



M E M O R A N D U M

Date: April 20, 2017
To: OMA Energy Group (OMAEG)
From: John Seryak, PE (RunnerStone, LLC)
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RE: Analysis of SB 128/HB 178 – Zero-Emissions Nuclear (ZEN) Credit Program

Senate Bill 128 (SB 128) and a companion bill, House Bill 178 (HB 178), were recently introduced in the Ohio General Assembly. SB 128/HB 178 propose to change Ohio’s policy regarding electricity generation resources. Ohio’s current policy regarding electricity resources states:

“Ensure diversity of electricity supplies and suppliers, by giving consumers effective choices over the selection of those supplies and suppliers and by encouraging the development of distributed and small generation facilities.”

SB 128/HB 178 would alter state policy, mandating the operation of nuclear generation, even if it is inefficient or more costly in the competitive market:

- Nuclear generation technology would be given special status that no other technology enjoys, as it would be state policy to specifically ensure “diversity of ... resources, including zero-emissions nuclear resources.”
- The state would no longer limit itself to ensuring diversity through choice and encouragement, but instead would encourage diversity by recognizing “the need for nuclear energy resources.”
- State policy would also be changed to ensure diversity of, and recognize need for, a more generalized category of electricity resources that provide “fuel diversity and environmental and other benefits.”

SB 128/HB 178: Zero-Emission Nuclear Credits

- ZEN = Attributes of 1 MWh nuclear generation
- Cost: approx. \$300 million/yr, for 16 years or \$4.8 billion total
- Allows and needs out-of-state ZEN credits to meet mandates
- Shifts state policy from support for competitive markets to specific generator “need”
- Limits customer intervention at PUCO
- Would cost a small manufacturer \$90,000 over 16 years
- Would cost large, intensive manufacturer \$90 million over 16 years

In brief, the state’s current policy of diversity through choice, encouragement, and elsewhere mentioned innovation and access, establishes competitive market conditions for electricity generation. SB 128/HB 178 would seriously infringe upon this market policy by dictating a “need” for nuclear technology, and opening the door to a “need” for other unspecified technologies that meet fuel diversity, environmental, and “other” benefits.

SB 128/HB 178 also set forth how the state would meet the new policy goal of recognizing a need for



nuclear generation. Broadly speaking, SB 128/HB 178 create a Zero-Emissions Nuclear Credit mechanism, or ZEN credits, which would be bought from Ohio's nuclear generators, as well as generators operating out of state, and paid for by some of Ohio's customers.

Details of the ZEN credit mechanism:

- ZEN credit definition: A ZEN credit would equal the “attributes” associated with one megawatt hour (MWh) of nuclear generation. “Attributes” is not defined, but presumably refers to emissions attributes, meaning the lack of emission pollutants. However, attributes could extend to include other environmental externalities of electric generation that may someday be priced in, such as water use or spent fuel storage.
- ZEN credit price: SB 128/HB 178 mandate that the initial price of a ZEN credit be \$17, and that the PUCO should periodically adjust the price for inflation.
- ZEN credit quantity: The number of ZEN credits to be purchased will equal 1/3 of a distribution utility's customer load, provided that the distribution utility has a qualified nuclear resource within its certified territory. Additionally, if that distribution utility is owned by a holding company, which in turn owns other distribution utility companies in Ohio, all of that holding company's Ohio distribution utilities would be required to participate in the ZEN credit program. In plain terms, this would include all three of FirstEnergy Corp.'s distribution companies (Cleveland Electric Illuminating, Toledo Edison, Ohio Edison), but not AEP Ohio, DP&L, or Duke. The total annual distribution load of the FirstEnergy Ohio distribution utilities is approximately 54 million MWh, resulting in a requirement to purchase about 18 million ZEN credits.
- ZEN credit program duration: The ZEN credit program could last for 16 years (eight 2-year terms).
- ZEN credit cost: The customers of the FirstEnergy Ohio distribution utilities would be required to purchase 18 million ZEN credits at a price of \$17 per ZEN, totaling ~\$300 million per year (plus any increases for inflation). The cost to Ohio ratepayers over the 16 years term of the program would be at least \$4.8 billion.
- ZEN credit availability, Out-of-state ZEN credits: Ohio's two nuclear power plants, Davis-Besse and Perry, fall short of producing 18 million ZEN credits per year. In fact, according to the U.S. Energy Information Administration, not once has nuclear generation in Ohio produced 18 million MWh since 2001.
 - In the most recent 5 years, Ohio nuclear plants produced on average 16.7 million MWh. Thus, an additional 1.3 million ZEN credits would need to be purchased from out-of-state nuclear resources. If the production trend continues, Ohio customers would consistently send \$21.5 million each year to out-of-state nuclear resources.
 - In 2003, nuclear generation in Ohio fell to approximately 8.5 million MWh. In such a year, Ohio would spend approximately \$160 million on out-of-state ZEN credits.

