BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of the 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**

Second Supplemental Testimony of Tyler Comings

Redacted Version

On Behalf of
Sierra Club

October 13, 2015

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I. INTRODUCTION AND PURPOSE OF TESTIMONY

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

A My name is Tyler Comings. I am a Senior Associate with Synapse Energy Economics, Inc. (Synapse), which is located at 485 Massachusetts Avenue, Suite 2, Cambridge, Massachusetts.

A Are you the same Tyler Comings who filed direct testimony in this matter on December 22, 2014, and supplemental testimony on May 11, 2015?

A Yes.

Q What is the purpose of your supplemental testimony?

A My second supplemental testimony evaluates how the Sammis generating units perform under the Integrated Planning Model ("IPM") modeling regarding the final Clean Power Plan ("CPP"), and is in response to the errata filed by Companies' witness Evans on September 14, 2015.

II. THE COMPANIES IGNORED MASS-BASED COMPLIANCE

Q Do you agree with the Companies that Sammis will "help Ohio meet the requirements of the CPP [Clean Power Plan]"?[1]

A No. Continuing to operate a carbon-intensive resource such as Sammis does not make compliance with a rule that targets carbon reduction easier. The CPP allows for states to comply through an emission rate reduction ("rate-based") or by meeting a cap on tonnage of emissions ("mass-based"). As with his previous discussion of the proposed CPP, in his errata, Mr. Evans claims that Sammis will help the state comply with the final rule.[2] He points to ICF International's IPM results that were developed for U.S. EPA and that show all seven units of the plant continuing to operate through the CPP compliance period under a rate-based compliance scenario.

[1] Evans Errata testimony, p.2, lines 16-17.
[2] Evans Errata testimony, p.5, lines 11-13.

Q Did EPA include an IPM modeling run completed for a mass-based compliance option?

Yes. The IPM modeling used to support the CPP analyzed one rate-based scenario and one mass-based scenario.[3]

Q Did the Companies present modeling results from IPM's mass-based compliance scenario?

A No. Mr. Evans mentions mass-based compliance but never shows the modeling results from that scenario. In fact, Mr. Evans testified that he has never evaluated EPA's mass-based modeling or whether any of the Sammis units are projected to retire under the mass-based scenario.[4] Instead, he only focuses on the IPM modeling of rate-based compliance. This is a significant omission, because the mass-based compliance scenario presents a different future outlook for the Sammis units than the one presented by Mr. Evans in his errata.

Q Do the IPM mass-based scenario results show all Sammis units continuing to operate?

A [redacted] Under mass-based modeling an additional 1613 MW of coal capacity retires in the PJM-ATSI region by 2030, compared to the results from rate-based modeling.[5] Unlike the rate-based scenario results, the IPM modeling for the mass-based scenario results in [redacted]. CONFIDENTIAL Table 1 shows IPM's projected capacity factors for Sammis units under its mass-based modeling. The results show [redacted] by 2025, while [redacted] by 2030. The capacity for [redacted]; thus the capacity factor for 2030 and thereafter is based on a [redacted] capacity at that unit.

