Company Exhibit _____

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

DONALD MOUL

ON BEHALF OF

OHIO EDISON COMPANY
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
THE TOLEDO EDISON COMPANY

AUGUST 4, 2014

INTRODUCTION, PURPOSE, AND SUMMARY OF CONCLUSIONS

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is Donald Moul. I am Vice President of Commodity Operations at FirstEnergy Solutions Corp. ("FES"). My business address is 341 White Pond Dr., Akron, OH 44320.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND, PROFESSIONAL QUALIFICATIONS, AND EMPLOYMENT EXPERIENCE.

A. I earned a Bachelor of Science degree in nuclear engineering from The Pennsylvania State University and a Masters degree in Business Administration from the University of Notre Dame. Prior to joining FES, I served for seventeen years in various management positions in the nuclear power generation industry for several other utilities. I joined FES in 2004 as Operations Superintendent at Davis-Besse. In 2005, I was named Manager of Site Work Management at Davis-Besse. In 2006 I was named Manager of Site Operations at Davis-Besse, and in 2008 I was named Director of Site Engineering at Davis-Besse. I then became Vice President of Nuclear Support for FirstEnergy Nuclear Operating Company ("FENOC"). I have also been licensed as a Senior Reactor Operator by the Nuclear Regulatory Commission at the Salem Nuclear Generating Station as well as at Davis-Besse Nuclear Power Station. In 2011, I was promoted to President of Ohio Edison Company and Penn Power Company.

I assumed my current position at FES in October 2012. In my current position, I am responsible for fossil fuel and related commodities, generation dispatch, energy market transactions, retail load forecasting, retail structuring and pricing, and the wholesale transaction functions of FES.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony addresses the proposed Economic Stability Program of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company's (collectively, the "Companies") fourth electric security plan entitled Powering Ohio's Progress (also referred to as "ESP IV") and the benefits it will produce. The Economic Stability Program includes a retail rate stabilization mechanism derived from the costs and revenues of purchases of the output of certain generation facilities by the Companies and the Companies' sale of the purchased energy, capacity and ancillary services into the market. In this potential transaction, the Companies would purchase the output of the Davis-Besse Nuclear Power Station ("Davis-Besse") and the W.H. Sammis Plant ("Sammis") (collectively, the "Plants") and FES's share of the output of two generating plants owned and operated by Ohio Valley Electric Corporation ("OVEC"). In this testimony, I will discuss: (1) why the future of the Plants is uncertain; and (2) how the Economic Stability Program will provide certainty and support resource diversity.

Q. PLEASE BRIEFLY SUMMARIZE YOUR CONCLUSIONS.

A. The economic viability of the Plants is in doubt. Market-based revenues for energy and capacity have been at historic lows and are insufficient to permit FES to continue operating the Plants and to make the necessary investments. Near-term forecasts for energy and capacity prices are unfavorable. While Company witness Rose forecasts that market prices for energy and capacity will increase over time, the Plants may not survive to see these better days. Recent experience demonstrates that nuclear and coal baseload generating assets like the Plants help support stable and reliable retail service in Ohio. The Economic Stability Program will provide predictable and stable revenue to these

baseload generating assets, thereby permitting these plants to stay in operation, which in turn, promotes fuel diversity and certainty for Ohio's retail customers.

<u>THE FUTURE OF THE PLANTS IS UNCERTAIN.</u>

Q. HOW HAVE MARKET PRICES AFFECTED PLANT OPERATIONS?

A. Markets have not, and are not, providing sufficient revenues to ensure continued operation of the Plants. Since 2008, FES has managed the Plants in the face of significant revenue decline and uncertainty, pricing volatility and ever-changing environmental mandates.

Q. DO YOU SEE THE SITUATION IMPROVING IN THE NEAR TERM?

A. No. The market is in a state of transition, which brings uncertainty and volatility. The uncertainty and volatility in energy and capacity prices over the last several years would need to subside immediately for the outlook for the Plants to improve. Today's energy prices remain extremely low. Although the economy has been recovering, power prices have not experienced a similar recovery. As discussed by Company witness Rose, near-term forecasted prices will remain low, but are forecasted to increase over the longer term. However, the Plants may not survive long enough to see the higher prices.

Q. WILL THE PLANTS CONTINUE TO OPERATE IF THE ECONOMIC STABILITY PROGRAM OF THE POWERING OHIO'S PROGRESS PLAN IS NOT APPROVED?

A. The only thing that can be said with certainty is that the future of the Plants is in doubt. The Plants are not receiving sufficient revenues to cover the Plants' costs, both from an energy and capacity standpoint.

