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October 31, 2013

William F. Welch, Clerk
Massachusetts State Senate
State House – Room 335
Boston, MA 0213

Steven J. James, Clerk
Massachusetts House of Representative
State House – Room 145
Boston, MA 0213

Dear Messrs. Welch and James,

Pursuant to Section 41 of Chapter 209 of the Acts of 2012, please find attached the Energy Policy Review Commission's (EPRC) Report to the Legislature. This Report reflects months of diligent work by EPRC members, substantive feedback from stakeholders and the general public, and countless hours of staff time and resources – both in facilitating meetings as well as researching and responding to requests for information and data from EPRC members.

Considering the depth and breadth of the charge before the EPRC, the Commission divided the Report into two sections. The first is a general overview of the Massachusetts energy picture and suggested metrics for energy policy decision makers to consider. The first section represents a consensus of the members. The second section is an Appendix which includes supporting documents, such as presentations and meeting minutes. The Appendix also

contains individual opinions of EPRC members which did not receive consensus approval from the members..

As Chair of the EPRC, I submit this report to the Legislature on behalf of the members of the Commission. We have also posted this Report online for your convenience: http://www.mass.gov/eea/energy-utilities-clean-tech/energy-policy-commission/. If you need additional information, please contact my office.

Sincerely,

Richard K. Sullivan, Jr.

Secretary

cc: Senator Ben Downing

Representative John Keenan

Energy Policy Review Commission

Report to the Legislature

October 31, 2013

Submitted by Members of the Energy Policy Review Commission

TABLE OF CONTENTS

I. Background and Charge

In August 2012, Massachusetts Governor Deval Patrick signed S. 2395, "An Act Relative to Competitively Priced Electricity in the Commonwealth" (the 2012 Energy Act) which is now Chapter 209 of the Acts of 2012. *See*, Appendix, Part 1. This law made several modifications to energy efficiency and renewable programs, required several studies, and created both a task force and a commission to review specific energy policies.

The law created the Energy Policy Review Commission (the Commission) and charged it to undertake the following:

> *research and review the economic and environmental benefits, as well as, the economic and electricity cost implications of energy and electricity policies in the commonwealth. The commission shall report to the legislature recommendations on how to (i) further expand the commonwealth's renewable energy portfolio and promote energy efficiency; (ii) encourage business development and job creation; (iii) reduce the costs associated with energy programs funded, in whole or in part, by the commonwealth, while maximizing the benefit of these programs; (iv) reduce the cost of electricity for commercial, industrial and residential customers; and (v) increase electricity reliability.*

In addition to reporting on the five sections listed above, the Commission was also required to:

> *at minimum, research, evaluate, consider and report on: (i) determining consistent metrics to be utilized to evaluate the success and cost-effectiveness of programs under chapter 169 of the acts of 2008; (ii) the associated economic and environmental impact of scheduled increases in demand resources, aggregate net metering capacity and renewable energy capacity; (iii) the structure of the regional wholesale electricity market and its impact on retail electricity costs; and (iv) the overall impact of the commonwealth's energy and electricity policies on economic growth in the commonwealth, specifically net job creation and business development, establishment and retention.*

Furthermore, the Commission shall at minimum include:

> *an analysis of the estimated or actual economic and environmental benefits, as well as, economic cost, electricity cost and implication for electricity reliability of: (i) implementing administrative, regulatory and legislative rulemaking as it*

pertains to electricity and the structure of the wholesale electricity market; and (ii) meeting legislative and administrative goals and requirements related to greenhouse gas reductions, energy efficiency and renewable energy generation.

This nine person Commission, chaired by the Secretary of the Executive Office of Energy and Environmental Affairs (EEA), Richard K. Sullivan, consisted of the following appointees:

Members/Appointers	**Designee**
Secretary of EEA (Chair)	Richard K. Sullivan
Attorney General (Martha Coakley)	Sandra Merrick
Associated Industries of Mass (AIM)	Robert Rio
Speaker of the House (Robert DeLeo)	Not Appointed
President of the Senate (Therese Murray)	Sen. Benjamin Downing
Minority Leader of the House (Bradley Jones)	Thomas J. Regh
Minority Leader of the Senate (Bruce Tarr)	Elliott Jacobson
Academic Seat	Robert K. Kaufmann
Small Energy Efficiency Business Seat	Robert Calnan

Originally, a final report from the Commission to the Chairs of the Telecommunications, Utilities, and Energy Committee was required by July 1, 2013. However, the Commission members requested and received an extension until October 31, 2013. *See*, Appendix, Part 7.

Considering the breadth of the charge, the Commission met frequently and regularly. *See*, Appendix, Part 6. All meetings were posted according to the requirements of the Commonwealth's open meeting laws. *See*, M.G.L. c. 30A §§ 18-25.

To ensure each Commission member had a common knowledge base of existing state policies and programs and to develop topics for a robust discussion, Commissioners from the Department of Public Utilities (DPU) and the Department of Energy Resources (DOER), relevant state agency directors, and their teams presented an overview of the work germane to the Commission. *See*, Appendix, Part 3. Several Commission members made presentations from a list of topics reflecting the mandate of the statute. No financial resources were included in the statute, which limited the Commission's capability to call on outside analytic assistance. For example, there were no funds allocated to hire a consultant or undertake an in-depth economic review. With this limitation, Commission members worked with existing information from the public domain with a particular reliance on presentations and responses to data requests provided by state agencies.

The following report provides background on existing energy policy and an overview of issues discussed by the Commission as required by statute. Contained in the Appendix are presentations made to the Commission, minutes of the Commission's meetings, as well as the analysis and positions of each Commission member. The positions and analyses in the Appendix do not necessarily reflect the opinions of the entire Commission.

II. Current Energy Status and Legal Framework

A. Overview of the Commonwealth's Energy Picture

At the state level, energy decision making resides in the Executive Office of Energy and Environmental Affairs (EEA) and in its administratively reporting agencies, the DPU and the DOER. The DPU regulates the electric distribution companies, known as investor owned utilities (IOUs) by adjudicating rates for all classes of customers: residential, commercial and industrial. Electric utility rates include charges for commodity, transmission, distribution, energy efficiency, renewable energy, and transition costs. The DPU sets the rates for only the distribution and transition portions of a customer's bill; the remaining charges are passed through directly to the ratepayer. The DPU establishes the costs for the local utility to run the distribution system (ie: local wires). The Federal Energy Regulatory Commission (FERC) sets the transmission rates, which apply to the large transmission network which connects generation sources to the local distribution system. Commodity prices are a function of the competitive generation marketplace which is under the jurisdiction of FERC. Since restructuring, customers have had the option of contracting with competitive electricity supplier for their commodity. The DOER is the state agency charged with carrying out the Commonwealth's energy policies. *See, generally* M.G.L. c. 25A.

Any discussion of energy in the Commonwealth must start with an understanding of the state's overall energy picture. New England has historically been at a competitive disadvantage with regards to energy, both in terms of supply and price. The Energy Information Administration ranks Massachusetts near the top for electricity rates in the United States, with

electricity costs for all sectors, higher than in some states that compete for our technical talent.[1] This situation can put Massachusetts' energy intensive industries at a competitive disadvantage.

In 1997, the Commonwealth restructured its electric industry. An Act Relative to Restructuring The Electric Utility Industry In The Commonwealth, Regulating The Provision Of Electricity And Other Services, And Promoting Enhanced Consumer Protection Therein, ST. 1997, c. 164 (1997 Restructuring Act), resulted in formerly vertically integrated electric utilities divesting themselves of their ownership of their generation units. The theory behind restructuring was that competitive market forces would lead to lower electricity rates over time. Restructuring resulted in a market-based wholesale energy market, overseen by Independent System Operators, known as ISOs, which set the rules for the reliable operation of the energy grid. The ISO- New England (ISO-NE) serves as the market monitor for the six New England states and oversees New England's wholesale electricity market, including assuring bulk reliability.

In 2010, the New England energy mix used to generate electricity was approximately 46 percent based on natural gas, 31 percent nuclear, 11 percent coal, 6 percent hydroelectric, and 6 percent renewable. *See*, Appendix, Part 3. Over the last decade, the New England mix has become increasing dependent on natural gas. The national drop in natural gas prices has lowered electricity prices in the Commonwealth but as with any commodity, the likelihood of price volatility remains.

Electricity rates have been historically high in the Northeast for multiple, complex reasons. Among the factors which lead to this is the fact that Massachusetts historically sits at the

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[1] *See:* http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_06_a

end of the energy supply chain, requiring fuels to be piped or transported, adding costs. Electricity demand peaks in the summer and electricity capacity has to be available to meet that high demand and aging infrastructure in the Northeast continues to require significant investment.

EEA responds to requirements set by the Massachusetts Legislature. As a result of these mandates renewable energy and energy efficiency have become a focal point of the Commonwealth's energy policy. EEA and its agencies have identified the following goals:

- Increase energy efficiency and demand response in order to reduce energy use and peak demand.
- Meet ambitious goals for renewable energy generation (e.g., solar photovoltaic, solar thermal, hydroelectric, organics to energy and wind) and create incentives that drive the market to achieve these goals.
- Ensure fuel diversity and reliability.
- Encourage cost effective grid modernization to replace old infrastructure, enhance reliability, communicate price signals, and integrate renewable energy;
- Ensure success in meeting greenhouse gas reduction requirements for 2020 and 2050.
- Enhance development of a clean technology energy sector in order to promote energy innovation while growing local companies and jobs.
- Continue to work towards keeping energy bills as low as possible while furthering our energy policy goals and ensure participation in all energy opportunities for economically challenged customers, as well as assure consumer protections and equity considerations.

B. Current Legal and Regulatory Framework

Since restructuring in 1997, the Legislature has enacted a series of laws relating to energy and the environment. Brief overviews of these laws are outlined below.

1. An Act Relative to Green Communities

After unanimous approval by both houses of the Legislature, Governor Patrick signed into law An Act Relative to Green Communities (GCA), Chapter 169 of the Acts of 2008. This Act coordinated the efforts of utilities, municipalities and the state government to reform the Commonwealth's energy strategy.

Among the requirements of the GCA is for investor owned utilities (IOUs) as first recourse to secure cost-effective energy efficiency resources, or those less expensive than purchasing supply. This mandate has launched energy efficiency to be the state's first-priority fuel. *See*, ST. 2008, c. 169, § 11. Under the GCA, investments in energy efficiency measures have increased substantially by adding the Energy Efficiency Reconciliation Factor (EERF) to the existing System Benefit Charge (SBC) of $0.0025 per kWh. The GCA also mandated the program administrators to design and implement three-year energy efficiency plans and provided for the creation of the Energy Efficiency Advisory Council (EEAC). The EEAC, which guides and monitors the development of energy efficiency plans, is comprised of a diverse group of volunteer stakeholders such as residential customers, low income advocates, the environmental community, business and labor groups.

The GCA also required state agencies implement efficiency in state facilities and required Massachusetts to adopt the International Energy Conservation Code (IECC), ensuring energy

standards are constantly updated with the latest international codes.[2] *See,* ST. 2008, c. 169, §§§ 1, 5, and 2. The GCA also created the Green Communities program which provides municipalities with technical and financial assistance to promote energy efficiency and the financing, siting and construction of renewable and alternative energy facilities.[3] The Commonwealth currently has 110 qualified Green Communities under this program and offers technical assistance to many more.[4]

The GCA strengthened the Renewable Portfolio Standard (RPS) by increasing requirements for new renewable energy, requiring that by 2020, 20% of the Commonwealth's energy generation will come from renewable energy sources. *See,* ST. 2008, c. 169, § 16. The Massachusetts RPS was one of the first programs in the nation that required a certain percentage of the state's electricity to come from renewable energy. In order to meet the RPS requirements, retail electricity suppliers can buy renewable energy credits (RECs) from developers in a marketplace. This is a market based incentive to support residential, commercial, public, and non-profit entities in developing renewable energy across the Commonwealth. The projects that qualify as renewable and eligible for meeting the RPS are also listed in the Act. The GCA

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[2] In April 2007, Governor Deval Patrick's Executive Order 484 established the Leading by Example Program (LBE). LBE works to reduce the overall environmental impacts of state government operations, particularly climate and energy impacts. It established higher energy efficiency standards in the operation of state buildings, set short and long term targets and goals to advance clean energy and efficiency and reduce greenhouse gas emissions. It also promotes sustainability activities within state government including waste reduction, water conservation, green buildings, alternative fuels, efficient transportation, and recycling.

