TESTIMONY OF MADELINE FLEISHER
IN OPPOSITION TO HOUSE BILL 114
ENVIRONMENTAL LAW AND POLICY CENTER
OHIO HOUSE PUBLIC UTILITIES COMMITTEE
TUESDAY, MARCH 21, 2017

Good afternoon Chairman Seitz, ranking member Ashford and members of the committee. Thank you for the opportunity to testify before you today. As we have stated in previous testimony, while the Environmental Law and Policy Center (ELPC) is an environmental organization, it has a strong consumer background and supports balanced energy policies that benefit both consumers and the environment.

While my testimony today will focus more on energy efficiency, we look at Ohio's energy future in a holistic way. We need baseload power from coal, nuclear and natural gas, and these resources will be around for a long time. However, we cannot and should not ignore one important fact: once you build wind and solar they are no-cost resources. Coal and natural gas plants both rely on fossil fuels that can go up or down in price based on the markets for those fuels; and we know that they have. [1] Even natural gas, as cheap and plentiful as it is, doubled in price in 2014 when we had a cold winter. Prices might have gone even higher if not for the presence of non-fossil resources, especially wind, in the PJM generation market. Thus, even if you don't believe in any of the clean air and other environmental benefits of renewables, they should be part of a balanced portfolio. A 12.5% target for 2025 is more than reasonable, and still means that 87.5% of our electricity will come from coal, natural gas and nuclear.

With respect to energy efficiency, ELPC has been an intervenor in the energy efficiency cases before the Public Utilities Commission (PUCO) and an active participant in the legislative process. We have first-hand knowledge that these programs produce savings for customers and would not support them if they didn't do so. The whole point of energy efficiency is to help customers meet their energy demands, while maintaining their current level of comfort and convenience, but using less electricity. The utility-run programs are designed to give customers discounts and rebates to make investments that save them money on their electric and gas bills. Most importantly, the law requires all utility programs must be cost-effective, which means that they must cost less than the electricity they replace. Just to be clear, utilityu spending on

[1] The shale boom started in about 2011 – in that time, there have been several dramatic rises and falls:

- In under a year, prices fell 53% from $4.96/mcf to $2.34/mcf (Dec 2014 to Sept 2015).
- Price spike of 60% over three months from Sept 2015 to Dec 2015 ($2.34 to $3.75)
- Since 2011, there have been 5 instances of the OH NG prices changing by more than $1 in a single month. (May 2012, Sept 2012, Nov 2012, Jan 2013, Feb 2014).

efficiency means less spending on electricity. When FirstEnergy or any other utility spends $1 on efficiency that is one less dollar it spends on purchasing electrons.

The utilities' own testimony in the PUCO cases and the Commission's orders reflect these significant benefits. AEP's current efficiency plan projects saving customers 1.3% in each of the next three years, beating its goal of 1.0% by a substantial margin. Additionally, AEP projects that the programs will save 2.1 times the total cost of the programs and efficiency measures, with participating customers saving $9 in electricity costs for every dollar they spend (which doesn't even account for associated natural gas savings). These benefits are not limited to a select few; for example, every year hundreds of thousands of Ohioans participate in residential utility programs by purchasing discounted lighting that can save them more than the average cost of the efficiency rider each year for seven years or more. In aggregate, in a given year 57% of AEP's residential customers will participate in at least one of the utility's programs. Moreover, non-participants will also benefit from lower market prices and reduced need for new power plants. Also, as FirstEnergy notes in its Plan, the utility's education and marketing helps all customers make "more informed decisions regarding their energy usage."

Overall, these programs are working. Senator Seitz, although you have cited a Greenlink Group report pointing out the benefits of targeting energy savings of 17% by 2026, we believe that report understates potential savings in Ohio and that the utilities can cost-effectively achieve 22% savings as demonstrated by the attached analysis. There is no reason to deprive customers of these benefits by lowering the bar unnecessarily.

Ultimately, we are only looking for a very reasonable and doable level of efficiency and renewables that will benefit all Ohioans through both cleaner air and lower bills. Therefore, we urge the House to keep consistent requirements for clean energy in Ohio and set the state back on the right path. Thank you for your consideration of these issues.

