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WRITER'S DIRECT NUMBER:

January 13, 2016

Docketing Division
Public Utilities Commission of Ohio
180 E. Broad Street, 11th Floor
Columbus, OH 43215-3793

RE: PUCO Case No. 14-1297-EL-SSO: Errata and Corrections to the Third Supplemental Testimony of Edward W. Hill

Dear Docketing Division Staff,

Enclosed please find an errata sheet and a corrected version of the Third Supplemental Testimony of Edward W. Hill, which was originally filed with the Commission on December 30, 2015. These changes correct typographical errors and eliminate inadvertent duplication of information. The minor corrections do not substantively affect the conclusions and opinions provided in Mr. Hill's Third Supplemental Testimony.

Please let us know if you have any questions or concerns.

Sincerely,

Danielle Ghiloni

Danielle M. Ghiloni

Errata to Third Supplemental Testimony of Edward W. Hill
Third Supplemental Testimony Filed December 30, 2015

Page	Line	Change
3	10	Replace "am" with "was"
13	FN 22	Clarifying reference. "Id. at 10" should be "Id."
14	FN 23	Clarifying reference. "Id. at 9" should be "Mikkelsen Fifth Supp. Testimony at 9; Third Supp. Stipulation At 6."
15	10	"December 2005" should be "December 2014"
26	FN 24	Clarifying reference. The footnote should read "Mikkelsen Fifth Supplemental Testimony at 10-12; Third Supp. Stipulation at 6."
28 line 12 through page 36		Delete duplicative testimony
2, 17, 23, 30, 31		Added missing page numbers

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

CORRECTED
THIRD SUPPLEMENTAL TESTIMONY OF EDWARD W. HILL
ON BEHALF OF THE
OHIO MANUFACTURERS' ASSOCIATION ENERGY GROUP

December 30, 2015
As corrected, January 13, 2016

Introduction, Purpose, and Summary of Conclusions

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

A. My name is Edward W. Hill. I am Professor of Public Affairs and City and Regional Planning and a member of the Faculty of the Discovery Theme in Materials and Manufacturing for Sustainability at The Ohio State University's John Glenn College of Public Affairs and College of Engineering. I was appointed to this position beginning September 1, 2015. I retired as the Dean of the Maxine Goodman Levin College of Urban Affairs at Cleveland State University and Professor of Economic Development on June 30, 2015. My business address is 310P Page Hall, 1810 College Road, Columbus, Ohio 43210.

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 was a member of the Cleveland State University faculty from 1985 to the end of June 2015. During my 30 years at Cleveland State University I rose through the academic ranks: Assistant Professor, Associate Professor, Professor and

Distinguished Scholar of Economic Development, Vice President of Economic Development, and then serving as Dean of the Levin College of Urban Affairs.

The Ohio State University asked me to join the interdisciplinary Discovery Theme in Materials and Manufacturing for a Sustainable World beginning in the 2015-16 academic year. I was appointed as a Professor in the John Glenn College of Public Affairs and in City and Regional Planning and I am a faculty member of the Ohio Manufacturing Institute. I am teaching the doctoral seminar in Public Economics in the spring of 2016. I will be teaching economic development policy and practice and public finance in subsequent semesters.

In addition, I was a non-resident Senior Fellow at the Brookings Institution's Metropolitan Policy Program and was an Adjunct Professor in Public Administration at South China University of Technology for three years. I was also a non-resident Visiting Fellow at the Institute of Government Studies at the University of California at Berkeley for five years, ending in 2013.

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 statutorily expired in 2014.

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

My research has focused 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 am widely published. I have published one book and am in the process of 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 participated in much of the energy research conducted at the Levin College either as an advisor or as an investigator. I led the research and writing of the 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 was also the co-chair of the advisory committee to the recently released three-part report on the natural gas resources in the state of Ohio.[2]

Q. Have you provided written testimony before in this proceeding?

[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/.

[2] See, e.g., Iryna Lendel et al., "Economics of Utica Shale: "Mapping the Opportunities for Shale in Ohio: Workforce Analysis." (September 2015) at http://engagedscholarship.csuohio.edu/urban_facpub/1330/; "Economics of Utica Shale: Supply Chain Analysis" (September 2015) at http://engagedscholarship.csuohio.edu/urban_facpub/1329/; "Mapping Opportunities for Shale Development in Ohio" (September 2015) at http://engagedscholarship.csuohio.edu/urban_facpub/1328/.

A. Yes, I provided written Direct Testimony on December 22, 2014,[3] Supplemental Testimony on May 11, 2015,[4] and Second Supplemental Testimony on August 10, 2015.[5] My testimony addressed the policy implications that I believe the Public Utilities Commission of Ohio (Commission or PUCO) should consider regarding the request of Ohio Edison Company (Ohio Edison), The Cleveland Electric Illuminating Company (CEI), and The Toledo Edison Company (Toledo Edison) (collectively, the Companies) for approval of an Economic Stability Program (Program), which includes shifting the financial risk of operating generation plants onto their customers through a rider and the utilization of a power purchase agreement (PPA) to subsidize portions of the generation capacity owned by the Companies' affiliate, FirstEnergy Solutions,[6] as well as the various stipulations filed.[7] I explained that the proposal, adopted by the stipulations, shifts the risk of owning and operating generating capacity to customers, including those customers who choose to shop and purchase their generation from alternative suppliers or generators other than the Companies' affiliate, FirstEnergy Solutions. I also addressed, in response to the Attorney Examiner's Entries dated March 23, 2015 and May 1, 2015, whether and how the Commission's factors set forth in the recent AEP Ohio Order regarding AEP's electric security plan (ESP) and request for cost recovery associated with a PPA[8]

[3] OMAEG Ex. 17.

[4] OMAEG Ex. 18.

[5] OMAEG Ex. 19.

[6] Companies Ex. 1.

[7] Companies Ex. 2 through 4.

[8] *In the Matter of the Application of Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to R.C. 4928.143, in the Form of an Electric Security Plan*, Case No. 13-2385-EL-SSO, et al., Opinion and Order at 25 (February 25, 2015) (AEP Ohio Order).

should be considered in evaluating the Companies' request for future cost recovery associated with a PPA.[9]

Q. What is the purpose of your Third Supplemental Testimony?

A. My Third Supplemental Testimony addresses the Third Supplemental Stipulation and Recommendation filed in this proceeding on December 1, 2015 (Third Supp. Stipulation), and explains how the Third Supp. Stipulation submitted by the Companies differs considerably from the Application that it filed on August 4, 2014, as amended by the three previously filed stipulations.[10] The Third Supp. Stipulation presents a new ESP (termed by the Companies as the "Stipulated ESP IV"[11]) while keeping its economic security plan for the power plants included in the PPA largely unchanged. The Third Supp. Stipulation is also purportedly supported by a number of signatory or non-opposing parties (collectively, Signatory Parties), which has also changed in substantial ways since the first stipulation was filed on December 22, 2014.[12] In the Third Supp. Stipulation, the Companies have raised new issues, offered new arguments, and presented an expanded coalition of supporters, labeled a "redistributive

[9] *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 (ESP IV Proceeding), Entry at 2 (March 23, 2015) and Entry at 10 (May 1, 2015) (citing AEP Ohio Order).

[10] As explained by the Third Supp. Stipulation at 2, the Third Supp. Stipulation, together with the "Prior Stipulations" (defined as the December 22, 2014 Stipulation, the May 28, 2015 Supplemental Stipulation, and the June 4, 2015 Second Supplemental Stipulation) form the "Stipulated ESP IV," which must be considered as a package. See also Fifth Supplemental Testimony of Eileen M. Mikkelsen at 2 (December 1, 2015) (Mikkelsen Fifth Supplemental Testimony). See OMAEG Ex. 19 for a discussion of the amendments to the Application as a result of the three Prior Stipulations.

