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Hearing on Senate Bill 128 – Zero Emissions Nuclear (ZEN) Program
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Chairman Beagle and members of the Committee, my name is Jamie Beier Grant and I am Director of the Ottawa County Improvement Corporation, which serves as the lead economic and workforce development agency for the county. I appreciate the opportunity to give you my perspective on Senate Bill 128 and the importance of preserving Ohio's nuclear generation fleet.

My testimony today centers around what I believe are the three most compelling reasons nuclear deserves a future in Ohio's energy generation portfolio – economic impact, environmental benefits, and energy resilience.

Economic Impact

As I shared in the House Public Utilities Committee public hearing on May 16, I know much has already been shared by other interested parties regarding the economic impact that FirstEnergy's nuclear plants contribute to the local, regional and statewide economy. Specific to the Davis Besse Nuclear Power Station, located in Ottawa County and

Northwest Ohio, the plant represents 600 full-time employees with an annual total payroll of \$60million. Davis Besse's 600 full-time jobs stimulate another 2,100 jobs in Ottawa County and 1,800 additional jobs in other Ohio industries (a 3:1 ratio of downstream impact). That \$60million of total annual payroll also flows downstream into every aspect of northern Ohio's economy – residential property ownership, support of local public school districts, professional services, construction and trades, retail, etc. In a 2015 Nuclear Energy Institute report of Davis Besse's economic impact, NEI found that for every dollar of output generated from Davis Besse, our local economy produces \$1.66 in output and the state economy produces \$2.25 in output.

Looking at the 600+ employees working daily at the plant site, it is true that employees at FirstEnergy nuclear facilities are extremely well educated and highly skilled – it is necessary to safely and efficiently operate these facilities. Engineers, electricians, nuclear navy service members, reactor operators, and security specialties give perspective on the level of education and experience necessary to work in a nuclear power generating facility. These employees undergo rigorous background checks, and maintain a drug-free and alcohol-free workplace...nuclear plant employees are the best of the best in my opinion. And, in an environment today where it is a constant struggle to find employees able to pass drug tests, the ability of these nuclear plants to ensure a drug-free and alcohol-free workplace is exceptional. In addition, Veterans of every branch of the military make up close to 50% of Davis Besse's workforce. It's because of these skill sets and experience that Davis Besse is in the top quartile for the most efficiently run nuclear facilities in the nation.

And these education and skill levels make nuclear workers extremely marketable and mobile in the workforce. That's great for those individuals if these plants were to close as they can re-engage in the workforce quickly, however because of this mobility, the likelihood they stay in our region or state is severely diminished. Meaning an even further erosion of our tax base. For comparison, the Brattleboro Development group in

the State of Vermont has predicted and tracked the impact of the recent closure of the Vermont Yankee plant and presented a report in October 2016 entitled “When People and Money Leave (and the Plant Stays)”. Brattleboro Development, through a REMI analysis, has seen a reduction in employment at the Vermont Yankee site from 550 employees to 318 employees at the end of 2016. This reduction has led to a reduction in tax base “output” as they refer to it of \$380million in the course of one year (from \$493million in output to \$113million). By the year 2020, employment will further be reduced from 318 to 126 employees with an output reduction estimated to leave only \$69million in tax base. By the year 2021, employment will be down to a shell of 24 employees with annual output of just \$5million. That’s a reduction from \$493million in output to \$5million in just 6 years. For a county of 42,000 people like mine, these numbers are gut-wrenching. And the impact that Davis Besse’s closure will have on other industry sectors in Ottawa County (which is comprised mostly of small businesses that rely on community resident spending) will be enormous. Furthermore, at the former Zion Nuclear Plant in Illinois the community saw an increase in property taxes from 8% when the plant was operational to 22% when it closed.