[3] The funding for the Green Communities program includes Regional Greenhouse Gas Initiative (RGGI) funds, Alternative Compliance Payment (ACP) funds, and the Renewable Energy Trust Fund (RETF). *See,* ST. 2008, c. 169, § 49.

[4] *See*: http://www.mass.gov/eea/docs/doer/green-communities/grant-program/map-summary-green-communities-110.pdf

excludes large hydro above 25 MW from being included as eligible to meet the states renewable goals. This has since been increased to 30 MW.

Section 83 of the GCA required utilities to solicit and enter long term contracts, of 10-15 years, for the purchase of eligible new renewable energy. This was intended to provide critical financial assurances for renewable energy development. The GCA also established requirements for net-metering. *See,* ST. 2008, c. 169, § 78. Net metering allows customers of certain electric distribution companies to generate their own electricity in order to offset their electricity usage. The GCA allowed municipalities to own renewable energy facilities and provided the necessary authority for municipalities to issue bonds or notes for financing. Several of these GCA programs, such as long term contracting and net metering, were later modified in future legislation which is described in more detail below.

2. Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) requires major power producers to buy allowances at auction for each ton of carbon dioxide they emit. The GCA maximized the benefits of Massachusetts' adoption by requiring at least eighty percent of the auction proceeds are used to fund energy efficiency programs, and some of the remainder is currently directed to community clean energy programs. *See*, ST. 2008, c. 169, §§ 7 and 11.

3. An Act Relative to Green Jobs

An Act Relative to Green Jobs in the Commonwealth (Green Jobs Act), Chapter 307 of the 2008 Acts, was enacted to accelerate the growth of clean energy jobs in the Commonwealth and to prepare workers for these jobs through training initiatives. Two major components of the

Green Jobs Act were: (1) the creation of The Massachusetts Clean Energy Center (MassCEC), which is dedicated to job creation and economic development in the clean energy sector; and (2) the establishment of the Alternative and Clean Energy Trust Fund, to stimulate growth of the state's emerging clean energy economy.

Subsequent to the passage of the Green Jobs Act, An Act Relative to Clean Energy, Chapter 158 of the Acts of 2009, amended the MassCEC's enabling legislation (codified at M.G.L. c. 23J) to also provide funding through the Massachusetts Renewable Energy Trust Fund (RETF).

In combination, Chapter 23J of the General Laws designates MassCEC as a quasi-public entity which aims to support the clean energy sector through workforce training and research in the clean energy sector and stimulating investment in clean energy technologies. The MassCEC also supports the creation and development of new clean energy ventures that contribute to a strong clean energy industry sector. MassCEC aims to foster collaboration between industry, state government, research universities and the financial sector to advance clean energy technology commercialization and venture development while promoting programs and investments that lead to pathways towards economic self-sufficiency for low and moderate-income individuals and communities in the clean energy industry.

4. An Act Establishing the Global Warming Solutions Act

The Global Warming Solutions Act (GWSA), Chapter 298 of the 2008 Acts, was one of the first laws in the nation to confront climate change on a comprehensive basis. The Act required the Secretary of EEA to establish a statewide limit on greenhouse gas (GHG) emissions of 10% to 25% below 1990 levels for 2020 – on the way toward an 80% reduction in emissions

by 2050. This required designing and implementing a statewide framework to reduce GHG emissions across all sectors through the creation of a Massachusetts Clean Energy and Climate Plan for 2020. Based on analysis and input from the Climate Protection and Green Economy Advisory Committee, also created by the GWSA, the Secretary recommended a standard that by 2020, emissions levels must be 25% lower than they were in 1990. The Climate Plan delineated the following reductions to meet these goals: 9.8% of emissions reductions from buildings, 7.7% from electricity supply, 7.6% from transportation sector, and 2% from non-energy sources.

5. An Act Relative to Competitively Priced Electricity

The 2012 Energy Act contained modifications to several energy statutes and programs, including changes to net metering provisions contained in the GCA, raising the private net metering cap from one percent to three percent and for governmental entities and municipalities cap from two percent to three percent. *See,* ST. 2012, c. 209, §§ 27-28. It also added anaerobic digestion to the list of eligible technologies considered renewable for purpose of meeting the state RPS. *See*, ST. 2012, c. 209, § 49.

The 2012 Energy Act created additional requirements for distribution companies to jointly engage in two procurement periods to satisfy their annual RPS obligations. *See,* ST. 2012, c. 209, §§ 35-36. These additional provisions required utilities to solicit an additional four percent of their peak load, in addition to the three percent required under the GCA. A 10 percent carve out of the contracts were reserved for newly developed small, emerging or diverse energy generation. The 2012 Energy Act also required that the DOER complete a study of long-term

contracting requirements before the Section 83A requirement for joint solicitation of renewable energy could take effect.[5]

The 2012 Energy Act required a series of studies, investigations, and working groups.[6]

Studies and Investigations Mandated by the 2012 Energy Act

Agency Called Upon	Program Description	Date of Targeted Completion
DPU - § 40; DPU 12-77.	Over next 10 years, look at the needs for additional capacity within the Northeast Massachusetts (NEMA) region.[7]	March 15, 2013
DPU - § 44; DPU 13-73.	Investigate the cost of low-income discount programs run by electric and gas companies.	January 1, 2014
DPU - § 50; DPU 13-51.	Examine increasing transparency of utility bills.[8]	June 1, 2013
DPU - § 51; DPU 12-126.	Explore the creation of a cost-based rate design for each gas and electric company and	January 1, 2014

[5] *See*: http://www.mass.gov/eea/docs/doer/pub-info/long-term-contracting-section-83-green-communitiesa-act.pdf

[6] Pursuant to the 2012 Energy Act, the EOEEA was directed to assemble this Commission and the Salem Plant Revitalization Task Force. Both commissions are required to report their findings and recommendations to the Legislature. *See*, ST. 2012, c. 209, §§ 41, 42. Additional dockets that impact energy policy and will be discussed, but were not required by the Acts of 2008 or 2012, include Grid Modernization (DPU 12-76) and Service Quality (DPU 12-120).

[7] Pursuant to Section 40 of the Energy Act of 2012, DPU conducted an evaluation of the need for capacity in the NEMA region over the next 10 years. DPU concluded that without Footprint's added generation, there would be a need for additional resources by 2016/2017. DPU Order 12-77 at 17. However, since the DPU does not have actual proof of market failure, it cannot require local distribution companies to enter into long-term contracts at this time for fear of disrupting the wholesale marketplace. *Id.* at 32.

[8] *See*: http://www.env.state.ma.us/dpu/docs/electric/13-51/13-51-Filing-3551.pdf

	approve reconciling factors for each rate charge.[9]	
DOER, Attorney General's Office (AGO) - § 43.	Study the feasibility, regulatory barriers and potential benefits of engaging in central procurement.	September 30, 2013
DOER - § 45.	Study Class II RPS program in order to reduce reliance on ACP payments. [10]	January 1, 2013
DOER - § 46.	Look into adding "useful thermal energy" to the list of eligible alternative energy generating source in meeting AEPS goals.[11]	January 1, 2013
DOER - § 47.	Examine the reactivation of pre-existing hydroelectric power sites.	January 1, 2016
DOER - § 52.	Investigate the impacts of restructuring the marketplace and the effects of the energy industry consolidation with the market. Massachusetts Electricity Markets and Planning Study.[12]	July 15, 2013

While some of these studies and investigations have been completed at the writing of this report, many are still ongoing. Once these studies and investigations have completed, they will provide additional data and discussion relevant to this Commission's mandate.

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9 On July 1, 2013 DPU issued a Report to the Joint Committee on Telecommunications, Utilities and Energy stating that "it would be administratively efficient to commence a proceeding to analyze and implement revisions to the presentation of charges on customer bills, bill inserts, and distribution companies' websites." DPU 13-51 at 33.

10 *See*: http://www.mass.gov/eea/docs/doer/pub-info/rps-class-2-evaluation.pdf

11 *See*: http://www.mass.gov/eea/docs/doer/renewables/renewable-thermal-study.pdf

12 This study directs the Department of Energy Resources (DOER) in consultation the Attorney General to examine, first, the status of the markets which have been in place since restructuring and, second, the status of planning for new electricity resources.

C. State Programs and Expenditures

The DOER has four divisions that focus on (1) Green Communities (2) Energy Markets, (3) Energy Efficiency, and (4) Renewable/Alternative Energy. Expenditures by DOER program and program descriptions for FY 2013 are listed below. As noted previously, the EEAC guides and monitors the development of energy efficiency plans and programs, such as Mass Save ®. The DPU appoints EEAC members and the DOER Commissioner Chairs the EEAC with the support of DOER staff.

Expenditures By Programs FY2013			
Divisions	**Budget**	**Source**	
	FY13	**Federal**	**State**
Green Communities	$6,926,123.62	$859,022.86[1]	$6,067,100.76[1]
Leading by Example	$2,753,884.33	$2,476,730.98[2]	$277,153.35[2]
Energy Markets Division	$1,038,757.60	$306,398.98[3]	$732,358.62[3]
Energy Efficiency Division	$33,147,520.75	$646,874.52[4]	$32,500,650.00[4]
Renewables Division	$714,424.28	$250,749.62[5]	$463,674.66[5]
Total	**$44,580,710.58**	**$4,539,776.96**	**$40,040,937.39**

[1]Federal spending in FY 2013 was composed primarily of ARRA, and State Spending is primarily RGGI auction funding.
[2]Federal spending in FY 2013 was composed primarily of ARRA, and State Spending is primarily Alternative Compliance Payment funding
[3]Federal spending in FY 2013 was composed of the annual State Energy Plan grant from US DOE, and State spending was from the main operating account at DOER.
[4]Federal spending in FY 2013 included the Raising the Bar Grant and the Catalyzing the Home Energy Market grant from US DOE, and State spending was almost exclusively through the RGGI Auction proceeds.
[5]Federal spending in FY 2013 included the State Energy Plan Grant from DOE, and State spending including Alternative Compliance Payment funding and the annual operating account.

Green Communities: The Green Communities program serves as a resource to all 351 cities and towns on all of their energy needs, leading them along a path of enhanced energy efficiency and development of renewable energy projects. It provides grants to designated Green Communities who demonstrate that they have met five criteria for reducing energy consumption and promoting development of clean energy. Division programs and responsibilities include:

- Green Communities designation grant management
- Green Communities support for existing and future green communities

- Grant programs for technical assistance
- Competitive grant programs for existing Green Communities
- Development of new grant programs for municipal energy reduction

Leading By Example: Through various initiatives the Leading by Example Division, works to reduce the overall environmental impacts of state government operations, particularly climate and energy impacts. It assists state facilities in reaching the aggressive targets set in Executive Order 484 for reductions in greenhouse gas emissions, energy conservation and efficiency, renewable energy, green building, and water conservation. Division programs and responsibilities include:

- Oversight of Lead by Example Competitive Grant program for state agencies and public higher education.
- Management of the Lead by Example team comprised of state facility representatives to assist in the "greening" of Massachusetts government.
- Participation with DCAM on energy related procurements and projects

Energy Markets Division: The Energy Markets Division collects data, performs research, and other activities related to energy markets including electric customer migration data and lists of competitive suppliers for electricity and natural gas. Division programs include:

- Preparation of EMIT-Energy markets database
- Research on Energy Markets Policy for DPU proceedings, and energy market analyses
- Preparation of studies as required by the Legislature.
- Notification of the latest fuel and heating oil prices and other consumer related reporting

Energy Efficiency Division: The Energy Efficiency Division develops and administers programs relative to energy efficiency. Division programs and responsibilities include:

- Oversight of Mass Save ®: Cost effective efficiency programs regulated by the DPU and overseen by the EEAC with funding derived from RGGI and ratepayer programs
- Management of the EEAC
- Implementation of the Home MPG Pilot to test virtual ASHRAE Level II auditing that can illustrate the energy performance in large office space
- Implementation of a pilot to test virtual ASHRAE Level II auditing that can illustrate the energy performance in large office space

Renewables Division: The Renewables Division develops and administers programs relative to renewable energy. Division programs and responsibilities include:

- Creation and Monitoring of the Renewable Portfolio Standard program and Solar Renewable Energy Credit (SREC) Auction
- Oversight of the biomass program including biomass certificate implementation
- Implementation of the SAPHIRE Grant program for renewable thermal at schools and public housing
- Development of a renewable thermal strategy
- Monitoring of the Alternative Compliance Payment program
- Review of distributed generation and interconnection issues
- Support of Alternative Transportation and Biofuels

MassCEC

MassCEC programs are funded by Massachusetts ratepayers through the Renewable Energy Trust Fund and expenditures by program and program description for FY 2013 are listed below.

