

COMMONWEALTH OF PENNSYLVANIA



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March 12, 2024

**Via Electronic Mail Only**

Rosemary Chiavetta, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building  
400 North Street  
Harrisburg, PA 17120

Re: Petition of Philadelphia Gas Works  
for Approval of Demand-Side  
Management  
Plan for FY 2024-2026

Philadelphia Gas Works Universal  
Service and Energy Conservation  
Plan for 2014-2016 52 Pa. Code  
Section 62.4 – Request for Waivers  
Docket No. P-2014-2459362

Dear Secretary Chiavetta:

Consistent with 52 Pa. Code Section 5.412a of the Commission's regulations, which requires the electronic submission of pre-served testimony, and per Administrative Law Judge Brady's Interim Order Granting Joint Stipulation for Admission of Testimony and Exhibits into the Evidentiary Record entered on March 11, 2024, enclosed for electronic filing please find the following "Admitted Evidence" on behalf of the Office of Consumer Advocate ("OCA") in the above-referenced proceeding.

Rosemary Chiavetta, Secretary  
March 12, 2024  
Page 2

**Office of Consumer Advocate's Direct Testimony**

OCA Statement 1 – Direct Testimony of Geoffrey C. Crandall, and accompanying Exhibits GCC-1 through GCC-3

**Office of Consumer Advocate's Surrebuttal Testimony**

OCA Statement 1SR – Surrebuttal Testimony of Geoffrey C. Crandall

Respectfully submitted,

/s/ Gina L. Miller

Gina L. Miller

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Enclosures:

cc: The Honorable F. Joseph Brady (Letter and Certificate of Service only)  
Certificate of Service

\*4893-5743-7612

CERTIFICATE OF SERVICE

Petition of Philadelphia Gas Works :  
for Approval of Demand-Side Management :  
Plan For FY 2024-2026 :  
: Docket No. P-2014-2459362  
Philadelphia Gas Works Universal Service :  
and Energy Conservation Plan For 2014-2016, :  
52 Pa. Code § 62.4- Request for Waivers :

I hereby certify that I have this day served a true copy of the following document, the Office of Consumer Advocate's Admitted Testimony as follows:

**Office of Consumer Advocate's Direct Testimony**

OCA Statement 1 – Direct Testimony of Geoffrey C. Crandall, and accompanying Exhibits GCC-1 through GCC-3

**Office of Consumer Advocate's Surrebuttal Testimony**

OCA Statement 1SR – Surrebuttal Testimony of Geoffrey C. Crandall

upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant), in the manner and upon the persons listed below:

Dated this 12<sup>th</sup> day of March 2024.

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**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PETITION OF PHILADELPHIA GAS WORKS :  
FOR APPROVAL OF DEMAND SIDE :  
MANAGEMENT PLAN FOR FY 2024 - 2026 :

PHILADELPHIA GAS WORKS UNIVERSAL :  
SERVICE AND ENERGY CONSERVATION :  
PLAN FOR 2014-2016, 52 PA. CODE § 62.4- :  
REQUEST FOR WAIVERS :

Docket No. P-2014-2459362

DIRECT TESTIMONY  
OF  
GEOFFREY C. CRANDALL

ON BEHALF OF  
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

November 13, 2023

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## **I. STATEMENT OF QUALIFICATIONS**

1   **Q.    What is your name and business address?**

2    A.    My name is Geoffrey C. Crandall. My business address is MSB Energy Associates, Inc.,  
3        6907 University Avenue #162, Middleton, Wisconsin 53562.

4   **Q.    On whose behalf are you testifying today?**

5    A.    I am testifying on behalf of the Office of Consumer Advocate (“OCA”).

6   **Q.    Please describe your background and experience in the field of gas and electric  
7        utility regulation.**

8    A.    I am a principal and the Vice President of MSB Energy Associates, Inc. I have over 40  
9        years of experience in utility regulatory issues, including resource planning, restructuring,  
10       mergers, fuel, purchase power and gas cost recovery and planning analysis, energy  
11       efficiency, conservation and load managements, program design and other issues. I have  
12       provided expert testimony before more than a dozen public utility regulatory bodies  
13       throughout the United States. I have provided expert testimony before the United States  
14       Congress on several occasions and have previously filed testimony in numerous cases  
15       before the Michigan Public Service Commission.

16       My experience includes over 15 years of service on the Staff of the Michigan Public  
17       Service Commission (Commission). In my tenure at the Commission, I served as an  
18       analyst in the Electric Division (Rates and Tariff section) involving rate as well as fuel and  
19       purchase power cases. I also served as the Technical Assistant to the Chief of Staff,  
20       supervisor of the energy conservation section (involving residential and commercial energy

1 efficiency programs). I also served as the Division Director of the Industrial, Commercial  
2 and Institutional Division. In that capacity, I was Director of the Division that had  
3 responsibility for the energy efficiency and conservation program design, funding, and  
4 implementation of Michigan utility and DOE-funded private company implemented  
5 programs and initiatives involving Industrial, Commercial, and Institutional gas and  
6 electric customers throughout Michigan.

7 In 1990, I became employed by MSB Energy Associates, Inc. and have served clients  
8 throughout the United States on numerous projects related to system planning, fuel,  
9 purchase power and gas cost recovery assessments, energy efficiency and load  
10 management program development, electric restructuring, customer impact analyses, and  
11 other issues.

12 **Q. Have you prepared a summary of your qualifications and experience?**

13 A. Yes. My vita is attached as Exhibit GCC-1. I have also attached additional exhibits to  
14 support my testimony, Exhibits GCC-2 and GCC-3.

15 **Q. Have you previously testified in any proceedings before the Pennsylvania Public  
16 Utility Commission regarding Philadelphia Gas Works?**

17 A. Yes. I offered testimony regarding PGW's Phase II DSM Plan in Docket P-2014-  
18 2459362(06/15). I reviewed PGW's Phase III DSM Plan in Docket P-2014-2459362 in  
19 June-July 2020, but did not file testimony.



1 **II. PURPOSE OF TESTIMONY**

2 **Q. What is the purpose of your testimony in this case?**

3 A. The purpose of my testimony is to assess the reasonableness of Philadelphia Gas Works’  
4 (PGW) proposed Phase IV Revised Demand Side Management Plan for FY 2025- 2029 in  
5 Docket No. P-2014-2459362. I note that when PGW submitted its DSM Plan on June 16,  
6 2023, the DSM was proposed for a period of time extending from September 1, 2023 to  
7 August 31, 2026<sup>1</sup> but PGW has now proposed a Revised Phase IV Plan for the period of  
8 September 1, 2024 to August 31, 2029 (Revised DSM IV Plan.)<sup>2</sup> I address several  
9 operational, budget, and financial issues regarding the proposed Revised DSM IV Plan,  
10 which were covered in this docket primarily by PGW Witness Denise Adamucci (PGW St.  
11 No. 1) and Theodore M. Love (PGW St. No. 2). I am offering specific suggestions to the  
12 Administrative Law Judge and the Commission concerning several elements of PGW’s  
13 proposed Revised DSM IV Plan.

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<sup>1</sup> *Philadelphia Gas works EnergySense Demand Side Management Portfolio Implementation Plan*, Fiscal Years 2024-2026, p. 4 (June 16, 2023).

<sup>2</sup> PGW St. No. 1, p. 4. I note that PGW did not file a new plan, but instead it submitted a revised version in its direct testimony which proposed an extended term and to propose a modified approval process. The modified approval proposal is that if PGW wishes to implement a new initiative or measure while the Phase IV Plan is in place, it would propose that such a change that increases the budget by no more than 10% would be reviewed within three months of submission. PGW St. No. 1, p. 11.

1 **III. DISCUSSION**

2 **A. Summary**

3 **Q. Based upon a review of PGW’s testimony, exhibits and discovery responses**  
4 **regarding PGW’s proposed energy efficiency programs to its customers, what is**  
5 **your overall impression of the proposed Revised DSM IV Plan?**

6 A. I believe the Revised DSM IV Plan should be approved, but subject to certain conditions,  
7 including that it be limited to a three-year term. Overall, the programs are reasonable and  
8 provide access to a broad array of customers. The Revised DSM IV Plan is cost effective,  
9 with a benefit cost ratio of 2.35, and the adoption of the conditions I recommend will ensure  
10 that PGW’s Revised DSM IV Plan provides additional accountability to ratepayers and  
11 flexibility to address changes that may occur over time.

12 For purposes of context, it is my understanding that PGW is not required to file an energy  
13 efficiency program, and that PGW's DSM Plan started as a result of the settlement of the  
14 2010 base rate case. The goal was that PGW's customers might save some money, first  
15 though their own heating bills, and second by lower or less frequent base rate case filings  
16 due to an assumed reduction in PGW’s cash working capital needs based on a reduction in  
17 the amount of natural gas that PGW would need to buy. While rate cases have likely not  
18 been reduced, the programs’ cost effectiveness demonstrates that if utilized customers can  
19 save money.

20 Although PGW has demonstrated that it can provide cost-effective and comprehensive gas  
21 DSM programs and energy conservation resources, I have some recommendations to  
22 improve PGW’s proposed Revised DSM IV Plan. The following recommendations are

1 made in areas where PGW needs to provide more detail and support for its DSM  
2 programming.

3 **Q. Please identify significant issues that should be considered and addressed by the**  
4 **Commission in this docket.**

5 A. The Commission should adopt the following recommendations regarding PGW's  
6 proposed Revised DSM IV Plan.

7 1. PGW should resubmit the budget information to provide more detailed breakouts,  
8 including specifying incentive, administration, marketing, inspection, and  
9 evaluation costs.

10 2. PGW should attempt to obtain federal funds to leverage and improve the  
11 effectiveness of its DSM programs. PGW should report annually on its efforts and  
12 success in obtaining any funding.

13 a. In conjunction with its attempts to obtain federal funds, PGW should  
14 perform outreach to customers to educate them about rebate opportunities  
15 they may be eligible to pursue on their own, such as rebates available  
16 through the High-Efficiency Electric Home Rebate Act.

17 3. The Commission should not approve the five-year term now proposed for the  
18 Revised DSM IV Plan. Instead, the Commission should confine PGW's DSM IV  
19 Plan to the three-year term as it originally proposed in its June 16, 2023 filing.<sup>3</sup>

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<sup>3</sup> *Philadelphia Gas works EnergySense Demand Side Management Portfolio Implementation Plan, Fiscal Years 2024-2026 (June 16, 2023).*

1 Approval of the three-year DSM-IV Plan should then be subject to the conditions  
2 that:

- 3 a. PGW report annually on the performance of the DSM programs and  
4 provide the opportunity for stakeholder input.
- 5 b. PGW monitor changes in economics, technologies, law or regulatory  
6 policy and other circumstances that may require changes in the DSM IV  
7 budget and programming.
- 8 c. PGW propose modifications to the DSM IV budget and programming  
9 when changes warrant them prior to the next regular plan filing.

10 **B. Recommendation 1: PGW should resubmit the budget information to provide**  
11 **more detailed breakouts, including incentives, administration, marketing,**  
12 **inspections and evaluations.**

13 **Q. What is your reason for asserting that PGW should submit additional information**  
14 **for this docket?**

15 A. After reviewing the Revised DSM IV plan and discovery responses to OCA and other  
16 interested parties who are involved in this litigation, it appears to me that additional  
17 supporting information would be helpful to review in order to get a better understanding  
18 of PGW's Revised DSM IV Plan energy efficiency programs. Portfolio budgets are shown  
19 on page 7, Table 1 and 2 of the Revised DSM IV Plan at PGW Exhibit DA-1. Table 1 shows  
20 the budget by program by year. Table 2 shows the total portfolio budget (for all of PGW's  
21 DSM programs) by functional category, customer incentives, administration, marketing,

1 inspections and evaluation. Neither Table 1 nor Table 2 provides the program budget  
2 broken out by functional category.

3 The Revised DSM IV Plan does break out the program budgets by functional components  
4 in the discussion of each program. For example, Table 10 on p. 18 of PGW Exhibit DA-1  
5 provides a breakout for the projected budget for the Residential Equipment Rebates  
6 Program. However, Table 10 still does not provide supporting information or detail the  
7 activities that the budget is to cover.

8 **Q. Why is it important to have each program budget broken out by functional**  
9 **category?**

10 A. Having that additional detail is helpful in evaluating the overall budget, and seeing whether  
11 each program budget is reasonable. For example, one might assume that a significant  
12 portion of the Residential Equipment Rebates budget is in customer incentives. But there  
13 is no way of knowing whether that is how PGW derived the Residential Equipment Rebates  
14 budget. Normally you would be able to examine each component of the budget and verify  
15 that each component matches your expectations. If it does not match your expectations,  
16 you would investigate more deeply to determine why. It might be because the program  
17 contains some unique or unusual elements, or because your assumption was wrong. But  
18 being able to identify where and how it is different from your past experience is a key  
19 element to determining whether the budget is reasonable. The lack of detail and supporting  
20 information in PGW's Revised DSM IV budget makes that difficult.

21 In addition to a budget number by program and function, it is important to have an  
22 understanding of what the budget is planned to be used for. Continuing the example of the

1 Residential Energy Rebates program, what if you found that the marketing budget for that  
2 program was as large as the customer incentives portion? Is that reasonable? Perhaps, if  
3 the marketing was to inform customers of the existence of the program and rebate. Perhaps  
4 not, if marketing was for goodwill advertising, corporate image building or load building.  
5 PGW does not provide the specific activities it has budgeted to undertake for each of its  
6 DSM programs, which makes it difficult to assess whether the budget is appropriate.

7 The budget detail and supporting documentation should be made available to interested  
8 parties for their review.

9 **Q. Could you get that information by asking discovery questions?**

10 A. In theory, yes. However, relying on discovery to get basic information and supporting  
11 documentation adds to the expense and complexity of processing the case. PGW  
12 developed its budgets, which means that providing information about how they were  
13 prepared would not constitute any additional effort or new work on PGW's part – they  
14 could simply provide their workpapers. In contrast, responding to discovery questions  
15 takes additional time and effort and expense, not only for PGW but for the requestor.  
16 Ultimately, this means that parties have less time to evaluate PGW's programming, which  
17 could impact the record available for the Commission's review as well.

18 Furthermore, the discovery process often does not yield the expected results. For example,  
19 when PGW was asked whether or not it intended to provide a more detailed budget  
20 breakdown for the \$300,000 budget<sup>4</sup> for its Small Business Assessment program, PGW did

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<sup>4</sup> The plan initially filed budgeted \$300,000 for three years. It was revised to \$530,000 over the five year span of Revised DSM IV Plan.