With more than 30 years of operational output capacity left in Davis Besse and Perry, how can we even consider allowing the northern Ohio community to experience similar degradation in our economy over a 5 year window like Vermont Yankee? How will Ottawa County’s economic base and tax base even face a fighting chance of rebounding in time to prevent similar devastation?

As I stated earlier, I know much has been shared of the economic impact Ottawa County would be faced with should Davis Besse close. However, these numbers are real and they are devastating to face as a small community. And as a state, Ohio ranks 2nd nationally in businesses supporting the nuclear supply chain. So the impact will be felt far beyond just Ottawa County.

Environmental Impact

The Zero Emissions Nuclear (ZEN) Program legislation before you today looks to recognize the environmental benefits that nuclear power generation sustains, and place a monetary value on those benefits. As you are aware, operations of both Davis Besse and Perry nuclear plants prevent substantial emissions of CO₂, SO₂, NO_x and particulate matter, compared to the alternatives of natural gas and coal-fired generation that would replace nuclear output.

Going back to the Vermont Yankee plant, the US Energy Information Administration has tracked CO₂ emission levels in the state since Vermont Yankee closed less than three years ago. Since its closure, the Administration has seen a 2.5% increase in the CO₂ emissions in the state. Whether this increase is directly attributed to the plant's closure and loss of zero emission generated power or not can likely be debated and I do not deny that, but the irony of this recorded increase draws merit to the value of zero emissions generating facilities, especially since New England had been following a decade of declines in CO₂ emissions prior to the Vermont Yankee plant closure.

Gordon van Welie, President of ISO New England (the New England Interconnection) states in the article, "Closure of Vermont Yankee Nuclear Plant Boosted Greenhouse Gas Emissions in New England" found on MassLive.com that "putting a price on carbon could be the most efficient way to reduce greenhouse gasses while preserving competitive markets" especially since he anticipates a similar effect on CO₂ emissions once a second nuclear plant, Pilgrim, is slated to close in 2019.

According to the Brattle Group analysis recently commissioned by my organization and several others, eliminating nuclear from Ohio's portfolio would result in an estimated increase of 12,600 GWh of gas and 4,300 GWh of coal to replace nuclear power generation, likely leading to a rise in air emissions in our state.

Energy Resilience

The third, and final perspective important to the overall discussion of preserving Ohio's nuclear generation fleet is in regards to energy resilience. From a statewide perspective regarding preserving Ohio's nuclear fleet, I firmly believe this energy resilience piece is key to Ohio's future energy policy.

Once a nuclear plant closes, it does not reopen. It can't ramp back up when supply is low and demand is high. Its base load generation attributes make nuclear plants 24 hours a day, 7 days a week, 365 days a year steady producers of power. They don't depend on the sun shining, the wind blowing, or the gas pipeline flowing. Nuclear plants maintain anywhere from 18 – 24 months of fuel supply onsite. They don't ramp up or down, they're always there providing stability and resiliency to the grid. When the polar vortex hit Ohio a few years back, gas supply in pipelines were to be diverted away from gas plants and industry to serving the residential customer needs first. Nuclear generation did not have this issue.

If you look at City-Data.com, and search the Top 101 cities with the lowest average sunshine amounts in cities with populations 50,000+, all of the Top 101 cities are concentrated in the Great Lakes region and the State of Washington. CurrentResults.com reports a 50% average annual sunshine in Ohio's major metropolitan cities. Nuclear generation does not worry about when the sun shines.

And if you look at the US Department of Energy's National Renewable Energy Laboratory (NREL) "Wind Resource Map", Ohio's wind productivity falls into the bottom two categories of production (anywhere between 500 kWh/year to less than 350 kWh/year). Nuclear generation does not worry about when the wind blows. And yet, even though Ohio falls into some of the lower producing states in solar and wind, Ohio

provides notable renewable energy credit subsidies to the solar and wind industry at the cost of Ohio ratepayers. But there is no recognition or value placed on the base load, reliability or resilience attributes of generation like nuclear.

