BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan	)))))))	Case No. 14-1297-EL-SSO

DIRECT TESTIMONY OF EDWARD W. HILL ON BEHALF OF THE OHIO MANUFACTURERS' ASSOCIATION ENERGY GROUP

December 22, 2014

Introduction, Purpose, and Summary of Conclusions

Q. Please state your name, title, and business address.

A. My name is Edward W. Hill. I am the Dean of the Maxine Goodman Levin College of Urban Affairs at Cleveland State University and Professor of Economic Development. My business address is The Levin College of Urban Affairs, Cleveland State University, 2121 Euclid Avenue, UR 335, Cleveland, Ohio 44115.

Q. Please describe your educational background, professional qualifications, and employment experience.

A. I graduated from the University of Pennsylvania with a bachelor's degree in economics and urban studies. I then attended the Massachusetts Institute of Technology where I earned a master's degree in City and Regional Planning and a Ph.D. in Economics and Regional Planning. My doctoral field examinations in economics were in industrial organization and regulation, labor economics, and urban and regional economics. In the Department of Urban Studies and Planning my examinations were in regional economic development.

I have been a member of the Cleveland State University faculty since 1985. In addition, I am a Non-resident Senior Fellow at the Brookings Institution's Metropolitan Policy Program and Adjunct Professor in Public Administration at South China University of Technology. Previously, I was a Non-resident Visiting

Fellow at the Institute of Government Studies at the University of California at Berkeley.

I was appointed Cleveland State University's first Vice President of Economic Development in 2005. I relinquished that title in 2009 when I was appointed Dean of the Levin College.

I was the inaugural chair of the National Institute of Standards and Technology's Manufacturing Extension Partnership's National Advisory Board. I served in that capacity from 2007 until 2010. I continued to serve on that Board until my term expired in 2014. Board members' terms are limited by statute.

I have also served on Ohio's Urban Revitalization Task Force (appointed by Governor Taft), Auto Industry Support Council (appointed by Governor Strickland), Cooperative Education Advisory Commission (appointed by Speaker Batchelder), and the Manufacturing Task Force (appointed by Director Schmenk).

My research focuses on the areas of urban and regional economic development policy, the operation of regional labor markets, and industry studies with an emphasis on manufacturing. My research has a particular emphasis on issues that are important to the state of Ohio's economy.

I have written one book and am completing my second. I have edited five books, written eight book-length reports, and have authored over 90 articles, book

chapters, and columns. I was the editor of *Economic Development Quarterly* from 1994 to 2005. *Economic Development Quarterly* publishes peer-reviewed research that is relevant to the development and renewal of the American economy.

I participate in much of the energy research conducted at the Levin College either as an advisor or as an investigator. I lead the research and writing of the ongoing publication titled *Ohio Utica Shale Gas Monitor* and was one of the authors of *An Analysis of the Economic Potential for Shale Gas Formations in Ohio* (February 2012).[1] I also advised the research team that produced the reports on the electricity market that are referenced in this submittal.

Q. What is the purpose of your testimony?

A. I am testifying on behalf of the Ohio Manufacturers' Association Energy Group. My testimony addresses the strategy proposed by Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company (collectively, FirstEnergy or the Companies) in their fourth Electric Security Plan as it relates to the proposed Economic Stability Program (Program) and power purchase agreement. I will explain why I think that FirstEnergy's Program is misguided, and why I believe that the PUCO should reject it.

[1] See, e.g., Edward W. Hill, et al., "Ohio Utica Shale Gas Monitor" (January 10, 2014) at http://engagedscholarship.csuohio.edu/urban_facpub/1143/; Thomas, Andrew R., Iryna Lendel, Edward Hill, Douglas Southgate, and Robert Chase, "An Analysis of the Economic Potential for Shale Gas Formations in Ohio" (February 2012) at http://engagedscholarship.csuohio.edu/urban_facpub/453/.

Q. Please briefly summarize your conclusions.

A. FirstEnergy's Program and strategy to utilize a power purchase agreement seek a massive subsidy from state ratepayers to fund FirstEnergy's non-regulated subsidiary's aging and inefficient electric generating units.[2] Such a Program, if implemented, would fundamentally distort the electricity wholesale energy markets. It would shift the risk of market failure from FirstEnergy's generation affiliate to FirstEnergy's distribution consumers – undermining the intent of the Ohio General Assembly when it restructured Ohio's electricity markets in 1999 with the passage of Am. Sub. S.B. 3.