- SB 128/HB 178 further amends the state policy to extend long-term “environmental and ‘other’ benefits” to the region, not just the state.
 - Nuclear plant eligibility: SB 128/HB 178 provide remarkably specific criteria around which power generating resources are eligible.
 - In and Out-of-State Eligibility: Importantly, separate definitions exist for “in-state nuclear energy resources,” and for “all other nuclear energy resources.” Hypothetical Environmental Baselines: In-state nuclear resources would be eligible by comparing the emissions of the nuclear plant to that of “the predominant electric generation source ... as of the time the resource commenced operation.” The impact of those hypothetical emissions would assume “the then predominant electric generation source” was located in the exact same place as the nuclear plant. The intent of this provision seems to be to compare the emissions impact of nuclear plants not against what would currently likely replace the nuclear plants – a mix of natural gas, renewable energy, and energy efficiency, all sited at different locations – but instead against 30-40 year old generation technology, which was likely predominantly inefficient coal-power plants with high emissions. This would have the effect of bolstering the alleged environmental benefits to the region of nuclear technology, but would be wholly untethered to reality.
 - ZEN program process:
 - SB 128/HB 178 dictates that financial data and statements submitted by nuclear plant owners desiring to sell ZEN credits to Ohio customers would not be made public.
 - ZEN program cost recovery would be collected from customers of FirstEnergy’s Ohio electric distribution utilities through a non-bypassable rider.
 - The FirstEnergy Ohio distribution utilities would also be allowed to recover “indirect” costs that are not defined.
 - The cost of the ZEN program would be limited to a 5% increase on the total retail electric bill paid by any one customer. However, the FirstEnergy Ohio distribution utilities are allowed to defer any costs incurred over the cap, add interest, and recover from customers over a subsequent 12-month period.
 - The PUCO would have only 50 days to designate a nuclear plant as an eligible nuclear resource, or any nuclear resource that applies would be automatically eligible. Since presumably out-of-state nuclear resources could be eligible, and there are specific environmental requirements for all nuclear resources, the list of participating plants is not obvious, and could be open to challenge based on the requirements SB 128/HB 178 set forth. However, it is unlikely a robust process could take place at the PUCO within 50 days. Thus, even out-of-state nuclear plants could receive de facto eligibility without the full review of the PUCO and intervening stakeholders.
 - Transfer of ZEN eligibility to other companies:
 - If a current nuclear plant owner sells or transfers its nuclear power plant, the amount of ZEN credits purchased from the transferred nuclear resource would be reduced by half of the net proceeds otherwise available from the resource’s known obligations. The
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language is not clear and seems to blend concepts--the level of required ZEN credits for subsequent periods is reduced by proceeds that the seller would otherwise receive from the credits in past period. It also appears that even with this reduction, the requirement for the Ohio distribution utilities to purchase ZEN credits equal to 1/3 of their load remains, implying that Ohio customers would simply need to purchase more out-of-state ZEN credits.

Impact on Manufacturers

The ZEN credit program costs would currently be limited to FirstEnergy’s Ohio customers, even though SB 128/HB 178 clearly state that the benefit of the program is to the “region.” The table below shows the annual and 16-year impact to small, medium, large, and extra-large manufacturers located in the service territories of the FirstEnergy Ohio distribution utilities. The total cost, annually and for the full term, is shown, as well as the portion of the cost that could go to out-of-state nuclear plants. A small manufacturer could pay approximately \$91,000 extra over the 16-year term, whereas a large manufacturer with significant local employment could pay approximately \$9 million extra, and an extra-large manufacturer could pay over \$90 million extra over the course of the ZEN program.

Manufacturer Size	Consumption (kWh/year)	Annual			16-year Term		
		In-State ZEN Cost	Out-of-State ZEN Cost	Total ZEN Cost	In-State ZEN Cost	Out-of-State ZEN Cost	Total ZEN Cost
Small (~\$100k/yr in electricity costs)	1,000,000	\$ 5,383	\$ 284	\$ 5,667	\$ 86,130	\$ 4,537	\$ 90,667
Medium (~\$600k/yr in electricity costs)	7,500,000	\$ 40,373	\$ 2,127	\$ 42,500	\$ 645,974	\$ 34,026	\$ 680,000
Large (~\$6 million/yr in electricity costs)	100,000,000	\$ 538,312	\$ 28,355	\$ 566,667	\$ 8,612,985	\$ 453,682	\$ 9,066,667
Extra Large	1,000,000,000	\$ 5,383,116	\$ 283,551	\$ 5,666,667	\$ 86,129,851	\$ 4,536,816	\$ 90,666,667