

FILE

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PUCO EXHIBIT FILING

Date of Hearing: 9/19/2015

Case No. 14-1297-EL-SSO

PUCO Case Caption: In the Matter of the Application  
of Ohio Edison, 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.

List of exhibits being filed: Volume XV

ELPC 16

OMAEG 12

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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 : Case No. 14-1297-EL-SSO  
Authority to Provide for :  
a Standard Service Offer :  
Pursuant to R.C. 4928.143 :  
in the Form of an Electric:  
Security Plan. :

- - -

PROCEEDINGS

before Mr. Gregory Price, Ms. Mandy Chiles, and  
Ms. Megan Addison, Attorney Examiners, at the Public  
Utilities Commission of Ohio, 180 East Broad Street,  
Room 11-A, Columbus, Ohio, called at 10:00 a.m. on  
Monday, September 21, 2015.

- - -

VOLUME XV

- - -

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Columbus, Ohio 43215-5201  
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- - -

**Sierra Club Set 7**

Case No. 14-1297-EL-SSO  
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

**RESPONSES TO REQUEST**

**SC Set 7 –  
RPD-112**

Produce all documents that contain any information used, reviewed, or referenced in preparing your responses to any of the following interrogatories: SC-INT-130 through SC-INT-143.

**Initial  
Response:**

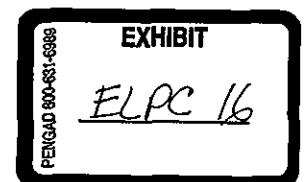
**Original Response Dated: 12/29/14**

See the Companies' responses to the referenced interrogatories and to SC Set 7-RPD-111.

**Supplemental  
Response**

**Supplemental Response Dated: 2/11/15**

See the Companies' responses to the referenced interrogatories and to SC Set 7-RPD-111.  
Please also see SC Set 7-RPD-112 Attachments 1 & 2.



*ELPC 16*



**ECONOMIC AND REVENUE IMPACTS OF  
DAVIS-BESSE NUCLEAR POWER STATION  
ON OTTAWA COUNTY  
AND THE STATE OF OHIO**

**PREPARED BY:**

**APPLIED ECONOMICS  
11209 N. TATUM BOULEVARD, SUITE 225  
PHOENIX, AZ 85028**

**NOVEMBER 2013**

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## 1.0 Introduction

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### Purpose of the Study

Applied Economics was retained by FirstEnergy to perform an economic analysis of the Davis-Besse Nuclear Power Station (Davis-Besse). The analysis includes the on-going operations of the plant plus the steam generator placement and re-fueling project that will take place over the next 6 months. This project will include replacing the steam generator, which is an important component of the pressurized water reactor system, as well as routine outage maintenance and refueling of the reactor.

This analysis is intended to provide a framework for understanding the economic and revenue impacts that this nuclear generating facility creates through its regular operations as well as the impacts of this one-time capital investment. Davis-Besse, located about 35 miles east of Toledo, was the first nuclear plant in Ohio and has been in operation since 1977. It is capable of generating over 900 megawatts of electricity. This analysis documents economic and revenue impacts of Davis-Besse on Ottawa County and on the state as a whole.

Davis-Besse is not only a major employer in the Toledo area, but also makes a substantial amount of local supplier purchases that support the region's economy. Davis-Besse directly employs over 750 people with an annual payroll of \$61 million. An estimated 2,300 additional local and non-local contractors will be employed over the next six months to support regular refueling outages as well as the steam generator placement project.

### Applied Economics Background

Applied Economics is an economic consulting firm, based in Phoenix, Arizona, specializing in economic development, economic and fiscal impact assessment, socioeconomic modeling, urban planning and custom software applications. Applied Economics conducts economic and fiscal impact studies and develops models to measure the effects of a wide variety of activities. These activities include development land use and policy changes, business-driven economic impacts, incentives, and program-driven economic and fiscal impacts. The partners at Applied Economics have worked together for more than twenty years, and are very experienced in working with local and regional planning and development issues. Applied Economics was formed in 1995 and specializes in the technical aspects of economic research.

The information and observations contained in this report are based on our present knowledge of the components of development, and of the current physical, socioeconomic and fiscal conditions of the affected areas. Estimates made in this analysis are based on hypothetical assumptions, current tax policies, and the current economic structure of the region.<sup>1</sup>

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<sup>1</sup> This analysis is based on the best available information and is intended to aid FirstEnergy in quantifying Davis-Besse's impacts on the local economy. Even if the assumptions outlined in this report were to occur, there will usually be differences between the estimates and the actual results because events and circumstances frequently do not occur as expected. In no way will Applied Economics be held responsible or have any liability or be subject to damages as a result of this analysis. This report may be used only for the purposes that it was intended.

## 2.0 Impact Summary

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The economic benefits shown here include the on-going operations of the power plant, as well as the impacts of additional local and non-local contract employees associated with the steam generator replacement and the reactor refueling. Economic impacts measure the effects of economic stimuli, or expenditures, in the local economy. These impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the nuclear power station. Indirect impacts are the result of the multiplier effect and capture supported supplier and consumer businesses and their employees in Ottawa County and throughout the state that benefit from Davis-Besse.

The operations of Davis-Besse detailed in this analysis provide substantial economic benefits to the county, region and state. These positive impacts include the following:

### Economic Impacts of On-Going Operations

- **On-Going Operations Impacts.** Davis-Besse creates an annual economic impact of \$444.2 million on the Ohio economy each year. The operations of the power plant directly and indirectly support an estimated 1,900 jobs and \$106.1 million in annual payroll in Ohio.<sup>2</sup>
- **Jobs and Income.** The facility directly employs about 760 employees with an annual payroll of \$60.7 million. Through the multiplier effect, an additional 1,100 jobs and \$45.4 million in payroll are supported annually at other businesses throughout the state. These additional jobs and payroll stem from supplier demand created by Davis-Besse and consumer demand created by its employees.