Memorandum

FROM: Environmental Law and Policy Center
SUBJECT: Ohio's Energy Efficiency Potential
DATE: 4/5/2016

Ohio utilities conduct potential studies that they use for developing their energy efficiency programs. However, these potential studies, for a number of reasons, provide conservative estimates of the minimum amount of achievable energy efficiency. We go further to identify additional opportunities for cost effective energy efficiency that the Ohio utility potential studies do not consider. We estimate that Ohio utilities, by incorporating best practices implemented by many other utility efficiency programs around the country, can achieve 1.5% savings or greater as a percent of sales each year for the next 15-20 years. This achievable savings percentage target rises to 3.5% if Voltage Optimization/Conservation Voltage Reduction (VO/CVR) is included in utilities' energy efficiency portfolios.

Between 2012 and 2014, the four investor-owned utilities in Ohio conducted potential studies to estimate achievable electric energy efficiency over the ensuing 10-20 year time frame. They identified a range of achievable efficiency of 0.7% to 1.2% of sales per year in the base case, to 0.9% to 1.9% per year in the high case. New potential studies will be filed by all four IOUs in 2016, which may show additional energy efficiency potential as a result of a lighting market that looks vastly different today than it did 4 years ago and emerging technologies that are becoming mainstream and cost effective. Additionally, creative procurement strategies, concerted efforts to weatherize homes, deploying conservation voltage reduction, implementing stable, long-term efficiency targets, and other policy mechanisms can help the utilities achieve economies of scale and bring down the costs of efficiency, which will allow more to be achieved more quickly. The following table outlines our conservative estimates of how much each of these categories can contribute to annual savings targets beyond the base-case potential scenario that each utility identified in its 2012-2014 potential reports. **The first row of the table outlines the potential savings identified by each utility in its last potential study. The subsequent rows show our conservative estimates of the additional annual savings that will be achievable over the next 15-20 years.** Below, we provide more detail for these approaches.

Table 1: estimate of additional annual efficiency potential by measure / approach

	AEP	First Energy	Duke	DP&L
Base case (potential study 2012-2014)	1.20%	0.70%	1.10%	0.70%
LED savings	0.41%	0.41%	0.41%	0.41%
Emerging Tech.	0.19%	0.19%	0.19%	0.19%
Smart Thermostats	0.10%	0.27%	0.13%	0.11%
Weatherization	0.01%	0.01%	0.01%	0.01%
Marketing / Customer Outreach	0.15%	0.15%	0.15%	0.15%
Total annual Potential	**2.06%**	**1.73%**	**1.99%**	**1.57%**
Additional savings – CVR/VO	**2.00%**	**2.00%**	**2.00%**	**2.00%**
Total annual Potential with CVR/VO	**4.06%**	**3.73%**	**3.99%**	**3.57%**

LED Lighting

In the utility efficiency potential studies conducted in 2012-2014, CFL lighting was still the primary efficient lighting technology, and LEDs were more of a specialty item with higher costs. Over the last 5 years, LED lighting costs have declined over 85%, and in some applications, LEDs are now cheaper than CFLs. This has important implications for utility efficiency potential: with cheaper LED bulb costs, the utilities can decrease the incentives they pay, which allows their budgets to go further. As the market has transformed and customers have embraced LED lighting, some manufacturers and retailers have abandoned CFLs altogether in favor of LEDs as an efficient option. LEDs are roughly 15% more efficient than CFLs (compared to incandescent bulbs) and last up to 6 times as long. Per our calculations, we estimate that First Energy Ohio, for example, could add 0.41% annual savings to its programs if all of its residential lighting programs incented LEDs rather than CFLs. In the longer term, utilities can continue to achieve similar savings through lighting controls and commercial LED installations.