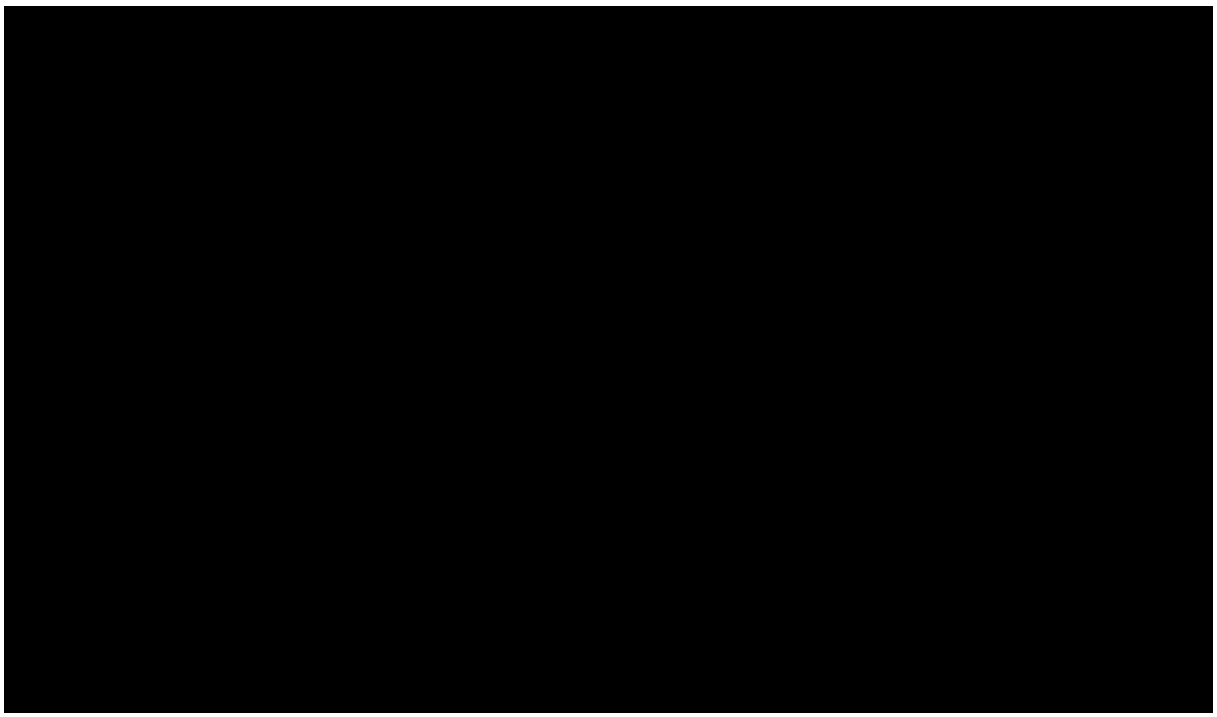
[3] Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. ES-3. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.
[4] Hearing Tr., Vol. XIX, page 3771 line 21 to page 3772 line 2.
[5] IPM modeling files: Rate-Based SupplyResourceUtilization.xlsxm and Mass-Based SupplyResourceUtilization.xlsxm, "PJM ATSI" tab (units labeled "00 Coal Retirement")—available in workpaper for Comings Second Supplemental Testimony, downloaded from: http://www.epa.gov/airmarkets/programs/ipm/cleanpowerplan.html.

CONFIDENTIAL Table 1: Sammis Capacity Factors by Unit from IPM Mass-Based CPP Modeling[6]

	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL Figure 1 below shows the change in total Sammis capacity available between the IPM rate-based and mass-based modeling. Under the mass-based modeling, Sammis units [redacted]. In total, there is a [redacted] relative to the rate-based results presented by Mr. Evans.

6 IPM modeling files: Mass-Based SupplyResourceUtilization.xlsxm, "PJM ATSI" tab—available in workpaper for Comings Second Supplemental Testimony, downloaded from: http://www.epa.gov/airmarkets/programs/ipm/cleanpowerplan.html.
Evans workpaper (Sammis unit codes): Rate-Based RPE File Supply Stacks v2, "Additional Data" tab.



CONFIDENTIAL Figure 1: Sammis Capacity Available under IPM Rate-Based and Mass-Based CPP Modeling[7]

Q Do the Companies mention that retirement of coal units could help Ohio achieve compliance with the CPP?

A No. Mr. Evans talks at length about how the retirement of the Davis-Besse nuclear plant could impede CPP compliance if it were replaced with carbon-emitting natural gas generation.[8] However, a natural gas combined-cycle plant would emit about 45 percent of the carbon dioxide emitted by the Sammis plant, per unit of energy.[9] And Mr. Evans fails to mention that replacement of Sammis