[11] Id.

[12] Company Ex. 2 and 2A.

coalition," in an attempt to influence the public policy process in ways that are deleterious for the state of Ohio. Also, the Third Supp. Stipulation and supporting testimony presents an analysis of the Commission's three-pronged test used to evaluate regulatory settlements.[13]

The Signatory Parties of the Third Supp. Stipulation and Stipulated ESP IV, with the exception of the staff of the PUCO, constitute a redistributive coalition; they are not a representative cross-section of diverse interests that serve as a proxy for the public's interest in this case as is asserted in the Third Supp. Stipulation. Rather, the Signatory Parties represent their own corporate and organizational interests.

Q. Does the Third Supp. Stipulation or Stipulated ESP IV satisfy all prongs of the Commission's three-part test referenced by the Companies?[14]

A. No. Neither the Third Supp. Stipulation nor the Stipulated ESP IV satisfies any prong of the three-part test:

(a) The Signatory Parties do not "represent a variety of diverse interests." Instead, they represent a somewhat diverse, *ad hoc*, collection of corporate and institutional interests that benefit directly from specific aspects of the Third Supp. Stipulation or the other stipulations comprising the Stipulated ESP IV. The Signatory Parties only represent themselves and provide a façade of representational diversity. The Signatory Parties did not bargain on behalf of large classes of customers or a diverse

[13]Third Supp. Stipulation at 4; (Mikkelsen Fifth Supplemental Testimony) at 7-10.

[14]Id. at 9-10.

group. They did not secure benefits for all individuals or businesses that were not direct participants in the bargaining, a particular type of participant, or members of organizations that participated in the bargaining. They sought benefits either for their own company or what amount to benefits for their members.

(b) The Stipulated ESP IV violates a number of important regulatory principles and practices. Specifically, the Stipulated ESP IV:

- Re-imposes an oligopoly in the electric generating market.
- Deters new entry into the electric generating market, thwarting both competition and hurting the long-term reliability of the electric power system as a whole in the state of Ohio.
- Introduces *de facto* price discrimination among competing large electricity users based solely on organizational membership or a particular type of customer.
- Relies upon an opaque system of income transfers and cross-subsidies among consumers.

(c) The Stipulated ESP IV as a whole does not benefit customers and the public interest. The major beneficiaries from the Stipulated ESP IV are FirstEnergy, its stockholders, and management. The Stipulated ESP IV shifts business risk away from stockholders and management to customers. The Stipulated ESP IV will result in regulatory taxation produced by two forms of subsidy. The first is through the Affiliate PPA and Rider RSS, where losses incurred in the operations of the plants covered by the PPA are passed on to all electricity users in the Companies' service territories. The second is through the way that negotiated rate discounts, subsidies,

and energy efficiency investments are made. Typically, the cost of utility negotiating provisions in a regulatory setting are not borne by the utility, but instead, the amounts spent are passed on to ratepayers that do not directly benefit. If you are a member of the club that negotiated benefits to support the PPA politically, then you receive the benefits of membership while others pay for the privilege.

The Stipulated ESP IV holds out the very real potential of deterring investment in the electric generating capacity and harming the long-term reliability of the electric system. The Stipulated ESP IV will reverse the benefits received by consumers from deregulated markets for electric generation and will increase electric rates relative to rates in competing regions and, thereby, harming the economic prospects for businesses that are not members of the redistributive coalition and of residents of the state of Ohio.

Q. Have you had an opportunity to review the Third Supp. Stipulation?

A. Yes. At various times I have reviewed all of the stipulations that have been filed to date and together comprise the Stipulated ESP IV, as well as relevant portions of the Companies' Plan termed at different times *Powering Ohio's Progress*, Electric Security Plan IV, and ESP IV. In addition to reading the Third Supp. Stipulation, I have also reviewed the supplemental testimony of Eileen Mikkelsen filed in this proceeding on behalf of the Companies.[15]

[15] Supplemental Testimony of Eileen M. Mikkelsen (December 22, 2014) (Mikkelsen Supplemental Testimony or Company Ex. 8), Second Supplemental Testimony of Eileen M. Mikkelsen (May 4, 2015) (Mikkelsen Second Supplemental Testimony or Company Ex. 9), Third Supplemental Testimony of Eileen M. Mikkelsen (June 1, 2015) (Mikkelsen Third Supplemental Testimony or Company Ex. 10), Fourth Supplemental Testimony of Eileen M. Mikkelsen (June 4, 2015) (Mikkelsen Fourth Supplemental Testimony or Company Ex. 11), and Mikkelsen Fifth Supplemental Testimony.

Q. What are the public benefits that are claimed in the Stipulated ESP IVresulting from the Third Supp. Stipulation?

A. There are six purported benefits presented in the testimony supporting the Stipulated ESP IV resulting from the Third Supp. Stipulation: (1) Long-term, stable, and predictable retail prices, (2) consumer empowerment and retail competition, (3) economic development and job retention, (4) a business plan for transmission grid modernization, (5) investments to begin modernizing the distribution system, and (6) a mixture of alternative energy and carbon reduction actions.[16] I have listed these purported benefits from the most misleading to the truly beneficial. To accept items 1 through 3 on their face requires suspending all knowledge of how markets operate along with ignoring data that documents the economic benefits that competition in the wholesale electric generating business has produced. My testimony is a response to these six claims as they are justification for the Companies asserting that the PUCO's three-prong test has been met by the Stipulated ESP IV.

(1) LONG-TERM, STABLE AND PREDICTABLE RETAIL PRICES[17]

Q. Will long-term retail electric prices be more predictable and stable under the terms of the Stipulated ESP IV?

A. There are four components to an honest answer to this question: (i) the Companies' affiliate's rate of return on equity on the PPA generating plants included in the Third Supp. Stipulation will be both stable and predictable under the Stipulated ESP IV. (ii) Retail electric prices may be somewhat more predictable under the Stipulated ESP IV

[16] Mikkelsen Fifth Supplemental Testimony at 10-12.

[17] Id. at 10, 13; Third Supp. Stipulation at 6.

than if the generating market remained unregulated. (iii) It is unlikely that retail electric prices will be more stable than they are currently. There are two reasons for this expectation. One is based on the documented 10-year record of stable electric prices that I will present. The other is based on the algebra of the Affiliate PPA. And, (iv) it is very likely that prices will be higher than if the generating market remain unregulated.

The Companies' Affiliate's Return on Equity:[18] The affiliate PPA has been the central, consistent, element through all proposals and submittals culminating in the Stipulated ESP IV. The Companies have testified that the two power plants in question, along with the Companies' partial ownership in OVEC lose money. What is new in the Third Supp. Stipulation is a reduction in the return on equity that FirstEnergy Solutions will receive (from 11.15% to 10.38%) from its equity invested in the plants covered by the affiliate PPA.[19] The period covered by the PPA, and its associated Rider RRS, has also been shortened from 16 years—2016 to 2031—to 8 years—2016 to 2024—in the Third Supp. Stipulation.[20] If approved this return on equity will be both stable and predictable.

Retail electric prices will be more predictable:[21] Retail electric prices may be somewhat more predictable under the affiliate PPA than under an unregulated

[18] Mikkelsen Fifth Supplemental Testimony at 7.

[19] Id. at 7 (which will be reflected in a modified Term Sheet regarding the PPA between the Compnaies and FirstEnergy Solutions).

[20] Id. at 3, 7 (which will be reflected in a modified Term Sheet regarding the PPA between the Compnaies and FirstEnergy Solutions).

[21] Id. at 10; Third Supp. Stipulation at 6.

generating market based on how the algebra of the PPA works. However, consumers will be negatively impacted by higher prices.