1 not commit to provide a detailed breakdown. Instead of providing any specificity, PGW  
2 indicated that it considered the cost of the program to be “all inclusive” and while PGW  
3 provided some estimated spending levels, no comprehensive budget was identified or  
4 provided. Exhibit GCC-2.

5 **Q. You previously stated that Table 10 of PGW’s Exhibit DA-1 contained functional**  
6 **breakdown for a specific DSM program. Do you need more information than is**  
7 **provided there?**

8 A. Yes. Table 10 of PGW’s Revised DSM IV Plan (September 27, 2023) indicates that  
9 \$50,559 per year is allocated to the administration category in the Residential Energy  
10 Rebates budget. PGW Exhibit DA-1, p. 18, Table 10. The year, and amount of “all  
11 inclusive” funds, was reported by PGW for Administrative costs on Table 10. However,  
12 sufficient and comprehensive documentation has not been provided by PGW. Such detail  
13 is needed to aid interested parties in gaining a better understanding of the financial aspects  
14 of the proposed programs.

15 **C. Recommendation 2: PGW should attempt to obtain federal funds to leverage**  
16 **and improve the effectiveness of its DSM programs. PGW should report**  
17 **annually on its efforts and success in obtaining any funding.**

18 **Q. Why should PGW attempt to obtain federal funds to reduce greenhouse gas**  
19 **emissions?**

20 A. As I explain below, federal funds are being made available that could help PGW and its  
21 customers to reduce greenhouse gas emissions through energy efficiency. Some of those  
22 funds may be used to complement or expand utility energy efficiency programs. PGW

1 should explore opportunities to utilize federal funding to expand its DSM programs. PGW  
2 should also explore collaborating with community based organizations and other entities  
3 eligible for federal funding to leverage PGW's DSM programs.

4 **Q. What are examples of recent federal funding opportunities for PGW to pursue?**

5 A. On August 16, 2022, President Biden signed into law the Inflation Reduction Act.<sup>5</sup>  
6 According to the US Department of Energy (Office of Policy), \$27 billion has been  
7 earmarked for Greenhouse Gas mitigation and an additional \$3 billion from Climate Justice  
8 Block Grants to reduce inflation and support communities experiencing disproportionately  
9 high energy burdens and pollution exposure. Exhibit GCC-3.

10 **Q. Alongside your recommendation that PGW pursue federal funding opportunities,**  
11 **are you also recommending that PGW use outreach opportunities to educate its**  
12 **customers about rebate opportunities that they may directly apply to receive?**

13 A. Yes. I recommend that PGW perform outreach to its customers to educate them about  
14 available rebate opportunities that they may pursue. As an example, PGW should educate  
15 its customers about the fact that the Inflation Reduction Act includes the High-Efficiency  
16 Electric Home Rebate Act (HEEHRA) that may provide rebate opportunities for energy  
17 efficiency.<sup>6</sup> HEEHRA is a voluntary program intended to assist low-income and moderate-  
18 income customers to save money on monthly energy bills through electrification projects.  
19 Specifically, HEEHRA would cover 100 percent of electrification projects costs, to a  
20 maximum of \$14,000 for low-income households and 50 percent of those costs up to the

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<sup>5</sup> H.R. 812 - 118th Congress (2023-2024): Inflation Reduction Act of 2023, H.R. 812, 118th Cong. (2023), available at: <https://www.govinfo.gov/app/details/BILLS-118hr812ih>

<sup>6</sup> <https://www.dep.pa.gov/Citizens/Energy/Pages/Inflation-Reduction-Act.aspx>



1 same maximum for moderate-income households. Qualifying projects may include, but are  
2 not limited to, heat pump HVAC systems, heat pump water heaters, measures such as  
3 upgrading circuit panels, insulation, air sealing, ventilation, and wiring.<sup>7</sup>

4 Additionally, the Inflation Reduction Act also makes available a HOMES energy rebate.  
5 Under the HOMES program, homeowners can receive up to \$4,000 or 50% of the cost of  
6 a home retrofit that lowers energy consumption by 35%.<sup>8</sup> I note that the Department of  
7 Environmental Protection's Energy Programs Office anticipates that HEEHRA and  
8 HOMES rebates will be available to Pennsylvania residents in mid-2024<sup>9</sup> and this puts the  
9 opportunity squarely within PGW's DSM IV term.

10 **Q. How could PGW perform outreach to its customers to educate them about**  
11 **opportunities available through HEEHRA and other funding that they may be**  
12 **eligible to apply for directly?**

13 A. PGW could elect to include information about the rebate opportunities on its monthly bills,  
14 and it could post the information on its website, among other things. I note that PGW's  
15 Revised DSM IV Plan indicates that it intends to work with a vendor to develop and  
16 implement communications strategies to promote programming and to drive customer  
17 participation (PGW Exhibit DA-1, p. 10); however, I encourage PGW to use its direct  
18 access to customers to cost-effectively and directly inform them of available rebate  
19 opportunities.

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<sup>7</sup> [file:///C:/Users/gm1/Downloads/one\\_pager\\_energy\\_assistance\\_programs\\_for\\_pennsylvanians\\_via\\_ira1.pdf](file:///C:/Users/gm1/Downloads/one_pager_energy_assistance_programs_for_pennsylvanians_via_ira1.pdf)

<sup>8</sup> *Id.*

<sup>9</sup> <https://www.dep.pa.gov/Citizens/Energy/Pages/Inflation-Reduction-Act.aspx>

1           **D.     Recommendation 3: The Commission should approve the DSM IV for a**  
2                   **three year term as opposed to the five-year term now proposed for the**  
3                   **Revised DSM IV Plan, and approval should be subject to certain conditions.**

4   **Q.     Why should the Commission reject PGW’s proposal to implement the DSM IV Plan**  
5           **for a five-year term?**

6   A.     Other than for its initial DSM Plan, historically PGW has filed its plan on a 3-year schedule.  
7           With each new 3-year plan filing, the cost effectiveness of the programs was reviewed, as  
8           was the performance of the DSM programs. The approach worked well – DSM programs  
9           could be updated and adjusted as circumstances changed, including changes in costs of  
10          natural gas and energy efficiency measures, new technologies, changes in law or policy  
11          and more that may develop over the life of the DSM IV term. The triennial review and  
12          approval worked well to adapt the DSM plan to changing conditions and to fine tune and  
13          improve the DSM Plan for the next 3-year period. As changing conditions continue to  
14          prevail, including changes in policy, pricing, and regulations, confining the DSM IV to a  
15          three-year term is reasonable and prudent in this case.

1 **Q. Because PGW’s as-filed DSM IV Plan provided for the term of 2024-2026, and its**  
2 **Revised DSM IV Plan provides for the term of 2025-2029, what term period are you**  
3 **recommending?**

4 A. For purposes of clarity, I am recommending that PGW’s DSM IV period be consistent with  
5 the three-year term of fiscal years 2024, 2025, and 2026, as proposed in its June 16, 2023,  
6 DSM IV Plan.<sup>10</sup>

7 **Q. Will your recommendation for PGW to implement the DSM IV Plan for a term of**  
8 **only three years impact PGW’s budget?**

9 A. I do not believe so, as I note that PGW’s DSM IV Plan identified a budget for the three-  
10 year term I am recommending<sup>11</sup> and therefore my recommendation would simply be that  
11 PGW revert back to the three-year budget it initially proposed.

12 **Q. What kinds of conditions are you recommending?**

13 A. As I explained above, as policies, costs, and regulations evolve, it is critical that PGW have  
14 a plan to evolve its DSM IV programming as necessary. In this case, as PGW did not  
15 propose a process to ensure that its DSM programs remain relevant and cost effective as  
16 circumstances change, I recommend that the Commission adopt the following conditions  
17 to approving PGW’s DSM IV programming on a three-year term:

- 18 • PGW should be required to report annually on the performance of its DSM  
19 programs. If the DSM programs are not performing up to expectations, corrective

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<sup>10</sup> *Philadelphia Gas works EnergySense Demand Side Management Portfolio Implementation Plan*, Fiscal Years 2024-2026 (June 16, 2023), p. 7, Table 1.

<sup>11</sup> *Id.*

1 action should be taken. The annual performance report must have the opportunity  
2 for stakeholder review and input. To avoid expensive and time consuming formal  
3 hearings, I recommend that the public input come through a collaborative process.

- 4 • In order to identify and correct problems with the DSM programs as quickly and  
5 efficiently as possible, so that corrective action can be taken as quickly as possible,  
6 PGW should be required to monitor changes in economics, technologies, law or  
7 regulatory policy and other circumstances that may require changes in the DSM IV  
8 budget and programming. The results of that monitoring should be shared in a  
9 collaborative process with stakeholders.

- 10 • The third condition I am proposing is intended to ensure that corrective actions for  
11 any DSM performance problems and or changing circumstances are taken as soon  
12 as possible. I recommend that PGW be required to propose modifications to the  
13 DSM IV budget and programming when changes warrant them prior to the next  
14 regular plan filing. PGW should present its proposed modifications through a  
15 collaborative process, and that input should be obtained from the stakeholders.

16 **Q. With these conditions, and with a three-year term for implementation, would**  
17 **PGW's DSM IV Plan be cost effective?**

18 A. Yes. The three-year period ensures that PGW and its customers are not locked into DSM  
19 programming for five years during a period of evolving policy, costs, and regulation.  
20 Alongside the limited term, the conditions I recommend also ensure that PGW's DSM IV  
21 is subject to review and input as necessary to ensure that the programming is reasonable  
22 and cost-effective. My recommended conditions require the ongoing assessment of the

1 DSM program performance, early identification of problems, and the early implementation  
2 of solutions. Using a collaborative process provides the opportunity to informally share  
3 expertise, receive public input and reduce the contentiousness that can accompany a formal  
4 hearing process.

5 **Q. Does this complete your direct testimony?**

6 A. Yes.

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PHILADELPHIA GAS WORKS :  
FOR APPROVAL OF DEMAND SIDE :  
MANAGEMENT PLAN FOR FY 2024 - 2026 :

PHILADELPHIA GAS WORKS UNIVERSAL :  
SERVICE AND ENERGY CONSERVATION :  
PLAN FOR 2014-2016, 52 PA. CODE § 62.4- :  
REQUEST FOR WAIVERS :

Docket No. P-2014-2459362

**VERIFICATION**

I, Geoffrey C. Crandall, hereby state that the facts above set forth in my Direct  
Testimony, OCA Statement 1, are true and correct and that I expect to be able to prove the same  
at a hearing held in this matter. I understand that the statements herein are made subject to the  
penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Signature:

  
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GEOFFREY C. CRANDALL

Consultant Address: MSB Energy Associates, Inc.  
6907 University Ave. Suite #162  
Middleton, WI 53562

DATED: November 13, 2023

**Résumé of  
Geoffrey C. Crandall  
Vice President and Principal**

**EDUCATION**

B.S. in Business and Pre-Law, Western Michigan University, 1974.

Mr. Crandall has also completed courses at Michigan State University Graduate School, the University of Wisconsin-Madison and Wayne State University, in areas of federal taxation, accounting, management and the economics of utility regulation. Mr. Crandall also completed the examination for the National Conference of States on Building Codes and Standards Energy Auditor.

**EXPERIENCE**

Mr. Crandall joined MSB in January 1990. Mr. Crandall has addressed issues related to fuel and purchase power, natural gas, re-regulation, planning, regulatory issues, residential and low-income issues, energy efficiency and impacts of utility restructuring on customers in California, New York, Colorado, Iowa, and Michigan. He has analyzed and/or designed energy efficiency programs for residential customers in Michigan, Georgia, Wisconsin, Arizona, and New Orleans, and has conducted workshops on system planning, energy efficiency, low-income restructuring and energy efficiency issues in over 20 states, including Washington, Hawaii, Nevada, Kansas, Michigan, Rhode Island, California, Virginia, and New Orleans. Mr. Crandall has analyzed integrated resource plan and or energy efficiency programs in the states of Arizona, Georgia, Hawaii, Illinois, Maine, Michigan, Minnesota, North Carolina, Ohio, Pennsylvania, Utah, Washington State, California, Iowa, Montana, Colorado, Missouri, Virginia, Wisconsin, and Washington D.C.

Prior to joining MSB, Mr. Crandall was employed by the Michigan Public Service Commission from 1974 through 1989, where he served in several capacities including analyst in the rates and tariff section, Technical Assistant to the Chief of Staff, and as the Director of the Demand-Side Management Division. He had responsibilities that included rate and tariff review, rate cases, utilities uncollectible and bad debts, integrated resource planning, the development, implementation and monitoring of government- and utility-sponsored demand-side management, energy-efficiency and load response policies and programs. These activities involved customers in the residential, commercial, industrial and institutional sectors.

Mr. Crandall has dealt with a wide variety of regulatory issues beyond energy efficiency, including utility diversification, incentive regulation, utility billing practices, utility power plant maintenance and management of plant outages.

Mr. Crandall served as Chair of the NARUC Energy Conservation Staff Subcommittee from 1986-1989. He has lectured and made presentations to many groups on demand-side programs and least-cost planning, including two NARUC-sponsored least-cost planning conferences; the 1990 NARUC Regional Workshops on Least-Cost Utility Planning in Newport, Rhode Island and Little Rock, Arkansas; the Wisconsin Public Service Commission's Integrated Resource Planning Workshop; the 1988, 1989, and 1990 Michigan State University Graduate School of Public Utilities and the U.S. Department of Energy.

Mr. Crandall has testified before the: United States Congress, Michigan Legislature, Michigan Public Service Commission, North Carolina Utilities Commission, Public Service Commission of the District of Columbia, Illinois Commerce Commission, Maine Public Utilities Commission, Massachusetts Department of Public Utilities, Public Service Commission of Hawaii, Minnesota Public Service Commission, Iowa Public Service Commission, Georgia Public Service Commission, Public Utility Commission of Ohio, Virginia Public Service Commission, Wisconsin Public Service Commission, and the City Council of the City of New Orleans, Louisiana.

Mr. Crandall has written several articles published in the Public Utilities Fortnightly and Electricity Journal, Natural Gas Magazine, and a number of proceedings for the Biennial Regulatory Information Conference and the American Council for an Energy-Efficient Economy.

#### TESTIMONY

Case No. U-5531, (8/77), Consumers' Power Company electric rate increase application. Mr. Crandall served as the Staff Witness and recommended that the Applicant initiate the Residential Electric Customers' Information program.

