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The Third Attempted Bailout of FirstEnergy's Uncompetitive Nuclear Power Plants: House Bill 6 is a threat to Ohio's economic future

House Bill 6
Opponent Testimony

Before the
Ohio House Energy and Natural Resource Committee
Subcommittee on Energy Generation
Representatives Dick Stein and Michael O'Brien, Co-Chairs

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The findings, conclusions, and recommendations expressed in this testimony are mine alone and do not represent the views of The Ohio State University, the John Glenn College of Public Affairs, or the Ohio Manufacturing Institute

Ohio House Energy and Natural Resource Committee
Subcommittee on Energy Generation

Chairman Stein, Chairman O'Brien and members of the Natural Resource Committee's Subcommittee on Energy Generation, thank you for providing me with an opportunity to speak in opposition to House Bill 6. My name is Ned Hill. I am Professor of Economic Development at The Ohio State University's John Glenn College of Public Affairs and a member of the university's Ohio Manufacturing Institute. Today's testimony is mine alone and does not represent the views of The Ohio State University, the John Glenn College of Public Affairs, or the Ohio Manufacturing Institute.

I am an economist and have worked on economic development policies in general, and on issues that affect Ohio's manufacturing sector in particular, for nearly thirty-four years. I am interested in the performance electricity markets in Ohio and have testified on my findings before the Public Utilities Commission of Ohio (PUCO) and the Ohio Legislature. I have also participated in research relating to the development of Ohio's natural gas resources since 2011.

As an economist who works on economic development issues, I view the attempts of Ohio's Investor Owned Utilities (IOUs) over the past five years to:

- Bailout failing power plants,
- Re-monopolize the electric generation industry through a mix of regulation and legislation,
- Re-balkanize and degrade an efficient and reliable regional generation market managed by PJM Interconnect,
- Mandate above market rate payments for electricity through anti-competitive purchase price agreements (PPAs), and
- Implement non-bypassable riders that are not connected with the generation, transmission or distribution of electricity service delivery

as being fundamentally detrimental to the state's economic development.

These attempted bailouts, PPAs, and riders all come after transition payments were made to the state's IOUs over the past decade and a half to allow them to mark down stranded assets and adjust to competition in the electricity market. Ohio's Consumer Counsel estimates that Ohio's IOUs have collected more than $14 billion in stranded asset payments and non-bypassable riders since 2000. House Bill 6 will add another $3 billion over the next ten years, and the bailout of the nuclear plants have no end date or sunset provision. We are looking at subsidy without end.

My testimony is in two parts. First, I review the regulatory and legislative scrum that has taken place since 2014. Second, I discuss the most problematic components of H.B. 6. The two most important are its opaque drafting and reliance on data from FirstEnergy, without independent verification. If time permitted, which it does not, I would present an alternative public policy path for the state that directly deals with clean air and reduces CO^2 production carbon, directly addresses the financial plight of

communities that rely on inefficient power plants for work and taxes, and preserves competitive electricity markets. That discussion is for another day.

The past five years

If it looks like a duck, waddles like a duck, and quacks like a duck, let's be honest and just call it a duck. We should also acknowledge, not celebrate, that we are close to starting our sixth year of duck hunting. August 2019 marks the sixth anniversary of a determined campaign by Ohio's IOUs to subsidize their (or their affiliates') loss-making power plants.

The bulk of House Bill 6 constitutes the third attempt by FirstEnergy (FE) to bail out its uncompetitive nuclear power plants, with similar levels of non-bypassable charges being demanded in each effort. In my assessment, these non-bypassable charges are de facto taxes because the power of the state is required to extract payments from electricity users.

Initially, the IOUs tried to use their Electric Security Plans (ESPs) as vehicles to gain approval for uncompetitive, non-bypassable power purchase agreements (PPAs) for their loss-making power plants from the PUCO. FE submitted the initial version of its plan to the PUCO in August 2014. The PUCO did not approve the PPA, but the ESPs contained a slew of non-bypassable riders that funneled above-market payments to the state's IOUs, turning the Electric Security Plans into Egregious Subsidy Proposals.

Next in line was FE's invention of a synthetic form of a PPA to subsidize its two loss-making Ohio nuclear plants along with what looked like a backdoor subsidy for its Beaver Valley nuclear facility located along the Ohio River in Shippingport Pennsylvania. Unsatisfied by the negative reception of this proposal at the Public Utilities Commission of Ohio and the Federal Energy Regulatory Commission (FERC), FirstEnergy shifted its attention to the legislature. FE petitioned for approval of novel synthetic Zero-emission nuclear credits, or ZECs, tied to non-bypassable power purchase agreements to subsidize its nuclear plants in House Bill 178 that was before the Legislature in 2016. FE sought a subsidy of $300 million a year in that bill.