Under the structure of the affiliate PPA, the associated generating plants sell their power to the Companies at a price that covers the operating, or variable, costs associated with generating electricity, the cost of debt associated with the plant, and a 10.38% return on equity. Debt payments and the mandated return on equity are fixed costs—they do not vary substantially over time. The variable costs associated with producing power will change over time, with the cost of fuel being a large component.

If P_{PPA} represents the sales price to the Companies under the affiliate PPA, D the amortized debt payments, E the return on equity, VC the variable cost of producing electricity, and with ΔVC representing a one-unit change variable costs, then:

$$P_{PPA} = D + E + VC, \text{ then } \Delta PP_{PA} = \Delta VC.$$

If D and E change they do so at a very gradual rate and for purposes of this illustration they are essentially fixed. The only parts of the equation above that can vary are the variable costs associated with production. In terms of microeconomics, the marginal cost of operating the generating plants are only associated with changes in variable costs. However, in a competitive market, equilibrium prices are associated with marginal or variable costs, not total costs.

Will prices be more predictable then they are now as stated in the supporting testimony?[22] The answer is yes because predicting the fixed costs will be well known to both the Companies and the Commission, and, because making electricity is a capital intense business, fixed costs have a higher share of total costs then in other

[22] Id.

industries. The formulaic nature of fixed costs and their relatively large share of total costs, along with a guaranteed return on equity (profit) will improve the predictability of the retail electricity costs passed onto the Companies under the PPA (assuming no large capital investments are required), and then flowed through to customers per Rider RRS. This will be also create a more predictable revenue stream to FirstEnergy Solutions compared to the units selling directly into the grid where the generator can lose money.

Under the affiliate PPA, retail prices will still change, however, with changes in the variable costs associated with making electricity (i.e., necessary capital investments). The confusion comes from the fact that under the PPA retail prices will be more predictable than they are currently due to the large fixed cost component in the sales formula. However, retail electric prices will also be higher and will be as variable as they are now since variable costs drive the equilibrium price in a free market and in the PPA's formula.

If a two-dimensional graph were drawn of the cost curves under the PPA and under the current unregulated market, the slopes of the two curves will be the same, but the place where the cost curve intersects the y-axis (the axis that measures cost) will be higher for the PPA generating cost curve than it will be for the free market cost curve, as will every other point of the PPA cost curve. Both lines will be equally variable, but the PPA cost curve will be more slightly predictable.

The Companies want us to believe that predictability coupled with both higher prices than currently exist in today's free market and with the same level of variability is preferred by retail customers. I do not agree.

Retail electric prices will be more stable than they are currently:[23] Data collected by the Commission over the past 10 years is remarkable for two statistical facts. First, after adjusting for the electricity component in the consumer price index for all urban consumers electricity prices have been declining. The decline is most likely due to a combination of falling demand and the introduction of competitive electrical generating markets. The decline in demand is secular due to a combination of population loss, the profound negative impact of the Great Recession and the slow pace of recovery, greatly increased efficiency in the manufacturing sector, and then the opening of the vast natural gas resources in the Appalachian Basin—first in the Marcellus shale formation and then in the Utica formation—creating a cheap fuel source, especially when considering environmental compliance costs. Second, in statistical terms, prices have been stable around a downward trend. See Figures 1 to 5 included below.

Statistical stability means low levels of variation in the data, where variation means the spread of observations around the mean of the distribution. Two measures of variation are commonly used to describe dispersion in a data series: the standard deviation and the Coefficient of Variation (CV). The standard deviation is an absolute measure of the spread of distribution around its mean, or average. In a normal distribution approximately two-thirds of the observations will be clustered within plus or minus one standard deviation of the mean. The smaller the standard deviation the tighter is the spread of data around the mean. The CV is a relative measure that

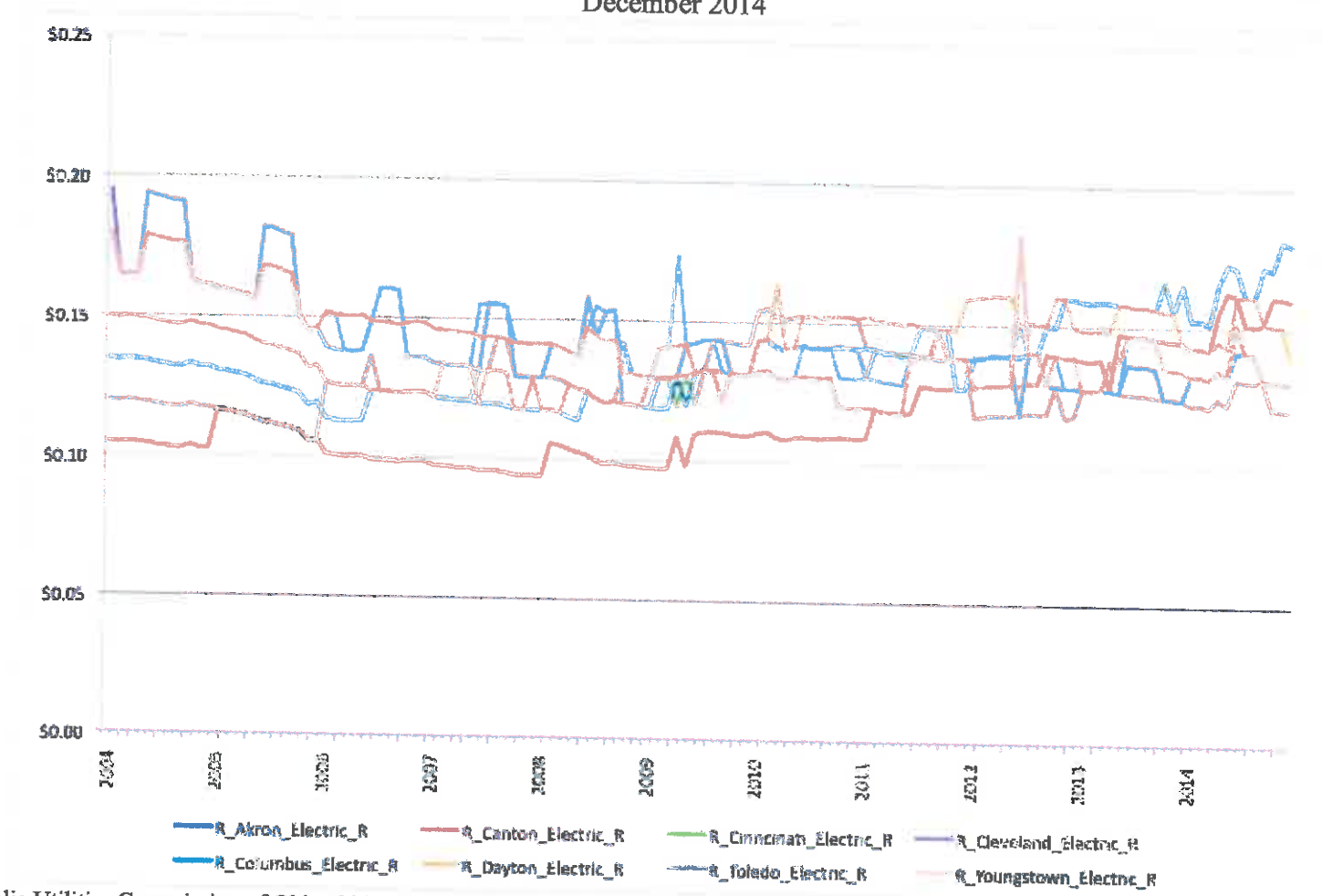
[23] Mikkelsen Fifth Supp. Testimony at 9; Third Supp. Stipulation at 6.

allows comparison of spread in different data series that are measured differently. The CV is defined as the standard deviation divided by the mean. See Table 1 included below.

