



**INTRODUCTION AND BACKGROUND**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

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

A. My name is Geoffrey C. Crandall. My business address is MSB Energy Associates, Inc., 1800 Parmenter Street Suite 204, Middleton, Wisconsin 53562.

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

A. I am testifying on behalf of the Environmental Law and Policy Center.

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

A. I am a principal and the Vice President of MSB Energy Associates, Inc. I have over 36 years of experience in utility regulatory issues, including energy efficiency, conservation and load management resources program design and implementation, resource planning, restructuring, mergers, fuel, purchase power and gas cost recovery and planning analysis, and related issues. I have provided expert testimony before more than a dozen public utility regulatory bodies throughout the United States. I have provided expert testimony before the United States Congress on several occasions.

My experience includes over 15 years of service on the Staff of the Michigan Public Service Commission (MPSC). In my tenure at the MPSC, I served as an analyst in the Electric Division (Rates and Tariff section) involving rate as well as fuel and purchase power cases. I also served as the Technical Assistant to the Chief of Staff and Supervisor of the Energy Conservation Section involving residential and commercial energy efficiency programs. I also served as the Division Director of the Industrial, Commercial and Institutional Division. In that capacity, I was Director of the Division that had responsibility for the energy efficiency and conservation program design,

1 funding, and implementation of Michigan utility and DOE-funded programs and  
2 initiatives involving Industrial, Commercial and Institutional gas and electric customers  
3 throughout Michigan.

4 In 1990, I became employed by MSB Energy Associates, Inc. and have served  
5 clients throughout the United States on numerous projects related to energy efficiency  
6 and load management program development, system planning, fuel, purchase power and  
7 gas cost recovery assessments, electric restructuring, customer impact analyses, and other  
8 issues. My curriculum vitae is attached as ELPC Exhibit 1.1.

9  
10 **Q. What is the purpose of your testimony?**

11 A. The purpose of my testimony is to address the reasonableness of the proposed  
12 Commonwealth Edison application seeking approval of its proposed 2011-2013 Energy  
13 Efficiency and Demand response Plan (“Plan”). The existing plan was approved by the  
14 Commission in docket 07-0540.

15  
16 **Q. What conclusions have you reached regarding ComEd’s proposed plan?**

17 A. I believe that ComEd has made a good faith effort and has proposed a fairly reasonable  
18 plan overall. However, there is considerable room for improvement. My major concern  
19 is that ComEd’s proposed plan strategy fails to accomplish the statutorily mandated  
20 energy savings Megawatt-Hours (“MWH”) targets for the three year period. This is the  
21 plan’s fatal flaw and the Commission should order the company to address this serious  
22 shortcoming. Also, I have some concerns regarding individual elements of the plan: the  
23 plan proposes a program entitled “Home Energy Reports” which uses a new behavioral

1 modification and customer education approach. Steps need to be taken to enhance  
2 longevity and durability of savings related to this program; The SAG process needs to be  
3 improved as I describe further in this testimony and SAG should be assigned review and  
4 assessment responsibilities in the development of program factors such as net-to-gross  
5 ratios, reasonableness of assumptions used in analyzing energy efficiency and demand  
6 response measures and financing option to overcome barriers to greater customer  
7 participation in the EE&DR programs; A statewide technical resource manual should be  
8 developed in Illinois; The avoided costs relied upon by ComEd in developing its plan  
9 inadvertently omitted avoided transmission values. ComEd's plan (including DCEO's  
10 analysis) should be corrected to reflect the avoided transmission values.

11  
12 **ComEd's Proposed Plan fails to meet Mandatory PY5 & PY6 MWH targets**

13 **Q. Do you have concerns regarding the proposed EE&DR Plan meeting statutory**  
14 **MWH targets?**

15 A. Yes. The estimated MWH savings impacts resulting from implementation of the  
16 proposed plan for 2011-2013 will not meet the statutory goals of 0.8% in 2011, 1% in  
17 2012 and 1.4% in 2013. ComEd indicated in its plan (Table 2, page 6) that the plan  
18 statutory MWH goals are 727,985 in PY4, 920,987 in PY5 and 1,294,739 in PY6.  
19 However, on Table 3 - Goal Calculation ComEd indicates that is projected MWH total  
20 savings would be 809,513 in PY4, 960,850 in PY5 and 869,892 in PY6. These values  
21 reflect an assumption that prior year banked savings can be applied to PY5. Assuming  
22 that the values are reasonably accurate, ComEd would satisfy its mandatory statutory

1 MWH targets for PY4 and PY5. However, it would fail to meet its PY6 Statutory MWH  
2 Goal by over 566,000 MWH's when compared to its proposed MWH Goal.