Expenditures By Programs FY2013		
Programs	**FY13 Budget**	**Source**
Catalyst Program	$490,000.00	Renewable Energy Trust Fund*
Commonwealth Hydropower	$710,000.00	Renewable Energy Trust Fund*
Commonwealth Organics-to-Energy	$2,478,195.00	Renewable Energy Trust Fund*
Commonwealth Small Pellet Boiler Program	$266,000.00	Renewable Energy Trust Fund*
Commonwealth Solar Hot Water	$816,556.00	Renewable Energy Trust Fund*
Commonwealth Solar II	$5,197,449.00	Renewable Energy Trust Fund*
Commonwealth Wind	$1,691,340.00	Renewable Energy Trust Fund*
InnovateMass	$954,000.00	Renewable Energy Trust Fund*
Investments in the Advancement of Technology	$2,625,000.00	Renewable Energy Trust Fund*
Massachusetts Clean Energy Internship Program	$1,034,400.00	Renewable Energy Trust Fund*
Offshore Wind and Marine Energy	$1,878,767.00	Renewable Energy Trust Fund*
The Pathways Out of Poverty Program	$999,232.00	Renewable Energy Trust Fund*
Production Tracking System	$295,154.00	Renewable Energy Trust Fund*
Woodstove Change-Out	$721,202.00	MassDEP
Workforce Capacity Building	$600,679.00	Renewable Energy Trust Fund*
Solarize Massachusetts (Solarize Mass®)	$2,163,340.00	Renewable Energy Trust Fund*
Total	**$22,921,314.00**	

* For every customer of an investor-owned utility, the charge is $.0005 per kilowatt-hour, or 1/20 of a cent.

Catalyst Program: In collaboration with the Massachusetts Technology Transfer Center, the Catalyst Program's primary intent is to stimulate the commercialization of clean energy technologies developed in the Commonwealth. Awarded funds are used to demonstrate the feasibility of technologies in specific industry applications in order to obtain increased industry and investor interest.

Commonwealth Hydropower: The Commonwealth Hydropower Program seeks to increase the output of the Commonwealth's hydropower assets by providing grants for ecologically-appropriate projects that can be implemented quickly and efficiently.

Commonwealth Organics-to-Energy: MassCEC's Commonwealth Organics-to-Energy program provides funding to educate businesses and communities about organics-to-energy technologies, help communities and businesses evaluate organics-to-energy projects, and support construction of facilities that convert organic material to energy and useful organic by-product.

Commonwealth Small Pellet Boiler Program: The Commonwealth Small Scale Pellet Boiler program provides financial assistance through grants to Massachusetts residents and organizations looking to install high-efficiency, low-particulate matter (PM) wood-pellet boilers or furnaces in their homes or business.

Commonwealth Solar Hot Water: The Commonwealth Solar Hot Water Program offers rebates for solar hot water (also known as solar thermal) systems that serve residential, commercial, non-profit, and publicly owned buildings. MassCEC provides this funding to reduce the upfront cost of installing a solar hot water system.

Commonwealth Solar II: Commonwealth Solar II provides rebates for homeowners and businesses in Massachusetts who install solar photovoltaics (PV). Rebates are granted through a non-competitive application process for the installation of photovoltaic (PV) projects by professional, licensed contractors at residential, commercial, industrial, institutional and public facilities.

Commonwealth Wind: The Commonwealth Wind Program ("CommWind") assists appropriately-sited wind energy development in Massachusetts. CommWind and its predecessor programs have been providing support to electric customers and the wind development community since 2000.

InnovateMass: InnovateMass provides awards to applicant teams that offer the most innovative, cost effective, and impactful clean energy solutions to tough energy and environmental challenges. Selected teams are proving/will prove out new technologies, or combine existing technologies in clean energy demonstration projects that are scalable, have strong commercialization potential and create jobs here in Massachusetts. Demonstration project areas of focus include technologies for energy storage, building energy efficiency, wind turbine manufacturing, residential home energy management sensors, hybrid vehicles and high-efficiency solar panels.

Investments in the Advancement of Technology: MassCEC makes venture capital equity and debt investments in promising early-stage Massachusetts clean energy companies that are developing and commercializing technologies that contribute to the advancement of renewable energy or energy efficiency. Also supports innovative programs to develop clean energy financing mechanisms to allow clean energy companies to access private capital markets as they develop in this emerging industry.

Massachusetts Clean Energy Internship Program: The Massachusetts Clean Energy Internship Program, run by MassCEC and the New England Clean Energy Council (NECEC),

helps prepare the next generation of clean energy workers by connecting students and recent graduates with Massachusetts companies in need of interns. The Program supports students interested in careers in the clean energy sector, with MassCEC providing stipends for interns during fall, spring and summer sessions.

Offshore Wind and Marine Energy: The Offshore Wind and Marine Energy Program is assisting the emerging but growing offshore wind and marine energy sectors in Massachusetts. Offshore wind is the largest potential source of clean energy for Massachusetts, and offshore wind has the potential to be a significant new industry here in the Commonwealth. MassCEC is investing in Infrastructure, including the Wind Technology Testing Center and the New Bedford Marine Commerce Terminal, as well as pursuing a range of initiatives including: wind energy area planning and assessment, evaluation of economic impacts, coordinated permitted and development, workforce development, supply chain development, and research and development.

The Pathways Out of Poverty Program: Pathways Out of Poverty provides grant funding for job training programs that help low- and moderate-income earners build careers in the clean energy sector and attain financial self-sufficiency. Funding is provided for green collar job training by clean energy companies, community-based nonprofit groups, educational institutions and labor organizations throughout Massachusetts.

Production Tracking System: The Production Tracking System (PTS) is a database used by the Massachusetts Clean Energy Center (MassCEC) to track the production of renewable energy systems that are installed throughout the Commonwealth. The PTS provides MassCEC with the

information necessary to monitor and evaluate the performance of renewable energy systems and the effectiveness of its renewable energy programs.

Solarize Massachusetts (Solarize Mass®): Solarize Mass® seeks to increase the adoption of small-scale solar electricity in participating communities through a competitive tiered pricing structure that increases the savings for everyone as more home and business owners sign contracts. A successful model for bringing down the costs of solar for residents and business owners, this program has been duplicated in other state and cities across the United States.

Woodstove Change-Out: The Commonwealth Woodstove Change-Out Program assists eligible Massachusetts residents with the cost of replacing coal stoves and non-EPA-certified woodstoves or fireplace inserts, with high efficiency, low emissions woodstoves or fireplace inserts, or wood-pellet stoves or fireplace inserts.

Workforce Capacity Building: MassCEC's Workforce Capacity Building program provides funding for clean energy-centered science, technology, engineering and math (STEM) for students throughout the Commonwealth. The initiative targets Massachusetts vocational-technical high schools, colleges, universities and community-based non-profit groups to help train students for careers in the rapidly-growing clean energy sector.

III. Discussion of Required Topics

The Commission was charged with reviewing a wide array of energy topics. The report and overall discussion was broken into six topics as required by the enabling legislation. The Commission considered the following issues: (1) expanding the Commonwealth's renewable energy portfolio; (2) promoting energy efficiency; (3) encouraging business development and job creation; (4) reducing costs associated with energy programs funded in whole or in part by the Commonwealth while maximizing benefits; (5) reducing the cost of electricity for commercial, industrial and residential customers; (6) increasing electric reliability.

As the Commission considered these topics, in accordance with its mandate, its members focused on how to develop appropriate metrics to measure success and cost-effectiveness, while reviewing the economic and environmental aspects of specific programs as noted in the legislation. The Commission also reviewed the structure of the wholesale electricity market and considered issues related to economic growth, job creation and business development. Furthermore, where possible, Commission members analyzed the estimated and actual economic and environmental benefits and costs, and discussed implementation through administrative, regulatory and legislative rulemaking, while keeping in mind the importance of meeting legislative and administrative goals and requirements related to GHG reductions, energy efficiency, prices and renewable energy programs. The report henceforth will divide the issues discussed into these sections. Within each topic, there includes an overview of current conditions and a discussion of metrics.

ISSUE ONE: Expanding Renewable Energy in the Commonwealth

A. Overview

The Commonwealth has established goals for the development of a renewable resource sector for the Massachusetts economy and to encourage utilities to include non-fossil fuel generation in their energy mix. The Administration goal is to set ambitious but achievable targets for renewable energy generation. In terms of targets, the goals are 2000 MW of installed wind and 1600 MW of installed solar by 2020.

Solar photovoltaic installation has grown from 16 MW in 2009 to 327 MW as of October 2013, with hundreds of additional MW in the queue. While solar installations have surpassed the Administration's original goal of 250 MW by 2015, siting land-based wind energy has been more challenging. Currently, there are 103 MW of land-based wind installations in Massachusetts. To encourage more on-shore wind development, on July 1, 2013 the Administration announced an inter-agency initiative to support and guide municipalities, developers and stakeholders for contemplating appropriately-sited land-based wind projects. Offshore wind development has remained challenging across the United States due to several factors, including siting and cost.

Despite these challenges, the Administration is working with the industry by facilitating research that will support the federal government's offshore wind development areas leasing process, and through the Commonwealth's construction of a Marine Commerce Terminal in New Bedford that will serve as the nation's first staging area for offshore wind. From a programmatic perspective, both DOER and the MassCEC have instituted programs to encourage renewable development which are previously listed.

B. Metrics

The Commission discussed the costs and benefits of the Commonwealth's current policy landscape and recommends the following metrics to evaluate the success and cost-effectiveness of programs under the GCA.

1. The continued measurement of the development and deployment of new renewable energy generation in Massachusetts, which should include a comparison of the installed capacity and actual amount of power generated by renewable technologies in the Commonwealth over time as well as the cost and price impact of these efforts.

2. The effects of energy resource diversification in the Commonwealth following the implementation of the GCA, including price suppression impacts, price increases, reductions in price volatility, and the implied market price of electricity generated by renewable sources.

3. The reductions in air pollutants and GHGs, that are achieved by replacing fossil fuel-based generation with renewable generation. This measurement should include a cost per unit of GHG ton avoided of the various renewable technologies.

4. Calculate the system-wide benefits of electricity generated by renewable sources and compare them to the cost of encouraging investments in renewable energy resources. One Commission member has done analysis on this topic. See Appendix 4, Issue 1.

5. Business and job creation in the renewable energy sector, including the development of criteria to define a clean energy job and its associated characteristics (salary, hours, benefits, etc) and the analysis of net job development and full time employment, in comparison with other similarly situated industries. More discussion on this topic can be found in Issue Three.

6. The price of renewable project installments over time and the progress toward reaching grid parity.

7. Policy makers should continue to consider the price of electricity as it relates to all customer classes, costs and bill impacts, and how it will impact said customers' share of income or budgets

ISSUE TWO: Promoting Energy Efficiency in the Commonwealth

A. Overview

Massachusetts has been recognized by the American Council for an Energy-Efficient Economy (ACEEE) as the number one state in the nation for energy efficiency in both 2011 and 2012. This rank derives from criteria set in a scorecard by the ACEEE: utility and public benefits programs and policies; transportation; building energy codes; CHP; state government-led initiatives; and appliance and equipment standards. The 2012 ACEEE rubric scores for Massachusetts were based on several factors and the point structure is as follows: 74% of the possible points were attributable to policy issues, 16% were attributable to the size of electric and

gas program budgets and 10% were attributable to the savings performance of electric programs. Massachusetts ranked seventh in the savings performance of electric programs. The performance of gas programs is not considered by the ACEEE.