The data displayed in Figures 1 to 5 below are from the monthly Ohio Utility Rate Survey, with the data covering January 2004 to December 2014. The staff of the Commission collects data monthly on the standard service offer (SSO) rates in the state's eight large metropolitan areas, Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Toledo and Youngstown, based on prototypical usage. These data are in the figures below. Figure 1 is for residential electric SSO for 750 KWH of electricity; Figure 2 is for commercial electricity customers using 300,000 KWH monthly and 1,000 KWH daily; Figure 3 is for a major industrial customer using 6,000,000 KWH a month and 20,000 KWH daily. The data in Figures 1 to 3 are adjusted for inflation using the electricity component of CPI-U so that the data are presented in 2014 real dollars.

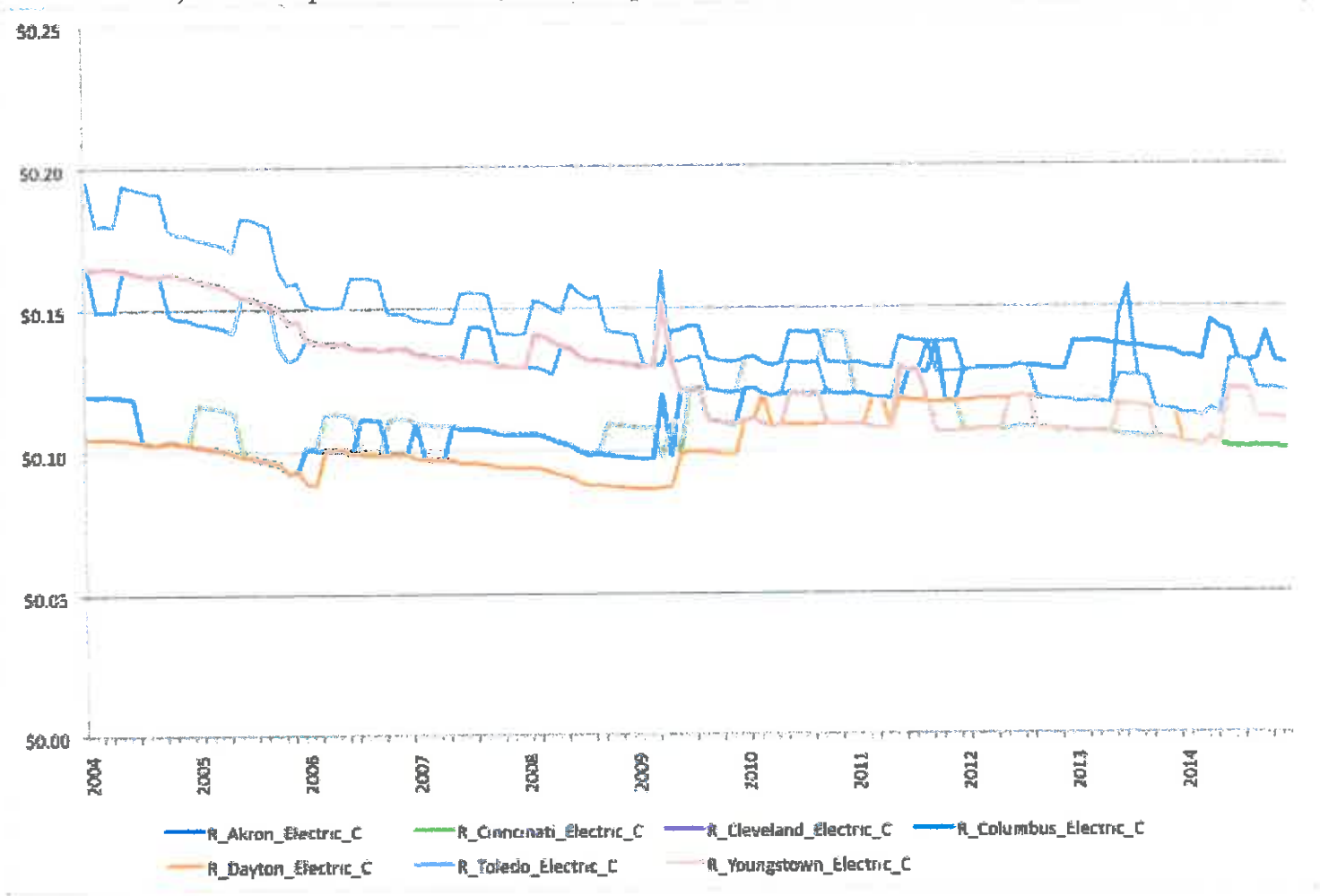
To illustrate the impact that the discovery of major natural gas resources in the Appalachian Basin has had on industrial energy prices, Figure 4 presents the data for commercial users of 45 MCF natural gas a month, while Figure 5 depicts the cost of a large industrial user of 350 MCF of natural gas. The data for Youngstown were incomplete in the dataset used to plot Figure 5.

Figure 1
Inflation Adjusted Residential Standard Service Offer per KWH Based on a Standard Service Offer of 750KWH from January 2004 to December 2014



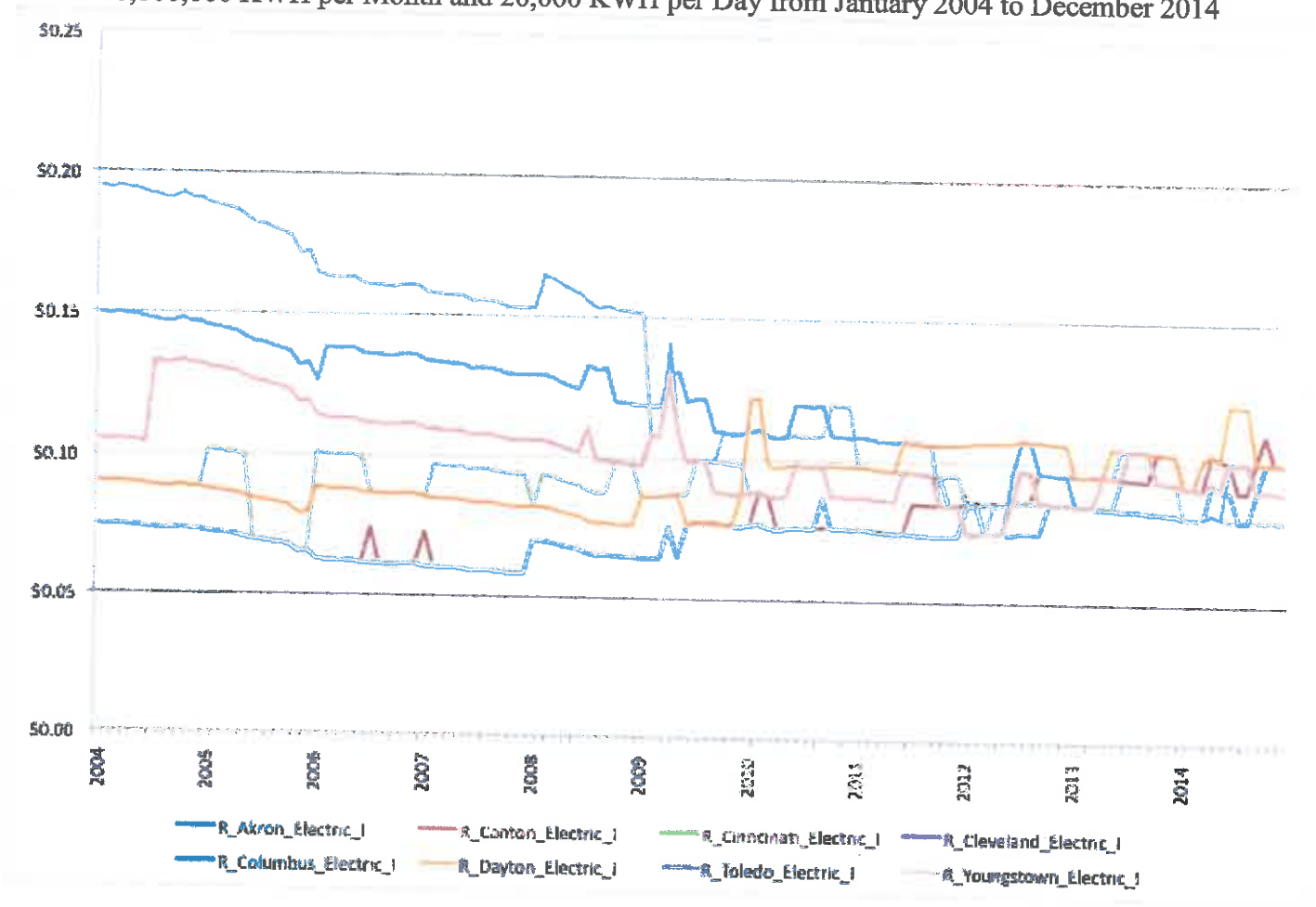
Sources: Public Utilities Commission of Ohio, Ohio Utility Rate Survey (monthly) and U.S. Bureau of Labor Statistics, Consumer Price Index—all Urban Consumers—Electricity, monthly downloaded from FRED, the data service of the St. Louis Federal Reserve Bank (December 29, 2015).