Beyond just the technology, delivery channels of lighting programs could yield additional savings for the utilities. In Duke Energy Ohio's territory, for instance, residential lighting programs provide efficient bulbs via kits that a customer has to request to be delivered or left behind by an auditor. This is not a best practice. In other states with successful efficiency programs, lighting programs focus on mid-stream and up-stream discounts, which means customers can buy discounted LEDs in their local hardware store, grocery store, or other locations, where the utility incentive has already been applied. This removes the burden of requiring customers to visit an online portal through their website to order bulbs, or requesting a house call from a utility implementer, as Duke requires.

Finally, only two of the four IOUs in Ohio allow municipal customers to opt in to efficient LED technology for their streetlights. There is vast potential in converting outdoor lighting to efficient LED technology, and the utilities should find a way to make this happen through their efficiency programs. As an example, the City of Los Angeles has installed over 167,000 LED streetlights since 2009, saving over 100 GWh and $8.9 million in energy costs each year, equivalent to 0.14% of all electricity consumption in LA County in 2014.[2]

If the utilities embrace LED technology and work to ensure their customers convert to efficient LED lighting, we are confident that they can achieve additional savings beyond what their potential studies identify.

Emerging Technologies

An additional flaw in the utility potential studies stems from the fact that they do not weigh the efficiency potential of technologies that are not yet mainstream in their territory. For example, smart thermostats, which are wifi-enabled devices that adapt to a customer's schedule and habits to generate savings automatically, were not considered in the most recent potential studies, but hold vast savings potential throughout Ohio. Smart thermostats are now being discounted or considered in all four Ohio utility programs, despite their savings not being counted in the potential studies. Utility evaluators have studied the impacts of smart thermostat technologies in

[2] http://bsl.lacity.org/led.html

many states, including Illinois and Indiana, and have found savings of at least 8% of cooling kwh and even more on heating (though in gas-heated homes the therms saved would not impact electric utility savings). In 2015, ComEd and the gas utilities in Northern Illinois announced a program with a goal of installing 1 million smart thermostats across their territory over 5 years. In the first 6 months, over 17,000 rebates have been processed for smart thermostats with many more being installed without rebates. We estimate that with similar installation rates in Ohio, smart thermostats could generate efficiency equivalent to an additional 0.1% to 0.27% of sales for the Ohio utilities per year for the coming 15-20 years.

The utility potential studies consistently underestimate the savings potential from emerging technologies like smart thermostats. Additional efficient technologies that have become more mainstream and cost-effective in recent years that were not considered in the last potential plans include measures such as heat pump clothes driers, multifamily housing retrofits, combined heat and power (CHP) projects, and on-bill financing and repayment mechanisms, all of which are proving cost effective and successful in other Midwestern states' utility efficiency programs.

Inclusion of emerging technologies in utility efficiency programs can contribute to a significant increase in achievable savings per year for utility efficiency potential. For example, Xcel Energy in Colorado, saw a 24% increase in economic potential when emerging technologies were included, going from 7,563 GWh to 9,363 GWh over 11 years (2010-2020). Total annual electric use was 28,552 GWh in 2010, so this translates to a per-year increase in economic potential of 0.57% of sales, from 2.41% to 2.98%. These numbers were supported by an ACEEE study in September 2015, which estimated that emerging technologies would reduce 2030 electricity usage by 22%.[3] While we don't have precise figures for Ohio, we expect similar increases in cost effective potential savings in Ohio from including emerging technologies in utility programs—even a conservative assumption that Ohio would have a third of the emerging technology potential as Colorado, in addition to the smart thermostat potential identified above, adds an additional 0.19% per year.

Voltage Optimization / Conservation Voltage Reduction

One final technology we would like to highlight that could increase the available cost-effective energy efficiency potential in Ohio is voltage optimization (VO), also known as Conservation Voltage Reduction (CVR). VO/CVR involves the utility transmitting power at a lower voltage, and yields roughly 1% savings for each 1% in voltage reduction. In the US, power is often transmitted to the substation at the maximum allowable 126V, and after line losses, homes receive voltage at 122.5V, which is more than a home needs. In fact, much electrical equipment in the US, including air conditioners, refrigerators, lighting, and appliances is designed to operate at 114V. Thus, if a home is receiving power at higher voltage than 114V, energy is wasted. Utilities nationwide are implementing VO/CVR programs that help customers save energy. AEP Ohio has implemented voltage optimization on 17 circuits and as a result reduced customer energy use by 2-3% on those circuits.[4] While we do not have potential figures statewide for Ohio, we see no reason why the statewide VO/CVR potential would be much different. In Illinois, for example, ComEd estimates that implementing VO/CVR could yield 2% persistent annual savings in a cost effective manner. The evidence in Ohio and elsewhere in the Midwest