Case No. U-6743, (3/81), Michigan Consolidated Gas Company. Mr. Crandall served as the Staff policy witness and recommended that the Commission approve a surcharge to cover all reasonable and prudent costs associated with Applicant's implementation of the Michigan Residential Conservation Services Program.

Case No. U-6819, (6/81), Michigan Power Company-Gas. Mr. Crandall served as the Staff policy witness and described the basis for the program and the expected level of activity, recommending that the Commission approve a surcharge to cover all reasonable and prudent costs associated with Applicant's implementation of the Michigan Residential Conservation Service Program.

Case No. U-6787, (6/81), Michigan Gas Utilities Company. Served as the Staff policy witness and described the basis for the program and the expected level of activity, recommending that the



Commission approve a surcharge to cover all reasonable and prudent costs associated with the implementation of the Michigan Residential Conservation Service Program.

Case No. U-6820, (6/81), Michigan Power Company-Electric. Served as the Staff policy witness and reviewed the Applicant's request to operate the Michigan Residential Conservation Service Program. Although not mandated by federal law, Applicant chose to operate the program in conjunction with its other services offered to residential gas customers. Recommended the establishment of a surcharge to cover all reasonable and prudent costs associated with the operation of that program.

Case No. U-5451-R, (10/82), Michigan Consolidated Gas Company. Served as the Staff policy witness and described the Staff's position regarding Applicant's proposed adjustment of surcharge level. Recommended that the eligibility criteria for customers be adjusted to more accurately reflect proper fuel consumption and to include customers who would be likely to realize a seven-year return on their investment by installing flue-modification devices in conjunction with Applicant's financing program.

Case No. U-6743-R, (10/82), Michigan Consolidated Gas Company. Served as the Staff policy witness regarding the Applicant's proposed expenses and revenues, as well as the reasonableness of activity and expense levels in the company's projected period.

Case No. U-7341, (12/84), Detroit Edison Company, Request for Authority for Certain Non-Utility Business Activities. Represented the Staff's position during settlement discussions and sponsored the settlement agreement.

Case No. U-6787-R, (3/84), Michigan Gas Utilities Company. Served as the Staff witness regarding the Applicant's proposed expenses and revenues. This also included a review of the company's future expenses associated with the Energy Assurance Program, the Specialized Unemployed Energy Analyses, and the Michigan Business Energy Efficiency Program expenses.

Case No. U-8528, (3/87), Commission's Own Motion on the Costs, Benefits, Goals and Objectives of Michigan's Utility Conservation Programs. Represented the Staff on the costs and savings of conservation programs and the other benefits of existing programs and described alternative actions available to the Commission relative to future energy-conservation programs and services and other conservation policy matters.

Case No. U-8871, et al., (4/88), Midland Cogeneration Venture Limited Partnership. For approval of capacity charges contained in a power-purchase agreement with Consumers' Power Company. Served as the Staff witness on Michigan conservation potential and reasonably achievable programs that could be operated by Consumers' Power Company and testified to the potential impact of these conservation programs on the Company's request for use of its converted nuclear plant cogeneration project. Also recommended levels of demand-side management potential for the commercial, industrial and institutional sectors in Consumers' Power service territory.

Case No. U-9172, (1/89), Consumers' Power Company, Power-Supply Cost-Recovery Plan and Authorization of Monthly Power-Supply Cost-Recovery Factors for 1989. Served as Staff witness on the conservation potential and reasonably achievable programs that could be operated by Consumers' Power Company. Testified to the potential impact of these conservation programs on the Company's fuel and purchase practices, its five-year forecast and the fuel factor. Recommended levels of demand-side management potential for the commercial, industrial and institutional sectors in Consumers' Power service territory as an offset to its more-expensive outside and internally generated power. Suggested that CPCO vigorously pursue conservation, demand-side management research, and planning and program implementation.

Case No. U-9263, (4/89), Consumers' Power Company Request to Amend its Gas Rate Schedule to Modify its Rule on Central Metering. Served as a Staff witness on the conservation effect of converting from individual metered apartments to a master meter. Suggested that the Commission continue its moratorium on the master meters, due to the adverse energy-conservation and efficiency impact.

Case No. E-100, (1/90), North Carolina Public Service Commission proceeding on review of the Duke Power Company's least-cost utility plan. Testified on behalf of the North Carolina Consumers' Council regarding utility energy-efficiency and demand-side management programs and the concept of profitability and implementation of demand-side management programs.

Case No. 889, (1/90), Public Service Commission of the District of Columbia. Testified on behalf of the Government of the District of Columbia in the Potomac Electric Power Company's application for an increase in its retail rates (general rate case). Sponsored testimony regarding the design and implementation and overall appropriateness of PEPCO's existing and proposed energy-efficiency and conservation programs.

Case No. 889, (4/90), Public Service Commission of the District of Columbia. Provided supplemental direct testimony and testified on behalf of the Government of the District of Columbia in the Potomac Electric Power Company's application for an increase in its retail rates (general rate case). Offered supplemental testimony regarding a more detailed review of PEPCO's existing pilot and full-scale energy-efficiency and conservation programs. Offered suggestions and recommendations for a future direction for PEPCO to pursue in order to implement more cost-effective and higher-impact energy-efficiency and conservation programs.

Case No. ICC Docket 90-004 and 90-0041, (6/90), Illinois Commerce Commission proceeding to adopt an electric-energy plan for Central Illinois Light Company (CILCO). Testified on behalf of the State of Illinois, Office of Public Counsel and the Small-Business Utility Advocate. Reviewed the CILCO electric least-cost plan filing and the conservation and load-management programs proposed in its filing. Sponsored testimony regarding my analysis of the proposed programs and offered alternative programs for the Company's and the Commission's consideration.

Case No. D.P.U. 90-55, (6/90), Commonwealth of Massachusetts Department of Public Utilities. Testified on behalf of the Commonwealth of Massachusetts, Division of Energy Resources. Reviewed and analyzed Boston Gas' proposed energy-conservation programs that were submitted for pre-approval in its main rate case. In addition, suggested that it might consider implementation of other natural-gas energy- efficiency programs, and not award an economic incentive for energy-efficiency and conservation programs until minimum program-implementation standards are satisfied.

Case No. U-9346, (6/90), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency Association. Reviewed and analyzed the Consumers' Power Company rate-case filing related to energy-efficiency and demand-side management programs. Proposed alternative energy-efficiency programs and recommended program budgets and a cost-recovery mechanism.

Case No. 89-193; 89-194; 89-195; and 90-001, (6/90), Maine Public Utilities Commission. Testified on behalf of the Maine Public Advocate's Office. Reviewed the appropriateness of Bangor Hydro-Electric Company's existing energy-efficiency and demand-side management programs in the context of BHE's main rate case and request for approval to construct the Basin Mills Hydro-Electric dam. Reviewed the overall resource plan and suggested alternative programs to strengthen the energy-efficiency and demand-side management resource efforts.

Case No. 6617, (4/91), Hawaii Public Utility Commission. Testified on behalf of the Hawaii Division of Consumer Advocacy. Described what demand-side management resources are, why they should be included in the integrated resource planning process and proposed the implementation of several pilot projects in Hawaii along with guidelines for the pilot programs.

Case No. E002/GR-91-001, (5/91), Minnesota Public Utilities Commission. Testified on behalf of Minnesotans for an Energy Efficient Economy. Assessed the DSM programs being operated or proposed by Northern States Power Company and made recommendations as to ways in which NSP could improve its DSM efforts.

Case No. 905, (6/91), Public Service Commission of the District of Columbia. Testified on behalf of the District of Columbia Energy Office. Responded to the energy-efficiency and load management aspects of Potomac Electric Company's filing and made several recommendations for DC-PSC action.

Case No. 6690-UR-106, (9/91), Public Service Commission of Wisconsin. Testified on behalf of The Citizens' Utility Board of Wisconsin. Assessed the DSM programs being operated or proposed by the Wisconsin Public Service Corporation, made recommendations as to the WPSCO energy efficiency programs, and suggested ways the company could improve its DSM efforts.

Case No. E002/CN-91-19, (12/91), Minnesota Public Utilities Commission. Testified on behalf of Minnesota Department of Public Service. Assessed the DSM potential and programs being operated or proposed by Northern States Power Company and made recommendations as to the potential for energy efficiency in the NSP service territory and ways in which NSP could improve its DSM efforts.

Case No. 912, (4/92), Public Service Commission of the District of Columbia. Testified on behalf of the Government of the District of Columbia in the Potomac Electric Power Company's application for an increase in its retail rates for the sale of electric energy. Testified regarding the reasonableness of DSM and EUM policy changes, the cost allocation of the DSM and EUM expenses, an examination of the prudence of management regarding the energy-efficiency programs, and an examination of the appropriateness of the costs associated with energy-efficiency programs.

Case No. PUE 910050, (5/92), Virginia State Corporation Commission. Testified on behalf of the Citizens for the Preservation of Craig County regarding the need for the Wyoming-Cloverdale 765 kV transmission line. Specifically, addressed the adequacy of the DSM planning of Appalachian Power Company and Virginia Power/North Carolina Power. Made recommendations as to APCO and VEPCO's energy efficiency programs, and suggested ways the company could improve its DSM efforts.

Case No. EEP-91-8, (5/92), Iowa Utilities Board. Testified on behalf of the Izaak Walton League concerning the adequacy of Iowa Public Service Company's Energy Efficiency Plan. Reviewed the plan and suggested modifications to it.

Case No. 4131-U and 4134-U, (5/92), Georgia Public Service Commission. Testified on behalf of the Georgia Public Service Commission staff regarding the demand-side management portions of Georgia Power Company's and Savannah Electric and Power Company's Integrated Resource Plans. Testimony demonstrated that it is reasonable for the Commission to expect that the utilities can successfully secure substantial amounts of demand-side management resources by working effectively with customers.

Case No. 917, (8/92), Public Service Commission of the District of Columbia. Testified on behalf of the District of Columbia Energy Office in hearings on Potomac Electric Power Company's Integrated Resource Planning process. Addressed a number of program-specific issues related to PEPCO's demand-side management efforts.

Case No. 4132-U, 4133-U, 4135-U, 4136-U, (10/92), Georgia Public Service Commission. Testified on behalf of the Staff Adversary IRP Team of the Georgia PSC. Provided a critique of Georgia Power Company's and Savannah Electric and Power Company's proposed residential and small commercial DSM programs.

Case No. 4135-U, (3/93), Georgia Public Service Commission. Testified on behalf of the Staff Adversary IRP Team of the Georgia PSC. Provided a critique of Savannah Electric and Power Company's proposed Commercial and Industrial DSM programs.

Case No. R-0000-93-052, (12/93), Arizona Corporation Commission. Testified on behalf of the Arizona Community Action Association. Critiqued and made recommendations regarding the integrated resource plans and demand-side management programs of Arizona Public Service Company and Tucson Electric Power Company.

Case No. 934, (4/94), Public Service Commission of the District of Columbia. Filed testimony on behalf of the District of Columbia Energy Office in hearings concerning the Washington Gas Light Company (WGL) general rate case application to increase existing rates and charges for gas service. Testimony involved critiquing and reviewing WGL's least cost planning efforts and integration of DSM, marketing and gas supply efforts.

Case No. U-10640, (10/94), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency Association concerning the need to integrate DSM and load promotion analysis into MichCon's GCR planning process.

Case No. 05-EP-7, (3/95), Wisconsin Public Service Commission. Testified on behalf of the Citizens' Utility Board on level of utility DSM and program designs and strategies.

Case No. 05-EP-7, (3/95), Wisconsin Public Service Commission. Testified on behalf of the Wisconsin Community Action Program Association on low-income customers and utility DSM programs.

Case No. TVA 2020-IRP, (9/95), Tennessee Valley Authority. Testified on behalf of the Tennessee Valley Energy Reform Coalition. Assessed, critiqued and made recommendations regarding the integrated resource plans and demand-side management programs proposed by the Tennessee Valley Authority.

Case No. R-96-1, (10/95), Alaska Public Utilities Commission. Testified on behalf of the Alaska Weatherization Directors Association regarding the proposed standards and guidelines for integrated resource planning and energy efficiency initiatives under consideration in Alaska.

Case No. D95.9.128, (2/96), Montana Public Service Commission. Testified on behalf of the District XI Human Resources Council concerning the low-income energy efficiency programs offered by the Montana Power Company.

Case No. DPSC Docket No. 95-172, (5/96), Delaware Public Service Commission. Prepared draft testimony on behalf of the Low-Income Energy Consumer Interest Group regarding Delmarva Power & Light Company's application to revise its demand-side programs. The case was settled, with LIECIG obtaining funding for low-income energy efficiency programs, prior to testimony.

Case No. U-11076, (8/96), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Michigan Jobs Commission's recommendations regarding electric and gas reform. Discussed the implications of utility restructuring and the needs of residential and low-income households, and proposed regulatory and industry solutions.

Case No. 96-E-0897, (3/97), New York Public Service Commission. Prepared draft testimony for New York's Association for Energy Affordability regarding the impact of proposed utility restructuring plans on low-income customers. The case was settled in Spring 1997.

Case No. R-00973954, (7/97), Pennsylvania Public Utilities Commission. Testified on behalf of the Commission on Economic Opportunity regarding the economics of demand-side measures and programs proposed for implementation by Pennsylvania Power & Light Company.

Case No. 98-07-037, (7/98), California Public Utilities Commission. Testified on the California Alternative Rates for Energy and the Low-Income Energy Efficiency programs regarding the implementation and adoption of revisions to these programs necessitated by the AB 1890 and the Low-Income Governing Board.

Case No. U-12613, (3/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Wisconsin Public Service Corporation application to implement PA 141 the electricity deregulation law. I reviewed the portions of the filing related to their provision of electric energy efficiency and load management.

Case No. U-12649, (3/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Wisconsin Electric Power Company and the Edison Sault Electric Company application to implement PA 141 Michigan's electricity deregulation law. I reviewed the portions of the filing related to their provision of electric energy efficiency and load management.

Case No. U-12651, (3/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Northern States Power Company – Wisconsin application to implement PA 141 the electricity deregulation law. I reviewed the portions of the filing related to their provision of electric energy efficiency and load management.

Case No. U-12652. (3/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Indiana Michigan Power Company d/b/a American Electric Power application to implement PA 141 the electricity deregulation law. I reviewed the portions of the filing related to their provision of electric energy efficiency and load management.

Case No. U-12725, (4/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Wisconsin Electric Power Company and the Edison Sault Electric Company application to increase its residential rates. I reviewed the portions of the filing related to their provision of electric energy efficiency and load management and recommended a significant increase in these activities.