And now we have House Bill 6, pegged near $300 million a year, bearing the same backdoor "foreign aid" provision that was in the 2016 legislation to spend ratepayers' money to support a failing atomic power plant located across the Ohio River in Pennsylvania. House Bill 6 is the reemergence of 2016's House Bill 178 with much more political muscle behind it.

The IOUs that own a piece of OVEC succeeded in getting on-going subsidies to bail out loss-making coal-fired power plants in Indiana and Ohio. Thanks to the OVEC bailout Ohio now has a "foreign" aid program designed to bail out failing out-of-state electricity plants and FirstEnergy is attempting to add its Beaver Valley nuclear plant in Pennsylvania to that list.[1]

[1] *AEP Ohio power purchase agreement rider*. Public Utilities Commission of Ohio. https://www.puco.ohio.gov/be-informed/consumer-topics/aep-ohio-power-purchase-agreement-rider/

It is essential to keep in mind the core public policy goals of competitive wholesale energy markets. They are to provide reliable power at the lowest cost to consumers. As former Federal Energy Regulatory Commissioner Tony Clark wrote in a July 2017 white paper: "For many, a 'freer market' was never the end goal. The market was a tool. Affordable power was the goal .... but many state public policy makers no longer see that as the only goal ... (Electricity generating markets) were never designed for job creation, tax preservation, politically popular generation, or anything other than reliable, affordable electricity."[2]

The electricity generation and capacity markets are working in Ohio and benefit consumers and employers. There is no economic rationale for introducing subsidies into the electricity generating markets; they amount to nothing more than corporate welfare.

There is a straight forward four-part test that determines if the electricity markets are working for consumers and the industry:

First: Are prices lower than they would have been without competitive electricity markets? The answer for Ohio is definitive and positive. Savings occur in two ways. The cost of Standard Service Offerings from the IOUs declined when the competition became effective, and the spread between competitive pricing and SSO pricing has narrowed over time. Narrowing differences between prices offered by established electricity providers through their SSOs and from competitive new market entrants is the expected result in operating free markets. Savings continue for commercial and industrial customers from shopping. In 2016 a research team that I was a part of estimated that nearly $3 billion a year in savings resulted from the entrance of new competitors.[3]

Savings from competitive generation markets have been clawed back to some extent through the expansion of non-bypassable riders by the PUCO. These riders are non-bypassable costs paid for by most electricity users and are not associated with charges for energy (generation), capacity reserves, transmission, distribution, or losses — most of the riders are used for their named purposes. However, an exception exists for a rider that allows FE to collect $168 million a year from 2017 to 2019 under a grid modernization rider and then apply to renew it for another two years. These funds are fungible for the IOU; they do not have to be spent on their named use, such as modernizing FE's transmission or distribution grids; the corporation apparently can use the funds as it wishes—including making good on losses from generating subsidiaries.[4]

Dormady et al. state that the riders paid for by residential customers may have fully offset their savings.[5] Thomas et al. (I was a member of this research team) also

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[2] Clark, Tony. *Regulation and Markets: Ideas for Solving the Identity Crisis*. Wilkinson, Baker, Knauer. July 2017. https://www.wbklaw.com

[3] Thomas, Andrew, et al. *Electricity Customer Choice in Ohio: How competition has outperformed traditional monopoly regulation*. Northeast Ohio Public Energy Council, November 2016.

[4] Kowalski, Kathiann M. *FirstEnergy won't say what it's done with Ohio grid modernization money*. Midwest Energy News. https://energynews.us/2018/07/30/midwest/firstenergy-wont-say-what-its-done-with-ohio-grid-modernization-money/

[5] Dormady, Noah, et al., *Why Ohio's Retail Deregulation Has Been Bad for Households and Why Re-regulation Would Be Even Worse*. Policy Brief, John Glenn College of Public Affairs, 2018a. Dormady,

noted the rise in riders but did not apply the cost of the riders against the savings in electricity generating costs that were paid for by the various classes of customers. What is the impact of these riders on aggregate electricity spending in Ohio?

Competitive electric generation markets were in effect in most of Ohio in 2016. At that time non-bypassable riders constituted 14 percent of the electricity prices and generation costs were 48 percent of the aggregate bill. In 2018 generation costs are 41 percent of aggregate payments and non-bypassable riders are 21 percent. There was a 7 percent swap between the two cost categories. The riders are a competitive problem, especially when firms that are being recruited to invest in the state are asking for "reasonable arrangements" that get the fees waived by the PUCO and shift on to other customers.