### Impacts of Steam Generator Placement and Refueling Project

- **Overall Economic Impacts.** Over the next six months, an additional 2,300 contractors with an estimated payroll of \$147.0 million will replace the steam generator and perform routine outage maintenance and reactor re-fueling. These additional employees will create a total economic impact of \$500.7 million over the next six months, which will more than double the impact of the facility on the state and regional economy this year.
- **Supplier Purchases and Employee Spending.** In addition to the 2,300 contract employees, the steam generator placement and refueling project will support an estimated indirect impact of \$66.7 million, along with 460 additional jobs and \$22.9 million in personal income statewide through local supplier purchases. The 940 of the 2,300 contractors that are from the local area will also re-spend a portion of their income at area businesses, creating an economic impact of \$80.5 million along with 660 jobs and \$25.7 million in personal income in Ohio. Total impacts from local

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<sup>2</sup> This level of annual economic impact is consistent with a 2009 report by the Nuclear Energy Institute that estimates the average 1,000 MW nuclear plant generates an annual economic impact of \$430 million, based on normalized averages from analyses of 22 U.S. nuclear power plants. (Nuclear Energy Institute, New Nuclear Plants: An Engine for Job Creation, Economic Growth, October 26, 2009.)

supplier purchases and local contractor spending are estimated at \$147.2 million and are included in the overall economic impacts for the steam generator placement and refueling project.

- **Visitor Impacts.** In addition to spending by local contractors, there will be approximately 19,200 visitor nights associated with non-local contractors working on this project that will stay in hotels or rental housing, eat in restaurants and make local retail purchases. These non-local contractors will create an economic impact of \$2.5 million over the next six months, supporting about 30 jobs, mostly in the Toledo region.

### **Revenue Impacts**

- **Direct Revenue Impacts.** The re-fueling project will generate a significant amount of additional property tax revenues in Ottawa County. The project includes \$23.6 million in real property improvements and \$429.4 million in new equipment. Annual new property tax revenues from the nuclear power station are estimated at \$2.4 million per year.
- **Indirect Revenue Impacts.** Davis-Besse also generates substantial indirect property, sales and income tax revenues in Ohio through employee spending and property ownership. Indirect state and local revenues from regular employees are estimated at \$5.3 million per year. In addition, the steam generator placement and refueling project will generate additional income and sales taxes from local contractors, as well as sales and lodging taxes from visitor expenditures by non-local contractors. Additional state and local revenues over the next six months from contractors associated with the steam generator placement and refueling project are estimated at \$5.5 million.



**FIGURE 1**  
**SUMMARY OF RESULTS**  
(Millions of Dollars)

<b>Davis-Besse Regular Operations</b>	
Direct Employees	759
Estimated Payroll	\$60.72
<b>Steam Generator Placement &amp; Refueling Project</b>	
Temporary Employees	2,300
Estimated Payroll	\$147.00
<b>Annual Economic Impacts on Ohio</b>	
<b>Regular Operations</b>	
Total Output	\$444.21
Total Personal Income	\$106.09
Total Jobs	1,860
<b>Steam Generator Placement &amp; Refueling Project</b>	
Total Output	\$500.73
Total Personal Income	\$196.42
Total Jobs	3,449
<b>Annual Direct and Indirect Revenue Impacts</b>	
<b>Direct</b>	
Property	\$2.44
<b>Indirect-Regular Employees</b>	
Property	\$1.39
Sales	\$0.90
Personal Income	\$3.00
<b>Indirect-Contract Employees</b>	
Sales and Lodging	\$1.31
Personal Income	\$4.19

### 3.0 Economic Impacts

#### Operations Impacts

Davis-Besse has an estimated annual economic impact of \$444.2 million on Ohio's economy from its normal operations. It directly and indirectly supports close to 1,900 jobs and \$106.1 million in annual payroll throughout the state (Figure 1). This includes the impacts of production activity at Davis-Besse, as well as the impacts of supplier purchases and employee spending at other local businesses.

FIGURE 1  
ANNUAL OPERATIONS IMPACT OF  
DAVIS-BESSE NUCLEAR POWER STATION  
(millions of dollars)

Year	Direct			Indirect (Supplier) Impacts			Induced (Employee) Impacts			Total		
	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income
<i>Ottawa County Impacts</i>												
Regular Operations	\$296.45	759	\$60.72	\$23.62	241	\$7.72	\$67.45	642	\$20.37	\$387.52	1,641	\$88.80
<i>State of Ohio Impacts</i>												
Regular Operations	\$296.45	759	\$60.72	\$66.39	433	\$19.45	\$81.37	668	\$25.92	\$444.21	1,860	\$106.09

Economic impact analysis is a means for identifying the nature of changes in jobs, personal income and business activity that can occur in a given area as a result of a project or program. Economic impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the facility through its operations. Indirect impacts are the result of the multiplier effect, and capture supported supplier and consumer businesses and employees in Ottawa County and throughout Ohio that benefit from Davis-Besse. Multiplier effects are a way of representing the larger economic effects on the local economy. In essence, the multiplier effect represents the recycling of local spending that, in turn, creates new business opportunities.

Direct impacts include the direct value of power generated by Davis-Besse, as well as employees and payroll at the facility. Total jobs include local vendors from whom Davis-Besse makes purchases, as well as local establishments where employees shop. These local vendors and their employees in turn make additional local purchases that are captured in the total impact estimates. The total impact includes both the direct impacts and the secondary impacts created by other local businesses and their employees. Additional purchases by both Davis-Besse and its employees also occur outside the region and are not represented here.

The largest component of Davis-Besse's impact is through its local vendor purchases. Based on the types of supplies typically purchased by electric generating facilities and the suppliers available locally and within the state, it is estimated that the company's vendor purchases create an impact of approximately \$23.6 million per year in Ottawa County and \$66.4 million statewide. This supports an estimated 430 jobs and \$19.5 per year in personal income statewide.