Case No. U-13060, (12/01), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Michigan Consolidated Gas Company application for Approval of their Gas Cost Recovery Plan and Five-Year gas Forecast. I reviewed the filing and recommended the Commission reject the proposed GCR factor and suggested continuation of the existing GCR factor or adopt an adjusted MCAA sponsored GCR factor. I also suggested a set-aside allocation be designated for low-income customers to ensure access to alternative gas providers under the applicant's customer choice program.

Case No. 6690-UR-114, (9/02), Wisconsin Public Service Commission. Testified on behalf of the Citizens Utility Board regarding the Wisconsin Public Service Corporation application to increase its electric and natural gas rates. I reviewed the portions of the filing related to their low-income assistance/weatherization and the proposed executive compensation incentive plan.

Case No. U-14401, (04/05), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Michigan Consolidated Gas Company application for Approval of their Gas Cost Recovery Plan and Five-Year gas Forecast. I reviewed the filing and recommended the Commission reject the proposed plan and suggested initiation of strategies that would lower the need to acquire expensive and unnecessary gas supplies.

Case No. U-14401-R, (10/05), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Michigan Consolidated Gas Company application re-opener Approval of their Gas Cost Recovery Plan and Five-Year gas Forecast. I reviewed the filing and recommended the Commission reject the proposed plan and suggested initiation of strategies that would lower the need to acquire expensive and unnecessary gas supplies.

Case No. U-14701, (02/06), Michigan Public Service Commission. Testified on behalf of the Michigan Environmental Council and The Public Interest Group In Michigan regarding the Consumers Energy Company application for Approval of a Power Supply Cost Recovery Plan and for Authorization of Monthly Power Supply Cost Recovery Factors for calendar year 2006. I reviewed the filing including the application, testimony, exhibits, discovery responses and submitted testimony recommending that the Commission not approve the five-year PSCR plan as filed due to the impacts related to the Palisades sale and the absence of alternative resources in the projected five-year resource portfolio.

Case No. U-14702, (02/06), Michigan Public Service Commission. Testified on behalf of the Michigan Environmental Council and The Public Interest Group In Michigan regarding The Detroit Edison Company application for authority to implement a Power Supply Cost Recovery Plan in its rate schedules for 2006-metered jurisdictional sales of electricity. I reviewed the application; testimony, exhibits and submitted testimony that recommended that the Commission not approve the proposed five-year PSCR plan as filed due because it was deficient in its selection of alternative resources in the projected five-year resource portfolio.

Case No. U-14992, (12/06), Michigan Public Service Commission. Testified on behalf of the Michigan Environmental Council and The Public Interest Group In Michigan regarding The Consumers Energy Company application for approval of the proposed Power Purchase Agreement in connection with the sale of the Palisades Nuclear Power Plant and other assets. The purpose of my testimony was to address the overall soundness of this application and proposal. I reviewed the application, testimony, exhibits and submitted testimony that recommended that the Commission not approve the proposed purchase power agreement and transfer the ownership of the nuclear plant and other assets.

Case No. 06-0800, (3/07), Illinois Commerce Commission. Provided testimony on behalf of the Illinois Citizens Utility Board regarding the Illinois electricity resource auction process. I assessed the existing resource/power supply auction-based bidding process and recommended modifications and improvements to the Illinois resource acquisition mechanism.



Case No. 24505-U, (5/07), Georgia Public Service Commission. Testified on behalf of the Georgia Public Service Commission Advocacy staff regarding the demand-side management portions of Georgia Power Company's Integrated Resource Plans. Testimony demonstrated that it is reasonable for the Commission to approve the five proposed DSM programs and expect that Georgia Power can successfully secure considerably more demand-side management resources by working effectively with its customers.

Case No. U-14992, (11/07), Michigan Public Service Commission. Testified on behalf of the Michigan Environmental Council and The Public Interest Group In Michigan regarding The Consumers Energy Company rate application for approval of a rate increase and the recovery of energy efficiency programs and certain costs in connection with the sale of the Palisades Nuclear Power Plant and other assets. I reviewed the application, testimony, exhibits and submitted testimony that recommended that the Commission not approve the recovery of transaction costs involving the transfer the ownership of the nuclear plant and other assets and on various aspects of its proposed energy efficiency programs and proposed incentives.

Case No. 07-0540, (12/07), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Commonwealth Edison Company application for approval of its proposed Energy Efficiency and Demand Response Plan. I assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. 07-0539, (12/07), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Central Illinois Light Company d/b/a and Ameren CIPS CENTRAL ILLINOIS PUBLIC SERVICE COMPANY and Ameren CIPS ILLINOIS POWER COMPANY d/b/a Ameren IP application for approval of its proposed Energy Efficiency and Demand Response Plan. I assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. U-15415, (2/08), Michigan Public Service Commission. Testified on behalf of the American Association of Retired People regarding The Consumers Power Company application for approval for authority to implement a Purchase Power recovery plan, 5-year forecast, and monthly PSCR factors for the 12-month period calendar year 2008.

I reviewed the application, testimony, exhibits and submitted testimony that recommended that the Commission adopt a more effective and less expensive resource acquisition procedure to help keep the cost of energy down in Michigan.

Case No. U-15417, (4/08), Michigan Public Service Commission. Provided testimony on behalf of the American Association of Retired People regarding The Detroit Edison Company for Authority to Implement a Power Supply Cost Recovery Plan in its Rate Schedule for 2008 Metered Jurisdictional Sales of Electricity. I reviewed the application, testimony, exhibits and submitted testimony that recommended that the Commission adopt a more effective and less expensive resource acquisition procedure to help keep the cost of energy down in Michigan.

Case No. U-15244, (7/08), Michigan Public Service Commission. Provided testimony on behalf of the Michigan Environmental Council and The Public Interest Group In Michigan regarding The Detroit Edison Company request for Authority to increase rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority. I reviewed the application, testimony, and exhibits and submitted testimony that recommended that the Commission direct DECO to make modifications to its Integrate Resource Planning analysis.

Case No. EEP-08-2, (7-08), Iowa Public Utilities Board. Provided testimony on behalf of the environmental interveners regarding the request of the Mid-American Energy Company for approval of an Energy Efficiency Plan. I made an assessment of the proposed energy efficiency and demand response plan and recommended modifications and improvements to the implementation strategy and proposed programs.

Case No. EEP-08-1, (8-08), Iowa Public Utilities Board. Provided testimony on behalf of the environmental interveners regarding the Interstate Power and Light Company request for approval of an Energy Efficiency Plan. I made an assessment of the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed programs and implementation strategy.

Case No. 137-CE-147, (2-09), Public Service Commission of Wisconsin. Provided testimony on behalf of PRESERVE OUR RURAL LANDS regarding the Application of American Transmission Company, as an Electric Public Utility, to Construct a new 345 kV Line from the Rockdale Substation to the West Middleton Substation, Dane County, Wisconsin. I suggested modifications of the proposal and rejection of the approval of the line.

Case No. M2009-2093218, (8-09), Pennsylvania Public Utility Commission. Provided testimony on behalf of The Office Of Consumer Advocate regarding the West Penn Power Company d/b/a Allegheny Power Energy Efficiency and Conservation Plan request for plan approval. I analyzed

the proposed plan and made an assessment of the proposed energy efficiency and demand response and cost recovery plan. I suggested modifications and improvements to the proposed programs as well as the proposed implementation strategy.

Case No. 09-1947-EL-POR, 09-1948-EL-POR, 09-1949-EL-POR, 09-1942-EL-EEC, 09-1943-EL-EEC, 09-1944-EL-EEC, POR, 09-580-EL-EEC, 09-580-EL-EEC, 09-580-EL-EEC, Public Utilities Commission of Ohio. Provided testimony on behalf of The Office Of The Environmental Law and Policy Center regarding the Ohio Edison Company, The Cleveland Electric Illuminating Company and the Toledo Edison Company for approval of their energy efficiency and peak demand reduction program portfolio and associated cost recovery mechanism and approval of their initial benchmark reports and in the matter of the energy efficiency and peak demand reduction programs. I reviewed, analyzed and assessed the appropriateness of the proposed plans, benchmark reports and proposed peak reduction program portfolio. I suggested modifications and improvements to the proposed programs. I also made recommendations regarding the proposed implementation strategy as well as accounting and program cost tracking.

Case No. U-16412, (10/10), Michigan Public Service Commission. Provided testimony on behalf of the Natural Resources Defense Council, Michigan Environmental Council and The Environmental Law and Policy Center regarding the Consumers Energy Company request to Amend its natural gas & energy efficiency Energy Optimization Plan. I reviewed the application, testimony, exhibits, discovery responses and submitted testimony that recommended modifications to the proposed Energy Optimization Plan.

Case No. 10-0570, (11/10), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Commonwealth Edison Company application for approval of its proposed Energy Efficiency and Demand Response Plan. Assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. 10-0568, (11/10), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Central Illinois Light Company d/b/a and Ameren CIPS CENTRAL ILLINOIS PUBLIC SERVICE COMPANY and Ameren CIPS ILLINOIS POWER COMPANY d/b/a Ameren IP application for approval of its proposed Energy Efficiency and Demand Response Plan. Assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. 10-0564, (11/10), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the People's Gas Light and Coke Company and North Shore Gas Company request for approval of its proposed Energy Efficiency Plan. Assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. 10-0567, (11/10), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Northern Illinois Gas Company application

for approval of its proposed Energy Efficiency Plan and approval of Rider 30, Energy Efficiency Plan Cost recovery and related changes to Nicor tariffs. Assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. M-2010-2210316, (3/11), Pennsylvania Public Utility Commission. I provided testimony on behalf of The Office Of Consumer Advocate regarding the UGI Utilities, Inc. Electric Division (UGI-Electric) request for Efficiency and Conservation Plan approval. I analyzed the proposed plan and made an assessment of the proposed energy efficiency and demand response and cost recovery plan. I suggested modifications and improvements to the proposed programs and implementation strategy.

Case No. 11-07026 and 11-07027, (11/11), Public Utilities Commission of Nevada. I provided testimony on behalf of the Bureau of Consumer Protection regarding both the Sierra Pacific Power Company and Nevada Power Company 2011 Annual Demand Side Management Update reports. I reviewed the filings and made recommendations regarding various aspects of demand response resources and demand side management portfolios.

Case No., U-16671 (01/12), Michigan Public Service Commission. I provided testimony on behalf of the Environmental Law and Policy Center regarding the reasonableness of the Detroit Edison Company's filing and assertions made by a witness regarding a net-to-gross factor relative to the 2010 and 2011 energy efficiency programs implemented in response to Public Act 295 of 2008.

Case Nos. P-2012-2320468, P-2012-2320480, P-2012-2320484, P-2012-2320450, (10/12), Pennsylvania Public Utility Commission. I provided testimony on behalf of The Office Of the Consumer Advocate regarding the application of Metropolitan Edison Company, Pennsylvania Electric Company, West Penn Power, Pennsylvania Power Company on the Energy Efficiency regarding the benchmarks established for the period June 1, 2013 through May 31, 2016. I analyzed the proposed adjustments of Phase II Energy Efficiency and Conservation target levels and energy efficiency acquisition costs.

Case No. Case Nos. 12-2190-EL-POR, 12-2191-EL-POR, 12-2192-EL-POR, (10/12) Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and the Toledo Edison Company for Approval of their energy efficiency and peak demand reduction program portfolio plan for 2013-2015. I provided testimony on behalf of Ohio Environmental Council and The Environmental Law and Policy Center regarding the Ohio Edison Company, The Cleveland Electric Illuminating Company and the Toledo Edison Company for approval of their 2013-2015 energy efficiency and peak demand reduction program portfolio. I reviewed, analyzed and assessed the appropriateness of the proposed plans, benchmark reports and proposed peak reduction program portfolio. I suggested modifications and improvements to the proposed programs and made recommendations and proposed new approaches to the proposed implementation strategy.

Case No., 12-06052 and 12-06053 (10/12), Public Utilities Commission of Nevada, I provided testimony on behalf of the Attorney General of the State of Nevada, Bureau of Consumer Protection regarding both the Sierra Pacific Power Company and Nevada Power Company 2013-2015 Triennial Integrated Resource Plan covering the period 2013-2032 and Approval of its Energy Supply Plan for the period 2013-2015. I reviewed, analyzed and assessed the appropriateness of the proposed plans and proposed peak reduction portfolio. I suggested modifications and improvements to the proposed programs and made recommendations and proposed new approaches to the implementation strategy.

Case No. U-16434-R, (10/12), Michigan Public Service Commission. Provided testimony on behalf of the Michigan Community Action Agency Association regarding The Detroit Edison Company for Reconciliation of its Power Supply Cost Recovery Plan for 12-month Period Ending December 31, 2011. I reviewed the application, testimony, exhibits and submitted testimony that recommended that the Commission adopt a remedy in regard to several aspects of the Reduced Emission Fuels projects that Detroit Edison was involved in.

Case No. Docket No. M-2012-2334388 (12/12), Pennsylvania Public Utility Commission. I provided testimony on behalf of The Office of the Consumer Advocate regarding the Petition of PPL Electric Utilities Corporation for Approval of an Energy Efficiency and Conservation Plan. I analyzed the proposed plan and made an assessment of the proposed energy efficiency and demand response and cost recovery plan. I suggested modifications to the proposed programs and implementation strategy to enhance its effectiveness.

Case No. U-17097, (03/13) Michigan Public Service Commission. Provided testimony on behalf of the Michigan Community Action Agency Association regarding The Detroit Edison Company filing for Reconciliation of its Power Supply Cost Recovery Plan for 12-month Period Ending December 31, 2013. I reviewed the application, testimony, exhibits and submitted testimony recommending that the Commission adopt a remedy regarding the Reduced Emission Fuels projects that Detroit Edison was participating in.

Case No. U-17095, (04/13) Michigan Public Service Commission. Provided testimony on behalf of the Michigan Community Action Agency Association regarding The Consumers Electric Company Application for Approval of A Power Supply Cost Recovery Plan and for Authorization

of Monthly Power Supply Cost Recovery Factors for 2013. I reviewed the application, testimony, and exhibits and submitted testimony recommending that the Commission reject the proposed five-year resource plan. I also recommend that the Commission prohibit CECO from collecting capital related investments for a pipeline in Zeeland, Michigan. I also recommended that CECO demonstrate to the Commission that the Palisades and MCV generation plants purchase power agreements are cost-effective, being complied with and are in the public interest.