3  
4 **Q. Do you agree with ComEd's request that it be allowed to lower its statutory MWH**  
5 **energy efficiency savings targets of 727,985 MWH/year as proposed in the filing (See**  
6 **Table 2, page 6)?**

7 A. No I do not. I do not believe the Commission should approve the ComEd plan as filed.  
8 ComEd has been a very cooperative member of the IL-SAG collaborative and has sought  
9 input from interested parties and has incorporated input into development of the plan.  
10 However, the proposed plan has serious deficiencies. ComEd has proposed a plan that, if  
11 authorized by the Commission, would fall short of the mandatory MWH energy  
12 efficiency goals required by statute.

13  
14 **Q. Has ComEd done all it can to accomplish the statutory MWH savings goals for**  
15 **2011, 2012 and 2013 within its projected budget?**

16 A. No. I do not believe it has. While I am generally satisfied with most aspects of the  
17 proposed plan, I note that ComEd relies very heavily on prescriptive and custom rebates  
18 to deliver the majority of energy efficiency savings for its proposed programs. It is true  
19 that rebates are a proven method as they are flexible and can be applied at the point of  
20 sale as well as midstream in the delivery chain to distributors. ComEd is also counting  
21 on considerable savings from its proposed Home Energy Reports program. This is a  
22 customer education program which creates an incentive for residential customers to save

1 energy by comparing customers energy use to others having similar properties in their  
2 community.

3  
4 **Q. Do you believe that other options and approaches exist but have not been included  
5 in the ComEd plan?**

6 A. Yes. While the proposed programs are promising and attractive, other incentive options  
7 and approaches exist for customer adoption of energy efficiency and demand response  
8 options which were not included in the proposed plan.

9  
10 **Q. Could you please describe other financial incentives that are being used by other  
11 utilities throughout the United States that were not included in ComEd's proposed  
12 plan?**

13 A. Yes. Utility sponsored loan program. Utility loans have been offered for decades and  
14 typically include many measures such as ceiling and sidewall insulation, windows,  
15 weather stripping, heating and air conditioning systems. However, ComEd's plan does  
16 not include an off – bill or on-bill financing program in the proposed plan. This seems  
17 odd since in February 2010 Witness Melloch proposed an on-bill program in conjunction  
18 with ICC Docket 10-0091. Witness Melloch provides program details and specificity for  
19 a proposed on-bill financing program in conjunction with that proceeding. However, on-  
20 bill financing element is not reflected by ComEd as an important component of its  
21 proposed EE&DR plan and implementation strategy.

22

1 **Q. What other customer financial incentives are not included in the ComEd EE&DR**  
2 **plan?**

3 A. ComEd has not included performance contracting in its proposed plan. However, DCEO  
4 has included performance contracting in its approaches to promoting customer adoption  
5 of energy efficiency and demand response measures. Performance contracting  
6 arrangements typically require a third party to provide the capital to retrofit a building  
7 and provide more efficient energy efficiency and demand response measures. The  
8 payment is typically structured to be less than the amount of savings that is realized by  
9 the customer from the reduction of their energy costs. So a positive cash flow is usually  
10 realized by the participating customer. ComEd has not included performance contracting  
11 in its implementation strategy as DCEO has. I believe that ComEd should pursue this  
12 approach.

13  
14 **Q. Do you have additional examples of customer financial incentives for energy**  
15 **efficiency measures that have not been included in the ComEd EE&DR plan?**

16 A. Yes. ComEd has not included leasing of energy efficiency or demand response measures  
17 in its proposed implementation strategy. Utilities and others have offered leases on LED  
18 street lighting, water heaters, high efficiency lighting and other energy efficiency  
19 equipment. For example, in North Carolina utilities offer leases on streetlighting as well  
20 as area lighting. In Santa Clara, California, the utility there offers leases on solar pool  
21 heating, solar thermal process heat and solar water heating.

22

1 **Q. Are there yet additional energy efficiency customer financial incentives that have**  
2 **not been included in the ComEd EE&DR plan?**

3 A. Yes. ComEd has not included a Tarriffed Installation Program approach (TIP). This  
4 approach has been used by other utilities. For example, since 2007 a utility in Kansas has  
5 a program that involves an initial on-premise audit and after the customer selects a  
6 contractor, the installation of a broad array of measures. These measures are eligible to  
7 be installed in residential, multi-family and rental units. The tariff is designed to be less  
8 than the savings that will result from the use and installation of energy efficiency  
9 measures. Therefore, the customer realizes a positive cash flow from the beginning of  
10 the arrangement. The program operates through the tariff and is tied to the meter.