In addition to impacts from vendor purchases, Davis-Besse creates economic impacts by virtue of its employees and payroll. A sizeable portion of employee payroll is spent at local establishments throughout the Northern Ohio region, with additional spending elsewhere in the state. The impacts of employee spending are based on typical spending patterns by income level. This household consumption impact accounts for the wide range of products and services that are

purchased by a typical household and is measured against the availability of those products and services locally and statewide. Approximately 39 percent of the workforce lives in Ottawa County, with the remainder living in primarily in Sandusky, Wood, Lucas and Erie counties. Davis-Besse's 759 regular employees with a payroll of approximately \$60.7 million, plus all of the local supplier employees, create an annual employee spending or induced impact of \$67.5 million in Ottawa County and \$81.4 million throughout the state. This employee spending supported an estimated 640 local jobs and 670 jobs statewide.

### Steam Generator Placement and Refueling Impacts

In addition to the on-going impacts of operations, FirstEnergy is making significant capital investments in Davis-Besse to replace the steam generator. At the same time, the plant will be going through outage maintenance and reactor re-fueling. This will result in approximately 2,300 additional employees on-site over the next six months. The majority of the work will occur in January and February, with completion expected by the end of March. These 2,300 employees, which include skilled trades as well as engineers and other professionals, will have an estimated payroll of \$147.0 million. About 41 percent will be from the Northern Ohio region, while the remaining workers will be from outside the area.

During the six month period when this project is taking place, it will create an economic impact of \$458.9 million on Ottawa County and \$500.7 million statewide (Figure 2). This includes the direct impacts or value of improvements to the power station, as well as local supplier purchases and purchases by local and non-local contractors. Although these impacts are non-recurring, they are very significant over the next six months and in fact are greater in magnitude than the normal annual impacts of plant operations. In addition to the 2,300 contractors working at Davis-Besse, there are an estimated 1,100 more local jobs that could be supported at other businesses throughout the state over the next several months.

FIGURE 2  
IMPACT OF STEAM GENERATOR PLACEMENT AND REFUELING PROJECT  
DAVIS-BESSE NUCLEAR POWER STATION  
(millions of dollars)

Year	Direct			Indirect (Supplier) Impacts			Induced (Employee) Impacts			Contractor Impacts			Total		
	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income
Ottawa County Impacts Steam Generator Placement & Refueling Project Contractors	\$351.07	2,300	\$147.00	\$38.95	337	\$13.17	\$66.74	635	\$20.15	\$2.10	26	\$0.72	\$458.89	3,298	\$181.04
State of Ohio Impacts Steam Generator Placement & Refueling Project Contractors	\$351.07	2,300	\$147.00	\$66.70	458	\$22.92	\$80.51	661	\$25.65	\$2.45	30	\$0.85	\$500.73	3,449	\$196.42

### Non-Local Contractor Impacts

Of the total 2,300 contractors, a sizeable portion are from outside the local area. Based on a detailed schedule of the number of non-local contractors that will be working on the steam generator placement and refueling project each week, this translates into 2,737 person-weeks. During this time, these non-local contractors will make expenditures for food, transportation, lodging and retail. Based on information from the Ohio Division of Travel and Tourism, we are assuming these non-local contractors spend approximately \$79 per day. This is less than the \$105 per person per day average visitor spending for Ohio. Since these contractors are working

during the day, it is likely that they spend less on retail and recreation than the average visitor. Nonetheless, the 19,200 visitor nights generated by non-local contractors could translate into estimated spending of \$1.5 million in the local economy during the project period (Figure 3).

**FIGURE 3  
ESTIMATED NON-LOCAL CONTRACTOR EXPENDITURES**

Type of Expenditure	Expenditures	Distribution
Lodging	\$201,554	11%
Food & Beverage	\$544,195	34%
Transportation	\$624,817	19%
Retail	\$151,165	23%
<b>Total Visitor Expenditures</b>	<b>\$1,521,731</b>	<b>87%</b>
<b>Total Visitor Days</b>	<b>19,159</b>	
<b>Average Expenditure per Day</b>	<b>\$79</b>	

Sources: Ohio Division of Travel and Tourism, 2012 (spending patterns);  
FirstEnergy Ohio (visitor levels).

\*Based on 2,737 person-weeks for non-local contractors between January 2013 and April 2014.

These visitor expenditures support local jobs and payroll in the hospitality industry. All total, the \$1.5 million in contractor spending would result in a total economic impact of \$2.1 million in Ottawa County and \$2.5 million statewide (Figure 4). This corresponds to \$720,000 in personal income and about 26 jobs at local retail and hospitality establishments in Ottawa County, plus an additional 4 jobs and \$133,000 in personal income in the surrounding region.

**FIGURE 4  
VISITOR IMPACTS FROM NON-LOCAL CONTRACTORS  
DAVIS-BESSE NUCLEAR POWER STATION**

	Direct			Total		
	Visitor Spending	Jobs	Personal Income	Output	Jobs	Personal Income
<b>Ottawa County Impacts</b>	<b>\$1,521,731</b>	<b>20</b>	<b>\$536,328</b>	<b>\$2,102,856</b>	<b>26</b>	<b>\$718,403</b>
Lodging	\$201,554	2	\$57,120	\$294,548	3	\$87,324
Food & Beverage	\$544,195	10	\$188,155	\$763,530	12	\$254,896
Transportation	\$624,817	5	\$209,312	\$840,010	7	\$278,326
Retail	\$151,165	2	\$81,741	\$204,768	3	\$97,858
<b>State of Ohio Impacts</b>	<b>\$1,521,731</b>	<b>22</b>	<b>\$558,886</b>	<b>\$2,453,121</b>	<b>30</b>	<b>\$851,526</b>
Lodging	\$201,554	2	\$59,333	\$340,441	3	\$105,373
Food & Beverage	\$544,195	10	\$188,395	\$911,031	13	\$297,258
Transportation	\$624,817	7	\$229,494	\$967,115	10	\$340,649
Retail	\$151,165	2	\$81,664	\$234,534	3	\$108,247