[7] IPM modeling files: Rate-Based SupplyResourceUtilization.xlsxm, "PJM ATSI" tab; Mass-Based SupplyResourceUtilization.xlsxm, "PJM ATSI" tab— available in workpaper for Comings Second Supplemental Testimony, downloaded from:
http://www.epa.gov/airmarkets/programs/ipm/cleanpowerplan.html.
Evans workpaper (Sammis unit codes): Rate-Based RPE File Supply Stacks v2, "Additional Data" tab.
[8] Evans Errata testimony, p.6, lines 3-14.
[9] Clean Power Plan Final Rule, p. 645: "The average NGCC rate was approximately 850 lb CO2/MWh gross in 2014"—available here: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf. Sammis emission rate of 1878 lb of CO2/MWh (gross) based on EPA AMPD data for January through June 2015—available here: http://ampd.epa.gov/ampd/.

with lower carbon-emitting resources would reduce Ohio's carbon emissions—thereby easing CPP compliance.

Indeed, EPA's stated goal for the final Clean Power Plan is "to cut carbon pollution from existing power plants."[10] It is counterintuitive to claim that continuing to operate the most carbon-intensive type of generation resource—a coal plant—helps Ohio achieve carbon reductions compared to operating less carbon-intensive resources.

Q **Is it your opinion, then, [redacted]**

A [redacted] EPA modeled a single compliance pathway under each of the rate-based and mass-based targets. Other compliance pathways may be pursued. Thus, the IPM modeling of the final CPP should not necessarily be interpreted as how states will actually comply. I provide further discussion of this point later in my testimony.

Q **Is there reason to think that the IPM modeling results for the rate- and mass-based scenarios are overly optimistic for Sammis's economic viability?**

A [redacted] Both the rate- and mass-based scenario IPM modeling results project, with only one exception,[11] [redacted] capacity factors at each Sammis unit in 2016, 2018 and 2020. Such capacity factors are [redacted] than actual results in 2010 through 2014, during which time the Sammis plant averaged a 57 percent capacity factor.[12] And while the Companies projected [redacted], the actual capacity factor from

[10] See: http://www2.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants#rule-summary
[11] The exception is the 2016 capacity factor for Sammis Unit 5 in the mass-based modeling, which is projected at [redacted].
[12] Supplemental Testimony of Tyler Comings, page 13, footnote 25, and competitively sensitive confidential Figure 3.

January through July of 2015 for the Sammis plant is 47 percent.[13] Even if the plant ran at 100 percent capacity factor for the rest of the year, [redacted]. In order for the Sammis plant to achieve the capacity factors projected for 2016 in the IPM modeling, [redacted] but that has [redacted] to date.

Q Does the 2015 performance of Sammis matter in the assessment of the continued viability of the plant?

A Yes, it matters quite a lot. It becomes more difficult to project conditions in the electric sector the further out into the future one goes. If projections of the performance of the Sammis plant in 2015—the year we might be expected to predict most accurately—are [redacted], it [redacted] for the predictions of plant performance in the years further into the future.

III. EPA'S CPP SCENARIOS ARE "ILLUSTRATIVE," NOT CONCLUSIVE

Q Does the IPM modeling determine how states will actually comply with the CPP?

A No. Compliance with the rule will be determined by the states, assuming the state submits a plan that is ultimately approved by the EPA. As described in the Regulatory Impact Analysis (RIA), the IPM modeling:

> …is intended to be **illustrative** to inform the broad impacts of the rule across the power sector, and **not intended to forecast the specific approaches that individual states might choose**, and how sources might prefer to achieve the emission reductions to

[13] EIA Plant Level Data, Net Generation, January 2015 through July 2015. Available here: http://www.eia.gov/electricity/data/browser/. 47% capacity factor = 5,281,240 MWh/(2220 MW*5088 hours).

> reflect each state plan in response to particular policy signals or requirements.[14] (emphasis added)

EPA repeatedly refers to the compliance paths as "illustrative scenarios."[15] In reality, states will determine their own compliance pathways, which are unlikely to mirror the IPM modeling results.

Q Did the IPM modeling allow for state-by-state trading to achieve compliance?