Massachusetts also ranked second in the country in the 2013 U.S. Clean Tech Leadership Index's overall clean technology rankings. It ranked first in several individual categories, including policy, which measures variables such as transportation policies and climate change targets, and the capital category, which measures venture capital investment, number of patents and higher education and research institutions. Even with these accolades the Commission considered whether the Commonwealth could meet its mandate under the GCA more effectively.

The GCA requires that the demand for electric and natural gas resource needs be satisfied first through all available, cost-effective energy efficiency and demand reduction resources. A primary driver of these efforts is the aforementioned three-year plans. There was some discussion among Commission members about the current process of the EEAC three-year plan review given the legislative timelines in current statute.

The framework for measuring energy efficiency in the Commonwealth is based on costs and benefits. As with any investment, there are initial costs, but also measurable benefits in terms of energy cost savings, benefits to program participants, and environmental benefits. Costs are relatively easy to measure and include investments in program planning, administration, marketing and advertising, incentives, technical assistance and training, evaluation, market research activities, and participant expenses. Benefits, often more difficult to measure, include but are not limited to gas and electricity savings, other resource savings such as #2 fuel oil and water, non-resource benefits such as improved thermal comfort, reduced noise, equipment

maintenance, improved home durability, increased property value, health benefits, and the overall reduction of energy collectively and its impacts for Massachusetts.

From 2010 to 2012, energy efficiency had a $1.6 billion investment with evaluated results reported by program administrators will yield $6 billion in total benefits, over the life of the installed efficiency measures. *See*, Appendix Part 3. In the 2013 to 2015 plan, the DPU has approved a total program investment of $2.2 billion is anticipated to yield total benefits of $8.8 billion, over the life of projects.

Although there is general appreciation of the importance that energy efficiency plays in achieving the Commonwealth's energy goals, the Commission explored whether impacts of the program costs have been effectively considered. There are multiple programs and ratepayer costs that may need greater transparency, including potential uncertainties which could impact overall performance results, overstating or understating the impact. Issues that were addressed through data requests included unraveling the costs of energy efficiency and other investments in clean energy as compared across utilities. Many of these issues are reflected in the positions of the Commission members found in the Appendix.

B. Metrics

Given the extent of the discussion related to energy efficiency and its delivery, the metrics in this area will reflect the importance of energy efficiency's role in achieving our energy policy goals. The Commission considered various metrics to evaluate the costs and benefits of the Commonwealth's current policy landscape and recommends using the following metrics as a framework to evaluate the success and cost-effectiveness of programs under the GCA.

1. The correlation, between energy demand reduction and the consumption peak. Commission members noted that there are multiple ways to measure the impact, particularly the relationship between energy consumption and annual peak demand. As annual energy consumption increases, energy efficiency measures have been recognized by the ISO-NE as playing a role in reducing the peak. In its summer forecast for 2013, the ISO-NE acknowledged the role that energy efficiency has played in reducing its forecasted need for new generation capacity.

2. Reductions in air pollutants and GHG that are achieved through energy efficiency. This measurement should include a cost per unit of GHG ton avoided of the various energy efficiency efforts.

3. The price of electricity as it relates to all customer classes, costs and bill impacts, and how it will impact said customers' share of income or budgets and the correlation of energy efficiency activities.

ISSUE THREE: Encouraging Business Development and Job Creation in Massachusetts

A. Overview

Massachusetts has placed a particular focus on the development of a robust clean energy industry. The Green Jobs Act established the MassCEC which has a broad mission of accelerating the successful growth of clean energy technologies, companies and programs in the Commonwealth. Unlike other agencies in the Commonwealth, MassCEC is a publically-funded agency with its own board of directors and a dedicated funding stream from the renewable

energy system benefits charge. MassCEC programs and budget can be found earlier in this report.

The Commission focused on the MassCEC's role in growing Massachusetts clean energy economy and particularly the 2012 Clean Energy Industry Report (the 2012 Jobs Report), which was the most recent report available for much of the discussion.[13] According to the 2012 Jobs Report, Massachusetts clean energy employment grew at 11.2 percent from 2011 to 2012, with 4,995 clean energy firms and 71,500 clean energy workers, or 1.7 percent of all workers in Massachusetts.[14] Several Commission members discussed the interpretation of employment and growth made in the Jobs Report, citing the fact that the report did not use a "full-time equivalent" measure of employment as a definition. There was a suggestion that the 1.7 percent could imply a total workforce of 4.2 million, whereas 3.2 million civilian workers were employed in Massachusetts in 2010 according to U.S. Census data.[15] Particularly, discussion around the impact of federal policies, including the impact American Recovery and Reinvestment Act of 2009 (ARRA), may have had on the industry. For example, the 2012 Jobs Report showed that

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[13] Section 5 of Chapter 23J requires MassCEC to annually submit to the governor, the joint committee on telecommunications, utilities and energy, the joint committee on economic development and emerging technologies and the senate and house committees on ways and means a report detailing the commonwealth's clean energy sector. Under that section "the report shall include, but shall not be limited to, an examination of the growth rate of the commonwealth's clean energy sector, including the number of in-state jobs and businesses." M.G.L. c. 23J, §. 5.

[14] The 2011 Massachusetts Clean Energy Industry Report established a 2010 employment baseline against which annual growth would be measured. This baseline was estimated based on survey responses regarding how many clean energy workers were employed as of July 2010.

[15] The 11.2 percent growth rate was also discussed and there was a suggestion that the report statement of 16 percent of those jobs are existing positions that have had new clean energy responsibilities added.

the Installation and Maintenance sector declined by 11.7% from 2011 to 2012 while other areas grew during that time period.

On September 17, 2013, MassCEC released a subsequent report, the 2013 Clean Energy Industry Report (2013 Jobs Report). [16] This report showed that the clean energy industry continued to grow during 2012-2013, at a rate of 11.8 percent over that year. The report showed there are currently 5,557 clean energy firms and 79,994 clean energy workers in the industry, which represents 1.9% of total workers in the Commonwealth. This growth occurred across all measured activities, and across all regions of the Commonwealth.

Each of MassCEC's Jobs Reports defines a clean energy worker as "someone spending at least a portion of their time supporting the clean energy aspects of their business." This approach is intended to capture the breadth of clean energy employment in the Commonwealth. A clean energy firm is defined as an employer engaged in whole or in part in providing goods and services related to renewable energy, energy efficiency, alternative transportation, and carbon management. In part, due to Commission discussion, the MassCEC was able to modify the 2013 Jobs Report to quantify the number of clean energy workers in three ways: 1) those that spend any portion of their time on clean energy 2) those that spend at least 50 percent of their time on clean energy; and 3) those that spend 100 percent of their time on clean energy. The results indicated that a significant majority of the 79,994 workers are spending most of their time on clean energy activities. Specifically, 79% spent all of their time doing so. The 2013 Jobs

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[16] *See*: http://images.masscec.com/uploads/attachments/2013/09/MassCEC_2013_IndustryRpt.pdf

Report was released later in the Commission's process, therefore it received less attention than the 2012 Jobs Report.

The MassCEC responded to several information requests regarding responses received from surveys performed for the 2012 Jobs Report and some members of the Commission expressed opinions about the impact of the Commonwealth's clean energy policies on job growth. *See*, Appendix, Part 5.

B. Metrics

The Commission discussed the costs and benefits of the Commonwealth's current policy landscape and recommends the following metrics to evaluate business development and job creation in Massachusetts with regards to energy policy.

1. Business creation, expansion and job growth in the clean energy sector. Commission members expressed that this analysis be done as is done with other high technology sectors in the Commonwealth, which are also the focus of particular growth policies, such as life sciences, communications, information technology and software. Within this measurement, the following data points are recommended:
    a. Number of businesses in the Massachusetts clean energy sector, defined as an employer engaged in whole or in part in providing goods and services related to renewable energy, energy efficiency, alternative transportation, and carbon management.
    b. Definition of a clean energy job and its associated characteristics (salary, hours, benefits, etc). The Commission suggests a comparison with similar situation industries such as those in technical fields and early stage companies.

c. Number of clean energy workers by industry segment, including energy efficiency, renewable energy, carbon management, and alternative transportation.

d. Number of clean energy workers by activity type, including sales and distribution, installation and maintenance, engineering and research, manufacturing and assembly, and support services.

e. Amount of taxpayer and/or ratepayer support that the industry receives, so that a cost per job created metric can be calculated and compared with other industries receiving similar support.

2. Job creation and maintenance in light of diminishing federal funding, such as ARRA. This metric may indicate how many new clean energy jobs are attributable to state or federal funding.

3. Measurement of workforce development and job training programs should continue to be measured by participation numbers, completion rates, and the definition of long-term success.

4. The impact of energy prices, including price volatility and other factors, on economic development Massachusetts versus other states, particularly those with lower energy costs should be considered.

ISSUE FOUR: Reducing Costs Associated with Energy Programs While Maximizing Benefits

A. Overview

The underlying question for the Commission is whether the Commonwealth's energy policy with all its multiple facets, in particular, energy efficiency and renewable energy, is delivering an effective product to a broad sector of the energy consuming public. Over the years, policymakers have utilized a set of cost/benefit metrics, in part determined by the DPU and in part determined by intense stakeholder processes. Some members of the Commission expressed concern that the development of programs remains uncoordinated, is based on subsidies, too little third party verification of results, and favors certain technologies. Other members considered the Commonwealth's energy policies to be built upon rigorous analysis of costs and benefits, intense stakeholder processes, a focus on resource diversity, GHG emission reductions, successful national leadership on energy efficiency, and a forward looking emphasis on clean technologies.

Commission members sought to gain an overview of the energy programs that impact ratepayers from discussions, presentations, and information requests. *See,* Appendix, Parts 3 and 5. In responses to data requests, DOER and the DPU provided an overview of the available information related to all the charges attributed to energy efficiency and renewable energy policy. *See,* Appendix, Part 3. Although some Commission members sought even more granular data on specific measures relating to the implementation of energy efficiency programs at the utility level, some of this information was unavailable because it was based on contracts between the utilities and private contractors.

The Commission discussed ratepayer funded energy efficiency activities. The ability of this Commission to produce a detailed cost/benefit analysis of energy efficiency program performance was limited; however, some members recognize that much of this work is performed under the purview of the EEAC.

B. Metrics

The Commission discussed the current policy landscape and recommends the following metrics to evaluate costs and benefits of energy programs in the Commonwealth.

1. Program costs and benefits should be measured and tracked. This includes continuing to review and improve oversight mechanisms already in place to ensure costs are managed effectively and benefits to customers are realized. An analysis of the 2012 Mass Save ® Home Energy Services program was compiled individually by a Commission member. See Appendix 4, Issue 4.

2. Programs should strive for transparency and simplicity, whenever possible. This includes oversight mechanisms and an ease of access to varying levels of detailed information.

3. Progress towards the Commonwealth's policy goals, including reduction of GHG emissions, measurable reduction in peak consumption, and whether there is a functioning competitive marketplace at the wholesale level should continue to be measured.
4. Policy makers should consider establishing an administrative mechanism or body to reconcile conflicting policy goals set by the legislature.

5. Policy makers should continue to leverage outside funding opportunities, including federal funds, whenever possible.

ISSUE FIVE: Reducing the Cost of Electricity for Commercial, Industrial and Residential customers

A. Overview

Reducing the price of electricity requires a broad understanding of many exogenous variables contributing to energy costs which are internalized in the ratemaking process. Investments in energy require a steady approach so that stakeholders have some degree of price stability. The issue of reducing electricity costs for customers draws upon the linkage between the wholesale and retail electric market place and whether the restructuring of the electricity market has reduced electricity prices over the last 15 years. The role of the ISO-NE is critical here because it establishes the market rules. These are very complex, and include issues related to bulk reliability, capacity constraints, dispatch of generation and available resource mix. The DOER, in consultation with the AGO, is currently reviewing this topic and plans to release a report. Over half of New England's generation is currently reliant on natural gas as fuel. However, like all commodities, natural gas prices are subject to external events and market forces.