## Overall Economic Impacts

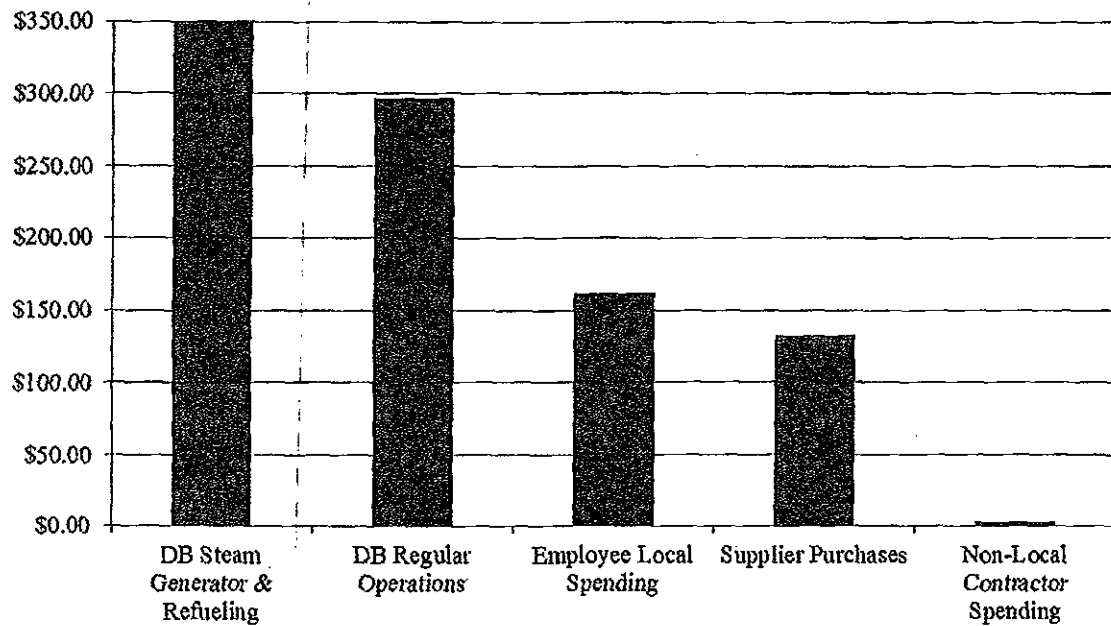
The composite operations impact results presented here are broken down in terms of direct impacts, indirect impacts (supplier purchases), induced impacts (employee spending), non-local contractor spending impacts and total impacts. All total, Davis Besse Nuclear Power Station will create a total economic impact of \$944.9 million in Ohio this year, including regular plant operations plus the steam generator placement and refueling project. On an on-going basis, Davis-Besse creates an estimated annual economic impact of \$444.2 million on the state's economy, directly and indirectly supporting about to 1,900 jobs and \$106.1 million in annual payroll, including jobs and payroll at the plant. This year, there are \$500.7 million in additional impacts associated with the steam generator placement and refueling project, along with 3,400 jobs and \$196.4 million in personal income.

Direct impacts include the employees, payroll and value of production at the plant. Total jobs include local supplier businesses where Davis-Besse makes purchases; the value of work being performed in the steam generator and refueling project; increases in demand local establishments where employees shop; and lodging, restaurants and retail where non-local contractors spend money. These supported local businesses and their employees in turn make additional local purchases that are captured in the total impact estimates. The total impact includes both the direct impacts and the secondary impacts created by other local businesses and their employees (Figures 5 and 6).

FIGURE 5  
COMBINED IMPACT OF REGULAR OPERATIONS AND STEAM GENERATOR PLACEMENT AND REFUELING PROJECT  
DAVIS-BESSE NUCLEAR POWER STATION  
(millions of dollars)

Year	Direct			Indirect (Supplier) Impacts			Induced (Employee) Impacts			Contractor Impacts			Total		
	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income
Ottawa County Impacts															
Regular Operations	\$296.45	759	\$60.72	\$23.62	241	\$7.72	\$67.45	642	\$20.37	\$0.00	0	\$0.00	\$387.52	1,641	\$88.80
Steam Generator Placement & Refueling Project															
Contractors	\$351.07	2,300	\$147.00	\$38.98	337	\$13.17	\$66.74	635	\$20.15	\$2.10	26	\$0.72	\$458.89	3,298	\$181.04
<b>Total</b>	<b>\$647.51</b>	<b>3,059</b>	<b>\$207.72</b>	<b>\$62.60</b>	<b>578</b>	<b>\$20.89</b>	<b>\$134.19</b>	<b>1,276</b>	<b>\$40.52</b>	<b>\$2.10</b>	<b>26</b>	<b>\$0.72</b>	<b>\$846.41</b>	<b>4,939</b>	<b>\$269.85</b>
State of Ohio Impacts															
Regular Operations	\$296.45	759	\$60.72	\$66.39	433	\$19.45	\$81.37	668	\$25.92	\$0.00	0	\$0.00	\$444.21	1,860	\$106.09
Steam Generator Placement & Refueling Project															
Contractors	\$351.07	2,300	\$147.00	\$66.70	458	\$22.92	\$80.51	661	\$25.65	\$2.45	30	\$0.85	\$500.73	3,449	\$196.42
<b>Total</b>	<b>\$647.51</b>	<b>3,059</b>	<b>\$207.72</b>	<b>\$133.09</b>	<b>891</b>	<b>\$42.37</b>	<b>\$161.88</b>	<b>1,329</b>	<b>\$51.57</b>	<b>\$2.45</b>	<b>30</b>	<b>\$0.85</b>	<b>\$944.94</b>	<b>5,309</b>	<b>\$302.51</b>

**Figure 6**  
**Statewide Economic Impacts by Type**



The multipliers used in this analysis are from IMPLAN, a national vendor of economic impact software, and are specific to Ottawa County and Ohio. Industry specific multipliers were used for construction, electric power generation, each category of visitor spending and household spending. On average, the output multiplier for the nuclear power station is 1.46. This means that for every \$1 million of power produced by Davis Besse, an additional \$460,000 in economic activity is generated in the state's economy. Similarly, for every direct job created at Davis Besse an additional 1.7 jobs are supported at other businesses in the state.