Case No. EEP-2012-0001, (4-13), Iowa Public Utilities Board. Provided testimony on behalf of the environmental interveners regarding the Interstate Power and Light Company 2014-2018 Energy Efficiency Plan. I made an assessment of IPL's proposed resource planning as well their energy efficiency, renewable energy and demand response resources. I recommended modifications and improvements to the proposed programs, implementation and resource measurement strategy.

Case No. U-17131, (04/13), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Michigan Consolidated Gas Company application for Approval of their Gas Cost Recovery Plan and Five-Year gas Forecast and approval to implement a reservation charge. I reviewed the filing and recommended the Commission require MichCon to initiate procurement strategies that would reduce the heavy reliance that is being placed on the 75% VCA gas procurement strategy.

Case No. U-17133, (04/13), Michigan Public Service Commission. Testified on behalf of the Michigan Community Action Agency regarding the Consumers Energy Company application for approval of its gas cost recovery plan and authorization of a gas cost recovery factor from April 2013- March 2014. I reviewed the filing and made recommendations regarding the Quartile Fixed Price Purchases Gas purchasing strategy used by CECO.

Case No. EEP-2012-0002, (6/13), Iowa Public Utilities Board. Provided testimony on behalf of the environmental interveners regarding the Mid-American Energy Company 2014-2018 Energy Efficiency Plan. I made an assessment of MidAm's proposed resource planning as well their energy efficiency, renewable energy and demand response resources. I recommended modifications and improvements to the proposed programs, implementation and resource measurement strategy.

Case No. 13-0431-EL-POR (08/13), Public Utility Commission of Ohio. Provided testimony regarding the Application of Duke Energy Ohio, Inc. for Approval of its Energy Efficiency and Peak Demand Reduction Portfolio of Programs.

The testimony was provided on behalf of Ohio Environmental Council and The Environmental Law and Policy Center. Duke Energy Ohio, Inc. was seeking approval of their revised energy efficiency and peak demand reduction program portfolio. I analyzed and reviewed the appropriateness of the revised plan and proposed peak reduction program portfolio. I suggested significant additions and modifications to the proposed programs. I offered specific program recommendations and new elements be added to their programs and implementation strategy.

Case No. 13-0498, (10/13), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the request by Ameren Illinois for approval of its proposed Energy Efficiency and Demand Response Plan 3. Assessed the proposed energy efficiency and demand response plan and recommended modifications and improvements to the proposed plan filing.

Case No. 13-0499 (10/13), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the request by The Illinois Department of Commerce and Economic Opportunity for approval of its proposed Energy Efficiency Plan 3. Assessed the proposed energy efficiency plan and recommended modifications and improvements to the proposed plan filing.

Case No. 13-0495 (11/13), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the request by Commonwealth Edison application for approval of its proposed third Energy Efficiency Plan. I assessed the proposed energy efficiency plan and recommended modifications and enhancements to the proposed plan.

Case No. 13-0550 (12/13), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the request by North Shore Gas Company and The Peoples Gas Light and Coke Company for approval of its proposed second Energy Efficiency Plan. I assessed the proposed energy efficiency plan and recommended modifications and enhancements to the proposed plan.

Case No. 13-0549, (01/14), Illinois Commerce Commission. Provided testimony on behalf of the Environmental Law and Policy Center regarding the Northern Illinois Gas Company D/b/a/ Nicor for approval of its proposed second Energy Efficiency Plan, Cost recovery and related changes to Nicor tariffs. I assessed the proposed energy efficiency plan and recommended modifications and improvements to the proposed plan filing.

Case No. U-17319, (06/14), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the DTE Electric Company application for approval of its PSCR Plan 2014 - 2018. I reviewed the filing and made recommendations regarding the PSCR five-year forecast and plan.

Case No. U-17317, (08/14), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the Consumers Energy Company application for approval of its PSCR Plan 2014 - March 2018. I reviewed the filing and made recommendations regarding the PSCR five-year forecast and plan.

Case No. U-17680, (03/15), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the DTE Electric Company application for approval of its PSCR Plan 2015 - 2019. I reviewed the filing and made recommendations regarding the PSCR five-year forecast and plan.

Case No. U-17678, (04/15), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the Consumers Energy Company application for approval of its 2015 – 2019 PSCR Plan. I reviewed the application, filing and related documents and offered suggestions to improve the proposed five-year PSCR forecast and plan.

Case No. U-17735, (04/15), Michigan Public Service Commission. Provided testimony on behalf of the Michelle Rison and the Residential Consumer Group regarding aspects of the Consumers Energy Company general rate case application for authority to increase its rates for the generation and distribution of electricity and other relief. I reviewed the general rate case application, filing and related documents regarding CECO's reliance on and implementation of an Advanced Metering Infrastructure to deliver services to its customers. I offered specific recommendations regarding tariffs and policies related to Advanced metering infrastructure.

Case No. U-17767, (05/15), Michigan Public Service Commission. Provided testimony on behalf of a number of residential customers of DTE Electric under the nomenclature of Dominic and Lillian Cusumano and the Residential Customer Group. I provided testimony regarding DTE Electric's general rate case application for authority to increase its rates for the generation and distribution of electricity and other relief. I reviewed the general rate case filing and issues related to DTE Electric's reliance on and implementation of an Advanced Metering Infrastructure. I offered specific suggestions to improve DTE Electric's tariffs, policies and procedures related to implementation of an advanced metering infrastructure.

Case No. Docket No. P-2014-2459362 (06/15), Pennsylvania Public Utility Commission. I provided testimony on behalf of The Office of the Consumer Advocate regarding the Petition of Philadelphia Gas Works for Approval of Demand-Side Management Plan for FY 2016-2020; and Philadelphia Gas Works Universal Service and Energy Conservation Plan for 2014-2016 52 Pa Code Section 62.4- Request for Waivers. I analyzed the proposed five-year DSM plan and made an assessment of the proposed plan emphasizing the proposed conservation adjustment mechanism and the proposed performance incentives mechanisms. I suggested extensive modifications to the proposed Plan.

Case No. U-17792 (08/15), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association. I provided testimony and exhibits regarding Consumers Energy Company proposed 2015 Biennial Renewable Energy Plan. I reviewed the Biennial Renewable Energy Plan, testimony, exhibits and supporting information related to Consumers Energy Company renewable resource strategy resulting from the enabling statute (Public Act 295 of 2008). I offered my opinion and assessment of the reasonableness of the proposed plan as well as specific recommendations to improve the 2015 Biennial Renewable Energy Plan as well as Consumers Energy Company's electric resource planning procedures.

Case No. U-17793 (08/15), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association. I provided testimony and exhibits regarding the proposed DTE Electric Company 2015 Biennial Renewable Energy Plan. I reviewed the



proposed Biennial Renewable Energy Plan, testimony, exhibits and supporting information related to the DTE Electric Company renewable resource strategy resulting from Public Act 295 of 2008. I offered my opinion and assessment of the reasonableness of the proposed plan and made specific recommendations for improvement of the 2015 Biennial Renewable Energy Plan as well as DTE Electric Company's annual PSCR plan development and electric resource planning procedures.

Case No. M-2015-2514767 (01/16). I provided testimony on behalf of The Office of the Consumer Advocate regarding the joint Petition of the First Energy Companies serving customers in Pennsylvania. I reviewed the proposed five-year Energy Efficiency and Conservation Plan and offered suggestions to modify and improve various programs proposed for the 2016-2020 Plans.

Case No. M-2015-2515691 (01/16). I provided testimony on behalf of The Office of the Consumer Advocate regarding the joint Petition of the PECO Energy Company serving customers in Pennsylvania. I reviewed the proposed five-year Energy Efficiency and Conservation Plan and offered suggestions to modify and improve various programs proposed for the Act 129 related Energy Efficiency and Conservation Plan for 2016 – 2020.

Case No. U-17920, (03/16), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the DTE Electric Company application for approval of its PSCR Plan 2016 – 2020. I reviewed the filing and made recommendations regarding the PSCR five-year forecast and plan.

Case No. U-17918, (03/16), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the Consumers Energy Company application for approval of its PSCR Plan 2016 – 2020. I reviewed the application, filing and supporting materials and made recommendations regarding the PSCR five-year forecast and plan.

Case No. U-18014, (07/16), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the DTE Electric Company general rate case application for approval to raise rates. I reviewed the filing and made recommendations regarding inclusion of a corporate tax deferred debit, policies and tariffs related to smart meters and DTE's transition to an automated meter infrastructure.

Case No. U-17087 (Remand), (08/16), Michigan Public Service Commission. Provided testimony on behalf of the Residential Consumer Group regarding the Consumers Energy Company application to increase its rates for the generation and distribution of electricity. I reviewed the filing regarding the support and substantiation for the opt-out tariff that is included and approved for Consumers Energy Company. I made a series of specific recommendations regarding the lack of substantiation for the up-front and monthly charges (both existing and proposed) contained within the non-transmitting meter tariff (among other tariffs) and policies related to smart meters and DTE's transition to an automated meter infrastructure.

Case No. U-18111, (08/16), Michigan Public Service Commission. The purpose of my testimony was to address the reasonableness of Detroit Edison Company's (DTE) requested changes to its Biennial Renewable Energy Plan which had been previously approved in Case No. U-17793. I also recommended procedural changes in an effort to enhance the review, assessment and ultimately the integration of additional renewable resources into DTE's provision of electricity to its customers in the future.

Case No. U-18090, (10/16), Michigan Public Service Commission. Provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the Consumers Energy response to the Commission's own Motion to establish a method and avoided cost for comply with the Public Utilities Regulatory Policy Act of 1978, 16 USC 2601 et seq. I reviewed the filing including Consumers Energy proposal for their preferred avoid cost methodology and made recommendations as to an appropriate approach and methodology for deriving avoided costs to be relied upon by Qualifying Facilities in Michigan.

Case No. U-18402 (04/18), I provided testimony on behalf of the Great Lakes Renewable Energy Association regarding Consumers Energy Company PSCR application, 2018-2022 five-year plan and filing materials. Based on my review I offered suggestions and recommendations regarding the PSCR level, impacts of residential, commercial and industrial customer owned renewable resources in its 2018-2022 PSCR resource mix.

Case No. M-2017-2640306 (04/18), The Pennsylvania Office of Consumer Advocate regarding a Peoples Natural Gas Company proposed the Energy Efficiency and Conservation Plan. I reviewed the proposed five-year Combined Heat and Power, Energy Efficiency and Conservation Plan proposed by Peoples Natural Gas Company. I sponsored direct, rebuttal and surrebuttal testimony, which addressed the design of the programs due to the deficiencies that were embodied in the proposed Plan.

Case No. U-18403 (04/18), I provided testimony on behalf of the Great Lakes Renewable Energy Association regarding the Application of DTE Electric Company for authority to Implement a Power Supply Cost Recovery Plan in its Rate Schedules For 2018 Metered Jurisdictional Sales of Electricity. Based on my review I offered recommendations regarding the reasonableness of its PSCR factor level and resource mix proposed for its 2018-2022 PSCR resource mix.

Case No. U-18231 (04/18), I provided testimony on behalf of the Great Lakes Renewable Energy Association regarding Consumers Energy Company Renewable Energy Plan application. I reviewed the proposed renewable energy plan and related filing materials. Based on my review I offered suggestions and recommendations regarding to improve the REP Plan development process. I recommended that the REP Plan development process be coordinated with Act 304 as well as Integrated Resource Planning processes and general rate proceedings to result in a more beneficial resource mix to better serve CECO ratepayers.

Case No. U-18232 (07/18), I provided testimony on behalf of the Great Lakes Renewable Energy Association regarding The Detroit Edison Company Biennial Renewable Energy Plan application. I reviewed the proposed renewable energy plan and related filing materials. Based on my review I offered suggestions and recommendations regarding to improve the REP Plan development process. I recommended that the REP Plan development process be coordinated with Act 304 as well as Integrated Resource Planning processes and general rate proceedings to result in a more beneficial resource mix which would benefit Detroit Edison Company ratepayers.

Case No. M-2017-2640306 (09/18), The Pennsylvania Office of Consumer Advocate regarding a Peoples Natural Gas Company proposed the Energy Efficiency and Conservation Plan. I reviewed the proposed five-year Combined Heat and Power, Energy Efficiency and Conservation Plan proposed by Peoples Natural Gas Company. I offered Supplemental Surrebuttal testimony with suggestions for energy efficiency program and plan improvements.

Case No. M-2017-2640195 (09/18), The Pennsylvania Office of Consumer Advocate regarding an Application of Transource Pennsylvania, LLC for approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection - East and West Projects in portions of York and Franklin Counties, Pennsylvania. I reviewed the proposed transmission project and plan. I offered suggestions for utilization of energy efficiency programs and improvements to the transmission plan.

Case No. U-20219 (05/19), Michigan Public Service Commission. Provided testimony on behalf of the Michelle Rison and the Residential Consumer Group regarding aspects of the Consumers Energy Company PSCR Plan application seeking authorization to increase its rates for the generation and distribution of electricity and other relief. I reviewed the PSCR Plan application, filing and related documents. I reviewed, assessed and offered suggestions to improve the PSCR Plan and 5-year forecast that Consumers Energy Company (CECO) provided and to made recommendations to improve the PSCR Plan. I pointed out concerns regarding lack of benefits emanating from the Tax Cut and Jobs Act of 2017 (TCJA), leasing the Zeeland plant interconnection pipeline, and the gas management services contract terms for acquisition of natural gas at its Zeeland, Jackson and Karn plants.

Case No. U-20561 (11/19), Michigan Public Service Commission. Provided testimony on behalf of Michelle Rison and the Residential Consumer Group regarding aspects of THE DTE ELECTRIC COMPANY rate case seeking authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority. I reviewed the application, supporting testimony, exhibits and work papers and related documents. I addressed the issue of the appropriateness of a projected test period compared to a historic test period. In addition, I addressed the issue of the initiation and modification of DTE's advanced metering infrastructure .

Case No. U-20209 (03/20) Michigan Public Service Commission. Provided testimony on behalf of Michelle Rison and the Residential Consumer Group regarding aspects of the application of CONSUMERS ENERGY COMPANY reconciliation portion of the case dealing with implementation of its approved gas cost recovery plan for the 12-month period of April 1, 2018 through March 31, 2019. I reviewed the filing including the application, testimony, exhibits, work papers and other supporting documentation. I highlighted several concerns regarding the lack of GCR customer benefits that should have been derived from implementation of the Tax Cut and Jobs Act of 2017, leasing arrangements regarding an interconnection pipeline, and failure to identify or quantify GCR customer benefits resulting from the gas management services that CECO subcontracted out for its Zeeland, Jackson and Karn plants.