Research conducted at the Levin College shows that in 2010, Ohio had the highest level of manufacturing activity among the Midwestern states.[3] Ohio's energy-intensive industries are prominent parts of the state's economic base; these include primary metals, petroleum and coal products, chemicals, food processing, nonmetallic mineral production, paper manufacturing, and wood products. FirstEnergy's Program would have significant negative effects on the manufacturing productivity of firms throughout these sectors.

[2] See Sanzillo, T. and C. Kunkel, "FirstEnergy: A Major Utility Seeks a Subsidized Turnaround," Institute for Energy Economics and Financial Analysis (October 2014) at http://www.ieefa.org/wp-content/uploads/2014/10/First-Energy_-A-Major-Utility-Seeks-a-Subsidized-Turnaround-OCT20141.pdf (attached as Exhibit EWH-1).

[3] Lendel, I, S. Park and A. Thomas, "Moving Ohio Manufacturing Forward: Competitive Electricity Pricing" (2013) at 4-7. *Urban Publications*, Paper 679 at http://engagedscholarship.csuohio.edu/urban_facpub/679 (attached as Attachment EWH-2).

The Program would also undermine competition among retail electricity customers in Ohio. And it would have a chilling effect on future investments into Ohio markets by Competitive Retail Electric Service (CRES) providers.

The Program will also extend and exacerbate the ongoing threat to Ohio's economy and environment. It is designed to shore up coal-based electricity generation at a time when it is becoming increasingly uneconomical due to both the age of the plants and the introduction of large supplies of methane as an alternative fuel source. At the same time, regulations designed to reduce the amount of carbon released into the atmosphere from coal-fired power plants are on the horizon. All of these factors will further increase the relative cost of generating electric power from coal. The proposal is also being made at a time when oil prices are plunging and as global energy markets are shifting toward methane—natural gas.

The Program will reinforce another economic development challenge for the urbanized portions of the state of Ohio; the impact of existing levels of air pollution on the attraction, retention, and expansion of businesses in the state's metropolitan areas. Facilities that desire to locate or expand in areas that are considered to be either new major stationary sources of air pollution or modifications to existing major sources of air pollution are subject to nonattainment New Source Review (NSR).[4] A major source is one that emits

[4] See Ohio EPA Fact Sheet, Division of Air Pollution Control, "What Businesses Need to Know About National Ambient Air Quality Standards and Nonattainment" (February 2014) at

more than 100 tons of air pollutants per year. The threshold for a major source modification can be 40, 25, 15 or 10 tons per year. Ohio's Environmental Protection Agency cautions:

> *For major sources that are subject to nonattainment New Source Review, the basic requirements related to this are:*
>
> - *The new/expanding company must obtain emission credits (called offset credits) from existing sources located in the vicinity of a proposed source which (1) offset the emissions increase from the new source or modification and (2) provide a net air quality benefit.*
> - *The new/expanding company must obtain a nonattainment air permit from Ohio EPA which includes installing pollution control equipment that demonstrates the company is achieving the lowest achievable emission rate (LAER).*
>
> *For every one ton of pollutants the company will emit, it must obtain more than one ton of emissions credits from a company that has reduced its emissions or is no longer operating. Credits must be obtained from a company that is in the same nonattainment area.*

The Ohio EPA notes that the pollutants of concern in Ohio are lead, nitrogen dioxide, fine particulate matter, ozone and sulfur dioxide.