#### 4.0 Revenue Impacts

In addition to creating demand and supporting jobs and payroll in the regional and state economy, Davis-Besse also generates substantial local and state tax revenues. Economic impacts represent the benefits to the private economy, while revenue impacts represent the benefits to state and local government. The steam generator replacement will result in additional direct property taxes. Davis-Besse also indirectly supports additional revenues through employee and contractor spending, income and property ownership. All total, Davis Besse will generate an estimated \$13.2 million in direct and indirect revenues to local and state governments this year, not including any property taxes from existing power plant facilities.

##### Direct Revenues

As part of the steam generator replacement, FirstEnergy will invest \$23.6 million in real property for a containment access facility, a warehouse, renovation and expansion of the old steam generator storage facility and a new steam generator storage facility. In addition, they will purchase new equipment, including the steam generator, valued at \$429.4 million. These investments will generate approximately \$2.4 million in additional property taxes in the county on an on-going basis.<sup>3</sup>

FIGURE 7  
LOCAL AND STATE REVENUE IMPACTS  
DAVIS-BESSE NUCLEAR POWER STATION

		Local Taxes			State Taxes		Local &
	Property	Sales	Lodging*	Income	Sales	Income	State Total
Direct Revenues from New Capital Investment	\$2,439,563	na	na	na	na	na	\$2,439,563
Indirect (Employee-Driven) Revenues							
Regular Operations	\$1,390,494	\$164,639	\$0	\$900,032	\$736,048	\$2,101,066	\$5,292,279
Steam Generator Placement & Refueling							
Local Contractors	na	\$261,340	\$0	\$600,783	\$958,248	\$3,588,981	\$5,409,353
Non-Local Contractors	na	\$17,686	\$9,964	\$0	\$64,850	\$0	\$92,500
Total	\$3,830,057	\$443,666	\$9,964	\$1,500,815	\$1,759,146	\$5,690,048	\$13,233,695

Note: Includes indirect revenues generated by Davis-Besse employees based on county of residence. Analysis assumes that 41 percent of Steam Generator Placement & Refueling employees are from the local area.

\*Includes city and county lodging taxes based on an average rate of 6 percent. Lodging stays for 30 days or more are exempt from tax.

##### Indirect Revenues

Davis-Besse employees and contractors living in the local area also generate a significant amount of property, sales and income tax revenues. Indirect revenue impacts shown here are only for direct employees and contractors of Davis-Besse. There are additional indirect revenues generated by indirect employment supported by local supplier purchases and employee spending. Based on assessed value per capita in Ottawa County and average local property tax rates, the direct employees at Davis-Besse could generate an estimated \$1.4 million in indirect property tax revenues this year.

<sup>3</sup> Public utility personal property is taxed at 24 percent of market value. For the purpose of this analysis, average depreciation of 50 percent is assumed. Real property is taxed at 35 percent of market value. A tax rate of 40.804 mills was used, consistent with the current tax rate at the Davis-Besse site.

Based on employee and contractor payroll at Davis-Besse, employees could also generate approximately \$426,000 in local sales tax revenues and \$1.7 million in state sales tax revenues this year. This estimate assumes that local employees spend approximately 29 percent of their wages on goods that are subject to sales tax, based on data from the Census Annual Consumer Expenditure Survey. Applying this assumption to personal income of employees, and applying a local sales tax rate based on the distribution of employees by place of residence, yields local sales tax revenues from employee spending.

In terms of state and local income tax, Davis-Besse employees and local contractors could generate approximately \$1.5 million in local taxes and \$5.7 million in state taxes this year. Income taxes are based on average income per employee of \$80,000 less a \$1,600 deduction, times the appropriate state, city or school tax rate. City and school tax rates are based on employee residence by zip code.

In addition, the non-local contractors generate a significant amount of revenues this year as a result of their visitor expenditures. This includes \$18,000 in local sales tax and \$65,000 in state sales taxes on hotel, restaurant, retail and car rental expenditures. In addition, they could generate about \$10,000 in local lodging taxes from an estimated \$166,000 in hotel expenditures based on an average county and local lodging tax rate of 6 percent. Note that this total excludes stays of more than 30 days which are exempt from lodging tax.<sup>4</sup>

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<sup>4</sup> Stays over 30 days are estimated at 18 percent of total room nights based on projected staffing patterns for non-local contractors.



## **5.0 Summary**

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Davis-Besse is a significant contributor to the region's economy. It provides a clean, long-term source of power. It also provides high quality jobs to thousands of workers and supports the local economy with millions of dollars each year in vendor purchases. The steam generator replacement and refueling project will generate significant one-time impacts over the next six months in terms of additional jobs, payroll, spending and taxes that will more than double the plant's annual impact this year. In addition, the capital investments associated with this project will result in long term impacts in the form of additional property tax revenues to local governments.



**ECONOMIC AND REVENUE IMPACTS OF  
FIRSTENERGY W.H. SAMMIS PLANT**

**PREPARED BY:**

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**JUNE 2014**

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## 1.0 Introduction

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### Purpose of the Study

Applied Economics was retained by FirstEnergy to perform an economic analysis of the W.H. Sammis Plant in Stratton, Ohio. This analysis is intended to provide a framework for understanding the economic and revenue impacts that this generating facility creates throughout the region. W. H. Sammis is FirstEnergy's largest coal-fired power plant in Ohio. It has been in operation since 1959 and has the capacity to generate over 2,200 megawatts of electricity. This analysis documents economic and revenue impacts of W.H. Sammis on a tri-state region including the following counties: Jefferson, OH; Columbiana, OH; Mahoning, OH; Belmont, OH; Beaver, PA; Brooke, WV and Hancock, WV. These counties represent the region where the majority of the workers at the plant live.