Figure 2
Inflation Adjusted Comparison of Commercial Utility Bills per KWH in 8 Major Ohio Cities Based on a Standard Service Offer of 300,000 KWH per Month and 1,000 KWH per Day from January 2004 to December 2014



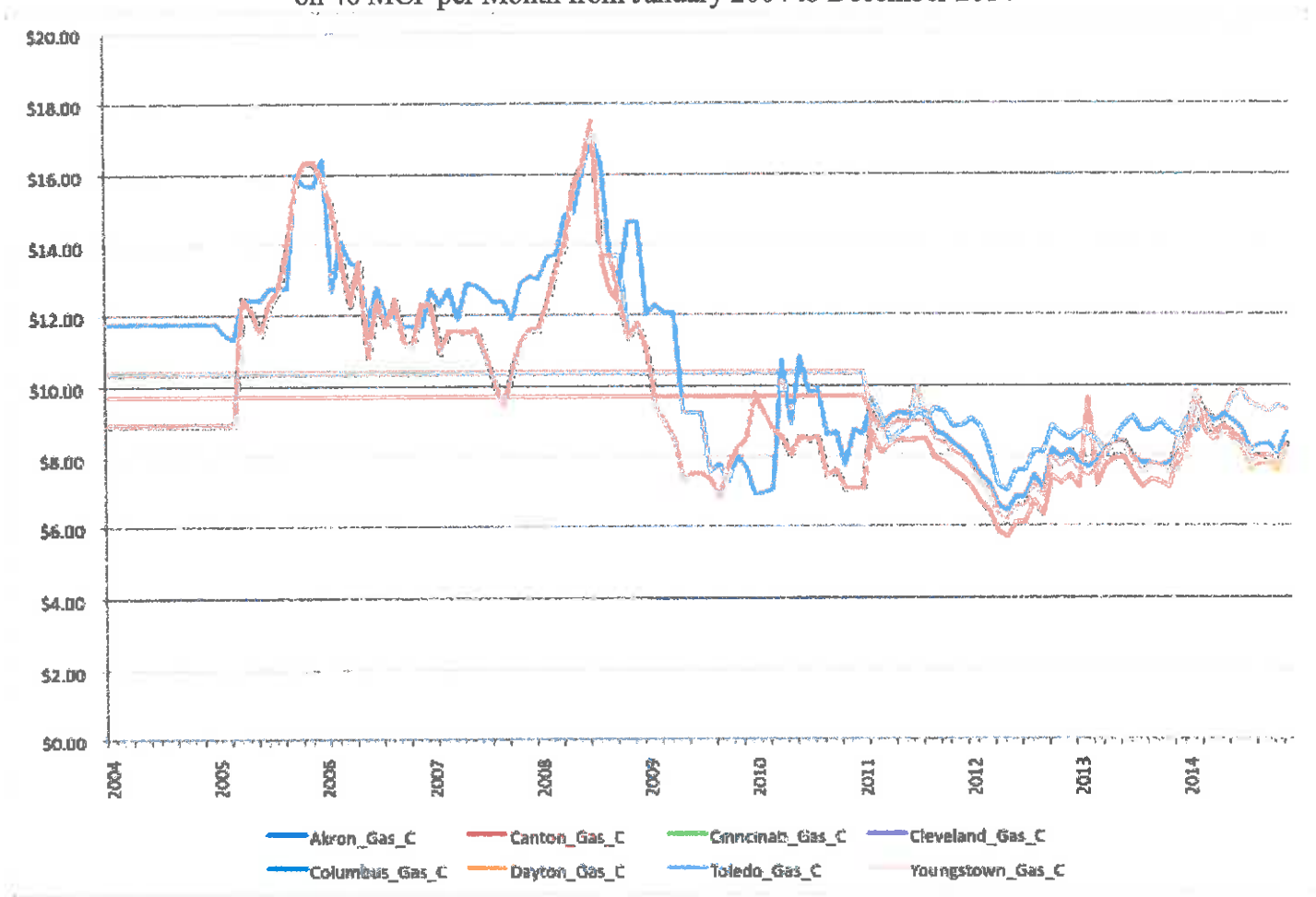
Sources: See Figure 1

Figure 3
Inflation Adjusted Comparison of Industrial Utility Bills in 8 Major Ohio Cities per KWH Based on a Standard Service Offer of 6,000,000 KWH per Month and 20,000 KWH per Day from January 2004 to December 2014



