

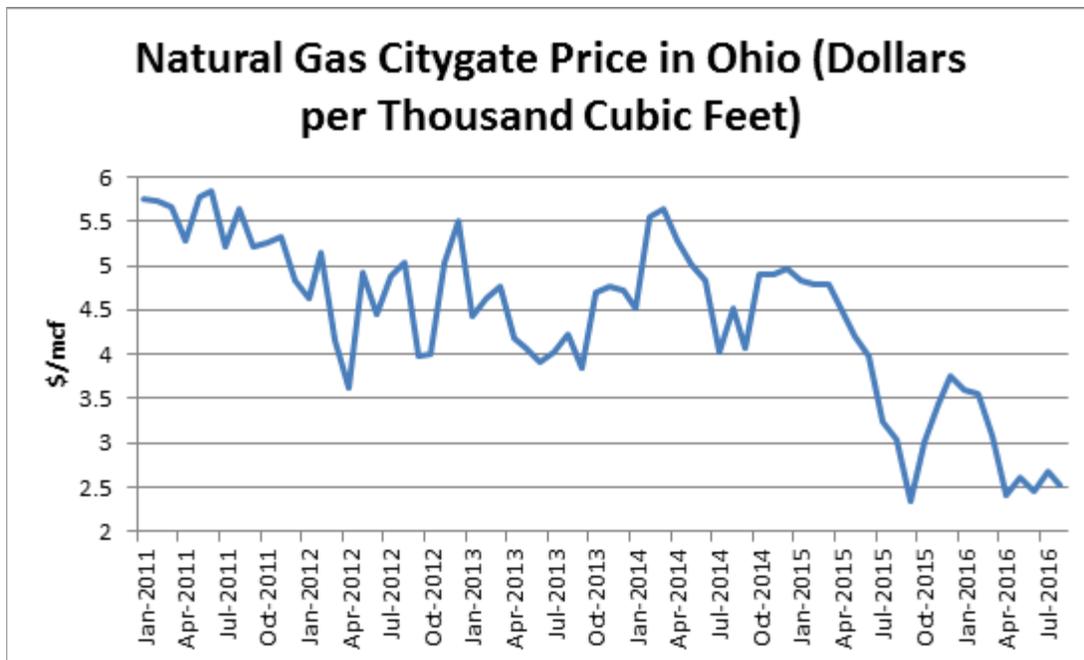
**TESTIMONY OF ROBERT KELTER
ENVIRONMENTAL LAW AND POLICY CENTER
OHIO SENATE ENERGY AND NATURAL RESOURCES COMMITTEE
TUESDAY, NOVEMBER 22, 2016**

Good morning Chairman Balderson, ranking member Gentile and members of the committee. Thank you for the opportunity to testify before you today. As I have stated in previous testimony, while 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. Before coming to ELPC, I was the Director of Litigation at the Citizens Utility Board in Illinois where I focused on electric rate cases and consumer fraud issues. ELPC has been an intervenor in the energy efficiency cases before the Public Utilities Commission (PUCO), and an active participant in the collaborative meetings with the utilities where we track the results of the programs and work to improve them. We have first-hand knowledge that these programs produce savings for customers and would not support them if they didn't do so. More importantly, the utilities' own testimony in the PUCO cases and the Commission's orders reflect this.

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. Hence, 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.

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).



Ohio Natural Gas Prices, U.S. Energy Information Administration, (Oct. 31, 2016), http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SOH_m.htm.

One more point, under the SB 221 standards in 2027 if we have 12.5% renewables this still leaves us with 87.5% of our energy coming from fossil fuel and nuclear. If you focus on the 87% number, that really puts this in perspective. The standards are not in fact draconian. They represent a prudent hedge.

Turning to energy efficiency, all four utilities in Ohio have filed new efficiency plans in order to comply with the standards. First Energy, the utility that in 2014 led the charge to kill the standards, filed its new plan before any of the other utilities way back in April. And to ELPC’s surprise, it has actually filed a good plan that cost-effectively meets the 1% target each year.