11

12 **Q. Has ComEd proposed the capitalization or amortization of energy efficiency related**  
13 **incentives or program costs rather than expensing it to the year incurred?**

14 A. No it has not.

15

16 **Q. Does ComEd capitalize demand response or energy efficiency related equipment**  
17 **currently?**

18 A. Yes. The demand response air conditioning program involves switches to control the  
19 operation of air conditioners. This equipment was capitalized as is described in the  
20 EE&DR plan.

21

22 **Q. Has amortization or capitalization treatment of energy efficiency resources been**  
23 **authorized by utility regulators?**

1 A. Yes. In addition to the Illinois example mentioned above, both Michigan and Wisconsin  
2 have authorized various methods to spread out and match the recovery of energy  
3 efficiency and demand response measures with the life of energy resources. While I am  
4 not proposing the use of amortization or capitalization treatment of a portion of ComEd's  
5 EE&DR related costs at this time, the feasibility and appropriateness of amortization or  
6 capitalization of EE&DR related costs should be reviewed and explored as soon as  
7 possible.

8  
9 **Q. What are you recommending that the Commission do with respect to the disparity**  
10 **between the statutory MWH targets and the level of savings proposed in this**  
11 **proposed plan?**

12 A. I suggest that the Commission direct the SAG and the company to conduct an in-depth  
13 assessment and investigation into the feasibility of using on-bill financing, off-bill loans,  
14 revolving loans, performance contracting, tariffed installation programs, leasing and  
15 other alternatives to allow ComEd to secure additional energy efficiency and demand  
16 response resources within its currently proposed budget.

17  
18 **Stakeholder Advisory Group**

19 **Q. Has the Illinois Stakeholder Advisory Group explored alternative financing options**  
20 **and solutions to address the disparity between the MWH savings target and the**  
21 **available budget?**

22 A. Not to any significant extent. A few presentations have been made to the SAG including  
23 the Property Assessed Clean Energy (PACE) program and other approaches to delivering

1 energy efficiency resources. However, SAG has concentrated quite heavily on start-up  
2 issues such as monitoring the implementation of the various energy efficiency programs,  
3 providing feedback and input related to the evaluation, measurement and valuation issues  
4 (e.g., NTG issues), building broad consumer awareness, and providing feedback for the  
5 development of PY4, PY5 and PY6 energy efficiency and demand response programs.  
6 SAG has not focused on consideration of capitalizing vs. expensing program costs and  
7 incentives, performance contracting, on-bill financing, creative financing, etc. SAG  
8 should make this a high priority for PY4, PY5 and PY6. The SAG facilitator should  
9 invite energy efficiency and utility financing experts in to explore solutions in Illinois to  
10 help get the maximum MWH's saved for the program dollars spent.

11  
12 **Q. Do you have other suggestions on how the SAG process could be improved?**

13 A. SAG participants have had difficulties getting materials to review prior to the meetings.  
14 The Commission should establish a guideline and policy that pre-meeting materials must  
15 be distributed at least three days prior to SAG meetings.

16  
17 **Q. Do you believe there are other improvements that can be made to programs by  
18 using the SAG process more effectively?**

19 A. Yes. I recommend that the Commission direct ComEd, Ameren, DCEO and SAG  
20 participants to develop a statewide technical resource manual (TRM). The TRM would  
21 include a wide array of information on the details of energy efficiency and demand  
22 response measures and programs. This typically includes: cost of measures, cost of  
23 installation, savings estimates in terms of estimated kWh, KW or therms. In addition the

1 TRM would include measure useful life estimates, estimated realization rates, net to gross  
2 or “demand” savings estimates for planning purposes and similar information. There has  
3 been a lack of continuity regarding input assumptions, savings estimates and NTG factors  
4 for the EE&DR programs implemented throughout Illinois. A statewide TRM similar to  
5 that being used in Pennsylvania is needed in Illinois. I recommend that the Commission  
6 direct the SAG to provide assistance and be the appropriate forum for the initial review of  
7 proposed NTG ratios, input assumptions and operational characteristics information for  
8 EE&DR measures and programs. The SAG should be directed to assemble  
9 representatives who have expertise and program knowledge to review the reasonableness  
10 of proposed program and measure input assumptions and NTG ratios. Once reviewed  
11 and recommendations are formulated the SAG should file a report with the Commission.  
12 The development of a statewide TRM should be handled primarily by SAG and should be  
13 funded by the utilities that have EE&DR program responsibilities. The EE&DR program  
14 developers and evaluation contractors would then use the TRM values in conducting  
15 program modifications as well as evaluation studies throughout the state.