The Commission discussed the importance of continuing the Commonwealth's policy of promoting fuel diversity. The Commonwealth will continue to be a net importer of natural gas. Because our electricity market is regional, the New England states under the New England Committee on Electricity (NESCOE) have undertaken a major study on natural gas expansion

which will contain comparative data with other fuels.[17] Decisions made about increasing the capacity of natural gas infrastructure in the region will likely impact Massachusetts energy prices.

Other regionally made decisions will also impact the price for electricity customers. Hydroelectric generation has long been recognized as a cheaper, renewable resource. Massachusetts relies largely on small scale hydro resources (to qualify for the RPS they must be certified by the low-impact hydropower institute and not exceed 30 MW) and larger hydro facilities located in Canada; including in Quebec, Labrador, Newfoundland, and the Maritime Provinces. In Massachusetts, hydro power is considered a clean and renewable resource; however, large scale hydro is not a developing resource that requires subsidies through receiving RECs. Since significant hydro power resources are located outside of Massachusetts, large scale transmission costs need also to be considered when evaluating hydro resources or other alternatives.

It is widely recognized that diversification of resources is a hedge against variable costs and price volatility of energy commodities. Any discussion related to costs to customer classes, needs to consider infrastructure replacement, grid modernization, and a number of other related issues. While the Commission highlighted these as ongoing issues, there was not in-depth analysis undertaken.

Having framed the expansive issues related to energy costs in the Commonwealth, the challenge for the Commission was to perform a high level review of costs from a programmatic

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[17] *See*: http://nescoe.com/uploads/Release_Notice_Phase_II_4.19.13.pdf

and operational perspective. Thus, prior sections of this report have addressed specific components. Rather than repeat the issues and arguments involved, it made sense to develop metrics which will enable others to consider these topics in greater detail in the future.

B. Metrics

The Commission discussed the Commonwealth's current policy landscape and recommends the following metrics to evaluate reducing the costs of electricity for certain customer classes.

1. Cost-effectiveness of energy efficiency for C&I customers, including consideration of system-wide benefits, in comparison to potential rate increases.

2. Rate impact of net metering, distributed generation, and other similar behind the meter measures on different rate classes, both in the short term and over time as part of a cost benefit analysis. One example is the potential for innovative technologies to proliferate in some rate classes but not others given current energy economics and policy environment.

3. Impact of resource diversification, particularly an increase in renewables and the enhancement of the solar goal, on various rate classes. Take into account the dependency on natural gas for powered generation and imports of large hydro in light of transmission uncertainties and costs.

4. Consideration of both electricity costs and bills for all customer classes in terms of a customer's income and the impact of electricity on residential budgets.

5. Measurement of how the development of on-site generation (CHP), wind, solar will impact the cost of electricity for those who still have to pay to maintain the distribution and transmission network as the customer size fluctuates.

ISSUE SIX: Increasing Electricity Reliability

A. Overview

As discussed above, issues relating to grid reliability involve multiple aspects. Drivers of reliability under current market conditions include: fuel diversity, gas/electric dependency, and the peak demand. The current regional wholesale market is premised on the notion of allocating greater amounts of risk to generators, to minimize the cost of producing electricity and to use the market to assure capacity through the Forward Capacity Market (FCM). There are three components of the wholesale electricity market, where energy generated is bought and sold to meet the region's demands: (1) the energy market; (2) the FCM; and (3) the Ancillary Services Market. The FCM is where resources are financially rewarded for being available to deliver energy during specific time periods. Ancillary services ensure that the capacity can be activated when needed under a range of operating conditions.

There are two other technical aspects to the system: (1) daily auctions for power; and (2) actual dispatch of the power. Participants in the daily auctions include large energy consumers, power plant owners and financial traders. Each hour of power has a different price associated based on the total system demand. The object of dispatch is to minimize the price of production while keeping the system in balance. Certain generators are "must run," which means that they are required to generate for reliability or some other system or technical need, while others run

based on their price to generate. The market clearing price is based on the price bid with respect to the last generating unit needed to meet demand. Additional issues are related to constraints, whether in terms of transmission or whether portions of the system have adequate resources to fulfill demand.

As bulk reliability falls under the purview of the ISO-NE, the state plays an indirect role in assuring reliability. The DPU regulates IOUs that must procure power for firm customers, maintain and operate distribution lines, and meet the mandates established by law and regulation. The Energy Facilities Siting Board (EFSB) works to appropriately site jurisdictional energy facilities including power lines, power plants and pipelines. Moreover, through policies including enabling all cost effective energy efficiency to play in the energy market, allowing demand response to shave energy consumption peaks, encouraging fuel diversity, addressing the gas/electric dichotomies at the regional level, the Commonwealth is able to address reliability.

B. Metrics

The Commission discussed the Commonwealth's current policy landscape and recommends the following metrics to evaluate reliability in the Commonwealth.

1. The most significant metric for electricity reliability is to assure the power system has sufficient resources to meeting the Commonwealth's demand. On the supply side, there needs to be adequate and appropriate resource diversification as well as generation capacity. Although reliability and price are considered separate issues, metrics related to price and cost affect considerations through this entire report. For example, price volatility and issues surrounding the energy peak will impact reliability.

2. The cause of outages on a local distribution level, related to for example equipment failure and to storm events should continue to be measured and analyzed. This includes annual data on mean duration of outages, other Service Quality metrics; and utility budgets for system maintenance/prevention. *See*, Service Quality docket, DPU 12-120. There needs to be adequate infrastructure in place to meet deliverability.

3. Energy stakeholders - whether generators, electric utilities, or customer- should continue to support innovation and work upon the issues identified in the DPU's grid modernization docket.

IV. Conclusion

In order to have a vibrant economy and sustainable environment, the Commission believes Massachusetts should continue to further strive to meet the following tenets: accessible and transparent data, harmonize and prioritize overlapping or conflicting state energy goals, seek ways to achieve goals in a cost-effective manner including through effective policy and open and competitive markets, continue to actively engage the public and interested stakeholders, and maintain and encourage a variety of programs to target all potential participants.

This Commission is required to reconvene after July 1, 2017 and shall submit a second report along with any recommendations no later than July 1, 2018.

APPENDIX

Part 1: Enabling Legislation

Acts of 2012: Chapter 209, Section 41

SECTION 41. (a) There shall be an energy policy review commission established to research and review the economic and environmental benefits, as well as, the economic and electricity cost implications of energy and electricity policies in the commonwealth. The commission shall report to the legislature recommendations on how to: (i) further expand the commonwealth's renewable energy portfolio and promote energy-efficiency; (ii) encourage business development and job creation; (iii) reduce the costs associated with energy programs funded, in whole or in part, by the commonwealth, while maximizing the benefit of these programs; (iv) reduce the cost of electricity for commercial, industrial and residential customers; and (v) increase electricity reliability.

(b) (1) The commission shall consist of 9 members: 1 of whom shall be the secretary of energy and environmental affairs, who shall serve as chair; 1 of whom shall be the attorney general or a designee; 1 of whom shall be a person appointed by the Associated Industries of Massachusetts; 4 of whom shall be persons who are experts in energy efficiency or renewable energy generation, 1 of whom shall be appointed by the speaker of the house of representatives, 1 of whom shall be appointed by the president of the senate, 1 of whom shall be appointed by the minority leader of the house of representatives and 1 of whom shall be appointed by the minority leader of the senate; and 2 of whom shall be appointed by the governor, 1 of whom shall be a representative of a Massachusetts energy efficiency business with 10 or fewer employees, and 1 of whom shall be a representative of an institution of higher education and who is also an expert in the structure of the regional wholesale electricity market. A vacancy in the commission shall be filled in the manner in which the original appointment was made.

(2) The members of the commission shall receive no compensation for their services.

(3) The powers of the commission shall include, but not be limited to: (i) using voluntary and uncompensated services of private individuals, agencies and organizations as may be offered or needed; (ii) recommending policies and making recommendations to agencies and officers of the commonwealth and local subdivisions of government to effectuate the changes outlined in subsection (a); (iii) enacting by-laws for the commission's own governance; and (iv) holding regular public meetings, fact-finding hearings and other public forums as the commission considers necessary.

(4) The commission may request from all state agencies such information and assistance as the commission may require. The commission may also request such information from companies and organizations with state contracts that provide services relative to the scope of the commission.

(5) The commission shall issue a report which shall include, but not be limited to, an analysis of the estimated or actual economic and environmental benefits, as well as, economic cost, electricity cost and implication for electricity reliability of: (i) implementing administrative, regulatory and legislative rulemaking as it pertains to electricity and the structure of the wholesale electricity market; and (ii) meeting legislative and administrative goals and requirements related to greenhouse gas reductions, energy efficiency and renewable energy generation.

(6) The commission shall, at minimum, research, evaluate, consider and report on: (i) determining consistent metrics to be utilized to evaluate the success and cost-effectiveness of programs under chapter 169 of the acts of 2008; (ii) the associated economic and

environmental impact of scheduled increases in demand resources, aggregate net metering capacity and renewable energy capacity; (iii) the structure of the regional wholesale electricity market and its impact on retail electricity costs; and (iv) the overall impact of the commonwealth's energy and electricity policies on economic growth in the commonwealth, specifically net job creation and business development, establishment and retention.

(c) (1) The commission shall consult with electric distribution companies, natural gas distribution companies, green businesses residing in the commonwealth and other interested parties, providing at least 1 opportunity for public comment, as well as, the public review of the commission's draft report prior to filing the report with the general court.

(2) The commission shall convene its first meeting by November 1, 2012 and shall submit its report, along with any recommendations for legislative or regulatory reforms, not later than July 1, 2013 with the clerks of the house of representatives and the senate who shall forward a copy of the report to the house and senate chairs of the joint committee on telecommunications, utilities and energy.

(3) The commission shall reconvene after July 31, 2017, under this section, and shall submit a second report, along with any recommendations for legislative or regulatory reforms, not later than July 1, 2018 with the clerks of the house of representatives and the senate who shall forward a copy of the report to the house and senate chairs of the joint committee on telecommunications, utilities and energy.

Part 2: Public Comment

As mandated by the Legislature, the Energy Policy Review Commission accepted public comments on the subjects being considered by the Commission, from May 2 through May 17, 2013. The Commission posted a public notice on the EOEEA website and sent out an email requesting comments to over 2000 identified stakeholders. The Commission received feedback from various members of the community, including approximately 25 written comments. This section is critical in assessing opinions from stakeholders outside the Commission, and provides a holistic context to the important challenges the Commonwealth must consider.

The Commission also held a second comment period on the draft of this Report, which was held October 18 – 28, 2013.

See First Period of Comments: http://www.mass.gov/eea/energy-utilities-clean-tech/energy-policy-commission/public-comments.html

See Second Period of Comments: http://www.mass.gov/eea/energy-utilities-clean-tech/energy-policy-commission/public-comments.html

Part 3: Presentations

1. Benefits, Costs and Rates: the Role of the DPU

   By: Commissioner Ann Berwick, Chair, Commissioner Jolette Westbrook, and Commissioner David Cash, DPU on January 17, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-01-17-dpu-overview.pdf

2. DOER Overview of Energy Policies

   By: Birud Jhaveri, Director of Energy Markets, Christina Halfpenny, Director of Energy Efficiency, and Braem Claeys, Renewable Energy Project Coordinator, DOER, on January 17, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-01-17-doer-energy-policy.pdf

3. Massachusetts Clean Energy Center & 2012 Clean Energy Industry Report Overview

   By: Alicia Barton, CEO, MassCEC on February 1, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-02-01-masscec.pdf

4. Energy Policy Review Commission

   By: Robert Rio, Associated Industries of Massachusetts, on February 22, 2013.
   See, http://www.mass.gov/eea/energy-utilities-clean-tech/energy-policy-commission/meetings-schedule.html

5. An Energy Portfolio for Massachusetts

   By: Robert Kaufmann, Full Professor at Boston University, on March 8, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-03-08-kaufmann.pdf

6. Impact of Renewables and Efficiency on Consumer Bills

   By: Sandra Merrick, Assistant Attorney General, on March 20, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-03-20-ag.pdf

7. Energy Efficiency: Benefits and Costs, & Program Performance

   By Thomas J. Regh, Progressive Energy Services LLC, on April 3, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-04-03-regh.pdf

8. Energy Efficiency: A Look Into Costs and Benefits

   By Christina Halfpenny, Director of Energy Efficiency, DOER, on April 3, 2013.