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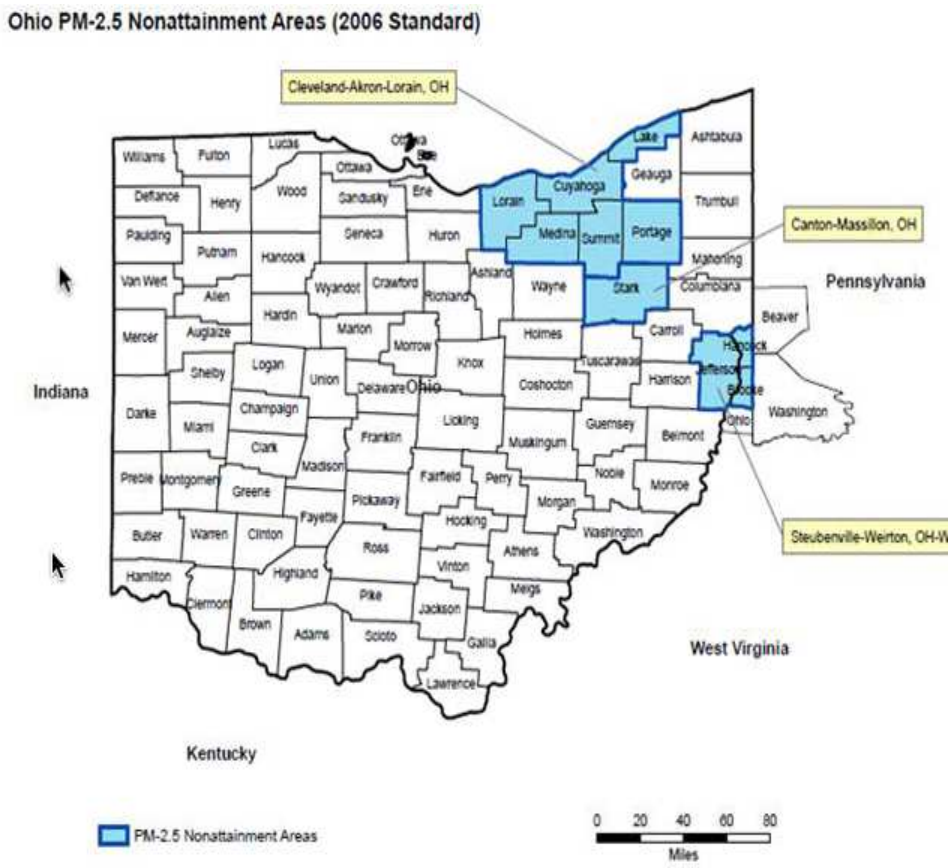
http://www.epa.ohio.gov/Portals/27/sip/NAAQS%20and%20Nonattainment%20-%20What%20Businesses%20Need%20to%20Know.pdf.