### **Home Energy Reports**

18 **Q. What is your impression of ComEd’s residential Home Energy Reports program?**

19 A. It is an interesting program that has great potential. But it is also relatively new and  
20 unproven.

21  
22 **Q. Why do you say it has great potential?**

1 A. The HER program utilizes normative feedback, providing customers with information  
2 about their energy consumption relative to their peers. This approach has the potential of  
3 being more motivating than simply providing information, tapping into people's  
4 competitive instincts.

5 The HER program also provides customers with tips for energy efficiency improvements.  
6 More importantly, the tips are customized to the homeowner based on their  
7 demographics, and indicate the savings estimates for both energy and money associated  
8 with each tip. The HER approach operates on the theory that by receiving a few relevant  
9 suggestions, customers are more likely to take action than when flooded by a list of  
10 generic suggestions.

11 The HER program is based on building public awareness and modifying participant  
12 energy consumption behaviors. If it is successful in doing so, it can identify and  
13 influence wasteful behaviors, such as failing to set the thermostat up (cooling) or down  
14 (heating) when the house is unoccupied. Public information and education programs,  
15 based on the premise that customers will take action when presented with the facts, have  
16 been an element of energy efficiency programs for decades. My main concern about the  
17 HER program is related to the persistence of savings.

18

19 **Q. To what extent is ComEd relying on the HER program to meet the energy targets in**  
20 **its plan?**

21 A. Com Ed is heavily dependent on the HER program. Over the three years of the plan,  
22 PY4-PY6, ComEd is counting on the HER program to deliver 10.8% of its total energy  
23 efficiency savings (26.8% of its residential energy savings).

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

**Q. How much does ComEd plan to spend on the HER program?**

A. Com Ed intends to spend 2.9% of its total energy efficiency budget (8.4% of its residential energy efficiency budget).

**Q. Are you convinced that ComEd’s HER program will work as ComEd projects?**

A. No. Because the HER program in ComEd and similar programs in other utilities are relatively new and unproven, I am not confident that ComEd will achieve the levels of impact it has projected. As significantly, I am not convinced that the savings achieved while the reports are being sent to customers will persist after the reports are terminated, or after their novelty wears off. I think this is analogous to going on a diet – initially you lose weight, but it is often very difficult to keep it off.

**Q. What has been the performance history of these behavior modification programs?**

A. The behavior modification programs, such as the HER program, were initiated in the mid-2000s. ComEd’s contractor, OPOWER, was founded in 2007 under the name Positive Energy. Positive Energy launched its first major utility program in April 2008 at the Sacramento Municipal Utility District. As of February 2010, OPOWER had contracts with 23 utilities to prepare home energy reports. An independent evaluation (“Social Norms and Energy Conservation”, Hunt Allcott, February 25, 2010) of a large scale OPOWER pilot in Minnesota estimates a reduction of energy consumption of 2.3%-2.4%, which is consistent with ComEd’s estimate of around 2% based on the first six months of ComEd’s HER pilot.

1 While this suggests that ComEd's HER program has potential, it should not be  
2 overlooked that most of the OPOWER experience is less than two years in duration.  
3 Thus, the persistence of the savings is not assured, despite the favorable initial results.

4  
5 **Q. What would affect the persistence of the savings of the HER program?**

6 A. Generally speaking, energy efficiency programs that involve hardware improvements  
7 produce more consistent savings over time. More efficient end use devices use less  
8 energy to provide the same level of service so the energy savings is locked in when the  
9 hardware is upgraded. Energy efficient behavior changes that become habit are more  
10 likely to persist.

11  
12 **Q. What is your impression of the persistence of savings under ComEd's HER  
13 program?**

14 A. I am concerned that the savings will not persist. At this point, it is not clear what actions  
15 customers will take to reduce their energy consumption in response to the HER program.  
16 If they respond by making behavioral changes, those changes may be reversed when the  
17 reports come less frequently or end. They may also be reversed if customers feel their  
18 amenity loss is too great to sustain. On the other hand, if the customer action involves  
19 installing energy efficient hardware, those savings will persist even if the customers cease  
20 to receive the reports.

21 At this point, I am not aware of any information that would predict how much of the  
22 savings came from behavioral changes and how much from improved hardware.

