

Memo

To: Massachusetts Program Administrators
From: Evaluation Management Committee
CC: Jerry Oppenheim and Ralph Prah
Date: July 25, 2012
Re: Additional Non-Energy Impacts for Low Income Programs

Overview

Members of the Program Administrator (PA) evaluator group have been meeting with Jerry Oppenheim of LEAN and Ralph Prah of the EEAC over the past several months to discuss Low-Income Non-Energy Impacts (NEIs) that were not included in the NMR study¹ submitted with the PAs' 2012 Mid-Term Modification filing. Lynn Westerlind (National Grid), Monica Kachru, Riley Hastings, Lisa Shea (all from NSTAR) and Monica Cohen (Columbia Gas of MA) have been on point for the PAs.

During these discussions it was determined that there were some NEIs that were not included in the study that could reasonably have been included. The group reached consensus that it is reasonable to add or revise the value used for the following four NEIs in the Low-Income Programs:

1. Refrigerator recycling
2. Lighting quality
3. Price hedging
4. Economic development

Below please find more detailed information about each of the four NEIs.

The group has also agreed to perform a study of health NEI study which will be incorporated into the programs once the research is complete.

Refrigerator recycling

The NMR study² quantified the benefits of turning in a refrigerator and/or freezer as part of the MA turn-in program. Hazardous materials such as chlorofluorocarbon (CFC) or hydro chlorofluorocarbon (HCFC) gases, polychlorinated biphenyls (PCBs), mercury, and oils contaminated with CFCs and HCFCs are removed from the collected units and disposed of in accordance with US EPA Responsible Appliance Disposal (RAD) program guidelines. The study analyzed the environmental benefits derived from properly collecting, destroying, or recycling the materials contained within refrigerators. After

¹ NMR Group (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation, filed with 2012 Mid-Term Modifications, [D.P.U. 11-106 through D.P.U. 11-116](#).

² NMR Group (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation.

confirming with those knowledgeable, it was determined that old appliances are indeed removed and properly disposed of through the Low-Income Programs, and this benefit should be included in the Low-Income Programs for consistency. The total benefit is comprised of 3 parts: \$1.06 for avoided landfill space, \$1.25 for recycling of plastics and glass, and \$170.22 for incineration of insulating foam.

Lighting quality

The NMR study recommended using the one-time operation and maintenance (O&M) benefit of \$3.00 per CFL bulb and \$3.50 per fixture. The study also did a survey of LI program participants and found that respondents assigned a positive value of \$56 to the lighting quality and lifetime of program sponsored energy efficient lighting. The group has agreed that \$56 per LI participant is a reliable estimate of lighting quality NEIs and will use that in lieu of the \$3.00 and \$3.50 per bulb and fixture, respectively.

Price hedging

The group determined that there is a value in minimizing program participants' exposure to price increases. With residential home heating fuels prices fluctuating, energy efficiency programs mitigate the impact of energy price fluctuations that affect customers' energy bills, by reducing the amount of energy that customers consume. A relevant paper came out of the Lawrence Berkeley National Lab that quantified the value that wind power provides as a hedge against volatile natural gas prices.³ The paper found a hedge value of \$0.76/MMBTU of gas and \$0.005/kWh.

Economic development

The group determined that there is an economic development benefit with respect to low-income programs that should be factored into cost effectiveness screening, so long as it complies with applicable regulatory and legal precedent. As discussed below, the group has determined that the focused low-income economic development benefit proposed does comply with such precedent.

The GCA does not give express guidance, but does mention economic development as a factor in prioritizing projects. GL c. 25, section 21(b)(2) has general language with respect to economic development noting that it can be included in determining which projects to prioritize: "With the approval of the Council, the plan may also include a mechanism to prioritize projects that have substantial benefits in reducing peak load, reducing the energy consumption or costs of municipalities or other governmental bodies, or that have economic development, job creation or job retention benefits." This language is not determinative, but does indicate the legislature's concern with economic development.

The Department's Energy Efficiency Guidelines are importantly instructive. Economic development benefits are not explicitly listed in the non-electric benefits/non-gas benefits that are expressly articulated in sections 3.4.4.1.a or 3.4.4.1.b, but both of these sections of the Guidelines provide a basket for inclusion of "all benefits associated with providing energy efficiency services to Low-Income Customers." Accordingly the Department EE Guidelines uniquely single out low-income customers as a class (unlike residential or commercial/industrial) when non-resource benefits are being articulated. This reference to low-income benefits is an important data point. The group has added a unique low-income benefit based on economic development benefits and such an approach is consistent with the Department's guidelines.

The next level of detail was consideration of the Supreme Judicial Court (SJC) guidance with respect to externalities from the case Massachusetts Electric Company v DPU, 419 Mass 239 (1994). In that case the SJC articulated the need for connection between costs/benefits to be included in utility cost effectiveness screening and "reasonably anticipated future circumstances [which] will impose costs on the utility that will be detrimental to the interest of ratepayers." The Department cannot take into

³ Lawrence Berkeley National Lab (2002). Quantifying the Value that Wind Power Provides as a Hedge Against Volatile Natural Gas Prices.

account broad external societal costs and benefits that do not and cannot reasonably be anticipated to have an effect on the utilities/PAs' costs and thereby on rates paid by customers. Factoring in reasonable economic development benefits in cost effectiveness screening can be related back to costs on the utility/PA that are born by ratepayers, in particular the subsidization of low income rates by all customers.

By linking the economic development benefit at the highest level to the GCA, at the next level to the Department's Energy Efficiency Guidelines, and then on a third level with the SJC precedent on externalities. The group thinks it is reasonable to include economic development as a benefit unique to low-income.

The tables below show the calculated economic development values of \$0.486 per therm and \$0.04 per kWh. These values were calculated utilizing the increase in GSP if programs were operating in isolation rather than simultaneously.

Table 1: Massachusetts – Gas Estimate					
Increase in GSP (Billion \$) (1)	Savings (Tbtu) (2)	Savings (therms) (3)	Economic output per therm (4)	11% for low income (5)	Inflated from 2008 to 2011\$ (6)
28	664	6,640,000,000	\$4.22	\$0.46	\$0.486
(1) Energy Efficiency: Engine of Economic Growth; ENE; October 2009; page 49.					
(2) Energy Efficiency in Massachusetts: Engine of Economic Growth; ENE; October 2009; page 2.					
(3) Tbtu times 10,000,000					
(4) Calculated as Increase in GSP/Savings (therms)					
(5) Multiply economic output per therm by 11%; assumes 11% inures to the benefit of low-income (the low-income fraction of population).					
(6) Uses an inflation rate of 1.85% from BCR models.					

Table 2: Massachusetts – Electric Estimate				
Increase in GSP (Billion \$) (1)	Savings (GWh) (2)	Savings (kWh) (3)	Economic output per therm (4)	11% for low income (5) (6)
70	217,300	217,300,000,000	\$0.32	\$0.04
(1) Energy Efficiency: Engine of Economic Growth; ENE; October 2009; page 47.				
(2) Energy Efficiency in Massachusetts: Engine of Economic Growth; ENE; October 2009; page 2.				
(3) GWh times 1,000,000				
(4) Calculated as Increase in GSP/Savings (kWh)				
(5) Multiply economic output per therm by 11%; assumes 11% inures to the benefit of low-income (the low-income fraction of population).				
(6) Using an inflation rate of 1.85% from BCR models does not change the estimate of \$0.04/kWh from 2008 to 2011\$.				