it is in customers' interest to subsidize uneconomic plants when it is not in its shareholders' interests.

Standard economics indicates that units receive a retirement signal from the market when revenues are not high enough to cover annual costs, called operating costs or going forward costs. There is no evidence that the PSEG plants face a retirement signal from the PJM markets.

The results for nuclear plants are very sensitive to small changes in PJM prices. In 2016, PJM prices were at the lowest level since the introduction of competitive markets on April 1, 1999. As a result, in 2016, PSEG's nuclear plants fell short of covering annual avoidable costs, based on IMM analysis that relies entirely on public data for transparency.<sup>1</sup> The analysis includes a conservatively high estimate of annual avoidable costs from the Nuclear Energy Institute (NEI) based on NEI's calculations for a sample of nuclear plants.<sup>2</sup> The annual costs are for 2016 and include 100 percent of NEI's annual capital expenditures, which likely exceeds actual expenditures at Hope Creek and Salem. For example, NEI's capital expenditures include historical expenditures to meet regulatory requirements that resulted from reviews based on the accident at the Fukushima nuclear plant in Japan, for example.

PSEG's nuclear plants covered their annual avoidable costs on average over the last five years (2013 through 2017) by an excess of \$1.4 billion even when 100 percent of NEI's capital expenditures are included (Table 3).<sup>3</sup> In 2016, PSEG had a shortfall of \$81 million, or less than six percent of the \$1.4 billion excess.

Table 1 shows PJM energy prices (LMP), capacity prices (BRA), and annual operating and capital costs over this period.

---

<sup>1</sup> Actual operating costs and capital expenditures for Hope Creek and Salem are confidential.

<sup>2</sup> Operating costs from: Nuclear Energy Institute (August, 2017) "*Nuclear Costs in Context*," <<https://www.nei.org/CorporateSite/media/filefolder/Policy/Papers/Nuclear-Costs-in-Context.pdf?ext=.pdf>>

<sup>3</sup> The NEI costs for Hope Creek and Salem were both treated as those associated with a two unit configuration because all three units are located in the same area. The reported results are based on public data including LMP, capacity market prices and cost data from the Nuclear Energy Institute (NEI). 2017 results use average LMP for the relevant plant locations for 2017 through December 16, 2017.

**Table 1 Prices in PJM energy and capacity markets and annual costs**

	Average DA LMP (\$/MWh)						BRA Capacity Price (\$/MWh)					2016 NEI Costs (\$/MWh)		
	ICAP	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	Fuel	Operating	Capital
Salem	2,332	\$37	\$52	\$32	\$23	\$26	\$8	\$8	\$6	\$6	\$5	\$7	\$19	\$6
Hope Creek	1,161	\$37	\$52	\$32	\$23	\$26	\$8	\$8	\$6	\$6	\$5	\$7	\$19	\$6

Table 2 shows the total dollars received by PSEG for Salem and Hope Creek compared to the operating and capital costs by year for the five year period.

**Table 2 Annual surplus (shortfall)**

	Surplus (Shortfall) (\$/MWh)					Surplus (Shortfall) (\$)				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Salem	\$14	\$28	\$7	(\$3)	(\$1)	\$289,037,627	\$569,924,502	\$146,626,759	(\$54,079,207)	(\$19,939,739)
Hope Creek	\$14	\$28	\$7	(\$3)	(\$1)	\$144,218,269	\$284,065,809	\$73,414,398	(\$26,730,762)	(\$9,668,261)
Total	\$28	\$56	\$14	(\$5)	(\$2)	\$433,255,896	\$853,990,310	\$220,041,157	(\$80,809,969)	(\$29,608,000)

Table 3 shows the total surplus in excess of annual costs received by Hope Creek and Salem over this five year period.