See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-04-03-doer.pdf

9. Working to Expand and Promote Energy Efficiency

   By: Kevin Galligan, Cape Light Compact, Program Administrators, on April 3, 2013.
   See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-04-03-pa.pdf

10. Energy Reliability, Costs, and the Regional Market

    By David Cash, DPU Commissioner, on April 17, 2013.
    See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-04-17-dpu.pdf

11. Energy Efficiency Concerns

    By Thomas J. Regh, Progressive Energy Services LLC, on May 1, 2013.
    See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/regh-may1-revised.pdf

12. Massachusetts Global Warming Solutions Act and The Clean Energy and Climate Plan for 2020: An Overview

    By Aisling O'Shea, EEA Global Warming Solutions Manager, on May 1, 2013
    See, http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-env-may-1-2013.pdf

Part 4: Position of Commission Members

1. The Executive Office of Energy and Environmental Affairs (EOEEA)

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October 28, 2013

Barbara Kates-Garnick, Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
Energy Policy Review Commission
100 Cambridge Street, 9th Floor
Boston, MA 02114

RE: Energy Policy Review Commission

Dear Undersecretary Kates-Garnick,

The Department of Energy Resources ("DOER") appreciates the opportunity to formally comment on the work of Energy Policy Review Commission ("Commission"), as created by Section 41 of an *Act Relative to competitively priced electricity in the Commonwealth* (ch. 209 of the Acts of 2012), including its draft report. As you know, DOER is grateful to have participated in a number of Commission meetings over the past few months, in both presentations and discussions. DOER applauds the Commission for its hard work and determination during this process.

While DOER recognizes that the body of the report represents a summary of the issues presented to the Commission and that the comments offered in the appendix of the report represent those ideas of the individual members, rather than the Commission itself, DOER finds it will be helpful to the Commission to comment on the entire draft report document, including the comments in the appendix.

Energy Efficiency Programs

Massachusetts energy efficiency programs are a proven leader in the field, having twice been named by the American Council for an Energy Efficient Economy (ACEEE) as top of the country's State Energy Efficiency Scorecard. Spending on energy efficiency programs displaces several billion dollars in spending on energy supply, generation, transmission, and distribution.

DOER agrees with the Commission's finding that energy efficiency programming could benefit from greater transparency. Having identified this need independently, the Energy Efficiency Advisory Council (EEAC) is in the process of extensive discussions and planning for a statewide energy efficiency database with the goal to dramatically improve the transparency and access to program costs and benefits.

DOER agrees with the Commission that the metric for energy efficiency should include consideration of system-wide benefits (page 40). DOER notes that while many of the factors included in the analysis of the cost effectiveness of a measure of the program are relatively well understood, there is an exception. The lack of consensus on the avoided cost of the damage that future GHG emissions would cause to the economy, general health and welfare and the environment prevents the evaluation of the true cost effectiveness of many of the efficiency, fuel switching and renewable measures and programs.

DOER, along with the EEAC, strives to grow the success of existing ratepayer energy efficiency programs. In that vein, DOER notes that while many of the metrics offered in the comments of Progressive Energy Services, LLC ("PES") would be and are helpful to the EEAC in planning programs, the data offered in support of the recommended metrics is faulty. The comments, however, disproportionately focus on one residential sector program in the ratepayer funded energy efficiency programs. Drawing conclusions about the health of the Commonwealth's energy policy portfolio based on such a proportionally small (albeit important) part would lead to fundamentally flawed results.

The Commission may find it helpful to understand these clarifications of data presented in the comments of PES. Energy efficiency program administrative costs in Massachusetts are challenged as being costly (p. 70), when regional data suggests that $.70 in customer incentives per energy efficiency dollar spend is a reasonable and responsible ratio.[1] New York, where both NYSERDA and their utilities run programming (p. 75), which has the lowest regional ratio, only gives customers $.50 per dollar.[2] In Massachusetts, this ratio has helped implementation rates, volume of participants, and savings increase dramatically (p. 70).[3] As legislators consider the proposed oil SBC, it should be noted that according to the Federal Energy Information

[1] See Northeast Energy Efficiency Partners Regional Energy Efficiency Database Expenditures as a Percent of Total Cost table at http://www.neep-reed.org/Focus.aspx
[2] Id.
[3] See Massachusetts 2010-2012 Energy Efficiency Investment Plan and supporting documentation at http://ma-eeac.org

Administration, 32% of Massachusetts homes heat with oil, not 51% as noted on p. 83. Further, a total of 37% of home heat with all unregulated fuels.[4]

An additional concern raised by PES comments cited the discriminatory nature of the non-compete statute (MGL c.25A, section 14a) for energy conservation projects for state and municipal projects with a total project cost under $100,000. The creation of this statute allows public entities to use vendors who have already been competitively selected, removing one step otherwise required by statute. Experience shows that public entities are more likely to maximize the use of utility incentives if working with utility vendors, who have been vetted and deemed qualified. Further, vendors can participate in the utility program to offer the services and gain a pool of potential new clients.

This provision has been a great tool in increasing participation in utility energy efficiency programs while streamlining project implementation. During ARRA, 66 projects were completed at state facilities using this provision, with more than $3M in total project costs and while accessing $1.4M in utility incentives and now is a huge part of the Accelerated Energy Program (AEP). In addition, Green Communities have accessed this provision for more than 50 projects, including lighting, HVAC systems, energy system controls, and weatherization while accessing utility incentives.

Distributed Generation

DOER manages an expansive program of renewable energy development, including the Renewable Portfolio Standard and its Solar Carve-Out, the Alternative Energy Portfolio Standard and assists in the development and management of distributed generation ("DG"). The Commission's examination of Issues Five and Six in their report focus on reducing the cost of electricity and increasing electric reliability. DOER's experience, in addition to numerous studies, show how, when sited and interconnected appropriately, DG can generally be a net-benefit. Additionally, further integrating DG into system planning, through grid modernization and other efforts, can better optimize benefits through increased system resiliency.

In recommending and applying metrics in these two Issues, the Commission should consider that both common and innovative distributed generation technologies can have negative or positive impact on non-participants, depending heavily upon the application of existing codes and standards and relying upon the entities responsible for suitable interconnection. Indeed, it is the utility engineer's job to ensure there will be no adverse impact on safety, reliability, or power quality. But, more can be done to focus on locations and technologies that can provide system hardening, increased remote visibility, and speedy recovery capabilities.

Furthermore, customers with DG pay their share when they connect to the grid. Traditionally, customers installing DG are required to pay for whatever distribution system upgrades are

[4] http://www.eia.gov/state/print.cfm?sid=MA

required to guarantee against adverse impact on reliability or safety. Such upgrades to antiquated system elements not only ensure other customers will not be impacted, they can lead to location specific benefits that will be experienced by the mix of rate classes being served by the specific distribution system element, whether it's at the substation, line section, feeder, or circuit levels. Such benefits can include reduced outages, better power quality, and speedier recovery from outages at no cost to non-participating customers. But, only when there are concerted efforts among the various stakeholders can we expect full integration of DG to provide maximum value to ratepayers.

Information Requests

As noted in the report (see pages 17-19), DOER is responsible for a number of leading renewable energy and energy efficiency programs. In response to information requests from several Commission members, DOER produced a series of expenditure spreadsheets, including a comparison of rate payer expenditures vs. tax payer budgets. This information was also presented to the Commission by DOER officials at a number of meetings which allowed for follow-up information to be offered.

In addition to the information provided specifically for the Commission, DOER advised the group of no fewer than 5 annual expenditure and budgetary reports that DOER is required to complete, including those for Green Communities and Renewable Energy programs. Further, it was noted, every dollar that flows through the state accounting system is available for the public to view and research on "Massachusetts Open Checkbook" on the mass.gov website. Tracking spending and measuring that spending against our objectives is part of DOER's management process.

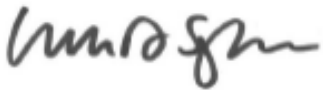
In response to information requests, DOER provided in great detail the data in its control. As noted in the report (page 36), some of the data requested stems from contracts among non-state parties and therefore not available to DOER. Despite that, there are voluminous reports from energy efficiency Program Administrators filed annually. Additionally, the Energy Efficiency Advisory Council publishes an annual report which provides spending details and associated benefits. Finally, specific costs associated with renewable purchasing by distribution companies is contained in rate recovery dockets at the Department of Utilities. Aggregated compliance costs for the RPS and APS programs are generally contained in an annual report from DOER, as noted to the Commission.

DOER is unclear as to the request made for a presentation about the reclassification of waste energy from Class II to Class I. DOER revised the regulations for Class I in June, with public hearings held in March and July, with no discussion of waste energy. DOER intends to open a rulemaking process to update Class II by the end of 2013; a public hearing will be held as part of the rulemaking, with the ability to query the status of the waste energy program.

A member of the Commission requested that expenditure data include a number of metrics and labels that have not previously been applied to this spending information. We are constantly looking to refine our expenditure reporting to ensure that the data is as useful to our internal policy development as it is to overall public spending transparency. We look forward to the commission's recommend framework for reporting standards.

DOER again thanks the Commission for its efforts, particularly its fresh perspective on the breadth of energy policies in the Commonwealth. DOER stands ready to offer continuing support of these efforts.

Sincerely,



Mark Sylvia
Commissioner

2. Tom Regh, Progressive Energy Services, LLC

General Comments

Before presenting my opinions later in this Appendix, I believe it is appropriate and useful to introduce my background and credentials. I received my bachelor's degree in electrical engineering in 1985 from Rensselaer Polytechnic Institute, and my Master's Degree in electrical engineering in 1992 from Worcester Polytechnic Institute. I had a 23 year career in electronic product development, working in both the defense industry and the private sector. The most significant accomplishment during that period was to open and staff a new product development center in Montreal, and to serve as its General Manager, with a staff of 65 engineers, software developers, and technicians, and an annual operating budget of $5M. In 2008, I started my own company, Progressive Energy Services LLC.

Progressive Energy Services provides comprehensive energy assessments and implements building envelope improvements for residential and small commercial customers, based upon a whole-house approach. I have been certified by the Building Performance Institute as a Building Analyst and Envelope Professional since January 2009, and I am a certified Level 1 Thermographer. I regularly attend regional and national Affordable Comfort Inc (ACI) home performance conferences to hone my understanding about building science, and I have completed the state's Weatherization Boot Camp Training as well as installer training from National Fiber, a local cellulose insulation manufacturer. I have completed numerous installations within the framework of the Massachusetts utility-sponsored energy efficiency programs (i.e. MassSave), however, I elected to discontinue my participation in that program in 2011, when significant program changes were implemented. I continue to successfully operate my business, despite a significant competitive disadvantage, in that I am not able to offer the

generous 75% financial program incentives to my customers. Progressive Energy Services serves a unique base of customers who are seeking high performance solutions, comprehensive diagnostic testing, deep energy savings, meticulous craftsmanship, and excellent customer service. Progressive Energy Services has a straight "A" rating from our Angie's List customers, and is the recipient of their coveted Super Service Award. The fact that I have been able to continue my business, in direct competition with MassSave, is a testament to the fact that energy assessments and building envelope improvements are not a commodity service, and that the existing MassSave limited program offering is not a good fit for some customers.

Fair competition and customer choices represent core American values. The marketplace for energy efficiency and related services must be open to all ratepayers and qualified businesses. It must be based upon the well accepted notion that free competition results in the greatest variety of products and services, the lowest prices, and highest quality. Any monopoly or restraint of free trade, especially the establishment of fixed prices, must be rejected. It is important to note that the customer base for energy efficiency products and services represents a diverse set of consumers, ranging from novices to savvy early-adopters. All consumers of electricity and gas contribute financially to support these programs, and therefore, a variety of programs must be available to suit the needs of all. While the existing programs clearly suit some customers, contractors, and other stakeholders, they are not adequately capturing a segment of the market characterized by large retrofit projects with significant customer financial contributions and deep energy savings. Additional programs must be developed, launched, and evaluated, and existing program modifications and improvements must be implemented, if MassSave is to be able to deliver on the aggressive savings targets established in the 2013-2015 Three Year Energy Efficiency Plans while minimizing the financial impact to ratepayers.