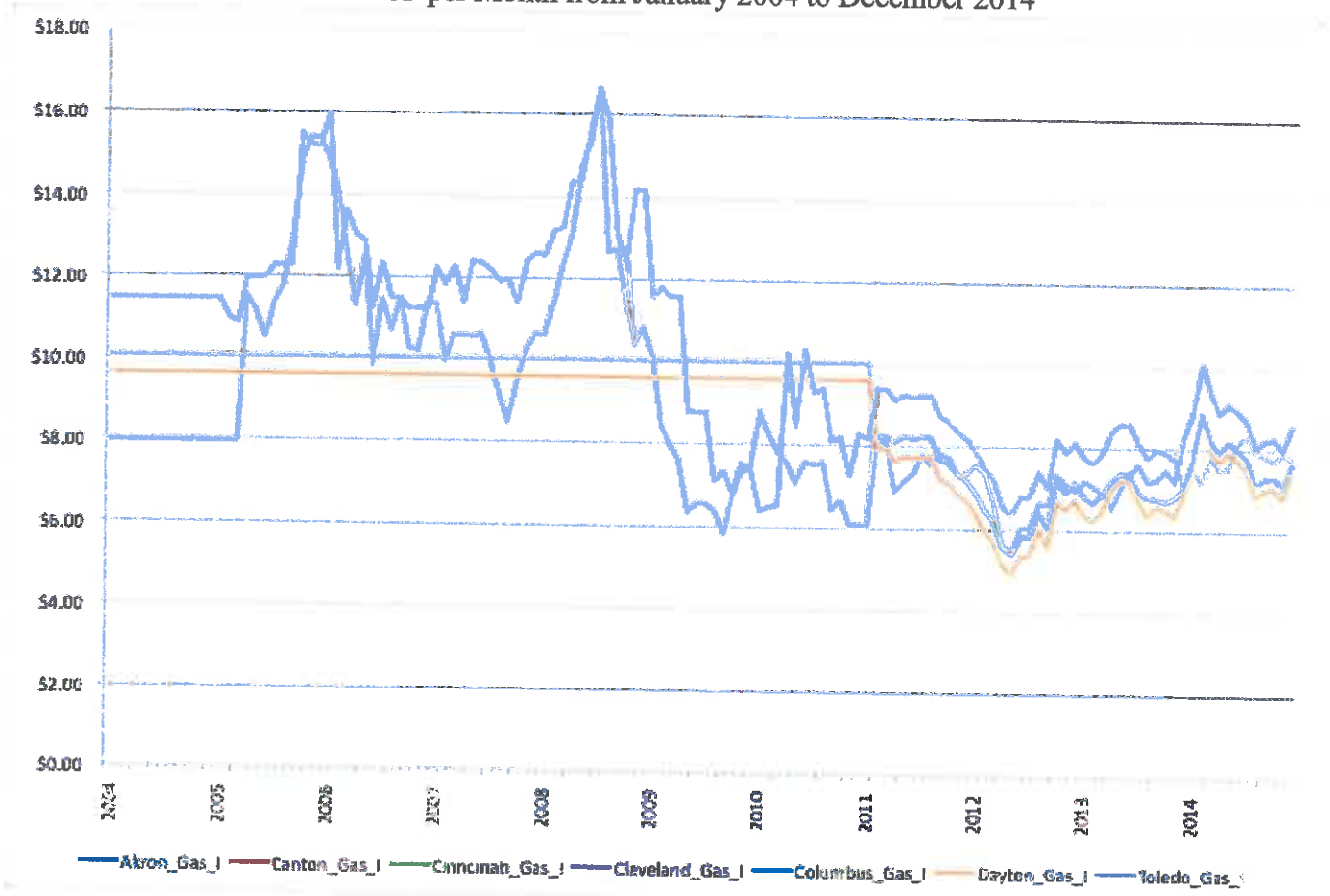
Sources: See Figure 1

Figure 4
Comparison of Current Dollar Natural Gas Bills for Commercial Customers per MCF in 8 Ohio Cities with a Standard Service Offer on 46 MCF per Month from January 2004 to December 2014



Source: See Figure 1

Figure 5
Comparison of Current Dollar Natural Gas Bills of Industrial Customers per MCF in 8 Ohio Cities with a Standard Service Offer of 350 MCF per Month from January 2004 to December 2014



Source: See Figure 1

Table 1

Monthly Utility Rates Have Been Extremely Stable From 2004 to 2014. Variances Have Gotten Smaller

		Residential Electricity			Commercial Electricity			Industrial Electricity		
Years	Metropolitan Area	Standard Deviation	Average (Mean)	Coefficient of Variation	Standard Deviation	Average (Mean)	Coefficient of Variation	Standard Deviation	Average (Mean)	Coefficient of Variation
2004-2014	Akron	0.01	$0.14	0.10	0.02	$0.13	0.15	0.01	$0.10	0.14
	Canton	0.02	$0.12	0.16	0.02	$0.09	0.22	0.01	$0.08	0.17
	Cincinnati	0.01	$0.13	0.09	0.01	$0.11	0.09	0.01	$0.09	0.12
	Cleveland	0.02	$0.14	0.12	0.01	$0.13	0.09	0.02	$0.12	0.18
	Columbus	0.02	$0.14	0.12	0.01	$0.12	0.12	0.01	$0.07	0.12
	Dayton	0.01	$0.14	0.09	0.01	$0.10	0.10	0.01	$0.09	0.12
	Toledo	0.01	$0.14	0.09	0.02	$0.14	0.16	0.04	$0.13	0.32
	Youngstown	0.01	$0.14	0.10	0.02	$0.13	0.15	0.01	$0.10	0.14
Jan-04 to Dec-08	Akron	0.01	$0.15	0.08	0.01	$0.14	0.09	0.01	$0.11	0.09
	Canton	0.01	$0.10	0.06	0.00	$0.07	0.04	0.01	$0.07	0.08
	Cincinnati	0.01	$0.12	0.06	0.01	$0.11	0.05	0.01	$0.09	0.11
	Cleveland	0.02	$0.15	0.13	0.01	$0.14	0.07	0.01	$0.14	0.06
	Columbus	0.01	$0.12	0.05	0.01	$0.10	0.07	0.01	$0.07	0.08
	Dayton	0.01	$0.13	0.08	0.01	$0.10	0.05	0.00	$0.08	0.05
	Toledo	0.01	$0.15	0.09	0.02	$0.16	0.10	0.02	$0.17	0.09
	Youngstown	0.01	$0.15	0.08	0.01	$0.14	0.09	0.01	$0.11	0.09
Jan-09 to Dec-14	Akron	0.01	$0.13	0.07	0.01	$0.11	0.08	0.01	$0.09	0.10
	Canton	0.02	$0.13	0.14	0.02	$0.10	0.17	0.01	$0.09	0.13
	Cincinnati	0.01	$0.13	0.09	0.01	$0.11	0.10	0.01	$0.09	0.12
	Cleveland	0.01	$0.14	0.05	0.01	$0.13	0.08	0.01	$0.10	0.14
	Columbus	0.01	$0.15	0.10	0.01	$0.13	0.09	0.01	$0.08	0.09
	Dayton	0.01	$0.15	0.06	0.01	$0.11	0.08	0.01	$0.10	0.11
	Toledo	0.01	$0.14	0.06	0.01	$0.12	0.07	0.01	$0.09	0.13
	Youngstown	0.01	$0.13	0.07	0.01	$0.11	0.08	0.01	$0.09	0.10
Difference 04 to 08 and 09 to 14	Akron	0.00	-0.02	-0.01	0.00	-0.03	-0.01	0.00	-0.02	0.00
	Canton	0.01	0.03	0.08	0.01	0.03	0.12	0.01	0.02	0.05
	Cincinnati	0.00	0.01	0.03	0.01	0.01	0.05	0.00	0.00	0.02
	Cleveland	-0.01	-0.02	-0.08	0.00	-0.01	0.00	0.01	-0.04	0.08
	Columbus	0.01	0.02	0.05	0.00	0.02	0.02	0.00	0.01	0.01
	Dayton	0.00	0.02	-0.02	0.00	0.01	0.03	0.01	0.02	0.06
	Toledo	-0.01	-0.02	-0.04	-0.01	-0.04	-0.03	0.00	-0.08	0.04
	Youngstown	0.00	-0.02	-0.01	0.00	-0.03	-0.01	0.00	-0.02	0.00

Source: Calculated from Public Utilities Commission of Ohio, Ohio Utility Rate Survey, monthly.
http://www.puco.ohio.gov/puco/index.cfm/industry-information/statistical-reports/ohio-utility-rate-survey/#sthash.dL7uGQBs.dpbs

Real, inflation-adjusted, residential electricity prices have experienced 10-years of secular decline with very modest price recovery beginning in mid-2009 (Figure 1) across the state of Ohio. Since 2009, residential retail prices have gone up the most in Canton and Akron regions, followed by Dayton, with the biggest real declines occurring in the state's largest metropolitan areas. Because the data are for SSO rates, it most likely overstates the rise in average monthly residential electric bills, especially in Northeast Ohio. The downward trend in the cost of electricity to commercial and industrial users is unmistakable in Figures 2 and 3, respectively. Here, the Akron metropolitan area is the outlier with commercial bills increasing from 2009 until they stabilized in late 2012 and Dayton's commercial users also saw prices jump throughout 2009 before stabilizing. The other metropolitan areas experienced consistent declines in commercial rates over the entire time period.