On March 30, 2017, PJM Interconnection issued a report entitled “PJM’s Evolving Resource Mix and System Reliability” that evaluated the “changing resource mix in PJM given environmental regulations, the preponderance of low-cost natural gas, the increasing penetration of renewable resources and demand response, and the potential for retirements of nuclear power resources” (p. 1). The report further looked to answer questions concerning whether the evolving energy resource mix is “resulting in a loss of diversity that will lead to future reliability problems” (p. 1). Within this context, PJM stakeholders are diving deeper into the impact of coal-fired generation retirements and the threat of nuclear generation retirement and whether the system is losing too many base load generation resources and whether the PJM system is, or could become, so dependent on natural gas or renewables that operational reliability is adversely impacted.

The PJM Interconnection report notes several items of particular interest to nuclear plants:

- Resource diversity can be considered a system-wide hedging tool that helps ensure a steady and reliable supply of electricity;
- Energy portfolios with the least amount of generation diversity had the lowest composite reliability indices and were deemed “at risk” for underperforming in key generator reliability attributes (to sum it up, all your eggs in one basket is risky business);
- A marked decrease in operational reliability exists in portfolios with significant increases in wind and solar capacity; and heavy reliance on natural gas-fired resources present increased concerns over uncertainties associated with stable gas supply capabilities (going back to the polar vortex example); and,

- Fuel diversity alone does not ensure reliability – types of generation ensure reliability – for example, nuclear facilities’ 18-24 month onsite fuel supply helps ensure reliability.

Moving forward, PJM comments “operations, market compensation and regulatory structures may need to shift to ensure that adequate levels of generator reliability attributes are maintained in future resource mixes”.

To that note, on April 14, 2017 Secretary of Energy Rick Perry ordered a review of the U.S. electrical grid, aiming to ascertain whether policies to boost renewable energy are fast-tracking the retirement of coal and nuclear, and threatening the erosion of base load power capacity and overall power reliability. The review will also assess whether the wholesale power markets adequately value the reliability attributes of base load coal and nuclear plants.

All of these issues, I believe, have been major factors leading states like New York and Illinois to pass legislation supporting continued operations of nuclear facilities, with Connecticut, Pennsylvania and New Jersey also considering similar legislation, in addition to Ohio.

The abundant growth in the natural gas market has obviously played a major role in shaping the supply and pricing environment in Ohio. But natural gas is a finite resource. Once it’s gone, it’s gone. And unfettered access to the natural gas supply we are extracting across the U.S. isn’t guaranteed. Private companies control the extraction and destination of the supply – consumers don’t control where the gas ends up. Forbes Magazine notes, “For U.S. gas producers, being able to export to the world is as vital as new domestic pipelines that can send gas to higher hub price points...the idea being to reach higher value markets.” Where will this leave consumers and domestic natural gas prices? We can predict where it will go, but cannot know for sure.

Keeping nuclear a part of Ohio's energy generation portfolio retains reliability in the overall generation landscape and helps provide stability to our overall market that residential, commercial and industrial customers expect.

Conclusion

I want to thank the committee for the opportunity to provide testimony today on Senate Bill 128. This is a complex issue that isn't solely a FirstEnergy issue, or an Ohio issue, or a regional grid issue. This is clearly a broad national issue that deserves time to evaluate and get right. I have equated this issue to peeling back the layers of an onion – the more layers you peel back, the more layers you discover exist.

I am not an expert. I do not know what the immediate pathway should be, but what I do feel very strongly about is the fact that nuclear power has an absolute place in Ohio's energy generation portfolio. From an economic impact perspective, an environmental perspective and an energy resiliency perspective, nuclear needs to remain a part of the pie.

I support any legislation that can be implemented in the State of Ohio to provide a bridge to the broader solution, to recognize the complete value of nuclear, and preserve these critical economic drivers of Ottawa County, northern Ohio, and the State of Ohio.

Thank You.