Act 129 Fuel Switching Working Group
Comments of Metropolitan Edison Company, Pennsylvania Electric Company and Pennsylvania Power Company
February 16, 2010

I. Introduction

Metropolitan Edison Company, Pennsylvania Electric Company and Pennsylvania Power Company ("the Companies") submit these comments in response to the Act 129 Fuel Switching Working Group subcommittee cost-benefit analysis of fuel switching programs dated January 25, 2010.

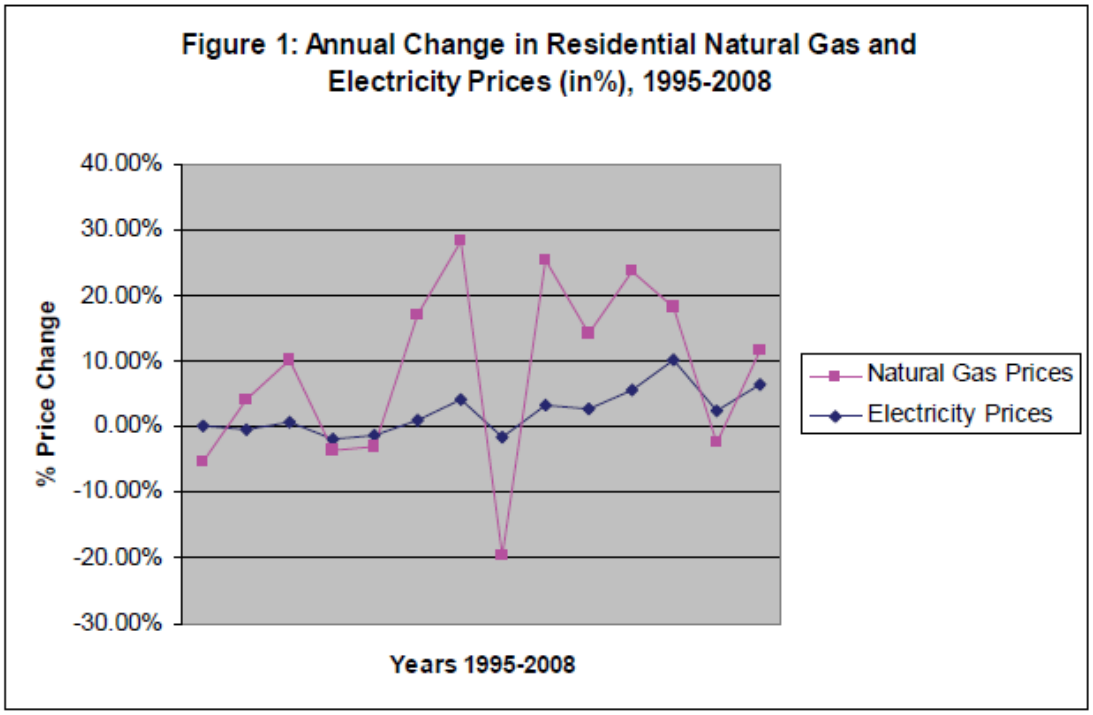
The Commission commenced a Fuel Switching Working Group in June 2009 in relation to the Technical Reference Manual ("TRM") proceeding at Docket No. M-00051865 to identify, research and address issues related to fuel switching with the possibility of its inclusion in a future version of the TRM. The Commission directed the Fuel Switching Working Group to provide recommendations by March 31, 2010 and consider whether changes to the TRM or Total Resource Cost Test are justified. As fuel switching was a contested issue in the Energy Efficiency and Conservation ("EE&C") Plan proceedings of several electric distribution companies ("EDCs"), the Commission ordered the Working Group to also address the fuel switching issues raised in the EE&C Plan proceedings in its March 31, 2010 report.

