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MEMORANDUM

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To: Ohio Manufacturers' Association – Energy Group

From: John Seryak, PE (RunnerStone, LLC)

Kim Bojko, Energy Counsel for the OMAEG (Carpenter, Lipps, & Leland)

RE: Analysis of H.B. 381 – Zero-Emissions Nuclear (ZEN) Credit Program

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House Bill 381 (HB 381), recently introduced in the Ohio General Assembly, proposes 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."*

But HB 381 would alter this 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."

HB 381: Zero-Emission Nuclear Credits

- ZEN = Attributes of 1 MWh nuclear generation
- Cost: greater than $100 million/yr, for at least 12 years, or more than $1.2 billion total
- Allows 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 ~$60,000 through 2030
- Would cost large, intensive manufacturer $500,000 through 2030

HB 381 is very similar to the previous legislation (Senate Bill 128 and a companion bill, House Bill 178), which required electric distribution utilities to purchase Zero-Emissions Nuclear (ZEN) credits that would be bought from Ohio's nuclear generators, as well as generators operating out of state, and paid for by Ohio's customers in FirstEnergy's service territories. HB 381 provides for the following modifications from prior versions:

- HB 381 modifies the duration of the ZEN program and cost recovery from customers,

guaranteeing that the program and cost recovery continue for at least 12 years, through 2030, with an opportunity for the General Assembly to extend after receiving a report from the PUCO in 2029.

- HB 381 clarifies that the credits are first allocated to each distribution utility, and then the distribution utility collects revenues from all of its customers through a non-bypassable rider in the amount associated with its allocation of the ZEN credits.
- HB 381 more clearly explains how the state of Ohio (PUCO) operates the program as a middle man in order to transfer ZEN credits and funds from an unregulated nuclear generator to a regulated distribution utility. The modifications in the bill are an attempt to create the illusion that FirstEnergy's customers are not subsidizing FirstEnergy's unregulated affiliate that owns nuclear generation (FES) to avoid any FERC scrutiny over such affiliate transaction.
- HB 381 deletes the cost cap included in the prior version of the bill and sets the rider rates similar to those in the OVEC legislation. Residential customers will be charged $2.50/month and non-residential customers will be charged the lesser of 5% of the customer's total bill or $3,500/month. There is no indication of whether the 5% calculation is referencing a customer's total annual bill or total monthly bill, which could affect the customer's monthly charge. The distribution utility may adjust these rider amounts downward if a lower rate would still allow full recovery of the cost associated with obtaining the ZEN credits that the utility is required to purchase. With this change, the deferral was eliminated.
- HB 381 also appears to have deleted recovery of indirect costs associated with the purchase of the ZEN credits.
- HB 381 removed the PUCO review of the program in years 6 and 11 and a recommendation as to whether the program should continue. Thus, the program is guaranteed to collect revenues associated with ZEN credits for 12 years, through 2030, with an opportunity to extend.

HB 381 sets forth how the state would meet the new policy goal of recognizing a need for nuclear generation by creating ZEN credits purchased from nuclear generators for distribution utilities and paid for by some Ohio 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 mandates that the initial price of a ZEN credit be $17.00, 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.

- ZEN credit program duration: The ZEN credit program, including cost recovery from customers, will last for at least 12 years and there is an opportunity for the General Assembly to extend that period.
- ZEN credit cost: The customers of the FirstEnergy Ohio distribution utilities would be required to purchase 18 million ZEN credits at a price of $17.00 per ZEN, totaling ~$300 million per year (plus any increases for inflation). The cost to Ohio ratepayers over the 12-year term would be at least $3.6 billion without a cost cap, though with the cost cap, the costs would still likely result in over $1 billion for the 12-year term.
- 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 US 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. Because the cost cap would limit annual cost to consumers by a magnitude greater than the out-of-state potential, it is not clear how the PUCO will decide which nuclear resource, be it in-state or out-of-state, would receive the subsidies.
    - 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.
- HB 381 further amends the state policy to extend long-term "environmental and 'other' benefits" to the region, not just the state.
- Nuclear plant eligibility: HB 381 provides 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:
    - HB 381 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 for at least 12 years.
    - The non-bypassable rider for non-residential customers will be set at the lesser of 5% of the customer's total bill or $3,500/month. This may be adjusted downward if a lower rate would still allow the distribution utilities to collect the full amount associated with the ZEN credits allocated to the distribution utility.
    - The PUCO would have only 50 days to designate a nuclear plant as an eligible nuclear resource after the resource files a written notice, or any nuclear resource that notifies the PUCO would be automatically eligible. Interested stakeholders may file comments within 20 days after the notice is filed. 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 HB 381 sets 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 defacto 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 allocated to the distribution utilities from the transferred nuclear resource would be reduced by half of the dollar amount of any net proceeds otherwise available from the resource's known obligations. It 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.

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Impact on Manufacturers

The collection of revenues associated with ZEN credits would currently be limited to FirstEnergy's Ohio customers, even though HB 381 clearly states that the benefit of the program is to the "region." The table below shows the annual and 12-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 $60,000 extra over the 12-year term, where as a large manufacturer with significant local employment could pay approximately $500,000 extra over the course of the ZEN program.

		Annual		12-year Term	
Manufacturer Size	Consumption (kWh/year)	Total ZEN Cost	With Cost Cap	Total ZEN Cost	With Cost Cap
Small (~$100k/yr in electricity costs)	1,000,000	$ 5,667	$ 5,000	$ 68,000	$ 60,000
Medium (~$600k/yr in electricity costs)	7,500,000	$ 42,500	$ 33,750	$ 510,000	$ 405,000
Large (~$6 million/yr in electricity costs)	100,000,000	$ 566,667	$ 42,000	$ 6,800,000	$ 504,000
Extra Large	1,000,000,000	$ 5,666,667	$ 42,000	$ 68,000,000	$ 504,000