W.H. Sammis is not only a major employer, but also makes a substantial amount of local supplier purchases that support the region's economy. W.H. Sammis directly employs close to 400 people with an annual payroll of \$34.0 million. The facility also supports an estimated 140 full-time equivalent contractors on a seasonal basis to assist with major maintenance.

The plant underwent a \$1.8 billion state-of-the-art upgrade of the air quality control systems several years ago. However, coal fired plants are facing strong competition from lower priced natural gas sources. Thus, the future of many coal powered plants is uncertain. The purpose of this study is to quantify not only the jobs and income that are supported by FirstEnergy directly at the W.H. Sammis plant, but also the effect that this plant has on the region in terms of supporting other local businesses.

### Applied Economics Background

Applied Economics LLC is an economic consulting firm, based in Phoenix, Arizona, specializing in economic development, economic and fiscal impact assessment, socioeconomic modeling, urban planning and custom software applications. Applied Economics conducts economic and fiscal impact studies and develops models to measure the effects of a wide variety of activities. These activities include development land use and policy changes, business-driven economic impacts, incentives, and program-driven economic and fiscal impacts. The principals at Applied Economics have worked together for more than twenty years, and are very experienced in working with local and regional planning and development issues.

The information and observations contained in this report are based on our present knowledge of the components of development, and of the current physical, socioeconomic and fiscal conditions of the affected areas. Estimates made in this analysis are based on hypothetical assumptions, current tax policies, and the current economic structure of the region.<sup>1</sup>

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<sup>1</sup> This analysis is based on the best available information and is intended to aid FirstEnergy in quantifying W.H. Sammis' impacts on the local economy. Even if the assumptions outlined in this report were to occur, there will usually be differences between the estimates and the actual results because events and circumstances frequently do not occur as expected. In no way will Applied Economics LLC be held responsible or have any liability or be subject to damages as a result of this analysis. This report may be used only for the purposes that it was intended.

## 2.0 Impact Summary

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The economic benefits shown here depict the on-going operations of the power plant. Economic impacts measure the effects of economic stimuli, or expenditures, in the local economy. These impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the nuclear power station. Indirect impacts are the result of the multiplier effect and capture supported supplier and consumer businesses and their employees in the larger region that benefit from the W.H. Sammis plant.

The operations of W.H. Sammis detailed in this analysis provide substantial economic benefits to the region. These positive impacts include the following:

### **Economic Impacts of On-Going Operations**

- **On-Going Operations Impacts.** W.H. Sammis creates an annual economic impact of \$585.6 million on the regional economy in Ohio, West Virginia and Pennsylvania each year. The operations of the power plant directly and indirectly support an estimated 1,100 jobs and \$67.3 million in annual payroll.
- **Jobs and Income.** The facility directly employs about 400 employees and 140 FTE contractors with combined annual payroll of \$45.9 million. Through the multiplier effect, an additional 520 jobs and \$21.4 million in payroll are supported annually at other businesses throughout the region. These additional jobs and payroll stem from supplier demand created by W.H. Sammis and consumer demand created by its employees and contractors.

### **Revenue Impacts**

- **Direct Revenue Impacts.** The W.H. Sammis plant is the largest taxpayer in Jefferson County, generating close to \$4.5 million in annual property tax revenues to local jurisdictions.
- **Indirect Revenue Impacts.** Employees and contractors also generate substantial indirect property, sales and income tax revenues in Ohio, Pennsylvania and West Virginia through household spending and property ownership. Indirect state and local revenues from workers are estimated at \$5.6 million per year.

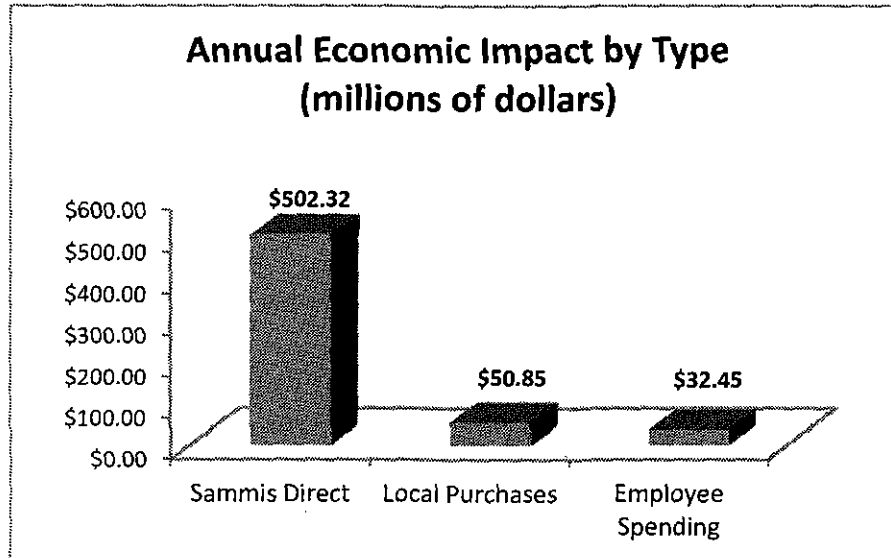
**FIGURE 1**  
**SUMMARY OF RESULTS**  
 (Millions of Dollars)

<b>W. H. Sammis Regular Operations</b>	
Direct Employees	396
Annual Payroll	\$33.98
Estimated FTE Contract Employees	139
Annual Labor Income	\$11.91
<b>Annual Economic Impacts on Tri-State Region*</b>	
<b>Regular Operations</b>	
Total Output	\$585.62
Total Personal Income	\$67.32
Total Jobs	1,059
<b>Annual Direct and Indirect Revenue Impacts</b>	
<b>Direct</b>	
Property	\$4.47
<b>Indirect (Employee Driven)</b>	
Property	\$908,727
Sales	\$1,386,605
Personal Income	\$3,311,548

\*Regional impacts include the following counties: Jefferson OH; Columbiana OH; Belmont OH; Mahoning OH; Brooke WV; Hancock WV; Beaver PA.