The intent and focus of Act 129 is to require energy usage reduction within each EDC's service territory. The Companies' primary objective is to provide opportunities for electric customers to save energy through the use of EE&C programs and funding as a result of Act 129. However, this objective must be balanced with the Companies' EE&C Plans in order to achieve the overall compliance goals set forth in Act 129. As such, the Companies may consider a fuel switching program(s) as part of its future revision to the EE&C Plans. However, the Companies strongly believe that the Commission should continue to direct that fuel switching programs are voluntary and not mandate the inclusion of broad based fuel switching programs in EE&C Plans going forward. As the Companies are responsible to implement EE&C Plans to achieve the targets mandated by Act 129 and ultimately may be subject to significant penalties if the targets are not met, the Companies must have the necessary discretion to include (or exclude) those programs and measures that they believe will balance their EE&C plans to best achieve the aggressive goals of Act 129.

If the Commission were to mandate fuel switching programs, it clearly would tilt the playing field and facilitate the gas companies' attempt to use Act 129 to leverage success in the competition for heating customers. The gas utility would unfairly be allowed to use electric customer funds to subsidize electric-to-gas fuel switching, while the electric utilities cannot do the reverse. Fuel neutrality would not be maintained, because gas would be favored over electricity.

In addition, the decision to switch fuels is a very complex undertaking for the customer. The customer must consider initial costs of the appliance and connection costs as well as operating costs. Natural gas appliances generally are more expensive than electric appliances.

The potential benefits of switching are case-specific and depend on various matters such as differences in home size, building shell energy efficiency, customer temperature preferences, natural gas availability, the energy services desired, and the relative costs of gas and electric energy. Furthermore, the customer cannot depend upon price stability, especially for natural gas. As Figure 1 shows, since the mid-1990s the residential price of natural gas has historically exhibited much greater volatility than the price of electricity. [1]



The Companies appreciate the opportunity to participate in the Commission's Fuel Switching Working Group. The Companies offer the following specific comments and suggestions to the cost-benefit analysis of fuel switching programs.

The Companies note that the cost-benefit analyses of fuel switching programs have used projections for electric avoided costs and natural gas costs that show a higher ratio of electric to gas costs to start with and higher escalation rates over time for electric costs than for natural gas costs. To provide another customer-oriented perspective, the Companies have analyzed payback periods for the proposed residential appliance fuel switching measures using current prices for electricity and natural gas in Pennsylvania.

II. Water Heating

Based on the data used for the water heating cost-benefit analysis, the payback from a customer's perspective to switch from electric to natural gas for water heating would be less than

[1] The figure uses national price data for the residential sector from the U.S. Energy Information Administration for the years 1995 – 2008.

half a year. From the cost-benefit analysis, the equipment cost for electric water heating was taken to be $800, with annual usage of 4,875 kWh. For gas water heating, equipment costs $900, with annual usage of 25 Mcf. To determine the prices that a customer would pay, price data from the Energy Information Administration ("EIA") were used that show the average price of residential electricity in Pennsylvania was 11.93¢ per kWh in October 2009, while the average price of residential natural gas was $12.81 per Mcf.

With these assumptions, the incremental measure cost for a customer switching from electric to gas water heating would be $100 (= $900 - $800), while the annual savings would be $262 (=4,875 kWh *0.1193¢ – 25 Mcf *$12.81). This implies a payback time for the fuel switching of 0.38 years. Given such a short payback from a customer's perspective, a mandatory program to promote electric to natural gas fuel switching for water heating is not needed because the customer can simply make this economic decision if interested in doing so.

Moreover, there is evidence that the market for water heating has been moving from electric to natural gas on its own without significant intervention. Using public survey data reported by the EIA from the 2005 Residential Energy Consumption Survey ("RECS"), the Companies have calculated that for households in Pennsylvania and New Jersey where water heating equipment is more than 10 years old, 33% of the households used electricity for water heating and 50% used natural gas. However, for households where water heating equipment is less than 10 years old, 23% used electricity and 69% used natural gas. This implies that a shift from electric to gas water heating has already been occurring without a forced intervention.

Further, it should be noted that the amount of kWh used for electric water heating that was assumed for the cost-benefit analysis (i.e., 4,875 kWh per year) is higher than the usage that EIA estimated from the 2005 RECS data. Table 1 shows the estimated average annual kWh usage for electric water heating for households in Pennsylvania and New Jersey, as developed from the 2005 RECS survey data. As stated above, the potential benefits of switching are case-specific and depend on various matters such as differences in home size, building shell energy efficiency, customer temperature preferences, natural gas availability, the energy services desired, and the relative costs of gas and electric energy.