Second: *Is investment in new generating capacity taking place in the PJM region and is investment taking place in Ohio?* The answer to this question is also, yes. Approximately $11 billion in new power plant investments in Ohio are operating, approved for operation, or in the approval process. The combined generating capacity is 11.1 MW.[6]

Third: *Are uncompetitive generating plants closing down? Yes. Between 2010 and 2022 48 coal-fired power boilers located at 16 separate power stations are, or will be retired, with 14MW of power generation capacity. These power stations are located throughout the state, with most are along the Ohio River*.[7]

Fourth: *Has the reliability of the electric grid improved?* The answer to this question is also positive. The power reserve standard for summertime peak usage under the previous state regulatory regime was between 12 to 16 percent. From 2008 to 2010, before competition in purchasing electricity was fully effective in Ohio, the PJM reserve margin was between 16.6 percent and 18.0 percent. PJM's reserve margin for 2019 is 27.5 percent, and they estimate that reserves will peak in 2021 at 28 percent. The reserves will decline a bit, yet still stay ten percentage points above the old regulatory rule-of-thumb, to a still-robust 26 percent in 2023.[8]

Some in the legislature are listening to industry lobbyists who claim that the energy insecurity is increasing in the state of Ohio because of the number of shuttered coal-fired power plants and the prospect of two northern Ohio nuclear generating plants closing. Statements have been circulated in the statehouse that Ohioans are at the mercy of an uncaring or incompetent PJM Interconnect. All of this is pure nonsense.

Noah, et al., "Do Markets Make Good Commissioners? A Quasi-Experimental Analysis of Retail Electric Restructuring in Ohio," *Journal of Public Policy*. Published online July 3, 2018b.

[6] Ohio Independent Power Producers. Testimony before the Ohio House Energy and Natural Resource Committee, Subcommittee on Energy Generation, March 19, 2018.

[7] The data were collected from: *Impact of Coal Plant Retirements on the U.S. Power Markets: PJM Interconnect Case Study*, Appendix A, Energy Ventures Analysis, July 2018; Seth Feaster, Record Drop in U.S. Coal-Fired Capacity Likely in 2018. IEEFA October 2018. http://ieefa.org/wp-content/uploads/2018/10/Record-Drop-in-U.S.-Coal-Fired-Capacity-in-2018_October2018.pdf; List of Power Stations in Ohio, Wikipedia; Individual pages maintained by Sourcewatch, example: https://www.sourcewatch.org/index.php/Eastlake_Power_Plant

[8] PJM Interconnect, Reserve Margin Graph, 2019. https://www.pjm.com/~/media/planning/res-adeq/20190409-forecasted-reserve-margin-graph.ashx

Electrons do now come in state colors and the location of a power plant on one side of the Ohio River or the other makes no difference to the grid. Electrons generated in Ohio, Pennsylvania, West Virginia, Kentucky, or Indiana all work the same way. What is humorous is that FE appears to have engineered House Bill 6 to bailout the electrons that it manufactures in Pennsylvania and AEP generates subsidized electrons in Indiana. Apparently, only non-subsidized foreign electrons are harmful according to the logic of selected lobbyists.

Reliability has increased with interstate transmission networks and competitive capacity markets by combining power generating capacity over a 13-state region. When weather events or outages shifts demand power can be dispatch throughout the PJM grid and reliability becomes more robust than when electricity generation was more isolated. This is electricity's version of the Law of Large Numbers at work.

Some in the legislature are listening to industry lobbyists who claim that the energy insecurity is increasing in the state of Ohio because of the number of shuttered coal-fired power plants and the prospect of two northern Ohio nuclear generating plants closing. Statements circulated in the statehouse that Ohioans are at the mercy of an uncaring or incompetent PJM Interconnect. All of this is pure nonsense. Electrons do now come dressed in state colors, and the location of a power plant on one side of the Ohio River or the other makes no difference to the grid. Electrons generated in Ohio, Pennsylvania, West Virginia, Kentucky, or Indiana all work the same way. What is humorous is that FE appears to have engineered House Bill 6 to bail out the atomic electrons that it manufactures in Pennsylvania, and AEP collects subsidies to support its coal-fired electrons in Indiana. According to the logic of some lobbyists, only non-subsidized out-of-state produced, also known as foreign electrons, are harmful.