Figure EWH-1

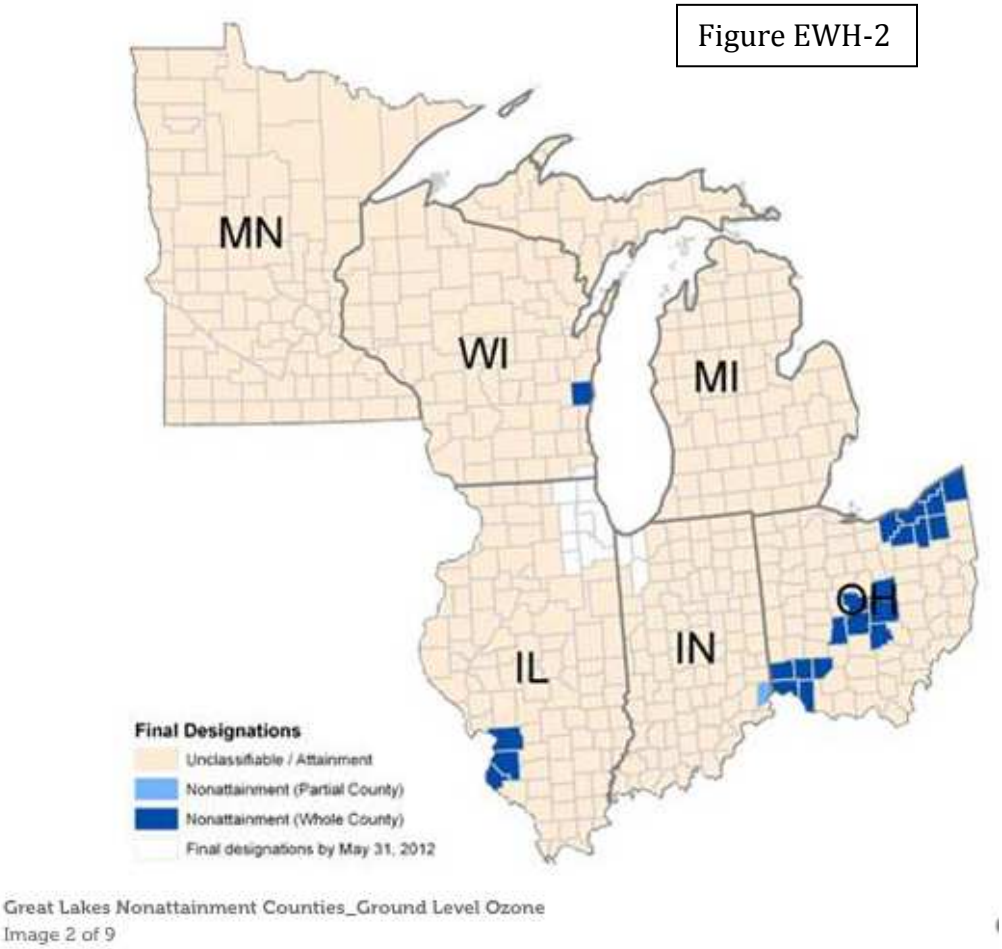


Ohio Nonattainment Counties_Small Fine Particulates map
Image 1 of 9

The Cleveland-Akron-Canton Consolidated Statistical Area (CSA) and the Steubenville Metropolitan Statistical Area (MSA) are defined by the U.S. Environmental Protection Agency as nonattainment areas for fine particulate emissions (PM-2.5). The Columbus MSA and the Cincinnati CSA join the Cleveland-Akron-Canton CSA in nonattainment in terms of ground level ozone levels.[5] (See Figures EWH-1 and EWH-2). The challenge is that firms have an incentive to locate outside of these metropolitan areas and their labor markets.

[5] Northeast Ohio Sustainable Communities Consortium, "Most Northeast Ohio counties fail to meet National Ambient Air Quality Standards for ground-level ozone and fine particulates" (2014) at http://cat.neoscc.org/findings/continuing-challenges/most-northeast-ohio-counties-fail-to-meet-national-ambient-air-quality-standards-for-ground-level-ozone-and-fine-particulates/.

Figure EWH-2



Great Lakes Nonattainment Counties_Ground Level Ozone
Image 2 of 9

Asking ratepayers to subsidize a strategy for maintaining uneconomic generation is a genuinely bad idea. Regulation needs to encourage an energy market that is not being distorted, does not reward market power, and moves the state of Ohio toward economic efficiency. FirstEnergy's proposal is not the right strategy to meet these goals.

Effects of the Economic Stability Program on Manufacturing

Q. What role do energy prices play in economic development?

A. We have long known that electricity prices play a significant role in economic development. For instance, there is evidence that the best manufacturing jobs are usually found in energy-intensive industries, which tend to require higher-skilled

workers.[6] Similarly, it has been documented that energy costs are an important site selection criteria for manufacturers; along with the location of customers, suppliers, and labor supply.[7]

Q. How do you define energy intensive industries?

A. Energy intensive industries are those that spend relatively large amounts of money on energy in the course of their operations compared to other expenditures. The research conducted at the Urban Research Centers by Lendel, et al., at the Levin College specifically examined intense users of electricity. The team used two indicators to identify electricity-intensive industries: the ratio of the industry's expenditure on electricity to the industry's total expenditure on its operations, and the industry's total expenditure on electricity.

The team demonstrated that natural break points occurred in both data series. The breaks resulted in three groups of industries: high electricity-intensive, moderate electricity-intensive and non-electricity intensive.[8] The results are consistent with the categories established by the Energy Information Agency for energy intensive manufacturing.[9]

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[6] L. Lord and J. Ruble, "A Case for Coordinating Economic Development Planning with Energy Planning," 7.2 *South Carolina Journal of International Law and Business* 165, 173 (2011).
[7] Id. at 165; see also D. Buelow & J. Trkulja, "Factoring Energy into a Location Decision," *Area Development Magazine* (April/May 2009) at http://www.areadevelopment.com/corpSurveyResults/Apr09/energy-availabilty-costs-location-decision001.shtml (survey determining energy costs are the third most important factor in manufacturing site selection).
[8] See Attachment EWH-2 at 4-7.
[9] Sendich, E. "The Importance of Natural Gas in the Industrial Sector with a Focus on Energy-Intensive Industries," Working Paper Series, U.S. Energy Information Agency (February 28, 2014) at http://www.eia.gov/workingpapers/pdf/natgas_indussector.pdf.

In Ohio, ten industries are considered to be electricity intensive (spending roughly 2 to 6% of every dollar on industry operations). Atop this list are metals, chemicals, foundries, food processing, paper manufacturing, glass manufacturing, and nonmetallic mineral product manufacturing.[10]

Q: What role do these industries play in Ohio's economy?

A. These industries are a critical part of Ohio's economic base. Our research shows that many of these industries export their products from Ohio in return for dollars that are brought into the state, resulting in job creation.[11]

Steel manufacturing, for instance, is about three times more important in Ohio than it is nationally, foundries and glass manufacturing about 2.5 times, and chemicals nearly twice.[12] All are related to the automotive and truck assembly and aircraft supply chains, which are especially important industrial clusters in the state of Ohio. These and similar industries are a major part of our export base, and they stand to be hurt the most by FirstEnergy's proposal.