Case No. U-20525 (06/20) Michigan Public Service Commission. Provided testimony on behalf of Michelle Rison and the Residential Customer Group regarding the application of CONSUMERS ENERGY COMPANY for approval of a power Supply cost Recovery Plan for the 12 months ending December 31, 2020. I reviewed the filing including the application, testimony, exhibits, work papers and supporting documents. I highlighted several concerns regarding the lack of GCR customer benefits that should have been derived from implementation of the Tax Cut and Jobs Act of 2017, leasing arrangements regarding an interconnection pipeline, and failure to identify or quantify GCR customer benefits resulting from the gas management services that CECO subcontracted out relative to the Zeeland, Jackson and Karn facilities.

Case No. U-20220 (12/20) Michigan Public Service Commission. Provided testimony on behalf of Michelle Rison and the Residential Customer Group regarding the application of CONSUMERS ENERGY COMPANY for reconciliation of its power Supply cost Recovery Plan for the 12 months ending December 31, 2019. I reviewed the case filing including the application, testimony, exhibits, work papers and supporting documents. I identified and defended several concerns regarding the deficiency of GCR customer benefits regarding the implementation of the Tax Cut and Jobs Act of 2017, leasing arrangements regarding an interconnection pipeline as well as the failure to identify or quantify GCR customer benefits resulting from the gas management services that CECO subcontracted out.

In addition, I have served the following public sector clients since 1990.

Client	<b>Nature of Service</b>
Alaska Housing Finance Corporation	Analysis of energy efficiency, system planning and applicability of Energy Policy Act standards to Alaska resource selection process.
California Low Income Governing Board	In conjunction with AB 1890 the state's restructuring statute provided analyses of options to deliver energy efficiency and assistance programs to low-income households in a restructured utility environment. Assisted the CPUC and Low-Income Governing Board in de low-income energy assistance and energy efficiency programs, implementation methods and procedures under interim utility administration.
Conservation Law Foundation of New England	Provided technical support to the collaborative working groups with Boston Edison, United Illuminating, Eastern Utilities Association, and Nantucket Electric regarding system planning approaches, energy efficiency programs and resource screening.
District of Columbia Public Service Commission	Testimony regarding demand-side management, least cost planning principles.
Germantown Settlement, Philadelphia	Analysis and technical support regarding business structure and market to aggregate load and/or provide energy efficiency and energy assistance services to low-income households.
City of New Orleans	Developed least cost planning rules, guided a public working group to develop demand-side programs, and developed a low income, senior citizens energy efficiency program.

Oak Ridge National Laboratory	Prepared an economic analysis of the customer impact from various electricity restructuring configurations for the State of Ohio
Ohio Office of Consumer Council	Analyzed two utilities' long-range plans and energy efficiency resource options. Analyzed the Dominion East Gas Company application to be relieved of the merchant function.
Ontario Energy Board	Developed demand-side management programs and evaluated need for natural gas integrated resource planning rules.
U.S. Environmental Protection Agency	Developed handbook, "Energy Efficiency and Renewable Energy: Opportunities from Title IV of the Clean Air Act", which focuses on how energy efficiency and renewables relate to acid rain compliance strategies.
U.S. Environmental Protection Agency and U.S. Department of Energy	Analyzed and compared utility supply- and demand-side resource selection for Clean Air Act compliance on the Pennsylvania-New Jersey-Maryland (PJM) interconnection.
Washington State Weatherization Directors	Natural Gas energy conservation program design involving Cascade Natural Gas Company

**Response of Philadelphia Gas Works  
to the Interrogatories of OSBA, Set I  
Docket No. P-2014-2459362**

OSBA to PGW I-1

*(Reference: (Reference: Proposed DSM Implementation Plan FY 24-26, pg. 28):* Projected participation for the Small Business Assessments indicates that 102 businesses will participate across all 3 years. Given the \$300,000 budget, this is only possible if the incentive amount is not maxed out at \$3,000 per participant. In addition, the budget lacks detail on how much of the \$300,000 will go towards incentives versus administration, inspections, etc.

- (a) Will PGW provide a more detailed budget breakdown for the SBA program that include the budget for incentives, administration, inspections, evaluation, and any other anticipated costs?
- (b) What does PGW anticipate as the average incentive amount per participant in the SBA program, and how does this align with the 102 projected participants and the overall SBA program budget?

**Response:**

- (a) PGW's proposed budget for SBA assumes the cost of the program to be all-inclusive, therefore, the cost for performing the assessment and the cost for installing the measures will be rolled into one. However, PGW anticipates that approximately one quarter of the cost will go toward the installation of direct-install measures during the energy assessment, and around 65% will be spent on assessments and reports. Ten percent is budgeted for other administrative costs, such as developing an online portal, program design and communications. Additionally, because each assessment will produce a report, PGW will not perform third-party quality assurance inspections in the SBA program. In its revised plan, PGW is proposing to move evaluation budget from the portfolio level to individual programs, with \$30k budgeted for SBA evaluation in FY2027. PGW also clarified a \$10,000 line item in the budget for administrative costs.
- (b) PGW anticipates spending roughly \$2,500 to \$3,000 per participant in the program for the audit and energy savings measures. This projection is based on the average cost of an ASHRAE Level 1 Audit, wherein the Energy Auditor conducts a basic walk-through assessment and identifies opportunities for energy conservation and cost savings. This aligns with the projected participation over the phase because the program seeks to incentivize approximately 34 projects each fiscal year.

**Response provided by:** Steven Jerue, Director of Customer Programs**Dated:** October 2, 2023

# The *Inflation Reduction Act* Drives Significant Emissions Reductions and Positions America to Reach Our Climate Goals

## Summary

The *Inflation Reduction Act of 2022* represents a historic, \$369 billion investment in the modernization of the American energy system. The U.S. Department of Energy's (DOE) preliminary assessment finds that this law—in combination with other enacted policies and past actions—will help drive 2030 economy-wide greenhouse gas (GHG) emissions to 40% below 2005 levels. The legislation would get the U.S. a significant way towards our overall 2030 climate goals, positioning the U.S. to reach 50-52% GHG emission reductions below 2005 levels in 2030 with continued executive branch, state, local, and private sector actions not included in this analysis. Examples of continued executive branch actions include implementation of the recently enacted CHIPS Act as well as updates to standards that drive energy efficiency and pollution reduction from the transportation, power, building, and industrial sectors.

DOE estimates that the clean energy provisions of the *Inflation Reduction Act of 2022* and the *Bipartisan Infrastructure Law of 2021* together could reduce emissions by approximately 1,000 million metric tons (MMT CO<sub>2</sub>e) in 2030, or about a gigaton. Considering the other climate and energy provisions of these laws brings the total to nearly 1,150 MMT CO<sub>2</sub>e. These expected emissions reductions are equivalent to the approximate combined annual emissions released from every home in the United States.

In addition to these pollution-reduction benefits, these measures would lower energy costs for consumers,

enhance energy security, and improve human health. Moreover, by stimulating investments in domestic supply chains, manufacturing, and clean energy deployment, these laws will create hundreds of thousands of high-quality jobs and new economic opportunities. The laws also address historical inequities in our nation's energy system by lowering the cost of and expanding access to clean energy technologies and by providing relief to communities that have suffered from disproportionate exposure to energy-related pollution.

## Introduction

The *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* together represent historic investments in the modernization of the nation's energy system, totaling more than \$430 billion. The specific provisions in these two laws will lower energy costs for consumers, enhance the nation's energy security, improve human health, mitigate climate change, create high-quality jobs and new economic opportunities for communities, and address historical inequities in our energy system.

In this issue brief, DOE estimates the potential impact of the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* on GHG pollution. These preliminary estimates, which focus on the clean energy provisions of the two laws, are based on DOE's understanding of the many programs and incentives created by the legislation. The issue brief also includes impacts associated with provisions pertaining to oil and natural gas as well as agricultural conservation and forestry—sourced from federal agency partners and external analysts.

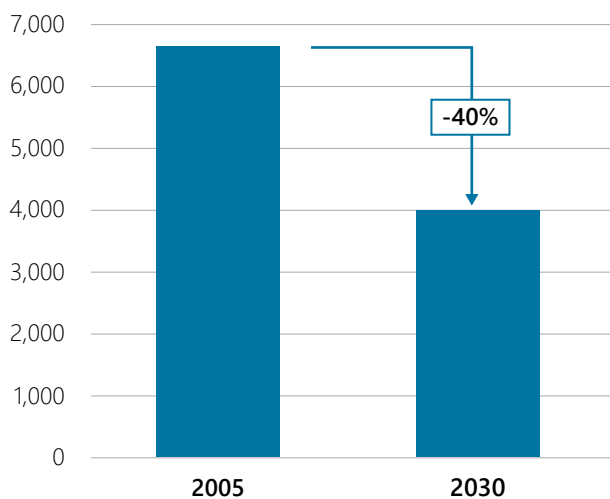


DOE has employed multiple modeling and assessment tools to develop these estimates. [See the appendix for an overview of this methodology.](#)

## Dramatically Reducing Greenhouse Gas Pollution

DOE's preliminary assessment finds that the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law*, in combination with past actions, are projected to drive 2030 economy wide GHG emissions to 40% below 2005 levels. Specifically, DOE estimates that the two laws could help reduce nationwide GHG pollution by nearly 1,150 MMT CO<sub>2</sub>e in 2030, in comparison to a business-as-usual scenario. DOE's focus in this analysis is on the clean energy provisions of these two laws, which are estimated to reduce emissions by approximately 1,000 MMT CO<sub>2</sub>e in 2030.

The *Inflation Reduction Act* and *Bipartisan Infrastructure Law* target every aspect of the energy system—thereby amplifying the GHG-reducing effect of any given provision. For example, electricity use in transportation, buildings, and industry yields emissions reductions in part due to corresponding decarbonization of the power sector.



Net Economy-wide GHG Emissions Over Time (MMT CO<sub>2</sub>e)

Estimating pollution reduction by sector is challenging, given the complexity of these interactions. Nonetheless, DOE's analysis projects GHG impacts across all sectors, with the power sector representing the largest source of potential GHG reductions through 2030, as illustrated in the figure. Many of the programs in question are intended to jump-start longer-term pollution reductions through catalytic investments. As such, DOE expects the pollution reductions from these provisions to increase across all sectors beyond 2030, ensuring continued progress toward the nation's 2050 net-zero emissions goal.

The *Inflation Reduction Act* and *Bipartisan Infrastructure Law* contain numerous clean energy programs and incentives. DOE's assessment suggests that the tax incentives in the *Inflation Reduction Act*, supporting clean electricity, clean transportation, building-envelope and equipment efficiency, clean fuels, carbon capture, manufacturing, and supply chains, will be effective in driving near- and long-term pollution reductions. Beyond the tax package, DOE expects the many grants, loans, and other programs featured in the two laws to have notable pollution-reduction impacts. These programs are diverse, targeting the power, industry, buildings, and transportation sectors.

Beyond the clean energy provisions, the laws also include new programs and policies related to agricultural conservation and forestry as well as oil and natural gas ("Other sectors" in figure). DOE draws on analysis from federal agency partners and external analysts to conclude that those provisions collectively result in significant net GHG pollution reductions. While oil and natural gas leasing provisions may lead to some increase in GHG pollution in 2030, those possible increases are dwarfed around 35-to-1 by the net estimated pollution reduction associated with the two laws. Moreover, the *Inflation Reduction Act* contains significant investments to support agricultural conservation and forests, investments that are expected to contribute to over 10% of the overall GHG benefits of the legislation.

Notably, these estimates do not include executive branch energy and climate activities underway now and over the next decade. Nor do they include future state, community, or private sector activities. That suite of activities will deliver future emissions reductions, beyond those estimated here.

## Key Drivers of Emissions Reductions across Sectors

Focusing on the clean energy as well as agriculture and forestry provisions of the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law*, DOE identifies the following key drivers.

### Power

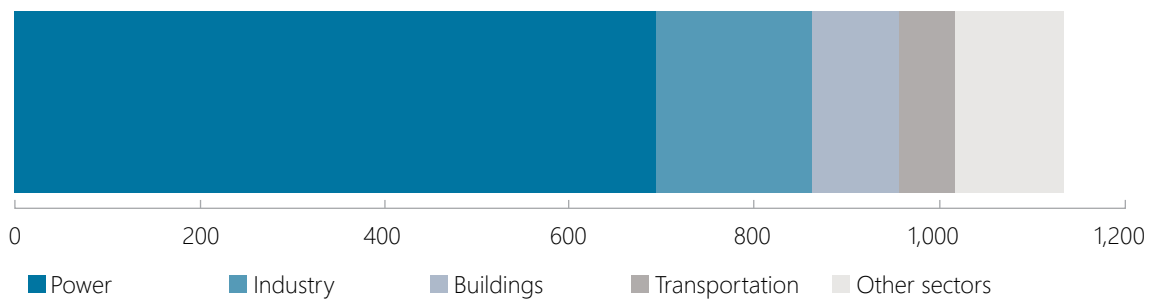
DOE's assessment finds that the new and extended tax incentives in the *Inflation Reduction Act* will drive near-term power-sector pollution reductions by accelerating the growth of clean electricity generation, including wind and solar power. Various transmission programs and authorities, as well as a new tax incentive for energy storage, will help ensure that these new resources are reliably delivered to customers. Meanwhile, a new production tax credit in the *Inflation Reduction Act* and the Civil Nuclear Credit program established by the *Bipartisan Infrastructure Law* will support the maintenance of the country's existing nuclear power fleet, ensuring that America does not lose these important clean

power resources.

The combined effects of the *Inflation Reduction Act* and *Bipartisan Infrastructure Law* will also drive technology innovation, enabling longer-term reductions in power-sector emissions. Enhanced funding for loans, research and development, and demonstration will support innovation and new deployments for a range of technologies, including nuclear, carbon capture and storage (CCS), long-duration energy storage, clean hydrogen, direct air capture, geothermal, and more. Long-term extensions of existing tax incentives and new and augmented tax incentives that collectively cover each of these technologies will help ensure strong commercial interest and provide a basis for potential large-scale deployment.