Reliability has increased with regional transmission networks and competitive capacity markets by combining power generating capacity over a 13-state region. When weather events or outages shifts demand, power can be dispatch throughout the PJM grid. Reliability becomes more robust in a regional network than when electricity generation was more isolated. Interconnection is power's version of the Law of Large Numbers.

Has regulatory capture occurred over the past five years? It has. Non-bypassable costs in the transmission and distribution portions of the business have grown faster among the IOUs that own generating capacity than the utility that does not. Duke Energy shed its electricity generation capacity, while AEP and FirstEnergy did not. The two different reactions to the legislature's encouragement of competition set up what economists refer to as a natural experiment. We observed how an IOU with generating plants behaves in the PUCO and Legislature compared to one that sold off its generating fleet.[9] The one without generating capacity has fewer and less costly non-bypassable riders in its ESP.

[9] Thomas, Andrew, et al. *Electricity Customer Choice in Ohio: How competition has outperformed traditional monopoly regulation*. Northeast Ohio Public Energy Council, November 2016.

Core Problems with House Bill 6

I have already referred to a number of the problems in House Bill 6 and they are so numerous I do not see how the bill can be fixed or how an altered bill can be useful economic development policy. I also understand that I am testifying at the end of two long days of hearings. I will do my best to stay out of the weeds and focus on the big conceptual issues. First, I have to dive into some microeconomics. Please forgive me.

House Bill 6 thwarts competitive electricity markets

The bill, if enacted, will hurt Ohio's economic development by increasing electricity costs and diminish the reliability of the state's electric grid. The bill subsidizes cost inefficient nuclear power plants and paves the way to pre-monopolize alternative energy production in the state of Ohio. House Bill 6 will also discourage investment in efficient natural gas-fired combined cycle power plants. This will help ensure that Ohio's abundant and clean sources of natural gas will be drilled, put into pipes, and shipped out-of-state. That prospect is an economic development nightmare and a loss for employment opportunities in Ohio's shale country.

How do competitive markets work?

Competitive markets work by having the lowest cost products enter a market first and more expensive goods, those that are more expensive to produce, enter in successive phases. The standard supply curve taught in introductory economics courses climbs the vertical price axis as the supply of the product increases for this reason. More expensive sources of the very same product enter markets after the more efficient sources of supply are exhausted. It also explains why economists state that in perfect markets profits are zero. However, the only producers who truly make no profit are the last ones to have products purchased because their cost of production equals the revenue earned at the sale. All of the other producers who have production costs that are lower than marginal revenue make money. Then there are those who cannot sell their products at all because their production costs do not justify turning on the lights. Their production costs are so high, they are so inefficient, that it does not make sense to turn the lights on.

Supply enters the market until the marginal cost (the price at which producers are willing to sell the last units that enter the market) equals the consumer's willingness to pay. The amount that is the lowest that a consumer is willing to pay and still take the product home is referred to as the marginal revenue (the revenue created by the last unit sold). And, of course, once the lowest price is known rational consumers will be unwilling to pay a higher price for the same thing. Markets clear when marginal cost equals marginal revenue; this is what "supply equals demand at the equilibrium price" means.

Those with production costs that are too high do not sell their products and are expected to exit the market.

There are two exceptions. Supplier with very high fixed costs—costs that stay the same when production is underway or when the company shuts down—will sell their product as long as the variables cost of production, the marginal cost, pays for all of the materials used and there is a something left to pay down the fixed, non-operating, costs. This is exactly what occurs in the electricity market. Fixed costs are high—especially for

nuclear and coal-fired production. However, companies can only survive for a short period of time using this strategy because their losses will keep piling on and they will run out of cash.

The second exception to the operations of competitive markets as I have described them is if the product is differentiated in some meaningful way. In the electricity market an electron is an electron no matter how it is produced—electricity is an undifferentiated commodity with one disruptive exception. Electrons that are made using solar, wind, or water power are considered differently by a growing number of consumers because CO^2 is not created as a global warming noxious by product, what economist term a negative externality. The question is how much of a premium are these customers willing to pay so that they avoid consuming non-green energy. Green energy is the only type of electron that has a meaningful color.

How does basic microeconomic theory apply to House Bill 6?

All of the microeconomics matters in coming to terms with House Bill 6. This bill gets the market mechanism perfectly backwards; not once, but twice. The bill's drafters are not even allowed to ride the grading curve and earn a gentle-person's C. Rather than having electricity supplied to users based on lowest-cost energy being the first units consumed, the bill mandates that the state's consumers use the most expensive electricity first. There are two sections where this occurs.