In light of the historically low level of revenues for the last several years, FES may not be financially able to bear the short-term losses associated with the Plants, despite the fact

that market prices are expected to rise over the long term. Simply put, FES may not be able to continue incurring losses by continuing to run the Plants in the near term in order to incur the long-term benefits associated with the Plants.

FES wants to operate generating plants, employ workers and support local and state economies. However, FES recently has been forced to retire several plants because they were not cost effective in this current market. In 2012, FES announced plans to retire six coal-fired plants with a total capacity of 2,689 megawatts. In 2013, FES announced plans to deactivate two additional coal-fired plants with a total capacity of 2,080 megawatts.

Q. IS THIS EXPERIENCE REFLECTED GENERALLY IN THE INDUSTRY?

A. Yes. The PJM Market Monitor's market data shows that 24,933 megawatts of fossil-fuel capacity is planning to retire.[1] Another 14,597 megawatts of fossil-fuel generation is at risk of retirement due to net revenue inadequacy in the PJM markets.[2] This represents approximately 8% of PJM installed generation capacity in 2014. These primarily are coal units which have not covered their avoidable costs since 2009.[3] In addition, although this 14,597 megawatt figure does not include the amount of nuclear units that are at risk of retirement, the data demonstrates that total PJM market revenues are not covering the total annualized costs of nuclear units in any part of PJM.[4] A significant portion of the nuclear fleet is at risk of retirement in the near future due to poor market conditions and, in fact, several nuclear plants are either being closed or on the verge of closure.

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[1] Monitoring Analytics, LLC, State of the Market Report for PJM, Volume 2: Detailed Analysis, p. 233 (March 13, 2014), available at http://www.monitoringanalytics.com/reports/pjm_state_of_the_market/2013/2013-som-pjm-volume2.pdf
[2] *Id.*
[3] *Id.*
[4] *Id.*

Q. WHY WERE THE PLANTS SELECTED FOR THE TRANSACTION WITH THE COMPANIES?

A. These are critical baseload plants located in Ohio that originally were built to serve Ohio customers, and their continued operation further ensures resource diversity. Specifically, these units satisfy important policy goals of fuel diversity and of promoting base-load units with significant on-site fuel supply.

Q. WHAT ARE THE CONSEQUENCES OF RETIRING THE PLANTS?

A. Once these plants are retired, they are very costly and difficult (if not impossible) to restart. They likely would be gone forever. The Plants, like other baseload facilities, are critical to a strong, reliable system that provides plentiful and affordable power to Ohio families and businesses when needed.

Retirement of the Plants could also mean that customers are forced to pay significantly more for energy, for transmission upgrades (as shown by Company witness Cunningham), and eventually for the construction of new baseload plants through higher capacity costs. If new plants are not constructed in Ohio to replace this baseload generation, customers also could see higher congestion costs resulting from capacity imports from other states. Ohio's customers are better off through continued operation of these existing resources.

<u>THE ECONOMIC STABILITY PROGRAM OF THE POWERING OHIO'S PROGRESS PLAN WILL STABILIZE AND PROVIDE CERTAINTY IN PROVIDING RETAIL ELECTRIC SERVICE.</u>

Q. HOW WOULD THE ECONOMIC STABILITY PROGRAM STABILIZE AND PROVIDE CERTAINTY IN PROVIDING RETAIL ELECTRIC SERVICE?

A. The Economic Stability Program of the Powering Ohio's Progress Plan would stabilize and provide certainty regarding retail electric service by, among other things, supporting resource diversity.

Q. WHAT IS RESOURCE DIVERSITY?

A. Resource diversity includes fuel diversity and asset diversity. Fuel diversity means having a mix of resources (e.g., coal, nuclear, gas, wind, solar) comprising the generation fuel mix. Asset diversity means having a mix of assets of different classes (e.g., baseload, intermediate, peaking). Both types of resource diversity are essential.

Q. WHAT IS THE VALUE OF RESOURCE DIVERSITY?

A. Resource diversity recognizes that different types of generating assets have different strengths and weaknesses. Coal and nuclear assets are an excellent way to provide affordable and reliable baseload power supply and provide critical operational and retail reliability benefits. Gas assets can take advantage of low-cost, locally-supplied natural gas. Renewables are a no-fuel-cost way to supplement the generation mix. Resource diversity means that the strengths of each type of resource can be maximized while protecting customers from over-reliance on any one type of fuel. As the Commission recently stated, "It is the responsibility of the PUCO to carry out the policy of the state of

1 Ohio to ensure the diversity of electricity resources. The benefits of energy diversity to
2 security, affordability, and reliability are well documented."[5]

3 **Q. WHAT ROLE DO THE PLANTS SERVE IN PROMOTING RESOURCE**
4 **DIVERSITY?**

5 A. The Plants promote resource diversity in several ways.

6 First and foremost, resource diversity helps mitigate price volatility. For example, if
7 generation supply were procured primarily from gas assets, and the price of gas increased
8 significantly, then the price of electricity would rise commensurately. The Plants serve to
9 shield retail customers against volatile and increasing gas prices.