Q. Are these industries important in FirstEnergy's service territories?

A. All economic indicators suggest that FirstEnergy's service territories have the highest proportion of electricity-intensive manufacturing in Ohio. This includes the highest density of employment (Cuyahoga, Stark, Trumbull and Lucas

[10] EWH-2 at 4.
[11] This is a result that is replicated in many studies conducted on Ohio's economy at the Center for Economic Development at the Levin College of Urban Affairs.
[12] EWH-2 at 10.

Counties); the highest generated Gross State Product (Cuyahoga, Lorain, Lake and Lucas Counties); and the highest number of establishments (Cuyahoga, Summit and Stark Counties).[13]

Q. Have you considered what likely effects the FirstEnergy Program may have on manufacturing?

A. Yes. The study conducted in 2013 by Lendel, et al., examined the gross state product created per employee and measured how it changed with the cost of electricity between 1990 and 2010. This gave an indication of the effects of electricity price on productivity. Our results showed that higher electricity prices have had a statistically significant negative effect on manufacturing productivity in Ohio, as well as in four neighboring states.[14]

Q. Did you measure the size of this effect?

A. Yes. Our studies showed that an increase of 1 cent per kilowatt-hour correlated to a decrease in gross product generated of about $2,527 per employee, a total of 2.2%.[15] In economic terms, this is a price elasticity of negative 2.2%. This will be felt most keenly within the electricity-intensive industries.

Effects of FirstEnergy's Economic Stability Program on Electricity Markets

Q. Did you also look at the effects of deregulation on manufacturing?

[13] Id. at 19-24.
[14] Id. at 30-31.
[15] Id.

A. Yes. We looked at industrial power prices for five states for the period of 1990-2010, two of which had not restructured their power generation markets (Indiana and Kentucky) and three of which had (Ohio, Michigan and Pennsylvania).

Q. What did you find?

A. Manufacturing productivity grew faster in the restructured states than it did in the regulated states. Manufacturing gross product grew by $120,000/employee over the twenty-year period for the deregulated states, but only by $113,000/employee in the regulated states. [All figures are in inflation-adjusted terms.] In the three deregulated states, we found that the average industrial price of electricity dropped after deregulation and the average total productivity per employee increased.[16]

Q. What does this mean to you?

A. It means that, at least in part, the 2001 restructuring of electricity regulation that was designed to introduce competition in the electricity markets has been working to reduce costs to Ohio consumers, and to make Ohio manufacturing more competitive.

The market restructuring may be flawed in places, and it requires constant vigilance on the part of state and federal regulators to ensure that big utilities do not enjoy too much market power in the energy markets. But the evidence, at least in Ohio and the surrounding states, is that a competitive electric market has

[16] Id. at 31-32.

helped to reduce industrial costs of electricity. This in turn has helped energy intensive industries in Ohio to be more competitive.

Q. How is this relevant to FirstEnergy's proposed Economic Stability Program and strategy to utilize a power purchase agreement?

A. FirstEnergy's Program strategy essentially provides FirstEnergy, and its affiliate, with a guaranteed return on its generating assets. The strategy directly undermines the competitive nature of the retail market for electricity in Ohio. It does this by introducing subsidized generation into both the energy and the capacity markets, thereby distorting those markets, and potentially driving lower cost generation out of the market.

The effectiveness of a competitive marketplace relies upon the assumption that it is free of monopolistic practices by the participants. The strategy proposed by FirstEnergy, to reintroduce certain aspects of traditional utility accounting practices into the energy and capacity markets, is fundamentally incompatible with a free marketplace.

It also sends the wrong message to CRES providers, national providers that have over the years established a major presence in Ohio. The message it sends is that the moment that they begin to out-compete Ohio's incumbent utility providers and to establish market share in this state, the State will step in and shore up the

incumbent providers to the CRES provider's detriment. This will have a chilling effect on future CRES provider investment into Ohio.

Subsidizing a generation owner that is affiliated with an electric distribution utility will destabilize the structure of the electricity markets in Ohio. Prior to any attempts to re-regulate, the state needs definitive proof that deregulation is not working. After such proof, if the state decides to reregulate, it should regulate the entire industry in the process, not just piecemeal generation based upon its inefficiencies or threats of closure. The evidence to date indicates that market restructuring is working, and changing the rules without a clear and convincing demonstration otherwise will send a signal that will strongly discourage investment in the state.