The first is at the heart of the bill when taxes, called non-bypassable riders, are enacted by the PUCO under the direction of the legislature to establish clean air credits. The most expensive energy source enters the market first and the most inefficient producers will never leave the market because of the revenue the credits provide will write down the fixed cost of the nuclear plants. The lack of exit cannot be denied because this is the entire purpose of the bill. And it cannot be denied because the bill does not have a realistic end date to the subsidy payments. It is subsidy without end. Inflation will just erode the real value of the credit over time. (But that can be fixed through appeal to the PUCO and claim that the legislatures' intent was to preserve the real value of the credit.)

Preventing the possibility of inefficient producers from leaving the market by using the taxing power of the state to prop up a failed company is what makes House Bill 6 a bailout for FirstEnergy and FirstEnergy Solutions. House Bill 6 is lemon socialism and crony capitalism. This is beyond debate; it is fact.

The clean air non-bypassable rider is paid for by all consumers and the market price of electricity will be artificially high causing further losses among consumers. How is it possible that the price of electricity will be higher than under a functioning market? First, the clean air credits are designed to keep the most expensive producer in the market—it helps pay down fixed costs. If the first layer of electricity in the market is the most expensive the average cost of the entire bundle has to be more expensive than if the most expensive power was not part of the bundle. This is straightforward arithmetic and statistics.

The second reason why power will become more expensive than it would be in the absence of this legislation is that it deters entry by producers with potentially lower

production costs; another implicit intent of House Bill 6. This is done because expensive power will crowd out cheaper power from the consumption bundle.

Also, the fact political power is used in Ohio to affect the structure of the market increases investment risk for potential power generators. They are investing into a flat market for electricity because they have lower cost, disruptive, technologies designed to crowd out their expensive competitors. That is how capitalism works.

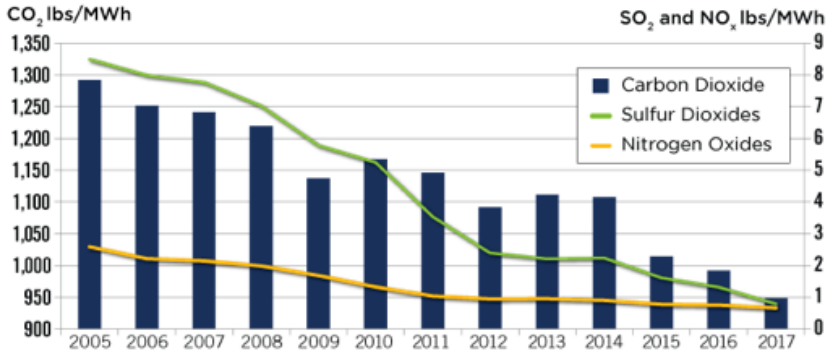
The following table from Monitoring Analytics was reported in Utility dive last month (March 15, 2019). It clearly shows the cost difference of producing electricity with nuclear power compared to combined cycle gas-fired plants. The difference is between coal and gas is $122 per MW and the difference between gas and nuclear is $112.

	Combustion turbine	Combined Cycle	Coal Plant	Diesel
Levelized cost ($/MW-Yr)	$118,116	$113,641	$562,747	$154,683
Short run marginal costs ($/MWh)	$34.10	$24.21	$31.48	$161.16
Capacity factor (%)	54%	88%	49%	2%
Levelized cost of energy ($/MWh)	**$59**	**$39**	**$161**	**$882**

	Nuclear	Onshore Wind	Offshore Wind	Solar
Levelized cost ($/MW-Yr)	$1,178,607	$214,780	$460,730	$232,230
Short run marginal costs ($/MWh)	$8.50	$0	$0	$0
Capacity factor (%)	94%	28%	45%	13%
Levelized cost of energy ($/MWh)	**$151**	**$88**	**$117**	**$198**

The bill has the same PPA flaw in its design for supporting solar power. There is a market for more expensive green power, and the cost of solar continues to fall. Take advantage of markets.

PJM's Inside the Lines in May of 2018 produced the following figure. It shows how noxious byproduct from generation have declined with the development of competitive electricity markets. More could be done with a carbon market, but much can be done at lower with removing obstacles to conservation and efficiency.



In sum, House Bill 6 will harm Ohio's investment climate by deterring new economic generating investments, especially natural gas generating plants.

The bill will also increase the cost of economic development investment in the state of Ohio. The Tennessee Valley Authority has taken action to lower its electricity costs in Ohio's principal competitor states for economic development investment, Ohio will be increasing its costs.

Thank you for providing me the opportunity to testify.