The industrial electricity market has converged over the decade. As the Figures demonstrate, in 2004, there was a $0.12 per KWH spread in SSO rates in 2004 with a high of nearly $0.20 per KWH in the Toledo region being the extreme outlier and holding that position until 2009 when average SSO rates declined to the norm for the state. Since 2012, the regional spread is about $0.03 per KWH.

The three Figures all show an overall pattern of decline in the cost of electricity across the state's metropolitan areas with significant convergence in prices taking place within each class for residential, commercial, and industrial customers beginning in 2011. This is exactly the pattern an analyst expects to see in an operating market. Nonetheless, if we review the statistics included in Table 1, we can see what has occurred in terms of the spread and stability of rates across time.

Table 1 lists the standard deviation, mean, and CV by the eight metropolitan areas in the PUCO's data for each class of customers, residential, commercial, and industrial. The first block of rows provides this information for the full 10-year time period. The second block covers the first five-years, January 2004 to December 2008, and the third block covers the second five-year period, January 2009 to December 2014. Not only does the data break evenly into two five-year blocks, but early 2009 appears to be a break point in the data with a slight recovery in electric prices and an acceleration in the convergence in prices paid within each group of customers across the state's major metropolitan areas. In terms of electricity prices, early 2009 marked an important event—most likely associated with e recovery from the Great Recession. The second time period also marks the full realization of the benefits of deregulation of the electric generating markets.

The last block of rows in the table lists the differences between the values in the two time periods. The value for the 2004 to 2009 time period was subtracted from the value for the later period, 2009 to 2014. If the result is negative it means that the value from 2009 to 2014 is smaller than the previous time period. For example, the negative mean number for residential customers in Cleveland in this bottom block means that the average SSO residential electric bill dropped by $0.02 per KWH. Similarly, the negative mean for industrial customers shows that the average SSO industrial customer saw their electric bill drop by $0.08 a KWH.

The data in Table 1 reveal the following:

- Bills for industrial customers have converged. Mean bill rates were lower in the second time period than in the first and the standard deviations in most of

the regions are at 0.01; this is ± one cent per KWH. Deregulation is working for industrial operations.

- Commercial electricity users have also experienced lower bills in the second time period compared to the first in Akron, Cleveland, and Toledo. The largest increase was in Canton at $.03 per KWH. Spreads are narrow with the standard deviation being 0.01 in most of the metros in second time period, with the exception of Canton.
- Residential ratepayers experienced average monthly bills decrease in Akron, Cleveland, Toledo, and Youngstown. Canton had a mean increase of $0.03 per KWH, Columbus and Dayton increased by $0.02 per KWH, and Cincinnati increased by $0.01 per KWH.
- The distributions of monthly billing rates for all three groups of customers were very narrow across both time periods, but were generally smaller form 2009 to 2014. Again, deregulation appears to be working. Prices have become less volatile.

The data presented in this section show that the Signatory Parties to the Stipulated ESP IV resulting from the Third Supplemental Stipulation got it wrong on this count. Electricity prices haves become more stable and predictable as deregulation progressed. Reregulation cannot narrow the spreads further, except by increasing costs across the board.

(2) CONSUMER EMPOWERMENT AND RETAIL COMPETITION

The Third Supp. Stipulation and supporting testimony asserts that the Stipulated ESP IV will empower customers and enhance retail competition.[24] This is an assertion that was made in previous iterations of the Prior Stipulations and supporting testimony and it suffers from the same logical and factual shortcomings as it did in the earlier versions. Consumers can never be empowered and retail competition can never be enhanced when regulatory powers are being used to increase the base price of the product and when regulation takes away the consumer's ability to choose a supplier. There is no amount of technology or information that can repeal partial price-fixing. Rider RRS is explicitly designed to socialize the losses from the three power plants under the PPA. The losses experienced by the Companies when they purchase power from the generating plants and then sell it into the grid at a lower price through PJM will be spread across to all ratepayers in the Companies' service territories (unless the ratepayer obtains an exemption from the PUCO), even if the residential consumer or business purchases their power from another supplier. This *de facto* tax imposed by regulation to support the Companies' affiliates uneconomic power plants neither empowers customers nor enhances retail competition. All that it does is increase the cost of electricity and lower the incentive to shop for lower electric prices and choose a competitive supplier. Rider RRS is a cross-subsidy.

[24] Mikkelsen Fifth Supplemental Testimony at 10-12; Third Supp. Stipulation at 6.

Any benefits that may be derived from deployment of smart meters included in the Third Supp. Stipulation[25] cannot offset the losses that will be derived from empowering a monopoly in the generating market.

(3) ECONOMIC DEVELOPMENT AND JOB RETENTION[26]

Q. Does the Stipulated ESP IV constitute a major economic and job development investment or set of policies?[27]

A. As a package, the Stipulated ESP IV resulting from the Third Supp. Stipulation does not constitute a major economic and job development investment or set of policies. There is a mixture in what the proposed Stipulated ESP IV purports to do to support economic development activities within the Companies' footprint. The Companies are an active supporter of the economic development profession and take a leadership position in regional economic development activities. And the cooperative reputation of the Companies' economic development group is well known. Of course, the Companies do benefit from attracting and expanding the number of electricity users in their service territories. The Companies agree to spend $3 million "in shareholders dollars" in each of the eight 12-month cycles covered by the agreement on energy conservation, and economic and job development programs in the Third Supp. Stipulation.[28]

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[25] Third Supp. Stipulation at 3, 9-10.

[26] Mikkelsen Fifth Supplemental Testimony at 9-10; Third Supp. Stipulation at 3, 6.

[27] Id.

[28] See Mikkelsen Fifth Supplemental Testimony at 6. The Companies also drape their actions to keep its uneconomic power plants open as economic development spending. See comments that I previously made on the Prior Stipulations, which explain the analytical inadequacies of the analysis performed on that count. See Hill Supplemental Testimony at 10-13 (May 11, 2015) (OMAEG Ex. 18).

When considered in its totality, the Stipulated ESP IV cannot be seriously considered to be a source of economic development stimulus because its ultimate goal is to raise electricity prices within the Companies' service territories as a way of making its three loss-making power plants profitable. When the price of a major factor of production increases operating costs will rise, with the increase in operating costs comes pressure to increase product prices, and when product prices increase relative to competitors' prices profits shrink, pressure to hold back wages increases, and jobs are lost. All other parts of the Stipulated ESP IV are window dressing. The primary goal of the Companies is to provide enough gain to the various members of its redistributive coalition to obtain approval of the affiliate PPA and Rider RRS.

Q. Do the provisions of the Stipulated ESP IV resulting from the Third Supp. Stipulation improve the competitive standing of the state of Ohio in terms of private sector operating costs and economic development as stated in the Stipulated ESP IV and supporting testimony?[29]

A. No. Despite the benefits derived in the marketplace from decreases in real electricity rates to commercial and industrial customers, Ohio's rates remain above those available in competitor states. Table 2 below provides data from the U.S. Energy Information Agency on the competitive position of Ohio in the aggregate compared to states in the upper Midwest that we compete with—Illinois, Indiana, Kentucky, Michigan, New York, Pennsylvania, and West Virginia, and in the Southeast and Middle South—Alabama, Georgia, North Carolina, South Carolina, and Tennessee.

[29] Mikkelsen Fifth Supplemental Testimony at 9-10; Third Supp. Stipulation at 3, 6.

Table 2 includes data on the average retail price of electricity in these selected states as of 2013. Ohio is ranked 23rd in the nation with an average price of $0.125 cents per KWH, which corresponds with the data in Table 1. Kentucky, Indiana, and West Virginia all have lower rates. Many of the Southeastern industrial states that Ohio competes with regularly also have lower rates—Alabama, Georgia, North Carolina, and Tennessee. I am using retail rates as a proxy for commercial and industrial rates, assuming that they are highly correlated. If so, this is no time to be raising rates and discouraging new investment through regulatory fiat.