Challenges

The Commission worked diligently to produce a quality report. Because of a diversity of opinions by Commissioners themselves, consensus was not achieved in many cases. Rather than presenting both sides of each issue within the main body of the report, the resolution was to publish the positions of each Commissioner in this appendix.

The Commission faced several challenges due to process issues, which I believe likely impacted its ability to fully meet its mandate, as follows:

- The Commission was chaired by a member of the administration, which impacted the ability of the Commission to perform an independent unbiased review of state energy policy.
- One Commission seat was never appointed, and full attendance at Commission meetings seldom occurred.
- The Commission had no authority to encourage cooperation from government agencies, utilities, or program vendors, resulting in some data requests not being completely addressed.
- The Commission was established without any supporting budget. Funding would have proven useful for hiring independent consultants, or collecting data from non-governmental entities. This would have enabled a comparison between Massachusetts programs and policies, and those of other states.
- The Commission members did not receive any compensation for their time and effort. I believe this limited the level of activity that could be expended by each member.
- The Commission charter was very broad, making it difficult to staff the Commission with experts across all topics.

- The frequency and duration of the initial meetings was not sufficient to foster debate and discussion.

ISSUE ONE: Expanding Renewable Energy in the Commonwealth

1. Elliott Jacobson, Action, Inc.

Any analysis of renewables should include long-term contracts and benefits, as well as short-term dollar costs. Benefits include non-energy benefits such as those the DPU reviews with respect to energy efficiency, and also the statutorily-recognized benefits of cleaner air, reduced GHGs, and economic development (jobs). Consideration should also be given to the hedge value against the likelihood of increased natural gas prices as: the US joins a very expensive world gas market (scheduled by the President to occur by 2020, seven years from now), environmental regulation of fracking becomes stricter, and gas production and reserves turn out to be less than now projected. It should be noted that the LEAN network has been operating renewable programs for nearly a decade, funded by the systems benefit charge administered by the Clean Energy Centre and its predecessor, which earmark an equitable level of programming proportionate to fund contributed by low-income ratepayers. LEAN has successfully leveraged this funding with, for example, DOE funding. The principle of equitable low-income funding should apply to all current and future renewable funding.

2. Robert Kaufmann, Boston University

The Green Community Act sets increasing higher targets for the generation of electricity from renewables sources, including photovoltaics (PV). Achieving these targets will generate a variety of benefits, such as reducing greenhouse gas emissions and increasing the diversity of electricity supply. Here, I describe preliminary estimates for the economic benefits to the grid,

specifically, the reduction in the wholesale price of electricity caused by PV. PV lowers the wholesale price of electricity because generation is positively correlated with period of high demand and therefore, high prices. By increasing generation during periods when prices and demand, fewer high-cost generating units are dispatched, which lowers the price. This reduction in price lowers costs for all those who purchase electricity from the grid, including those who do not have PV.

Estimating these costs savings proceeds in six Steps. In the first step, I generate hourly estimates for the quantity of electricity generated by PV in the Boston region. These estimates are used to estimate what demand would have been if there were no PV capacity in the second step. In the third step, I estimate a statistical model for the relation between demand and price for the Boston region. In the fourth step, this relation is used to estimate the price of electricity under existing conditions and the case in which there is no PV capacity. Next, the difference in price is multiplied by demand to calculate hourly savings. Finally, these savings are summed over the year to estimate grid-wide savings.

The results indicate that PV generation generates considerable benefits for in the consumers in ISO-New England region that supplies Boston during 2012. During 2012, hourly generation of PV power was correlated with hours with high demand and high prices such that the implied market price for electricity generated from PV is 10.7 percent higher than the average price for dispatchable power. This higher value had the net effect of lowering electricity prices by 0.23 percent during 2012. This 0.23 percent represents a total savings of $2.13 million.

This result is preliminary. Further analysis will examine the effect of PV on electricity prices and savings in the other ISO New England regions in Massachusetts, and for years 2010-2013.

Finally, these savings can be compared to the cost of REC's to measure on aspect of efforts to increase the generation of electricity from PV in the state of Massachusetts.

3. Bob Rio, Associated Industries of Massachusetts, Inc.

AIM believes that expanding renewable energy opportunities in Massachusetts is important for several reasons, including diversifying our energy resources, reducing our climate impacts, and shaving our peak load where applicable.

However, renewable programs, like any other ratepayer supported program, must be instituted with forethought and meet transparent cost-benefit analyses. Policy makers have an obligation to explain what benefit the person paying the bill is getting, especially when the person paying the bill is not always the direct recipient of benefits. In addition, the programs must be sustainable in that if Massachusetts is going to meet aggressive carbon reduction or other goals, opportunities must not be wasted. Ultimately, these programs must help ratepayers, not make high electric rates even higher.

Sadly, these concerns have not always been addressed by policymakers in Massachusetts when new or expanded renewable programs have been instituted.

The singular goal of expanding renewable energy in the commonwealth and meeting arbitrary installed renewable capacity goals has often overshadowed the real costs of these programs to the ratepayer. The "benefits" of these programs have often been clouded in doublespeak. At times, the justification for these programs has involved identifying goals with very little data or follow-up. For instance, goals claiming "new job creation," "leading the nation," "starting new industry clusters," or "reducing climate impact" are often times interchanged when the need arises or the audience changes, and serve to put a "thumb on the scale" in order to make inefficient programs cost-effective.

Additionally, so-called cost effectiveness calculations that have been offered are tilted toward approving politically attractive programs so that it is almost impossible to know how much additional ratepayer cost is too much that it will not be supported by the Department of Public Utilities or the Administration. Cost savings are often discussed as savings to the person installing the renewable energy (as it is in the net-metering program) or include savings to ratepayers around New England (as it was in the case of Cape Wind), ignoring the fact that it is the businesses and families in Massachusetts who are picking up the tab for others to save money - harming our economy so others can be free-riders. Worse, none of this data is transparent to the ratepayer. It is often buried in long decisions that are never summarized for the average ratepayer or updated when information changes.

Renewable programs are not coordinated with other programs. This is particularly harmful to the ratepayer and the grid because there may be options (i.e. CHP, energy efficiency or fuel switching) which compete for the same investment dollars that offer similar or better returns in environmental and ratepayer benefits. For instance, there are areas in Massachusetts where transmission related congestion problems result in higher congestion charges, yet AIM knows of no real coordinated effort to address these issues using renewable power (or CHP or energy efficiency). It is very possible that a coordinated effort with ISO-NE to install renewable power where it would have more beneficial transmission impacts is a better use of scarce ratepayer dollars than installing renewable power everywhere it is requested. Coordination among the programs is also important because as solar and other on-site renewables become more prevalent, the cost to the other ratepayers left on the system will be higher to pay for other programs supported by the Administration – i.e. smart grid, Cape Wind, utility owned solar, net

metering and others, having a future impact on distribution and transmission costs and revenue equity.

State supported programs for renewable power also seem to favor some technologies - particularly solar recently - over others, perhaps because solar installation companies have become a vocal force in Massachusetts and solar has become the path of least resistance as wind power has met some local resistance. The most extreme illustrations are the recent Solar REC regulations promulgated by DOER, which expanded the Solar REC program. This program will add tens, if not hundreds of millions of dollars to ratepayer costs. Yet, the required small business impact statement was written in terms of how *not* promulgating the regulations would negatively impact solar businesses while ignoring the cost impact and how that would negatively impact non-solar businesses, a complete reversal of logical transparency.

There have been numerous attempts by AIM members to reactivate dormant small hydro facilities. However, their efforts have been met with red tape from state and federal agencies and most have given up the fight after spending thousands of dollars on legal fees and permitting, yet small hydro would be more beneficial to the grid than intermittent solar. The rebate and assistance programs are simply not equal.

Also, the administration should review renewable energy technologies and incentives regularly as new information becomes available or new energy requirements become necessary. For instance, some technologies that contribute baseline power, such as energy from waste (EfW) may need to be reevaluated because of their importance in future energy mix and cost of production. Flexibility is important and a willingness to reconsider past decisions when new information becomes available will benefit the ratepayer as well as the environment.

In addition to favoring one technology over others, the Administration has often favored one project over another, despite its apparent cost to consumer and lack of benefit overall. This has led to wasted opportunities and a hodgepodge of projects throughout the region.

The best example of this meddling is the Cape Wind project. Instead of competitive solicitations under the Green Communities Act, the Administration supported the only project which was non-competitively solicited - Cape Wind. This has resulted in 75% of the long term contracts signed by utilities in Massachusetts since 2008 not being competitively sourced and also concentrated just one project - the most controversial one at that. By this action, the renewable energy policies of Massachusetts have been stymied by support for a project that may never be built while competitively sourced renewable projects supported by AIM are now being built, delivering clean renewable power to the Grid at near grid cost parity.

The environmental benefits of these programs are often overstated using myths or outdated information concerning our electricity infrastructure.

The fact is New England currently has an incredibly clean generation profile of approximately 52% natural gas, 31% nuclear, 6 % hydro, with the remaining amounts renewable power. Only a very small amount of coal is used, and virtually no oil. Therefore, almost half of our energy profile is already non-carbon emitting and the remainder is the cleanest non-renewable fuel available. If one of the Administration's goals is to reduce GHG emissions, on a cost per ton of GHG reduced, renewable power may be one of the most expensive ways to reduce GHG.

That is not to say that we turn our backs on renewable power because it costs more than traditional power or it may not be the absolute cheapest or the most efficient way to meet

environmental or energy reduction goals – just that there must be a balance and that balance needs to be supported by current facts and rational analysis..

The Administration must use appropriate metrics to make sure ratepayer dollars are spent wisely and used to generate the most renewable power for the citizens of Massachusetts. AIM believes it can be done. Supporting unprofitable programs or industries may be politically attractive but oftentimes distort the market and crowd out other projects that will result is better returns for the ratepayer. Without transparent data and cost-information, there is simply no way to know.

ISSUE TWO: Promoting Energy Efficiency in the Commonwealth

1. Elliott Jacobson, Action, Inc.

Any analysis of energy efficiency should include long-term costs and benefits, as well as short-term dollar costs. Massachusetts energy efficiency programs return more than $4 in benefits for every dollar invested in them. Benefits include reduced costs of demand (capacity), reduced costs of gas and electric energy and other resources, reduced costs of environmental compliance, non-energy benefits such as those the DPU currently reviews with respect to energy efficiency, and also the statutorily-recognized benefits of cleaner air, reduced GHGs, and economic development (jobs). Consideration should also be given to the hedge value against the likelihood of increased natural gas prices as the US joins a very expensive world gas market (scheduled by the President to occur by 2020, seven years from now), environmental regulation

of fracking becomes stricter, and gas production and reserves turn out to be less than now projected.

It should be noted that the LEAN network and its predecessors have been operating low-income energy efficiency programs for nearly four decades, funded by federal programs as well as the systems benefit charge and additional funding pursuant to the Green Communities Act, which earmarks an equitable level of programming proportionate to funds contributed by low-income utility ratepayers. LEAN has successfully leveraged this funding with, for example, US DOE and US HHS funding. The principle of equitable low-income funding should apply to all current and future energy efficiency funding. LEAN energy efficiency work is competitively bid, pays fair market wages, and requires adequate and appropriate training. LEAN low-income program delivery is unique for its innovation; deep, comprehensive implementation on a cost-effective, whole house basis; high quality due to redundant quality control; and contribution to affordability by not requiring co-payments.

2. Robert Kaufmann, Boston University

To assess the effectiveness of efforts to increase energy efficiency in the State of Massachusetts, analysts can calculate two general types of metrics; those that focus solely on the state of Massachusetts, and those that compare Massachusetts to the rest of the US, such as those done by the ACEEE. Given the plethora of information about programs in Massachusetts, it is possible to create an endless array of state-specific measures. As such, may be possible to create a metric to support nearly any political point.