The Effects of FirstEnergy's Program on Ohio's Economy in General

Q. Do you see any other problems with FirstEnergy's proposed power purchase agreement?

A. Yes. First of all, the Program, in part, subsidizes coal-fired power plants. In so doing, it ignores a fundamental problem facing Ohio in the coming years: carbon regulation. The U.S. Environmental Protection Agency has set forth goals for each state to meet. Under the proposed rules, upon its 2005 emissions, Ohio will have to reduce carbon dioxide emissions by 30% by the year 2030. Ohio must have a plan in place to do so by 2016, and must make progress toward meaningful reductions by 2020.[17]

If Ohio fails to submit a plan by 2016, the federal government may impose a solution.[18] The federally mandated plan will likely either be a cap and trade strategy or a carbon tax.

Since electricity generation in Ohio is heavily reliant upon coal generation, either plan would likely lead to a redistribution of economic activity away from Ohio to other states. What will make this redistribution especially painful is that what will likely move are the keystones of our most important industrial clusters in the

[17] U.S. EPA, Carbon Pollution Standards, "Fact Sheet: Clean Power Plan Framework, National Framework for States Setting State Goals to Cut Carbon Pollution," United States Environmental Protection Agency (June 13, 2014) at http://www2.epa.gov/carbon-pollution-standards/fact-sheet-clean-power-plan-framework.

[18] The EPA allows for a two-step process for submitting final plans if more time is needed. See "EPA Proposes First Guidelines to Cut Carbon Pollution from Existing Power Plants," United States Environmental Protection Agency News Release (June 2, 2014) at http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/5bb6d20668b9a18485257ceb00490c98!OpenDocument.

transportation industries—automotive, truck, aerospace, and locomotive—and our paint and chemical industries.

While some larger operations may pick up and leave, small and mid-sized companies will lose business to out-of-state competitors and go out of business. It is better for Ohio to develop a plan that meets the EPA requirements, yet at the same time protects jobs in this state.

Ohio has already placed itself in jeopardy of noncompliance by freezing its energy efficiency and renewable portfolio mandates. Ohio is currently in the process of re-evaluating those mandates. Now is the worst possible time for ratepayers to subsidize inefficient, old coal plants. While Ohio's policymakers may consider the role of nuclear power in meeting carbon emission reduction in the future as suggested by FirstEnergy, such consideration should be part of a thorough, systematic, and impartial bigger picture cost-benefit analysis of the way to react to impending carbon regulations, together with a review of the energy efficiency and renewable portfolio mandates. These analyses should be undertaken in 2015-2016 while policymakers consider strategies for Ohio to navigate both carbon emissions reduction and the aging coal-based power generation in Ohio.

Q. What other problems do you see?

A. In general, bailing out old, failing legacy industries is counterproductive. We should be very careful when we do so, and we should apply what has been learned in other industry bailouts over the past several decades. There must be a clear reason to expect that subsidies will turn around a company, not just revert to the *status quo*.

Ratepayers in American Electric Power Company's Ohio service territory paid over $150 million in subsidized electricity costs for Ormet Corporation's plant in Hannibal, Ohio, only to have Ormet file for bankruptcy. For the good of the regional economy, it is usually better to find a humane and promising strategy for change than to prop up old, failing legacy industries.

Q. But bailouts worked for the automobile and steel industries, did they not?

A. Yes, but the devil is in the details. We have to apply lessons learned in previous publicly-supported industry restructurings.

There never should be a simple bailout; that is, a return to the *status quo* after either providing an operating subsidy or in just restructuring debt. Subsidizing operating costs will eventually fail, as it did in Ormet's case.

Cleveland's steel mills had to experience bankruptcy and reorganizations to get their operating costs right.[19] Among the painful changes felt by one steel mill were major rewriting of shop floor work rules and staffing levels, accompanied by dumping pension obligations to the federal government, and changing wage levels. All of this was after corporate bankruptcies. After the last bankruptcy, the new owner of the steel mill invested heavily in new capital equipment and processes improvements taking advantage of modern work rules and lower operating costs, resulting in an extremely efficient operation.

Lessons from the bankruptcy of the domestically headquartered automotive assembly industry are similar. The restructuring was national, and its initial costs were borne by the national economy, not one state. Second, the companies were allowed to shed their legacy assets, outdated and abandoned assembly and parts plants, and to restructure their work rules, operating agreements, and labor costs. And, in the case of two companies, there were corporate bankruptcies.