A No. The IPM modeling explicitly does not allow for trading between states to achieve rate- or mass-based compliance. As the EPA states:

> Each of the two illustrative plan approaches assumes that sources within each state comply with the applicable state goals without exchanging a compliance instrument (ERC or allowance) with sources in any other state…. while the final rule enables states to achieve their mass goals with the flexibility of interstate trading, this RIA presents analysis is an illustrative plan approach that assumes that each state achieves its goal independently.[16]

Allowing states to trade emission rate credits (ERCs) or allowances will be an important mechanism for rate-based or mass-based compliance, respectively. The costs for compliance for Ohio will depend, in part, on how other states choose to comply (and vice versa). Ohio could choose to purchase ERCs or allowances to comply with the rule. Alternatively, Ohio could also choose to over-comply and sell ERCs or allowances to other states. Neither of these plausible compliance strategies is shown in IPM's "illustrative plan" for compliance.

[14] Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. 3-44. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf
[15] For example: Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. 3-11. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.
[16] Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. 3-10. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

Q Does the IPM modeling assume compliance with future environmental regulations?

A No. ICF updated modeling of the final rule to include compliance with regulations that were finalized after the proposed CPP modeling was performed. The final rule modeling included new costs for compliance with the cooling water intake rule (Section 316(b) of the Clean Water Act), coal combustion residuals rule, and new source greenhouse gas emissions (Section 111(b) of the Clean Air Act).[17] However, the final rule modeling did not include costs to comply with rules that were finalized after March 2015 or costs of future regulations.[18] Therefore, the IPM modeling for the final CPP assumed no compliance costs with the final Effluent Limitation Guidelines rule (released on September 30, 2015) or the latest National Ambient Air Quality Standards for ozone (released on October 1, 2015). Compliance with these and future rules will continue to affect the economics of many coal units going forward.

Q Is either IPM scenario likely to represent Ohio's least-cost CPP compliance plan?

A No. Mr. Evans states that "the operation of Sammis, combined with investment in the other building blocks, represents Ohio's least-cost strategy for complying with the CPP."[19] Again, he is referring only to the modeling of rate-based compliance. In addition, IPM's results are limited to "illustrative scenarios" of compliance that will likely not occur in practice. The IPM modeling assumes no state-by-state trading, only models two pathways to CPP compliance, and does not incorporate compliance with all existing environmental regulations.

Moreover, EPA does not claim to be modeling the least-cost solution, in practice:

[17] Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. 3-5. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf
[18] Id.
[19] Evans Errata testimony, p.3, lines 1-2.

> While IPM produces a cost-minimizing solution to achieve the state goals imposed in the illustrative scenarios, **there may be yet lower-cost approaches that the states may adopt to achieve their state goals** inasmuch as states and sources take advantage of emission reduction opportunities in practice, and flexibilities afforded under the final rule, that are not represented in this analysis and would yield different cost and emissions outcomes.[20] (emphasis added)

In reality, states will have more flexible means of complying with the rule—most importantly through trading ERCs or allowances with one another—and will have to comply with existing and future environmental regulations that were not accounted for in the IPM modeling. Least-cost planning for CPP compliance should take these factors into account.

IV. FINDINGS

Q What are your findings?

A The Companies continue to draw an inappropriate conclusion that Sammis will help Ohio comply with the Clean Power Plan. First, the Companies ignored mass-based compliance, whereby EPA's modeling shows that [redacted]. Second, EPA itself states that modeling results are "illustrative" and not intended to show how states will actually comply. Ohio can choose its path of compliance, which is unlikely to follow the IPM's "illustrative" path. Therefore, the Companies should not view the IPM modeling as evidence that Sammis will help Ohio comply with the CPP.

[20] Regulatory Impact Analysis for the Clean Power Plan Final Rule, U.S. EPA, August 2015, p. 3-11. available at: http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf

Q Does this conclude your testimony?

A Yes, it does. However, I reserve the right to update or supplement my testimony based on new information that may become available.

CERTIFICATE OF SERVICE

I hereby certify that on this date I served a copy of the foregoing Second Supplemental Testimony of Tyler Comings – Redacted Version upon the following parties via electronic mail.

Date: October 13, 2015

s/ Michael C. Soules
Michael Soules

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