Benefits of Efficiency and Proposed Changes to the Legislation

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 energy they replace. Just to be clear, when First Energy or any other utility spends \$1 on efficiency that is one less dollar it spends on purchasing electrons.

With that backdrop, I want to talk about the First Energy and AEP programs. AEP 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 cost, with participating customers saving \$9 for every dollar they spend. The programs are easily accessible to all customers, with the greatest savings coming from purchasing LED lighting. In a given year 57% of AEP’s residential customers will participate in at least one of the programs.

Moreover, non-participants will also benefit from lower market prices and reduced need for new power plants. Also, as First Energy notes in its Plan, the education and marketing First Energy does helps all customers make “more informed decisions regarding their energy usage.”

There are three main issues that trouble us with this bill. First, it makes the standards voluntary for the first three years. We believe that these standards should be mandatory. We understand the committee’s concerns regarding mandates, but these utilities are in fact regulated monopolies. They entered in to a regulatory bargain, and part of that bargain is to act in the public interest on issues like efficiency and renewables. As I stated earlier, these are not draconian standards and they are part of the obligation to provide just and reasonable service consistent with the law. Moreover, the utilities recover both their costs and lost revenues related to energy efficiency so they are held harmless. On top of that they share the savings they generate for customers through shared savings mechanisms that all the utilities have achieved. Some utilities have earned bonuses as high as \$20 million per year from running the programs. Making the standards voluntary sends the wrong signal regarding the importance of the standards and the need to meet the targets.

Second, we believe that a 22% benchmark is easily achievable as demonstrated by the attached analysis. But whether the target is 22% or 17%, there are several counting provisions that should be taken out of the bill because they do not provide consumers benefits and the utilities have no role in producing the savings. These include counting individual customer action, reducing water usage, and heat rate improvements on power plants – which simply enrich the utilities’ unregulated affiliates. We also note that while SB320 prohibits the utilities from earning shared savings on heat rate improvements it seemingly allows it on individual customer action and water use reduction. These categories are not trivial; for example, FirstEnergy attributed over 250,000 MWh of energy savings to customer action in 2015 alone – equaling more than a third of FirstEnergy’s annual savings target under a 1% benchmark. The law should make it clear that the utilities can only earn shared savings on the efficiency programs that directly influence customer actions. Otherwise we are simply handing the utilities additional profits from customers without them producing any customer benefits.

The third major issue we have with this bill is the expansion of the mercantile opt out provision. We know the argument that commercial customers have expertise on efficiency that residential and small business customers do not have, and that they take efficiency measures on their own in order to remain competitive. We understand the logic of that, but just don’t believe that it plays out in practice. The desire to maintain short term profits and the business demands that require immediate attention often get in the way of businesses achieving their efficiency potential. Additionally, not all mercantile customers have energy managers, especially if the legislature allows smaller customers to opt out, such as the pizza shops, convenience stores, and churches currently included in Ohio’s mercantile customer definition. These mercantile customers can represent more than a third of the total load of a utility like FirstEnergy, but it is far from clear that all or even most of them are implementing efficiency measures on their own. Moreover, the requirements for the opt out require little real commitment on behalf of the commercial customers. Thus, we believe the legislature should limit the opt out provision to the current law and require a firmer commitment if it chooses to allow opt out all. At a minimum the legislature

should require the applicant to submit a real efficiency plan outlining specific actions, and requiring approval by the PUCO.

Conclusion

In the final analysis, ELPC believes that energy efficiency and renewables play an important role in a balanced portfolio that not only provides clean energy, but also helps consumers lower their bills. Somehow, listening to the testimony and comments from proponents, one would think Ohio is about to become California. 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.

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 2014.¹

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

¹ <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%.² 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.³ 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

² <http://aceee.org/research-report/u1507>

³ 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 2018.⁴ 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.⁵

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,

⁴ <http://web1.env.state.ma.us/DPU/FileRoomAPI/api/Attachments/Get/?path=15-161%2fExhibit1AppendixC20162018PlanD.pdf>

⁵ 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.