### Industry

DOE finds that programs that support direct emissions abatement at industrial facilities and within manufacturing and recycling processes, incentives for clean fuels, and procurement measures for low-carbon materials all work together to drive industrial-sector emissions reductions. The *Inflation Reduction Act's* \$5.8 billion Advanced Industrial Facilities Deployment Program plays a significant role, providing financial assistance for facilities to use advanced industrial technologies, such as electrification, low-carbon fuels, carbon capture, and



Estimated Emissions Reductions in 2030 from *Inflation Reduction Act* and *Bipartisan Infrastructure Law* (2030, MMT CO<sub>2</sub>e)

other advanced-manufacturing processes. This will drive emissions reductions in key, emission-intensive industrial sectors, such as iron and steel, cement, and chemicals. The *Inflation Reduction Act* also leverages the purchasing power of the federal government to support demand for low-carbon construction materials through procurement provisions and supports standardizing Environmental Product Declarations to make it easier for the federal government as well as other climate-conscious buyers to select and purchase cleaner materials. The hydrogen production tax credit will leverage the hydrogen hub and demonstration investments from the *Bipartisan Infrastructure Law* to drive hydrogen production and subsequent use in subsectors, such as ammonia, petroleum refining, biofuels, heavy-duty transportation, and steel. Similarly, the extension and enhancement of the tax credit for industrial applications of CCS will leverage *Bipartisan Infrastructure Law* investments in CCS demonstrations and CO<sub>2</sub> transportation infrastructure to abate emissions in ethanol, cement, and refining.

### *Buildings*

Tax incentives for more efficient homes and commercial buildings, rebate programs for home efficiency and electrification, and funding to assist with state and local building-code adoption and compliance are key *Inflation Reduction Act* measures that will reduce direct emissions from buildings. These build on additional ongoing activities pursued by DOE with the U.S. Department of Housing and Urban Development—such as DOE’s actions to update appliance and equipment standards this year and save consumers an average of \$100 on their annual energy bills. Reductions also come from a variety of *Bipartisan Infrastructure Law* programs, including \$3.5 billion in Weatherization Assistance Program funding and support for the Energy Efficiency and Conservation Block Grant Program, State Energy Program, Capitalization for Efficiency Revolving Loan Funds, and Efficiency and Renewable Energy Grants for public schools. Many of these provisions support the electrification of buildings

with efficient equipment that takes advantage of low-carbon electricity, such as electric heat pumps for heating, air conditioning, and hot water. Other investments in efficient windows, doors, and insulation materials, regardless of a building’s heating-fuel type, will generate further emissions reductions. These investments in our nation’s buildings, which can operate for 100 years or longer, will ensure lower emissions, lower costs, and improved comfort for decades beyond 2030.

### *Transportation*

Tax credits for clean cars, trucks, vans, SUVs, commercial vehicles, and heavy-duty vehicles will help drivers and fleets adopt advanced technologies that lower operating costs and reduce emissions. The *Inflation Reduction Act*’s Clean Vehicle Credit will support the transition to a clean transportation future, reducing GHG emissions and local air pollution while accelerating the expansion of American supply chains for critical minerals and battery production. Together with *Bipartisan Infrastructure Law* investments of \$7 billion to strengthen the American battery supply chain, the *Inflation Reduction Act* establishes a production tax credit to manufacture battery modules and creates programs to support advanced vehicle technologies and revitalize automotive manufacturing facilities. Moreover, the *Inflation Reduction Act* will help more Americans access clean transportation through tax credits for lower-income drivers who purchase previously owned, clean vehicles.

Expanding upon the states’ efforts to deploy charging infrastructure, funded in part by the *Bipartisan Infrastructure Law*, an alternative refueling tax credit will help install charging equipment in low-to-moderate-income and rural communities. In addition, electric U.S. Postal Service trucks will help reduce pollution from mail deliveries. To further decarbonize all modes of transportation, the *Inflation Reduction Act* creates tax credits to facilitate the use of clean fuels including

biodiesel, renewable diesel, advanced biofuel, and sustainable aviation fuel. It also provides incentives to deploy alternative-fuel infrastructure and advanced aviation technology, and to reduce diesel emissions from freight and ports.

These investments build on efforts by the U.S. Department of Transportation and the Environmental Protection Agency to update fuel economy and tailpipe emissions standards for vehicles, which will work in concert with these new investments to drive toward meeting the President's goal of 50% zero emissions vehicles sold in 2030.

### *Agriculture and Forestry*

Combined with the *Bipartisan Infrastructure Law* and other investments already underway, the *Inflation Reduction Act* makes a once-in-a-generation investment in part through the U.S. Department of Agriculture that will support agricultural producers, rural communities and their infrastructure needs, while responding and adapting to the climate crisis. Recognizing the critical role American agriculture and forestry play in addressing the climate crisis, the *Inflation Reduction Act* will invest \$21 billion in climate-smart farmers, ranchers, and forest landowners working to reduce GHG pollution, increase storage of carbon in soils and trees, and make their operations more productive. The *Inflation Reduction Act* will also invest \$5 billion to protect communities from the risks of extreme wildfires, conserve forests with significant carbon sequestration benefits, and cool communities vulnerable to the threats of extreme heat. These investments will give farmers, ranchers, forest landowners and rural communities the resources and tools they need to prepare for and adapt to a changing climate, saving lives, property, and livelihoods.

## Addressing National Priorities

In addition to climate benefits, the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* will help modernize the nation's energy system, lower energy costs for consumers, enhance energy security, and improve human health. By stimulating investments in domestic supply chains, manufacturing, and clean energy deployment, these laws will create hundreds of thousands of high-quality jobs and new economic opportunities. And the laws address historical inequities in our nation's energy system by lowering the cost of and expanding access to clean energy and by providing relief to communities that have suffered from disproportionate exposure to energy-related pollution.

Below are a few examples of how specific provisions within the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* will work in concert to address these priorities:

- **Lowering energy costs for households and businesses:** The *Inflation Reduction Act* includes tax credits designed to help more Americans invest in equipment that can save them money and protect them from the volatility of fossil-fuel prices. These include tax credits for heat pumps, rooftop solar, and new and used electric vehicles. For example, a typical household that invests in rooftop solar can expect to save \$9,000 over the lifetime of the solar system.<sup>1</sup> Households that install a heat pump can save \$500, and in some cases nearly \$1,000, on their annual utility bills.<sup>2</sup> Furthermore, tax incentives for clean power generation can result in reduced retail electricity rates, saving all consumers—even those who do not purchase any incentivized equipment—money on their bills.

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<sup>1</sup> See: <https://www.energy.gov/policy/articles/president-bidens-agenda-building-better-america-will-lower-energy-costs-working>

<sup>2</sup> See: <https://www.energy.gov/policy/articles/president-bidens-agenda-building-better-america-will-lower-energy-costs-working>

- **Benefits for disadvantaged communities:** Provisions in the *Inflation Reduction Act* direct targeted support to disadvantaged communities and lower-income households. The \$3 billion Environmental and Climate Justice Block Grants and \$27 billion Greenhouse Gas Reduction Fund, for example, will support communities with disproportionate energy burdens and pollution exposure. Collectively, these provisions will advance projects that reduce the adverse health impacts of pollution and mitigate the effects of climate change, ensuring that all communities can share in the benefits of clean energy technologies.
- **Investments in energy communities:** Multiple provisions direct investments to communities that currently host, or previously hosted, fossil energy infrastructure. These include \$4 billion in investments under the Advanced Energy Project Credit directed to industrial or manufacturing facilities located in these communities and more than \$10 billion for rural electric cooperatives to deploy clean electricity, providing economic opportunities and benefits for regions that may be disproportionately affected by the transition to a decarbonized economy.
- **Workforce development and high-quality jobs:** The infrastructure created through the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* will expand the clean energy workforce. To receive the maximum value of the tax credits, clean energy projects must meet wage and apprenticeship requirements, ensuring that workers on those projects are paid prevailing wages and creating new opportunities for skilled workers to launch their careers.
- **Domestic manufacturing of clean energy technologies:** Many provisions support domestic manufacturing of clean technologies, through both direct funding and new incentives for domestically manufactured equipment. For instance, the Advanced Manufacturing Production Tax Credit in the *Inflation*

*Reduction Act*, along with several provisions in the *Bipartisan Infrastructure Law*, incentivize or provide funding for the domestic production of the full clean energy and storage supply chain, as well as supporting critical minerals production. *The Inflation Reduction Act's* deployment incentives complement direct manufacturing support by including a 10% bonus for clean electricity projects meeting domestic content criteria and increased consumer incentives for vehicles that meet domestic supply-chain requirements. This combined support for the supply and demand of domestic-made products offers a strong incentive for manufacturers to build clean energy supply chains in America.

The above list is a sampling of the many benefits of the *Inflation Reduction Act* and the *Bipartisan Infrastructure Law* and is not intended to be comprehensive. DOE looks forward to conducting additional analysis and working with other stakeholders in the months ahead to further assess the prospective impacts of these and other programs and policies.

To fully realize the benefits of the *Inflation Reduction Act* and *Bipartisan Infrastructure Law*, federal agencies must act decisively to implement these laws. DOE, like other federal agencies, is already hard at work implementing critical components of the *Bipartisan Infrastructure Law*. State governments, local governments, Tribes, civil society, and the private sector all have important roles to play in our collective effort to modernize the American energy system. An all-of-society approach will help maximize the positive returns from these historic programs and investments.



U.S. DEPARTMENT OF  
**ENERGY** | Office of  
Policy

DOE/OP-0018 • August 2022

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PETITION OF PHILADELPHIA GAS WORKS :  
FOR APPROVAL OF DEMAND SIDE :  
MANAGEMENT PLAN FOR FY 2024 - 2026 :  
:  
PHILADELPHIA GAS WORKS UNIVERSAL : Docket No. P-2014-2459362  
SERVICE AND ENERGY CONSERVATION :  
PLAN FOR 2014-2016, 52 PA. CODE § 62.4- :  
REQUEST FOR WAIVERS :

SURREBUTTAL TESTIMONY  
OF  
GEOFFREY C. CRANDALL  
  
ON BEHALF OF THE  
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

JANUARY 11, 2024

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1 **Q. What is your name and business address?**

2 A. My name is Geoffrey C. Crandall. My business address is MSB Energy Associates, Inc.,  
3 6907 University Avenue, #162, Middleton, Wisconsin 53562.

4 **Q. On whose behalf are you testifying today?**

5 A. I am testifying on behalf of the Pennsylvania Office of Consumer Advocate.

6 **Q. Are you the same Geoffrey C. Crandall who previously submitted Direct Testimony**  
7 **on behalf of the Office of Consumer Advocate in this proceeding?**

8 A. Yes, I am.

9 **Q. What is the purpose of your Surrebuttal Testimony?**

10 A. The purpose of this testimony is to respond to the Rebuttal Testimony of the following  
11 Philadelphia Gas Works (PGW) witnesses regarding my recommendations for PGW's  
12 Phase IV Revised Demand Side Management Plan for FY 2025- 2029 (Revised DSM IV  
13 Plan)<sup>1</sup>:

14 ➤ Denise Adamucci, PGW St. No. 1-R; and

15 ➤ Theodore Love, PGW St. No. 2-R.

16 **Q. Please summarize the recommendations you made in your Direct Testimony.**

17 A. My recommendations were that the Pennsylvania Public Utility Commission  
18 (Commission) should condition any approval of PGW's Revised DSM IV Plan upon the  
19 following terms:

20 1. PGW should resubmit the budget information to provide more detailed breakouts,  
21 including specifying incentive, administration, marketing, inspection, and  
22 evaluation costs.

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<sup>1</sup> As noted on page 2-3 of my Direct Testimony, PGW submitted its DSM IV Plan in this docket on June 16, 2023, but it later submitted a Revised DSM IV Plan, by way of an exhibit to PGW Statement No. 1, on September 27, 2023. PGW's operative proposal for this case is now the Revised DSM IV Plan.



1 2. PGW should attempt to obtain federal funds to leverage and improve the  
2 effectiveness of its DSM programs. PGW should report annually on its efforts and  
3 success in obtaining any funding.

4 a. In conjunction with its attempts to obtain federal funds, PGW should  
5 perform outreach to customers to educate them about rebate opportunities  
6 they may be eligible to pursue on their own, such as rebates available  
7 through the High-Efficiency Electric Home Rebate Act.

8 3. The Commission should not approve the five-year term now proposed for the  
9 Revised DSM IV Plan. Instead, the Commission should confine PGW’s DSM IV  
10 Plan to the three-year term as it originally proposed in its June 16, 2023 filing.  
11 Approval of the three-year DSM-IV Plan should then be subject to the conditions  
12 that:

13 a. PGW report annually on the performance of the DSM programs and  
14 provide the opportunity for stakeholder input.

15 b. PGW monitor changes in economics, technologies, law or regulatory  
16 policy and other circumstances that may require changes in the DSM IV  
17 budget and programming.

18 c. PGW propose modifications to the DSM IV budget and programming  
19 when changes warrant them prior to the next regular plan filing.  
20

21 **A. Recommendation 1-More Budget Detail Needed**

22  
23 **Q. How did PGW respond to your recommendation that it be required to resubmit  
24 budget information to provide more detailed breakouts of costs?**

25 A. PGW witness Adamucci indicated that PGW is willing to provide “additional budgetary  
26 information as requested” but she also stated that the information would be submitted after  
27 the Commission approved the Phase IV Plan. PGW St. No. 1-R, p. 3.

28 **Q. Does PGW’s response satisfy your recommendation?**

29 A. Only partly. I accept PGW’s commitment to provide budgetary information at the  
30 conclusion of this case for purposes of the DSM IV only, but my overall recommendation  
31 extends for future filings as well. Specifically, I recommended that PGW provide budget  
32 breakouts by functional components for each component of its DSM programming, and

1 supporting documentation, at the beginning of DSM cases. OCA St. 1, pp. 6-9. This  
2 information should include identification of the activities that each budget is planned to be  
3 used for, as well as the workpapers that identify PGW's budget calculation for each  
4 individual DSM program and for PGW's overall budget. For purposes of this case,  
5 providing any of this outstanding information at the conclusion will be sufficient, but my  
6 position remains that it should be provided at the beginning of any future DSM filing or  
7 extension request that PGW may wish to make.

8 **B. Recommendation 2-Federal Funding Opportunities**

9 **Q. How did PGW respond to your recommendation that it should attempt to obtain**  
10 **federal funding to leverage and improve the effectiveness of its DSM programs and**  
11 **then report annually on the status of those efforts?**

12 A. PGW's response was a good first step; however, it was somewhat contradictory. On one  
13 hand, witness Adamucci stated that PGW "does not necessarily oppose seeking available  
14 and relevant federal funding to advance its DSM programs." On the other hand, witness  
15 Adamucci also stated that PGW believes there is uncertainty about when and how the funds  
16 will be spent and whether any could be available to PGW. PGW St. No. 1-R, p. 3. Witness  
17 Adamucci defers to PGW witness Love's assessment that the funding opportunities I  
18 referenced as being available through the Inflation Reduction Act, including the Home  
19 Efficiency Rebates (HOMES) High-Efficiency Electric Home Rebate Act (HEEHRA), need  
20 to be applied for by a state energy office. PGW St. No. 2-R at 2. Witness Love opines that  
21 until there is more clarity from the presumptive state energy office for Pennsylvania, the  
22 Pennsylvania Department of Environmental Protection (PA DEP), there is not much PGW

1 can do to access federal funds. PGW also argues that it should not be “*required* by the  
2 PUC” to seek such funding or to report annually on its efforts. PGW St. No. 1-R at 3.