Ohio is the 9th largest electricity generating state in the nation while we are the 7th largest in terms of the amount of total energy used by our industrial sector, the 6th largest user of energy in the commercial sector, and 7th largest in terms of total energy use in the residential sector. Ohio is not a state that can be autarkic in terms of energy.[30] We are a huge producer of energy, but we import energy as well. Increasing self-reliance in energy requires a commitment on the part of the private sector to develop the natural gas resources of the Appalachian Basin. This will require encouraging investment by new entrants in gas fired power plants, which the Stipulated ESP IV does not.

[30]See Table 2 and Appendix Table 1 (attached hereto as Attachment EWH-1).

Table 2
Electricity Data for Ohio and Its Competitor States

State	Net Electricity Generation Sept.2015			Total Carbon Dioxide Emissions 2013			Average Retail Price Residential Electricity Sept. 2015			Total Energy Consumed per Capita, 2013		Total Energy Expenditures per Capita, 2013		Per Capita Energy Expenditure per Million Btu, 2013		State
	National Rank	thousand MWh	Percent of U.S.	National Rank	million metric tons	Percent of U.S.	National Rank	cents/kWh	State:US Average	National Rank	million Btu	National Rank	Dollars	National Rank	Ratio Dollars: million Btu	
Ohio	**9**	**11,033**	**3.1%**	**5**	**229**	**4.3%**	**23**	**12.55**	**1.0**	**23**	**324**	**28**	**4,334**	**23**	**13.38**	**OH**
Regional competitors																
Illinois	5	15,882	4.5%	4	230	4.4%	21	12.68	1.0	25	311	39	3,824	10	12.30	IL
Indiana	14	8,384	2.4%	7	200	3.8%	40	11.40	0.9	9	441	16	5,079	4	11.52	IN
Kentucky	20	6,724	1.9%	11	137	2.6%	47	10.36	0.8	11	414	15	5,097	11	12.31	KY
Michigan	13	9,044	2.6%	9	160	3.0%	13	14.56	1.1	32	287	36	4,107	34	14.31	MI
New York	7	12,005	3.4%	9	160	3.0%	6	18.44	1.4	50	184	51	3,350	44	18.21	NY
Pennsylvania	4	18,054	5.1%	3	244	4.6%	14	14.31	1.1	28	297	32	4,230	31	14.24	PA
West Virginia	23	6,013	1.7%	22	93	1.8%	44	10.79	0.8	14	398	19	4,794	7	12.05	WV
Southeastern competitors																
Alabama	6	12,993	3.7%	15	120	2.3%	26	12.31	0.9	13	400	18	4,997	12	12.49	AL
Georgia	10	10,663	3.0%	12	133	2.5%	30	12.10	0.9	34	280	37	4,004	33	14.30	GA
North Carolina	11	10,157	2.9%	14	122	2.3%	31	11.91	0.9	38	256	42	3,790	36	14.80	NC
South Carolina	15	8,220	2.3%	28	69	1.3%	19	12.76	1.0	19	333	23	4,553	26	13.67	SC
Tennessee	22	6,169	1.8%	20	97	1.8%	48	10.33	0.8	21	329	24	4,452	25	13.53	TN

Note: All state ranks are from High (1) to Low (51)

Source: U.S. Energy Information Agency, retrieved December 29, 2015, various tables.

Q. Can economic development discounts and incentives provide benefits to all ratepayers?

A. If structured properly, yes. As I have explained previously, economic development incentives can help companies lower production costs, control or provide increased certainty over their operating costs, speed the opening of a plant, and influence the design of plant and equipment[31]. Economic development incentives can be used to bring fallow land into use and they can be used to provide a trained workforce. In other words, a public benefit should be identifiable and the incentive should pass the "but for" test—but for the incentive the operation would not have opened.

Incentives may be appropriate for economic development reasons, but the incentives need to be uniformly applied and available to all similarly situated customers. The criteria for qualifying for the incentives and discounts should not be so narrowly tailored that they are discriminatory or only apply to one or a few companies. Economic development incentives also should be restricted to companies that primarily sell goods and services to out-of-state customers or have their goods and services bundled into these exported goods and services. These firms are considered to be part of the economic base of the state.

The selection of the recipients of narrowly defined economic development incentives should not be made by a private company (e.g., the Companies) that is in a position to provide one of its customers with a competitive advantage over another company in its service territory. This is especially true if there is a *quid-pro-quo* as is the case in the proceeding currently pending before the Commission. Most importantly, the state

[31] See OMAEG Ex. 19 at 10-11.

of Ohio should not be delegating its economic development strategy and authority to a privately owned electric utility.

What is presented in the Stipulated ESP IV is not a set of economic development incentives. Instead, the incentives are targeted price reductions and discounts that are being offered by the Companies through the regulatory process to only those customers or groups that have been invited to join the exclusive club formed by the Companies, and the costs of such discounts and incentives are being largely passed on to the broad pool of ratepayers in the Companies' service territories who were not invited to join the club formed by the Companies. While incentives may reduce the expenses and provide associated benefits to the Signatory Parties that are receiving the incentive, such discounting becomes problematic when the cost of the incentive is then passed on to other customers or other classes of customers rather than being financially absorbed by the company.

Q. Can the Stipulated ESP IV negatively affect interstate commerce and investment in Ohio's electric generating infrastructure?

A. The Energy Information Agency's profile of the state of Ohio shows that our state of Ohio is the 9th largest generator of electricity in the nation, accounting for 3.1% of all net electricity generated in 2012.[32] Additionally, other states that are members of PJM or touch Ohio's borders are also major sources of electricity production: Pennsylvania is 4th, Illinois 5th, New York 7th, Michigan 13th, Indiana 14th, New Jersey 19th, Kentucky 20th, and West Virginia is 23rd. Ohio's power plants can disrupt new investment in generating capacity across the grid if there is assurance that they

[32] See Appendix Table 2 (attached hereto as Attachment EWH-2).

have financial guarantees that will prevent them from exiting the market. Due to the nature of the grid, a PPA in Ohio will affect decisions to investment in generating capacity across PJM's grid.

The impact will be greater if there is capacity that cannot clear PJM's auctions, as is currently the case. A likely interstate outcome from the broad adoption of PPAs across Ohio is that other states will adopt them in much the same way that Ohio is following West Virginia's example. Political pressure will build to protect generating assets that cannot clear the PJM market due to the way the PPAs will influence the dynamics of the interstate power market. Ohio's demand will be tied through the PPAs to Ohio's plants, meaning that demand for out-of-state production capacity will drop. This will result in less efficient Ohio plants staying in the market while unsubsidized, more efficient, out-of-state generating will be forced to exit.

The federal interest in this dynamic can grow if the PPAs deter investment in new capacity and the reliability of the entire grid weakens and if the new capacity would result in lowering levels of carbon emissions across the grid. This is when Ohio's political-economic problem in supporting non-competitive generating plants becomes a national problem of pollution nonattainment and a barrier to interstate commerce.

Q. Do the benefits proffered in the other areas, a business plan for transmission grid modernization, investments to begin modernizing of the distribution system, and a mixture of alternative energy and carbon reduction actions offset the weaknesses that the affiliate PPA generate?

A. While some of these offerings may be desirable, they add more cost, risk continues to be shifted from the Companies to ratepayers and the benefits from competition in the generating market will be lost

Q. Does this conclude your testimony?

A. Yes.

CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing was served upon the following parties via electronic mail on January 13, 2016.

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Summary: Testimony Corrected Third Supplemental Testimony of Edward W. Hill On Behalf Of The Ohio Manufacturers' Association Energy Group electronically filed by Debra A Gaunder on behalf of Ohio Manufacturers' Association Energy Group