Table 1. Average Annual Energy Usage for Electric Water Heating, by Type of Housing Unit

Type of Housing Unit	*MBtu per Year*	*Equivalent kWh per Year*
Mobile home	5,152	1,509
Single family detached	10,178	2,982
Single family attached	8,686	2,545
Apartment building with 2-4 units	6,968	2,042
Apartment building with 5 or more units	5,402	1,583
All Types	9,159	2,683

III. Space Heating

In contrast to water heating, based on the numbers used for the space heating cost-benefit analysis, the payback from a customer's perspective from switching from electric to natural gas for space heating would be nearly 20 years. From the space heating cost-benefit analysis for the

Erie/Wilkes Barre areas, the equipment cost for electric space heating was taken to be $3,100, with annual usage of 10,771 kWh. For gas space heating, equipment costs $8,600, with annual usage of 80 Mcf. As in the water heating analysis, price data from the EIA were used that show the average price of residential electricity in Pennsylvania was 11.93¢ per kWh in October 2009, while the average price of residential natural gas was $12.81 per Mcf.

With this data, the incremental measure cost for a customer switching from electric to gas space heating would be $5,100 (= $8,600 - $3,100), while the annual savings would be $260 (=10,771 kWh *0.1193¢ – 80 Mcf *$12.81). This results in a payback time for the fuel switching of 19.6 years. This result does not provide for a timely economic benefit for a customer. However, the cost-benefit analysis assumes that a customer switching fuels would receive an incentive of $5,100 to cover the incremental cost of the equipment. This would require that fuel switching incentives for space heating be offered instead of other possibly more beneficial energy efficiency programs due to the finite amount of funds that can be spent to implement Act 129 EE&C programs and measures. Therefore, programs that could achieve more effective results may not have the funds available to offer such programs and an EDC's customers would be subsidizing less beneficial EE&C programs to the benefit of natural gas companies.

Additionally, in reality, the extent to which electricity is used for space heating is relatively small. Using public survey data reported by the EIA from the 2005 RECS, the Companies have calculated the percentage of units with different types of space heating for different types of housing units in Pennsylvania and New Jersey. This data is reported in Table 2. Overall, housing units with electric space heating account for fewer than 10% of all units, while housing units with fuel oil account for 20% and housing units with natural gas account for 66%.

Table 2. Percentage Distributions of Space Heating Fuels, by Type of Housing Unit

Type of Housing Unit	*% of Units with Gas Space Heating*	*% of Units with Fuel Oil Space Heating*	*% of Units with Electric Space Heating*
Mobile home	0.0%	41.5%	0.0%
Single family detached	64.3%	23.7%	8.1%
Single family attached	65.8%	15.5%	14.5%
Apartment building with 2-4 units	63.1%	30.4%	6.4%
Apartment building with 5 or more units	87.0%	0.0%	13.0%
All Types	66.0%	20.1%	9.8%

Further analysis using data from the 2005 RECS on the amount of energy used for space heating for housing units in Pennsylvania and New Jersey shows that units with electric space heating use considerably less energy for space heating than units using natural gas. These comparisons are shown in Table 3. The cost-benefit analysis for switching from electricity to natural gas for space heating appears to be based on energy usage for gas heating. However, given the dramatically different levels of energy use for space heating between electric-heated and gas-heated housing units, it appears that households using electricity for space heating may have other criteria that they used in choosing electricity that are significantly different than the

criteria used by gas-heating households. Thus, the point made above is worthy of repeating – the potential benefits of switching are case-specific. The benefits depend not only on the relative costs of different appliances and gas and electric energy costs, but also on various matters such as differences in home size, building shell energy efficiency, and the energy services desired.