23

1 **Q. What should ComEd do to address concerns about the persistence of savings of the**  
2 **HER program?**

3 A. First, Com Ed should strongly link the HER program to measures and hardware  
4 improvements. Obviously this should include link to ComEd’s rebate and other hardware  
5 oriented programs. To its credit, ComEd’s website for its current HER pilot program  
6 include a variety of hardware-based tips, ranging from weatherstripping to upgrading air  
7 conditioners to buying Energy Star appliances to improved insulation. The links between  
8 these tips and other ComEd programs and other sources of assistance to install energy  
9 efficient hardware is not as clear. It should be clarified to make it easier for customers to  
10 implement hardware solutions.

11 Second, ComEd should sustain the reports sufficiently to ingrain energy efficient  
12 behaviors. It is not clear how long ComEd intends to continue the reports, or with what  
13 frequency. The more that customers receive the reports, the more it will reinforce the  
14 energy efficient behaviors. If the energy efficient behaviors are reinforced sufficiently to  
15 become energy efficient habits, the savings are more likely to persist. If energy saving  
16 behaviors become ingrained, the HER program would not only be persistent, but would  
17 also combat energy waste (e.g., heating/cooling unoccupied space, leaving lights on) due  
18 to inefficient energy habits.

19 Third, ComEd should collect and monitor data regarding the actions taken by customers  
20 in response the HER program. Specifically ComEd should determine whether customers  
21 have taken actions to improve hardware, to modify behaviors, or to change habits. Based  
22 on this data, ComEd should modify its HER programs to implement more sustainable  
23 actions.

**Avoided Cost**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

**Q. Did ComEd understate its avoided costs?**

A. Yes. In response to ELPC data request 1.13 (see attached ELPC Exhibit 1.2), ComEd discovered that the transmission loss factor had not been incorporated into its analysis. The average transmission loss factor for ComEd is 1.6%. This should be reflected in ComEd's analysis. This adjustment could be made by either increasing the avoided cost by 1.6% or alternatively increasing the energy saved by 1.6%. Thus the current measure and program cost screenings understate the cost effectiveness by 1.6%.

**Q. Does ComEd's understatement of avoided costs significantly affect its energy efficiency plan?**

A. No, not at this time. For this plan, there are abundant cost-effective energy efficiency measures and programs to meet the target energy efficiency levels. The limiting factor to energy efficiency in this plan is the spending cap, not the amount of the energy efficiency resource. In future plans, the energy efficiency resource may be limiting, and small increases in the avoided costs could be significant. ComEd should make sure that the transmission losses are properly reflected in its analyses for future plans.

**Q. Do you have any recommendations or reactions to the DCEO portions of this EE&DR Plan filing?**

A. I conducted a preliminary review based on their plan filing, but did not receive responses to ELPC's discovery questions until after the close of business on November 1, 2010. That has not allowed us a sufficient period of time to analyze and review their EE&DR

1 plan methodology. As a result, I would like the opportunity to submit supplemental  
2 testimony on the DECO portions of the plan.

3

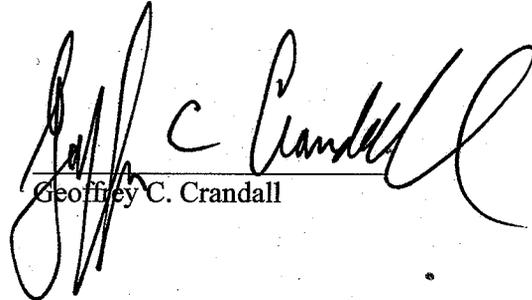
4 **Q. Does this complete your testimony?**

5 A. Yes, at this time.

STATE OF Wisconsin )  
 ) SS.  
COUNTY OF Dane )

**VERIFICATION**

I, Geoffrey C. Crandall, being first duly sworn, state that I have read the foregoing *Direct Testimony of Geoffrey C. Crandall*, and that the facts stated therein are true and correct to the best of my knowledge and belief.

  
Geoffrey C. Crandall

Subscribed and sworn to before  
me this 3rd day of November, 2010.

  
Notary Public  
exp. 12-11-11



**CERTIFICATE OF SERVICE**

I, Robert Kelter, hereby certify that I served on November 3rd, 2010 the attached DIRECT TESTIMONY OF GEOFFREY C. CRANDALL upon all active parties of record identified on the included service list electronically via e-mail. Paper copies will be provided upon request.



---

Robert Kelter  
Environmental Law & Policy Center  
35 E. Wacker Dr. Suite 1600  
Chicago, IL 60601  
(312) 795-3734  
Fax: (312) 795-3730  
Email: rkelter@elpc.org