Whenever companies are bailed out without requiring major behavioral change, an act of corporate lemon socialism has been committed. And, the most likely outcome is the recreation of the failed business model that created the necessity for bailout in the first place. This is what happened with Ormet, this is what happened to LTV's properties, this is the history of the Detroit-headquartered automotive companies, and this is exactly what FirstEnergy is asking for now.

[19] See "Steel in Cleveland," *Plain Dealer* archives at http://blog.cleveland.com/pdgraphics/2009/03/07FGSTEEL.pdf.

In this instance, FirstEnergy is asking the PUCO to return to a business model for one aspect of the business that not only previously failed, but to return to a model for which Ohio ratepayers have already paid FirstEnergy nearly $7 billion dollars to change.[20] Ohio ratepayers paid this fee as compensation for "stranded assets" that FirstEnergy incurred as a result of restructuring of the electric market. Those stranded assets included generation facilities that were divested to an affiliate. Now FirstEnergy wants to put old wine into new bottles and incur the inefficiencies of "cost plus" accounting for generation assets after previously collecting $7 billion to change its behavior.

It is important to note that I am not stating that power purchase agreements of this nature should *never* be allowed, or that social issues can *never* be a consideration for imposing riders on customers' electric distribution bills. For instance, power purchase agreements can, in principle, for instance, be very useful in helping distributed generation get off the ground in Ohio, as long as they are for a limited duration and are treated as industrial-scale feasibility experiments. Distributed generation promises to affect all aspects of electricity production and consumption: generation, transmission, distribution, capacity and environmental. So in some cases it might make sense for ratepayers to fund a long-term arrangement in order to finance distributed generation and test its purported

[20] See, e.g. "Electricity: Ohio Restructuring Active," U.S. Energy Information Agency (September 2010) at http://www.eia.gov/electricity/policies/restructuring/ohio.html; J.L. Migden-Ostrander, "A History of Deregulation, Senate Bill 3 and Current Situation," at 2 (November 14, 2007) at http://www.occ.ohio.gov/lservices/testimony/2007-11-14.pdf (noting that the generation portion of stranded costs were designed to permit the utility to recover its uneconomic investments in power plants); and Attachment EWH-1 at 29.

efficiencies. However, such projects are the opposite of what is proposed by FirstEnergy.

Q. Will throwing away the costs sunk into old generation disrupt Ohio's economy by requiring investment into expensive new generation?

A. No. First of all, we cannot be certain that FirstEnergy's affiliate, FirstEnergy Solutions (FES), will discard its generation asset by retiring the units. If either FirstEnergy or FES believes, as claimed, that market prices will eventually rise above the costs set forth in a power purchase arrangement, FES will do what it can to keep these plants operational, even if at reduced capacity.

Second, in a restructured market, we need to remember that Ohio is part of the PJM region when it comes to generation, and that PJM Interconnection LLC (PJM) is the region's grid operator and reliability coordinator. In this regard, there is ample generation in the PJM region to meet Ohio's generation requirements for the near term.

Third, perhaps most importantly, we cannot allow sunk costs to confuse us about the value proposition of keeping old plants functioning when they are no longer profitable. Indeed, this is a critical reason for not subsidizing aging, inefficient generation: it discourages the building of new, cleaner, more efficient generation that will cost less in both the short and long run.

Q: What are the relevant submarkets that exist in the generation and consumption of electricity?

A: The state of Ohio and PJM have the overall structure of the electric power production and consumption markets right. There is a market for base load power generation; a series of spot markets for the allocation of electricity during peak demand periods; and then regulated transmission and distribution systems.

The electrical generation components are treated as competitive markets due to changes in technology and lower barriers to entry. Additionally, the discovery of extremely large deposits of methane, or natural gas, in Ohio, West Virginia, Pennsylvania, New York, and the province of Ontario will further lower barriers to entry in the generation market and continue to disrupt existing models for base load generation.

Additional technologies and practices should be encouraged to continue to diversify the supply of electricity generation capacity and regulatory barriers to their entry should be removed. This is especially true for cogeneration, the entry of power from outside the state of Ohio, and for alternative sources of power that have proven to be cost competitive, such as solar.

At this point in time, the transmission and distribution of electric power is a natural monopoly and should be regulated as such. However, in the future, competition may be feasible in the transmission portion of the industry as

technologies change. Nonetheless, the distribution network will always be operated by either a monopoly or a duopoly and will always have to be regulated. The distribution system can transform from a monopoly system to a duopoly when natural gas utilities provide gas to households and commercial buildings that contain fuel cells and then bring surplus power back into the distribution system. However, fuel cells are not yet cost competitive for this particular market disruption.