### 3.0 Economic Impacts

W.H. Sammis has an estimated annual economic impact of \$585.6 million on the regional economy from its regular operations. It directly and indirectly supports close to 1,100 jobs and \$67.3 million in annual payroll throughout the region. This includes the impacts of production activity at the plant, as well as the impacts of supplier purchases and employee spending at other local businesses.



Economic impact analysis is a means for identifying the nature of changes in jobs, personal income and business activity that can occur in a given area as a result of a project or program. Economic impacts include direct and indirect jobs, personal income, and economic activity or output that is generated by the facility through its operations. Indirect impacts are the result of the multiplier effect, and capture supported supplier and consumer businesses and employees in the seven-county region that benefit from W.H. Sammis. Multiplier effects are a way of representing the larger economic effects on the local economy. In essence, the multiplier effect represents the recycling of local spending that, in turn, creates new business opportunities.

#### 3.1 Direct Impacts

Direct impacts include the direct value of power generated by W.H. Sammis, as well as employees and payroll at the facility. The facility has about 400 regular employees and an estimated 140 FTE contractors. Their combined annual payroll is estimated at \$45.9 million. Direct output for the plant is estimated at \$502.3 million which represents the cost of the power that is produced including wages, supplies and profits.

### 3.2 Vendor Purchases

The largest component of W.H. Sammis' impact is through its local vendor purchases. Based on the types of supplies typically purchased by electric generating facilities and the suppliers available within the region, it is estimated that the company's vendor purchases create an impact of approximately \$50.9 million per year. This supports an estimated 360 jobs and \$15.8 million per year in personal income throughout the region. An example of typical purchases for electric generation facilities based on the types of suppliers available in the region is shown in Figure 2.

**FIGURE 2  
TYPICAL LOCAL SUPPLIER PURCHASES**

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Maintenance and repair of facilities and structures
Rail transportation
Coal
Banking
Legal services
Petroleum refineries
Extraction of oil and natural gas
Truck transportation
Wholesale trade
Accounting
Telecommunications
All other professional and technical services
Architectural, engineering, and related services
Business support services
Commercial and industrial machinery and equipment repair

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### 3.3 Employee and Contractor Spending

In addition to impacts from vendor purchases, W.H. Sammis creates economic impacts by virtue of its employees and payroll. An estimated 94 percent of employees live in the seven-county region that forms the basis for the impacts shown in this analysis. A sizeable portion of *employee payroll is spent at local establishments throughout this area, with additional spending in other parts of the tri-state area.* The impacts of employee spending are based on typical spending patterns by income level. This household consumption impact accounts for a wide range of products and services that are purchased by a typical household measured against the availability of those products and services within the region.

Approximately 73 percent of the workforce lives in Jefferson and Columbiana Counties, with the remainder living primarily in Mahoning and Belmont Counties in Ohio, Beaver County in Pennsylvania and Brooke and Hancock Counties in West Virginia (Figure 3). The combined impact of household spending by the 540 regular employees and contractors, plus all of the local supplier employees, creates an annual employee spending or induced impact of \$32.5 million in the region. This employee spending supports an estimated 160 local jobs (Figure 4).



**FIGURE 3**  
**W.H. SAMMIS EMPLOYEES BY COUNTY OF RESIDENCE**

<b>Ohio</b>	
Jefferson Ohio	44%
Belmont Ohio	5%
Columbiana Ohio	29%
Mahoning Ohio	3%
Other Ohio Counties	3%
<b>West Virginia</b>	
Brooke WV	3%
Hancock WV	5%
Other West Virginia Counties	2%
<b>Pennsylvania</b>	
Beaver PA	5%
Other Pennsylvania Counties	2%
<b>Total</b>	<b>100%</b>

**FIGURE 4**  
**ECONOMIC IMPACTS OF EMPLOYEE SPENDING**  
**ON THE TRI-STATE REGION**

Employee & Contractor Spending	Direct		Total		
	Jobs	Personal Income	Output	Jobs	Personal Income
\$23,587,605	118	\$4,043,953	\$32,453,660	160	\$5,601,018

Note: Impacts are adjusted for share of employees living in the region.

\*Tri-State Region includes the following counties: Jefferson OH; Columbiana OH; Belmont OH; Mahoning OH; Brooke WV; Hancock WV; Beaver PA.

### 3.4 Overall Economic Impacts

The composite operations impact is broken down in terms of direct impacts, indirect impacts (supplier purchases), induced impacts (employee spending) and total impacts. All total, W.H. Sammis creates a total economic impact of \$585.6 million in the surrounding region each year, directly and indirectly supporting about 1,100 jobs and \$67.3 million in annual payroll, including jobs and payroll at the plant (Figure 5).

**FIGURE 5**  
**ANNUAL DIRECT AND TOTAL OPERATIONS IMPACT OF**  
**W.H. SAMMIS PLANT**  
(millions of dollars)

Direct			Local Supplier Purchases			Employee Spending			Total		
Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income	Output	Jobs	Personal Income
\$502.32	535	\$45.90	\$50.85	363	\$15.82	\$32.45	160	\$5.60	\$585.62	1,059	\$67.32

Direct impacts include the employees, payroll and value of production at the plant. Total jobs include local supplier businesses where W.H. Sammis makes purchases and increases in demand at local establishments where employees shop. These supported local businesses and their employees in turn make additional purchases that are captured in the total impact estimates. The total impact includes both the direct impacts as well as the secondary impacts created by other local businesses and their employees. Additional purchases by both W.H. Sammis and its employees also occur outside the region and are not represented here.