3 **Q. Do you agree with PGW’s claims that federal funding opportunities available through**  
4 **the Inflation Reduction Act are too uncertain for PGW to commit to pursuing the**  
5 **funding?**

6 A. No. I agree that there may be uncertainty about exactly when and how the funding may be  
7 made available for PGW to pursue, but I do not agree that failure to have all of that  
8 information today should be a barrier to PGW’s commitment to pursuing the funding when  
9 further information becomes available. As I indicated in my Direct Testimony, the PA  
10 DEP’s Energy Programs Office anticipates that further information about program funding  
11 will become available in mid-2024. OCA St. 1, p. 11. I continue to recommend that PGW  
12 should be required to pursue federal funding, including IRA funding, to increase the cost-  
13 effectiveness and efficiency of its DSM programming.

14 **Q. Do you agree that PGW should not be required to pursue available funding and to**  
15 **report on its efforts?**

16 A. No. Although I agree that PGW’s DSM programming is voluntarily offered, it is funded  
17 by ratepayer dollars; therefore, I believe PGW should be required to pursue funding to  
18 offset ratepayer costs by pursuing available funding that would further DSM programming  
19 goals. It is important to note that PGW’s stated goals for the DSM program are to (1) reduce  
20 customer bills; (2) maximize customer value; and (3) help the Commonwealth and the  
21 City of Philadelphia reduce greenhouse gas emissions and reduce PGW’s overall carbon  
22 footprint. PGW Exh. DA-1 at 4. Since pursuing federal funding, such as IRA funding,  
23 would further all three of PGW’s stated DSM programming goals, PGW should not be

1 opposing a requirement to pursue the funding, but it ought to be welcoming the  
2 opportunity. Additionally, PGW should report annually on the status of its efforts to ensure  
3 that it remains accountable to its customers in maximizing customer value and reducing  
4 customer bills.

5 Again, I note that PGW does not disagree with the substance of my recommendation to  
6 seek federal funding, but objects to being “required by the PUC” to seek federal funding.  
7 If PGW is going to seek federal funding on its own volition, an order requiring that it do  
8 so does not create any additional burden for PGW. If PGW does not seek federal funding,  
9 its ratepayers would be paying more for and/or receiving less benefit from PGW’s DSM  
10 programs, which is unacceptable. Requiring PGW to seek federal funding has no downside  
11 risk to ratepayers and no additional burden on PGW if PGW is planning to seek federal  
12 funding in the absence of the PUC requirement. On the other hand, without the PUC  
13 requirement, the ratepayers face a downside risk in that PGW may opt not to pursue federal  
14 funding.

15 **C. Recommendation 3-Outreach for Customer Rebates**

16 **Q. How did PGW respond to your recommendation that it should perform outreach to**  
17 **educate its customers about rebate opportunities that they may be eligible to directly**  
18 **pursue?**

19 A. PGW witness Adamucci’s response was similar to her position on seeking federal funding:  
20 that PGW would not “necessarily oppose” sharing relevant rebate opportunities to help  
21 their customers become more energy efficient, but that PGW should not be required to do  
22 so. PGW St. No. 1-R, p. 3. Witness Adamucci further claims that PGW should not be  
23 required to share rebate opportunities on its bill that would promote electrification or fuel

1 switching, such as those related to HEEHRA. Witness Adamucci further opines that PGW  
2 should not be required to promote the rebate opportunities on its bills because they are not  
3 related to regulated services. PGW St. No. 1-R, pp. 3-4.

4 **Q. What is your response to witness Adamucci?**

5 A. My response is that witness Adamucci's testimony is tentative and guarded. She states that  
6 PGW does not necessarily oppose sharing rebate opportunities that would help PGW  
7 enhance the energy efficiency of its customers. However, PGW does not want to be  
8 required to implement my recommendation. Therefore, it is unclear whether and how PGW  
9 is proposing to adopt the recommendation at this time. Similar to my recommendation that  
10 PGW pursue federal funding opportunities to further DSM goals, promoting the rebate  
11 opportunities to PGW customers is also entirely consistent with PGW's stated DSM goals  
12 of (1) reducing customer bills; (2) maximizing customer value; and (3) helping the  
13 Commonwealth and the City of Philadelphia reduce greenhouse gas emissions and reduce  
14 PGW's overall carbon footprint. PGW Exh. DA-1 at 4. In my opinion, PGW's readily  
15 available access to cost-efficiently advise customers of direct rebate opportunities on  
16 customers' bills and through its website provide it with an easy way to move towards its  
17 stated DSM goals. My recommendation is also consistent with helping PGW customers  
18 decrease natural gas usage, an aim that PGW also purports to support. As PGW's  
19 opposition is misaligned with its claimed DSM programming goals, my recommendation  
20 is unchanged.

21 As with seeking federal funding, it appears that PGW does not disagree with the substance  
22 of my recommendation that PGW share relevant rebate opportunities customers can pursue  
23 on their own to help them to improve their energy efficiency, but objects to being required

1 to do so by the PUC. If PGW on its own volition is going to educate its customers about  
2 rebates available from sources other than PGW, an order requiring that it do so does not  
3 create any additional burden for PGW. If PGW does not educate its customers regarding  
4 rebate opportunities, its customers are likely to miss out on chances to save money and  
5 PGW misses out on the resulting gas savings that would support the goals of PGW's DSM  
6 programs. Requiring PGW to educate its customers about rebate opportunities has no  
7 downside risk to ratepayers and would complement and leverage PGW's DSM portfolio.  
8 On the other hand, without the PUC requirement the ratepayers face a downside risk in that  
9 PGW may opt to not share information about rebate opportunities, and PGW misses the  
10 opportunity to leverage and complement its DSM portfolio at no additional ratepayer cost.

11 **D. Recommendation 4-Three-Year DSM Plan Term**

12 **Q. How did PGW respond to your recommendation that the Revised DSM IV Plan**  
13 **should be limited to the three-year term as originally proposed in its June 16, 2023**  
14 **filing?**

15 A. PGW witness Adamucci reasserted her prior position that it will be more cost effective for  
16 the DSM IV plan to be in place for the five-year period of FY25-FY29, as proposed. I note  
17 that witness Adamucci added that the five-year term would provide greater consistency for  
18 customers and that it would also be more efficient for the PUC since the plan “will not need  
19 to be relitigated unnecessarily.” PGW St. No. 1-R, p. 4. Finally, Ms. Adamucci indicates  
20 that regardless of what plan term is approved in this case, that the term should start with  
21 FY25 since PGW's FY24 started on September 1, 2023 and it may end by the time a final  
22 PUC order is issued in this case. PGW St. No. 1-R, pp. 4-5.

1 **Q. What is your response to witness Adamucci's claims regarding the five-year term?**

2 A. I continue to disagree that a five-year term is appropriate. The PUC should not elevate the  
3 administrative expedience of PGW above ensuring that PGW's DSM programming is cost-  
4 effective. As I explained in my Direct Testimony, in the past, PGW filed its plan on a 3-  
5 year schedule and it worked well because programming could be updated and adjusted as  
6 necessary. I also explained that adaptability is especially important now as significant  
7 changes are occurring, including changes in costs of natural gas and energy efficiency  
8 measures, new technologies, changes in law or policy and more that may develop over the  
9 life of the DSM IV term. OCA St. 1, p. 12. PGW did not make any arguments that refute  
10 my position, and I continue to recommend that PGW's Revised DSM IV Plan should be  
11 confined to the same three-year term as proposed in PGW's June 16, 2023 filing.

12 **Q. Do you agree that any DSM IV Plan term should start with FY25 as witness Adamucci**  
13 **proposes?**

14 A. No, the DSM IV Plan term should start with FY24. Witness Adamucci's position that the  
15 DSM IV term should not begin until FY25 is inconsistent with PGW's initial filing in this  
16 case, and it extends the programming term unnecessarily because it ignores that PGW has  
17 consistently sought and received permission to extend DSM programming while any new  
18 phase of the programming was pending. In this case, too, PGW asked for and received an  
19 extension to continue its DSM III programming until a final order is entered for its DSM  
20 IV. While it may not be administratively expedient for PGW, confining the DSM IV term  
21 to the originally proposed term of FY24 through FY26 provides another important

1 check point that parties and the Commission can rely upon in gauging the cost-  
2 effectiveness and efficiency of the DSM programming in relation to conditions that exist  
3 in 2026 that may not be foreseeable today.

4 **E. Recommendation 5-Annual Reporting/Stakeholder Input Opportunities**

5 **Q. How did PGW respond to your recommendation that it be required to report**  
6 **annually on the performance of the DSM programs and provide the opportunity for**  
7 **stakeholder input?**

8 A. PGW indicated that it is supportive in terms of continuing its current practice of issuing an  
9 annual report and holding a stakeholder meeting prior to submitting a new DSM plan.  
10 However, PGW claims that it should not be required to hold additional stakeholder  
11 meetings, particularly because it did not receive “substantive comments” from the parties  
12 in previous meetings. PGW St. No. 1-R, p. 5.

13 **Q. Do you agree that PGW should be permitted to limit stakeholder input opportunities**  
14 **as proposed?**

15 A. No. I continue to recommend that PGW provide an opportunity for stakeholder input as  
16 part of its annual reporting process. PGW’s dismissal of my recommendation, which  
17 appears to assume that the meeting is only necessary if stakeholders provide what PGW  
18 deems to be “substantive” comments and that no stakeholder will have those, is  
19 unreasonable. In my view, having an annual meeting alongside the reporting could help  
20 PGW find ways to adapt programming when necessary, and it could help PGW further its  
21 goal of avoiding litigation by giving stakeholders an opportunity to identify and trouble-  
22 shoot issues as they are emerging. Therefore, my recommendation stands.



1 **F. Recommendation 6-Monitoring the DSM IV for Changes**

2 **Q. How did PGW respond to your recommendation that it be required to monitor**  
3 **changes in economics, technologies, law or regulatory policy and other circumstances**  
4 **that may require changes in the DSM IV budget and programming?**

5 A. PGW indicates that it will monitor whether any changes to the plan are necessary and it  
6 will make any such proposals when necessary. PGW St. No. 1-R at 4.

7 **Q. Is PGW's monitoring commitment sufficient to satisfy your recommendation?**

8 A. No. While PGW's monitoring commitment is a positive step, it is only a unilateral one  
9 unless PGW couples it with an opportunity for stakeholder input. The value of stakeholder  
10 input is that it would avail PGW of additional information and perspectives beyond those  
11 which exist only within PGW. If PGW were to couple its monitoring commitment with an  
12 opportunity for stakeholder input, then its commitment would satisfy my recommendation.

13 **G. Recommendation 7-Modification of the DSM IV**

14 **Q. How did PGW respond to your recommendation that it be required to propose**  
15 **modifications to the DSM IV budget and programming when changes warrant them**  
16 **prior to the next regular plan filing?**

17 A. As I explained above, PGW plans to propose modifications to programming when it  
18 determines they are necessary, and without any opportunity for stakeholder input. PGW St.  
19 No. 1-R, p. 4.

20 **Q. Do you agree with PGW's plan for making modifications to DSM programming?**

21 A. No. Consistent with my position that limiting monitoring of changes in economics,  
22 technologies, law or regulatory policy and other circumstances that may require changes  
23 in the DSM IV budget and programming to PGW alone will be insufficient to ensure that

1 programming will be cost-effective and efficient during the DSM term, the same is true  
2 with respect to proposing modifications. PGW should be required to provide an opportunity  
3 for stakeholder input as part of any modification proposal if it truly wishes to avoid  
4 unnecessary litigation and to consider information and ideas that may not be available  
5 within PGW.

6 **Q. Please summarize your recommendations for this case.**

7 A. As PGW's rebuttal testimony has not provided any information that causes me to alter any  
8 of my recommendations for this case, my position continues to be that the Commission  
9 should condition any approval of PGW's Revised DSM IV Plan upon the following terms:

- 10 1. PGW should resubmit the budget information to provide more detailed breakouts,  
11 including specifying incentive, administration, marketing, inspection, and  
12 evaluation costs.
- 13 2. PGW should attempt to obtain federal funds to leverage and improve the  
14 effectiveness of its DSM programs. PGW should report annually on its efforts and  
15 success in obtaining any funding.
  - 16 a. In conjunction with its attempts to obtain federal funds, PGW should  
17 perform outreach to customers to educate them about rebate opportunities  
18 they may be eligible to pursue on their own, such as rebates available  
19 through the High-Efficiency Electric Home Rebate Act.
- 20 3. The Commission should not approve the five-year term now proposed for the  
21 Revised DSM IV Plan. Instead, the Commission should confine PGW's DSM IV  
22 Plan to the three-year term as it originally proposed in its June 16, 2023 filing.  
23 Approval of the three-year DSM-IV Plan should then be subject to the conditions  
24 that:
  - 25 a. PGW report annually on the performance of the DSM programs and  
26 provide the opportunity for stakeholder input.
  - 27 b. PGW monitor changes in economics, technologies, law or regulatory  
28 policy and other circumstances that may require changes in the DSM IV  
29 budget and programming.
  - 30 c. PGW propose modifications to the DSM IV budget and programming  
31 when changes warrant them prior to the next regular plan filing.

1 Q. Does that conclude your Surrebuttal Testimony?

2 A. Yes.

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PHILADELPHIA GAS WORKS :  
FOR APPROVAL OF DEMAND SIDE :  
MANAGEMENT PLAN FOR FY 2024 - 2026 :  
:  
PHILADELPHIA GAS WORKS UNIVERSAL : Docket No. P-2014-2459362  
SERVICE AND ENERGY CONSERVATION :  
PLAN FOR 2014-2016, 52 PA. CODE § 62.4- :  
REQUEST FOR WAIVERS :

**VERIFICATION**

I, Geoffrey C. Crandall, hereby state that the facts above set forth in my Surrebuttal Testimony, OCA Statement 1SR, are true and correct and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Signature:

  
\_\_\_\_\_  
GEOFFREY C. CRANDALL

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DATED: January 11, 2024