Professor Jean Tirole was awarded the Nobel Prize in economics for his work on market power and regulation and has addressed the issues surrounding a monopolized distribution network.[21] His work demonstrates that having competitive markets in the generation of electricity coupled with regulated distribution networks is the optimal way to organize these markets. In other words, treat them as separate markets and regulate the portion where market power can be exerted.

Restricting the purchase of power to a limited number of sources owned by one company is antithetical to the competitive operation of the market. Locking out other forms of generating capacity and new technologies will result in higher costs to consumers.

[21] Tirole's work is summarized in the technical brief to the Nobel Prize committee: "Jean Tirole: Market Power and Regulation" (October 13, 2014) at http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2014/advanced-economicsciences2014.pdf.

Q: What are the implications for the case before us?

A: The FirstEnergy Program will thwart the separation of these distinct product markets and will result in the judgment of regulators being substituted for market forces. This is after nearly 15 years of evidence that market forces work well in the allocation of generating capacity and at a time when new sources of generating capacity can enter the market.

Expanding the definition of capacity is called for; removing barriers for cogenerated power from entering the transmission system need to be lowered; artificial barriers to accessing power generated outside of the state should be removed; and industrial-scale feasibility experiments in carbon-free and lower carbon sources of energy production should be encouraged.

The power market is heading toward a distributed system of generation with sources of power coming from technologies that are currently being perfected. The implication is that the distribution system will be critical to Ohio's energy future because that future will be one of distributed generation tied into a smart transmission grid.

Q: What is the implication for the generation companies and for public policy?

A: First, the future of the current electric distribution utilities lies in their transmission and distribution networks not in their legacy generation capacity. Second, the financial implications of the future of legacy generation plants will dominate the business strategies and behaviors of the electric distribution

companies. And this will be to the detriment of the future of Ohio's economy. If these companies are crippled financially by their legacy costs they will aggressively use politics and regulation to defend their interests. They will behave like a frightened dog that is backed into a corner.

The solution to this eventuality lies in broadening the scope of regulation and changing the solution. We have to recognize that stranded electric generating assets are not Ohio's problem, Pennsylvania's problem, or West Virginia's problem. It is a regionally concentrated national problem brought on by changes in technology and resource costs that have disrupted the traditional way that electricity is generated in the United States. If the states that produce the power try to resolve the legacy cost problem on their own, power costs will escalate in ways that will be detrimental to their economic futures and resistance to the resolution will delay its implementation.

Those who benefited are those who both produced and consumed the electricity. To deal with the problem of production states, the footprint for the solution can be best approximated by the territory of PJM. This is the territory of those who benefited from both the production and consumption of power. (The same argument can and should be made for the other interconnects.)

The orderly resolution of legacy power plants should rest with an organization that acts in much the same way as a "bad bank" did in the resolution of the

savings and loan crisis, the financial meltdown associated with the Great Recession, and the legacy costs of the Detroit-headquartered automobile assembly companies. The assets should be transferred into the bad bank and the costs of the resolution be borne by ratepayers across the entire footprint.

The design of this solution is evolving and the Levin College's energy team will be instrumental in its development.

Q. As a major employer in Ohio, especially Northeast Ohio, should the health of FirstEnergy also be a consideration in subsidizing these plants through a power purchase agreement?

A. Possibly, but the electric distribution utility's health has not been raised as an issue in these proceedings. If FirstEnergy needs a bailout because it is having financial problems, it should present its case to the State of Ohio through other means than piecemeal, targeted, backdoor subsidies, such as the power purchase agreement strategy at issue in these proceedings. Only when the state can consider a complete strategy for repositioning the company and its role in the marketplace can the policymakers act.

Conclusion

Q. What is your overall recommendation for the PUCO with regard to FirstEnergy's "Powering Ohio's Progress" Plan and its strategy, set forth in its Fourth Electric Security Plan, as it relates to the Economic Stability Program and power purchase agreement proposed therein?

A. I recommend that the PUCO reject FirstEnergy's request for a power purchase agreement with its affiliate to subsidize FES' aging, inefficient power plants.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and accurate copy of the foregoing document was served on December 22, 2014 by electronic mail upon the persons listed below.

/s/ Rebecca L. Hussey
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Summary: Testimony of Edward W. Hill on behalf of OMAEG electronically filed by Ms. Rebecca L Hussey on behalf of OMAEG