The multipliers used in this analysis are from IMPLAN, a national vendor of economic impact software, and are specific to the seven-county region including Jefferson OH, Mahoning OH, Belmont OH, Columbiana OH, Brooke WV, Hancock WV and Beaver PA. Industry specific multipliers were used for electric power generation and household spending. On average, the output multiplier for the power plant is 1.17. This means that for every \$1 million of power produced by W. H. Sammis, an additional \$170,000 in economic activity is generated in the region's economy. Similarly, for every direct job retained at W. H. Sammis an additional 1.0 jobs are supported at other businesses in the region.

## 4.0 Revenue Impacts

In addition to creating demand and supporting jobs and payroll in the regional economy, W. H. Sammis also generates substantial local and state tax revenues. Economic impacts represent the benefits to the private economy, while revenue impacts represent the benefits to state and local government. All total, W.H. Sammis generates an estimated \$10.1 million in direct and indirect revenues to local and state governments each year, including property taxes from the power plant facilities.

### 4.1 Direct Revenues

W.H. Sammis is currently the largest property tax payer in Jefferson County. Last year, the plant generated \$4.5 million in local property taxes (Figure 6).

**FIGURE 6  
LOCAL AND STATE REVENUE IMPACTS  
W.H. SAMMIS PLANT**

	Local Taxes					Local & State Total
	Property	Sales	Income	Sales	Income	
Direct Revenues from W.H. Sammis Plant	\$4,469,620	na	na	na	na	\$4,469,620
Indirect (Employee-Driven) Revenues	\$908,727	\$295,238	\$1,089,650	\$1,091,367	\$2,221,898	\$5,606,879
Ohio region	\$781,085	\$295,238	\$1,055,651	\$933,274	\$1,831,155	
Pennsylvania region	\$70,063	\$0	\$33,998	\$63,237	\$104,375	
West Virginia region	\$57,579	\$0	\$0	\$94,856	\$286,368	
<b>Total</b>	<b>\$5,378,347</b>	<b>\$295,238</b>	<b>\$1,089,650</b>	<b>\$1,091,367</b>	<b>\$2,221,898</b>	<b>\$10,076,499</b>

Note: Includes indirect revenues generated by Sammis employees based on county of residence.

\*Tri-State Region includes the following counties: Jefferson OH; Columbiana OH; Belmont OH; Mahoning OH; Brooke WV; Hancock WV; Beaver PA.

### 4.2 Indirect Revenues

W.H. Sammis employees and contractors living in the local area also generate a significant amount of property, sales and income tax revenues. Indirect revenue impacts shown here are for direct employees and contractors as well as indirect employment supported by local supplier purchases and employee spending as shown in the economic impact results. Based on residential assessed value per capita in each county and average local property tax rates, the direct and indirect employees at W.H. Sammis could generate an estimated \$909,000 in indirect property tax revenues this year to local jurisdictions within the seven-county region in Ohio, Pennsylvania and West Virginia.

Based on employee and contractor payroll at W.H. Sammis, as well as indirect personal income from supplier and employee spending, employees could also generate approximately \$295,000 in local sales tax revenues and \$1.1 million in state sales tax revenues this year. This estimate assumes that local employees spend approximately 31 percent of their wages on goods that are subject to sales tax, based on data from the Census Annual Consumer Expenditure Survey. Applying this assumption to personal income of employees, and applying a local sales tax rate

based on the distribution of employees by place of residence, yields an estimate of local sales tax revenues from employee spending.

In terms of state and local income tax, W.H. Sammis employees and local contractors could generate approximately \$1.1 million in local taxes and \$2.2 million in state taxes this year. Income taxes are based on average income per direct and indirect employee of \$63,600 times the appropriate state or local income tax rate. Note that there are no local income taxes in West Virginia.

## **5.0 Summary**

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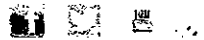
W.H. Sammis is a significant contributor to the region's economy. It provides high paying jobs with benefits to hundreds of workers and supports the area economy with millions of dollars each year in vendor purchases. In addition, the capital investments associated with this plant result in long term impacts in the form of additional property tax revenues to local governments. Cutbacks at this plant would not only impact FirstEnergy employees at the facility, but also many surrounding businesses that count on demand from purchases by FirstEnergy and its employees.



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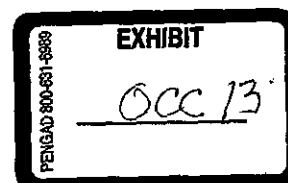
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The **Type SAM multiplier** uses all information about the institutions selected to be included in the predictive model. If only households are included, all information for industries, factors and households are included.

## Key Assumptions

Input-output modeling is based on several assumptions:

- ❖ Constant Returns to Scale
- ❖ No Supply Constraints
- ❖ Fixed Commodity Input Structure
- ❖ Homogenous Sector Output
- ❖ Industry Technology Assumption

The first assumption is that the **production functions** (an industry's list of expenditures) are assumed to **have constant returns to scale**. This means the production functions are considered linear; if additional output is required, all inputs increase proportionately.

**No supply constraints** means supplies are unlimited. An industry has unlimited access to raw materials and its output is limited only by the demand for its products.

A **fixed commodity input structure** implies that price changes do not cause a firm to buy substitute goods. This structure assumes that changes in the economy will affect the industry's output but not the mix of commodities and services it requires to make its products.

The fourth assumption is that there is **homogeneous sector output**. In other words: the proportions of all the commodities produced by that industry remain the same, regardless of total output. An industry won't increase the output of one product without proportionately increasing the output of all its other products.

The **industry technology assumption** comes into play when data is collected on an industry-by-commodity basis and then converted to industry-by-industry matrices. It assumes that an industry uses the same technology to produce all its products. In other words, an industry has a primary or main product and all other products are byproducts of the primary product.