**Table 3 Total surplus**

	Total Surplus (\$)
Salem	\$931,569,941
Hope Creek	\$465,299,452
Total	\$1,396,869,394

The results for Hope Creek and Salem are sensitive to LMP and to the factors that affect LMP. For example, 2018 capacity market prices are higher than 2017 capacity market prices by \$2.58 per MWh. This known increase in revenues will be received by Hope Creek and Salem and will reduce or eliminate any shortfall against annual costs. This known increase in revenues would result in Hope Creek and Salem covering their annual costs in 2018 even if LMP decreased by as much as \$1.60 per MWh. Gas prices are volatile and have a direct impact on PJM energy market prices. In 2014 for example, higher gas prices in the winter for a relatively short period resulted in a significant increase in net revenues and in a surplus over annual costs for Hope Creek and Salem. Market revenue was higher in 2017 to date than in 2016 by \$1.67 per MWh, resulting in a shortfall of only \$0.95 per MWh in covering annual costs. Even in 2016, prices were just \$2.65 per MWh short of covering annual costs.

Even if New Jersey wants to subsidize these nuclear plants in order to guarantee that the plants cover their avoidable costs including incremental capital expenditures, the proposed bill is not an effective way to accomplish that objective. The proposed subsidy is \$10.00 per MWh which is well in excess of the shortfall in 2016 (almost four times higher than the \$2.65 per MWh shortfall). The bill does not include a clear definition of the need for a subsidy. The bill states that the need for a subsidy is based on: “the nuclear power plant is cash negative on an annual basis, or alternatively is not covering its costs including its cost of capital on an annual basis...” (page 5, lines 45-47). “Cash

negative” can be interpreted as not covering annual going forward costs. Not covering its cost of capital is a significantly different standard, is vague as written, and would result in a significantly higher defined need for a subsidy, although PSEG has not calculated the required subsidy under this standard. Not covering its cost of capital is equivalent to reintroducing cost of service regulation under which customers guaranteed investors full recovery of costs including returns. Not covering its cost of capital is not the test for whether a unit is at risk for retirement.

The bill does not provide for reductions in the subsidy amounts if PJM market prices increase. As a result, there is the opportunity for PSEG to receive windfall profits when PJM market prices increase, as would occur during cold weather as a result of higher gas costs.

The bill does not provide that PSEG would pay back to customers the subsidy payments that resulted in recovery in excess of costs. The subsidy is not symmetric. Customers would pay PSEG when PSEG is not making enough but PSEG would keep 100 percent when PSEG is making more than its annual costs. As a result of the lack of clear definitions and lack of symmetry the bill is likely to result in significant overpayments to PSEG and payments in excess of the level needed to reverse any short run retirement signal received from the market.

If New Jersey wants to ensure that Hope Creek and Salem do not receive a retirement signal, the level of subsidy should be defined to equal the difference between all market revenues and annual costs including incremental capital expenditures on an annual basis and the subsidy should be subject to an after the fact true up based on verified actual costs.

The same conclusions about subsidies apply whether the New Jersey plants are economic or uneconomic. The proposed subsidy solutions ignore the opportunity cost of subsidizing uneconomic units. Such subsidies suppress energy and capacity market prices and therefore suppress incentives for investments in new, higher efficiency thermal plants but also suppress investment incentives for innovation in the next generation of energy supply technologies and energy efficiency technologies. These impacts are large and long lasting.

Subsidies are contagious, as this legislation illustrates. If subsidies are provided to one generating plant, this will suppress prices for all generating plants and create a need for additional subsidies for the remaining units. Competition in the markets will be replaced by competition to receive subsidies. Subsidies to economic units are simply a way to increase prices to individual plants at the expense of customers, with no impact on the operational status of the units.

There is no reason to intervene in the markets in order to provide reliability and resilience. If PJM or FERC or the U.S. DOE identify a need for greater reliability, it can be addressed using market mechanisms.

Competitive markets were introduced as an alternative form of regulation to ensure that wholesale power is provided to customers at the lowest possible price. The PJM markets are working. The PJM markets provide competitive, reliable and resilient outcomes. The PJM markets should be permitted to continue to work in New Jersey and across the entire PJM market. Subsidies will not result in the lowest prices for customers in New Jersey. Competition has resulted in the lowest possible prices for customers in New Jersey and will continue to result in the lowest possible prices for customers in New Jersey unless the growing trend of providing subsidies is permitted to undermine competition.