10 Second, resource diversity is an important way to avoid potential catastrophic issues with
11 a single class of generation. As an extreme example, if 100% of generation was procured
12 from solar assets there would be no power generated at night. In addition, during the
13 2014 Polar Vortex, gas resources were highly constrained. The Plants are reliable
14 sources of coal and nuclear generation, and are capable of running at any time of day and
15 in any weather condition with on-site fuel capability.

16 Third, resource diversity protects against interruptions in fuel supply for a given class of
17 generating assets. For example, intermittent renewables cannot be counted on for
18 baseload generation, because of the interruptible nature of their fuel supplies. Likewise,
19 the Commission recently observed that "fuel diversity is extremely important" because,
20 with "a significant portion of the retiring megawatts being replaced by natural gas
21 resources, we cannot afford to forget about protecting our current resources that help in

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[5] Comments On The U.S. EPA Carbon Paper Submitted On Behalf Of The Public Utilities Commission Of Ohio (Dec. 16, 2013) (hereinafter "PUCO Comments"), available at http://www.naruc.org/Publications/Public%20Utilities%20Commission%20of%20Ohio.pdf.

hedging against any unforeseen natural gas curtailments."[6] Coal and nuclear resources typically have secure sources of supply. The Plants provide a significant amount of baseload generation with secure fuel supplies.

Fourth, the Plants promote resource diversity by having sufficient on-site fuel resources to withstand extreme events. For example, the January 2014 Polar Vortex demonstrated that having a diversity of coal and nuclear generation with on-site fuel sources is essential. During the Polar Vortex, we saw interruptions in each type of major generation resource. Speculation in natural gas increased the price of gas-fired generation to phenomenal levels. The Plants, with their on-site fuel, helped ensure there was sufficient electric supply and likely prevented even higher market prices for electricity. The Economic Stability Program of the Powering Ohio's Progress plan will ensure that approximately 3,250 MW of coal and nuclear generation with significant on-site fuel supply will remain operating in Ohio to supply the retail needs of Ohio's end-use consumers.

Fifth, the Plants play a critical role in providing ancillary service needed to maintain grid reliability and integrate variable resources. Baseload generation provides VARS, voltage, and other vital grid support. Intermittent resources cannot provide these services.

Sixth, Davis-Besse is a zero-carbon resource that will play a significant role in the state's future efforts to meet U.S. Environmental Protection Agency ("U.S. EPA") carbon reduction standards.

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[6] Comments Submitted on Behalf of the Public Utilities Commission of Ohio at pp. 7-8, *Technical Conference on Winter 2013-2014 Operations and Market Performance in Regional Transmission Organizations and Independent System Operators*. FERC Docket No. AD14-8-000 (May 15, 2014).

Q. WHY DOES THE RETIREMENT OF COAL AND NUCLEAR PLANTS AFFECT RESOURCE DIVERSITY?

A. For 2013, the generation mix primarily serving Ohio was 44.4% coal, 35.1% nuclear, 16.4% gas, 1.9% wind and 0.9% hydroelectric (the remainder is provided by several smaller generation types). If additional coal and nuclear plants retire, then the generation mix will change. This will make Ohio more reliant on gas as a power source, exposing the market even more to the gas price as the marginal clearing price for power and to the higher risk presented by units reliant on interruptible sources of supply. As the Commission has stated, "The 'dash to gas' scenario causes concern to economic regulators because the more dependent a system is on one specific fuel type, the more risk and volatility there exists for ratepayers."[7] Ohio will also become more dependent on intermittent renewable generation, which produces electricity about 30 percent of the time and requires back-up generation and new transmission lines, as well as demand response, which relies on voluntary curtailment by customers.