[3] http://aceee.org/research-report/u1507

[4] http://www.edisonfoundation.net/iei/Documents/InnovationsAcrosstheGrid_LoRes_InstElcInnv.pdf

shows that energy efficiency programs could cost effectively achieve savings targets that are 2% higher each year with inclusion of VO/CVR programs.

Other Factors

Larger-scale, longer-term commitments from Ohio utilities to energy efficiency may help transform the market and lower the costs of programs. Evidence from other states helps support this theory. In Massachusetts, utility efficiency programs have continued to achieve net annual savings above 2% over multiple years. Utilities in that state provided low-income residential retrofits for more than 36,000 homes in 2014, and plan to continue with retrofits of over 31,000 homes per year from 2016 to 2018.[5] In Minnesota, a similar pattern has emerged: comprehensive efficiency programs have shown annual savings of more than 1.7% in 2012, 2013, and 2014. Neither Massachusetts nor Minnesota's savings figures include savings from voltage optimization, and only Massachusetts includes combined heat and power.

If we assume the utilities in Ohio undertake a concerted weatherization effort to improve the housing stock of 5,000 more residences in each of their territories per year with insulation and air sealing, it would save an additional 28.4GWh per year, or 0.022% of sales.[6]

We know that with stable, ongoing efforts for good, cost-effective energy efficiency programs in their territories, utility customer participation rates will climb in Ohio. In the 2014 potential study, for example, First Energy modeled participation rates that were lower than other utilities in the state. Further, the suspension of efficiency programs in First Energy territory in 2015-2016 that resulted from SB-310 meant that marketing, word-of-mouth promotion, and contractor advertising that tends to increase awareness of efficiency programs disappeared. The start-stop nature of Ohio efficiency programs over the last several years has harmed private investment and participation in energy efficiency statewide. With stable, concerted marketing efforts, including through contractors and retailers, coupled with the spillover effects and increased word-of-mouth advertising we believe that Ohio utilities will see a marked increase in the achievable efficiency potential. Other studies claim this can approach 0.6% per year in some places – but as a conservative estimate, we assume stable programs and increased customer awareness will lift efficiency potential by 0.15% per year.

Conclusions

ELPC has taken energy efficiency potential studies that we believe provide a reasonable starting data point in estimating the available cost-effective savings in a utility's territory, and added to them to account for changes in technology and the market. Even with such adjustments, history shows these studies consistently underestimate savings by nature of being a single snapshot of the cost effective technology available at the time they are completed. The marketplace of efficient technology is constantly evolving, and new technologies emerge almost continually that can help utilities achieve cost effective savings. Additionally, using innovative delivery mechanisms, such as reverse auctions or allowing 3rd parties to bid in efficiency programs can lead to more competition for efficiency and lower prices. Finally, better marketing and outreach,

[5] http://web1.env.state.ma.us/DPU/FileRoomAPI/api/Attachments/Get/?path=15-161%2fExhibit1AppendixC20162018PlanD.pdf

[6] Assumes 13% of homes are electric heated and assumes savings of 4900 kWh per year for an electric heated home, 900 kWh per year for a gas heated home.

stable programs, and mechanisms such as on-bill financing can increase participation beyond what utility potential studies predict. We are confident that the Ohio investor owned utilities can achieve cost-effective energy efficiency savings of at least 1.5% of sales per year over the coming 15-20 years, and 3.5% if CVR/VO is included in the utilities' portfolios. It will take innovation, embracing emerging technologies, and a concerted effort to follow industry best practices, but there is precedent in other states that gives us confidence that Ohio will be able to achieve higher annual efficiency targets each year for the coming decades.