Table 3. Average Annual Energy Use (in MBtu) for Space Heating, by Type of Housing Unit

Type of Housing Unit	*Units with Gas Space Heating*	*Units with Electric Space Heating*
Single family detached	71,098	14,061
Single family attached	62,729	9,558
Apartment building with 2-4 units	65,259	10,069
Apartment building with 5 or more units	36,691	8,470

IV. Clothes Drying

Based on the data used for the clothes drying cost-benefit analysis, the payback from a customer's perspective to switch from electric to natural gas for clothes drying would be just over five years. From the cost-benefit analysis, the equipment cost for electric clothes drying was taken to be $600, with annual usage of 1,075 kWh. For gas clothes drying, equipment costs $830, with annual usage of 6.528 Mcf. Again, price data from the EIA was used that shows the average price of residential electricity in Pennsylvania was 11.93¢ per kWh in October 2009, while the average price of residential natural gas was $12.81 per Mcf. With these numbers, the incremental measure cost for a customer switching from electric to gas clothes drying would be $230 (= $830 - $600), while the annual savings would be $45 (=1,075 kWh *0.1193¢ – 6.528 Mcf *$12.81). This implies a payback time for the fuel switching from a customer's perspective of 5.1 years. These results raise the question whether a typical electric customer would make the switch from electric to gas for clothes drying based on higher cost of equipment, minimal annual savings, a payback of more than 5 years and the fact that many clothes dryers are located in a remote area of the house such as a second floor laundry room.

Furthermore, there is evidence that the market for clothes dryers has been moving from electric to natural gas on its own without significant intervention. Using public survey data reported by the EIA from the 2005 RECS, the Companies have calculated that for households in Pennsylvania and New Jersey where clothes drying equipment is more than 10 years old, 73% of the households used electricity for clothes drying and 23% used natural gas. However, for households where clothes drying equipment is less than 10 years old, 56% used electricity and 44% used natural gas. This implies a shift from electric to gas clothes drying has already been occurring without a forced intervention by government.

V. Combined Heat and Power (Standard) and Combined Heat and Power (Micro)

With respect to the cost-benefit analyses for both Standard and Micro Combined Heat and Power ("CHP"), the Companies note that there are significant issues that arise in considering whether and how to structure programs for promoting CHP in Pennsylvania. Both New York and New Jersey have programs in place for promoting CHP, but these programs are not administered by utilities but rather by a state agency (NYSERDA in New York) or an independent contractor (in New Jersey).

The cost-benefit analyses for CHP that are presented are based on a single case study with a societal perspective. However, from the customer perspective, the important issue in deciding whether to implement a CHP project is the prospective prices of natural gas and electricity. In addition, the cost of the measure in the cost-benefit analyses for Micro CHP is depicted as $18,000 with an incentive of $18,000 provided to the customer. This would require that fuel switching incentives for CHP be offered instead of other possibly more beneficial energy efficiency programs due to the finite amount of funds that can be spent to implement Act 129 EE&C programs and measures. Aside from residential low income programs, no EE&C programs being launched in the Commonwealth have provided for incentive levels that equal 100 percent of the customer cost. The primary concern is that elevated incentive levels, while beneficial to program participants, can create a considerable negative effect on customers that do not participate. Would lower incentive levels motivate customers to install the Micro CHP?

Furthermore, an article titled "A Winter's Tale: My First Season With Micro Combined Heat and Power" authored by Kevin Ferguson states, "The cost for my system, including installation, came to $24,880. Rebates from the local utility and other incentives brought my out-of-pocket expense down to about $20,000." As shown in Figure 1 above, the residential price of natural gas has historically exhibited much greater volatility than the price of electricity. These trends likely go against the economics of CHP from a customer's perspective.

The Companies note that promotion of CHP is an issue that is broader than fuel switching *per se* and requires a broader analysis to ensure that a proper approach is taken. Program design and planning would be facilitated if an inventory of potential CHP sites in Pennsylvania were developed so that the resource could be better assessed.

VII. Conclusion

The Companies appreciate the opportunity to provide comments to the cost-benefit analysis of fuel switching programs. If the Commission decides to revise the TRM to recognize fuel switching, the Companies urge that the Commission only do so by making any inclusion of fuel switching programs in the EE&C Plans voluntary.

Respectfully submitted,

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On behalf of:
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Pennsylvania Electric Company
Pennsylvania Power Company