Q. WHAT ARE THE LIMITATIONS OF RELYING ON GAS AND RENEWABLE RESOURCES AS THE PRINCIPAL SOURCES FOR GENERATION?

A. Gas and renewable resources are a part of the total resource mix for Ohio. However, renewable resources are simply not a replacement for reliable coal and nuclear plants. For example, Sammis is a 2,220 MW coal plant, generating an average of 34,100 MWh of electricity per day rain or shine in any season. To put this in perspective, all of Ohio's solar resources generated approximately 7,000 MWh for the entire month of April 2014,

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[7] PUCO Comments, p. 8.

or the equivalent of only 233 MWh per day.[8] This means that all solar generation currently in Ohio would take more than 146 days to equal one day's production by the Sammis facility alone.

Moreover, the current gas infrastructure is stressed, and any transition to more gas-fired units will take time. For as long as gas-fired units are operated on an essentially "just-in-time," interruptible fuel supply, they cannot be relied upon exclusively as the backbone of the electric system. There is a need to maintain diversity of fuel supply.

Q. WHY IS IT RELEVANT THAT COAL AND NUCLEAR PLANTS CAN OPERATE ANY TIME OF DAY AND IN ANY SEASON?

A. Renewable resources are unsuitable for critical reliability support because they tend to be dependent on weather conditions. Solar resources are useful only during the day, and are less useful in the winter than in the summer. Wind resources are likewise intermittent and difficult to dispatch, and only useful when the wind is blowing, which often will not correspond to peak demand during hot summer months. In contrast, coal and nuclear plants operate in all seasons and at all times of day. This is a definite benefit providing stability and certainty in retail electric service.

Q. WHY IS THE STABILITY OF COAL AND NUCLEAR AS A FUEL SOURCE RELEVANT?

A. As discussed above, renewable resources are useful only during certain weather conditions. Therefore, renewable resources are less stable and less reliable than other sources of generation. While they have a role in the generation mix, they are not capable of replacing coal or nuclear as a baseload power source.

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[8] U.S. EIA, Electric Power Monthly, Table 1.20.a, available at: http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_20_a

This issue is not limited to renewable resources. While gas is a relatively stable source of supply, the recent Polar Vortex showed that a stable gas supply is not guaranteed. In brief, gas generally must be transported to the generation facility when it will be used; it is difficult and expensive to store in significant quantities. This means that gas-fired generation will not run when there is a disruption in transportation or when the finite supply of gas is inadequate to satisfy demand. For example, during the recent Polar Vortex, gas for generators was restricted because of transportation interruptions and the high demand for gas for heating. Coal and nuclear resources also encountered various operational issues and suffered higher-than-normal forced outages. However, during the January 7, 2014 evening peak, natural-gas-fired generators had the highest percentage of forced outages. Indeed, natural gas-fired plants accounted for over 45% of the forced outages in PJM, and nearly half of those forced outages at the natural gas-fired plants were due to fuel interruptions. It was because of fuel diversity that a broad mix of resources were able to pull together to meet load.

Coal and nuclear have none of the fuel supply concerns that challenge other generation sources. Coal is abundant, relatively affordable, and can be stored until needed. Nuclear fuel functions continuously for many months at a time. Both fuels are located on-site and are not dependent on interruptible supplies like natural gas. This makes coal and nuclear secure and stable fuel sources needed to ensure stable and certain retail electric service.

Q. ARE THERE OTHER BENEFITS OF MAINTAINING NUCLEAR GENERATION IN OHIO?

A. Yes. The recently proposed carbon emissions rules from the U.S. EPA emphasize the importance of maintaining existing nuclear generation as a carbon hedge. The proposed

rules specify a carbon reduction goal for each state, with each state having the responsibility to design a state implementation plan that will satisfy its goal. When the U.S. EPA proposed its rules on June 18, 2014, it recognized that "a host of factors — increasing fixed operation and maintenance costs, relatively low wholesale electricity prices, and additional capital investment associated with ensuring plant security and emergency preparedness — have altered the outlook for the U.S. nuclear fleet in recent years."[9] Operators have retired or announced the retirement of six nuclear units at five plants since 2012: San Onofre Units 2-3 in California, Crystal River 3 in Florida, Kewaunee in Wisconsin, Vermont Yankee in Vermont, and Oyster Creek in New Jersey. The Kewaunee Nuclear Plant was shuttered on May 7, 2013. The U.S. EPA's view is that an additional 5,700 MW of nuclear capacity, which is approximately six percent of the nation's nuclear capacity, is at risk of retirement.[10] Thus, the U.S. EPA has proposed that states with nuclear plants should be able to count toward their state reduction goals the emission reductions supported by retaining in operation six percent of each state's historical nuclear capacity. If Davis-Besse is retired, Ohio will lose 908 MW of carbon-free generation.

CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes. I reserve the right to supplement my testimony.

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[9] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34830, 34871 (June 18, 2014).
[10] *Id.*

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