Instead, I would suggest that the state devote some efforts towards understanding the measures developed by third parties, such as the ACEEE, that rank Massachusetts relative to

other states. This approach has the advantage of avoiding political disagreements about the 'best metric' and instead focus on what can be learned from efforts by other states to increase energy efficiency. Put simply, states can be viewed as laboratories that conduct experiments to increase energy efficiency. The success and failure of these experiments can be used to guide efforts in Massachusetts (and the other forty-nine states).

Consistent with this strategy, the commissions spent considerable time trying to interpret the ACEEE ranking. On one hand, Massachusetts ranked at or near the top in many categories. As such, it appears that Massachusetts' efforts to increase energy efficiency are effective On the other hand, simple manipulations of the ACEEE data indicate that the cost of increasing energy efficiency in Massachusetts is high relative to other states. This high cost should be the focus of analysis. Put simply, are other states spending their energy efficiency funds more effectively than Massachusetts? And if so, what are other states doing that Massachusetts should emulate? Conversely, are the high costs simply a function of the Commonwealth's ambitious goals and efforts. As with all economic efforts, the law of diminishing returns implies that the costs of increasing energy efficiency will rise as the goals for increasing energy efficiency are raised. Understanding these issues are critical to efforts to ensure that Massachusetts spends ratepayer money on energy efficiency in a cost effective manner.

3. Bob Rio, Associated Industries of Massachusetts, Inc.

AIM has actively supported and encouraged energy efficiency programs for many years. We have organized numerous programs in cooperation with the Program Administrators (PAs – utilities) to inform our members of the latest programs and encourage them to take advantage of any rebates offered by the utilities that would decrease consumption and possibly save money.

AIM is also a named member of the Energy Efficiency Advisory Council (EEAC).

Overall, AIM is satisfied that the energy efficiency programs are monitored appropriately by the EEAC. While no program is perfect, the program generally operates within the spirit of the law and the PAs are all committed to reducing energy use and are responsive to the needs of the program overseers and the ratepayers.

However, in the near future it may be time to revisit the notion of energy efficiency as a stand-alone program and take a more holistic approach to reduce our carbon footprint, energy use, and costs (a similar notion that we advanced for renewable programs under Issue One above). Efficiency programs, like other programs such as renewables, often exist in a vacuum with its own oversight and goals. Going forward, this may lead to less-than-optimal results.

For instance, reducing greenhouse gases is the most important goal the Administration has right now and by reducing the generation of power through energy efficiency, emissions are certainly reduced. However, with the electric generation profile in New England already 50% non-carbon emitting and with the vast majority of the rest natural gas, the days of using energy efficiency as a cost-effective way to reduce greenhouse gases way be waning. To be sure, there are obviously other benefits to reducing energy use but these benefits need to stand on their own.

Despite this, there is no real substitute or complimentary program on the horizon to focus on carbon reduction exclusively.

For instance, AIM has heard evidence that some products which are beneficial to the goal of reducing greenhouse gas emissions actually use more energy. Therefore, they are not eligible for a rebate under the energy efficiency program (or any other program). On balance, these products would be a net win for the environmental but they complicate efforts to reduce and track energy use in the energy efficiency program.

As an example, DEP is promulgating regulations to reduce climate damaging HCFCs in refrigerants, an important goal. However, in the kick-off meeting that AIM attended a participant mentioned that non-HCFC chilling equipment is available but uses more energy. Therefore these products are not routinely granted a rebate under the efficiency program despite their GHG benefits. The attendee stated that companies will often install the same models that use HCFCs because they receive a rebate. In a case such as this, it would have been appropriate to bring this issue to the energy efficiency program so that stakeholder to find a way where rebates for these products could have been squeezed into an existing program, perhaps creating a pilot program that requires the companies to reduce energy use elsewhere. This would have save greenhouse gases and lessened the burden on the companies. AIM knows of no such coordination and outreach, possibly wasting an opportunity.

In another example, several AIM members have found ways to convert from number 6 fuel oil to natural gas (either though expanding natural gas lines or bringing compressed natural gas to their facility), saving not only money but reducing criteria pollutant levels dramatically, and reducing GHG. Despite the environmental improvements, none of these conversions were eligible for energy efficiency rebates as they do not fit into the "saving energy" paradigm. Yet, dollar for dollar programs like this may result in a greater reduction in pollutants than some energy efficiency program. Ironically, these companies would have been eligible for rebates related to installing renewable power, even though such installations would return just a fraction of the reductions the company accomplished by fuel switching. There are dozens of companies in Massachusetts that would be amenable to such switching if the incentives were properly aligned or as favorable as incentives for renewable power.

Finally, as stated above, the energy efficiency programs (as well as renewable programs) do not appear to be coordinated with utility growth or ISO-NE needs in any significant way. For instance, if ISO-NE identifies congestion or other problems in a region, AIM knows of no formal mechanism to convey that to the efficiency program and have the PAs increase rebates or institute out-of-the box programs in that area relatively quickly in order to address this issue.

As energy codes become more stringent, the energy efficiency program must deal with the realization that the total dollars spent on applicable installations may decrease and the energy efficiency program should rethink paying for rebates in areas where stretch codes have been instituted and building labeling type programs are already changing behavior. In these cases, energy efficiency has already been ingrained into day to day operations.

In order to get to the next level in a clean environment, we need to look at all options which reduce energy and pollutants. The fact is that in the cases presented above, environmental and other benefits were overlooked because they do not neatly fit into a box. This is not the fault of the PAs or the DOER or anyone else. It is a focus that must be undertaken as the maturing of the programs takes place. The Administration needs to realize that energy efficiency in and of itself should not be the sole goal. Rather EE is a tool to accomplish a larger goal and more coordination will result in less money spent with more resources available for better environmental impact. While this dynamic notion of programmatic integration may not make for good bragging rights or for awards going forward, it is the right thing to do.

4. Tom Regh, Progressive Energy Services, LLC

Metrics, by definition, must be quantitative and measurable, in order to be able to compare performance year-over-year and to be able to identify trends. I believe that the following metrics

would be appropriate for all core initiatives, including residential, low-income, and commercial/industrial:

- $ invested in consumer education/# of consumer education programs
- Number of unique initial inquiries into the call center
- Number of participants (e.g. Home Energy Assessments completed)
- Quantity of each approved measure installed (e.g. air sealing, insulation, thermostat, etc)
- Average project size ($)
- Average annual and lifetime kWh savings per participant
- Average annual and lifetime therm savings per participant
- Average annual and lifetime electric benefits per participant
- Average annual and lifetime gas benefits per participant
- Average annual and lifetime resource benefits per participant
- Average annual and lifetime non-resource benefits per participant

Analysis of 2012 MassSave Electric and Gas Residential Programs

The following performance summaries for the MassSave Home Energy Services residential electric and gas programs were prepared from data reported by the utility Program Administrators in the 2012 Energy Efficiency Annual Reports, which were filed with the DPU in August 2013. The reports can be found on the EEAC web site using the following link, http://www.ma-eeac.org/Annual%20Reports.html. The supporting 08-50 tables, which are not attached in Appendix B of the online reports, can be found in DPU dockets 13-118 through 13-122 for the electric side, and 13-112 through 13-117 for the gas side. It should be noted that this analysis was shared with the attorneys representing several of the utilities in mid-September

2013, in order to provide an opportunity for the PAs to review and comment, and to assist with filling in some of the missing information; a response was never received.

These programs, targeted at residential customers living in 1-4 family homes, had combined expenditures of about $86M in 2012, with a total resource cost of about $126M. This comprehensive analysis provides a statewide overview of how much money was spent, what it was spent on, and what ratepayers received for their investment. There are also several quantitative business metrics that provide the basis for the analysis of the raw data.

> Several Commissioners, including the representative of the Massachusetts Attorney General's office, have called for a cost/benefit analysis to be performed. This analysis serves as a model for the type of output that should be expected from Program Administrators on a periodic reporting basis.

2012 Electric Program Plan

	PA Spend By Category						Total Costs			
Electric Utility	Program Planning and Admin	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Administrator Spend	Total Program Administrator Spend	Utility Incentive	Participant Costs	Total TRC Costs
National Grid	$ 48,563	$ 1,173,301	$ 15,630,420	$ 6,789,539	$ 1,020,246	$ 24,662,069	$ 24,662,069	$ 2,158,640	$ 1,823,952	$ 28,644,661
NSTAR	$ 1,100,781	$ 1,271,225	$ 11,242,650	$ 4,579,000	$ 1,005,590	$ 19,199,246	$ 19,199,246	$ 2,145,460	$ 3,725,504	$ 25,070,210
WMECO	$ 319,772	$ 19,630	$ 3,157,714	$ 1,142,152	$ 146,623	$ 4,785,891	$ 4,785,891	$ 847,161	$ 1,527,455	$ 7,160,507
Unitil	$ 42,600	$ 39,270	$ 346,214	$ 102,472	$ 41,180	$ 571,736	$ 571,736	$ 51,202	$ 98,315	$ 721,253
CLC	$ 264,467	$ 58,333	$ 7,404,384	$ 822,230	$ 636,688	$ 9,186,102	$ 9,186,102	$ -	$ 3,137,266	$ 12,323,368
Total Electric	**$ 1,776,183**	**$ 2,561,759**	**$ 37,781,382**	**$ 13,435,393**	**$ 2,850,327**	**$ 58,405,044**	**$ 58,405,044**	**$ 5,202,463**	**$ 10,312,492**	**$ 73,919,999**
% of Total	3.0%	4.4%	64.7%	23.0%	4.9%	100.0%	79.0%	7.0%	14.0%	100.0%

	Participants				Savings					Lifetime Benefits				
Electric Utility	Participants	Number of Air Sealing Installations Completed	Number of Insulation Installations Completed	Number of Heating System Replacements	Annualized Summer Capacity (kW)	Energy (Annual MWh)	Energy (Lifetime MWh)	Avoided Gas (MMBTU)	No. 2 Distillate (MMBTU)	Sum of Total Gas Benefits	Total Electric Benefits (Capacity & Energy)	Sum of Total Other Resource Benefits	Sum of Total Non Resource Benefits	Sum of Total Benefits
National Grid	20,500				2,245	17,118	132,217	-	136,421	$ -	$ 17,669,581	$ 71,065,509	$ 58,081,993	$ 146,817,083
NSTAR	15,000				4,231	14,510	125,916	3,437	117,479	$ 679,223	$ 30,637,876	$ 54,649,154	$ 54,687,284	$ 140,653,537
WMECO	5,597				1,450	3,707	40,279	-	37,855	$ -	$ 9,136,669	$ 25,062,931	$ 26,280,594	$ 60,480,194
Unitil	223				120	267	3,819	1,937	2,440	$ 344,501	$ 1,063,060	$ 1,172,206	$ 1,593,044	$ 4,172,811
CLC	3,094				2,799	6,055	92,651	44,749	72,296	$ 9,973,850	$ 17,843,688	$ 41,424,751	$ 8,363,773	$ 77,606,062
Total Electric	**44,414**				**10,845**	**41,657**	**394,882**	**50,123**	**366,491**	**$ 2,741,441**	**$ 45,667,823**	**$ 184,070,245**	**$ 155,420,504**	**$ 387,900,013**
% of Total										0.7%	11.8%	47.5%	40.1%	100.0%

2012 Electric Program Actuals (Evaluated)

	PA Spend By Category						Total Costs			
Electric Utility	Program Planning and Admin	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Administrator Spend	Total Program Administrator Spend	Utility Incentive	Participant Costs	Total TRC Costs
National Grid	$ 728,766	$ 698,499	$ 17,113,735	$ 6,613,095	$ 247,095	$ 25,401,190	$ 25,401,190	$ 2,306,367	$ 6,145,522	$ 33,853,079
NSTAR	$ 941,022	$ 1,036,310	$ 14,356,292	$ 4,800,468	$ 341,127	$ 21,475,219	$ 21,475,219	$ 2,386,349	$ 3,838,501	$ 27,700,069
WMECO	$ 260,824	$ 77,595	$ 2,681,265	$ 1,294,116	$ 19,435	$ 4,333,235	$ 4,333,235	$ 479,585	$ 736,281	$ 5,549,101
Unitil	$ 35,658	$ 12,656	$ 390,669	$ 130,027	$ 10,820	$ 579,830	$ 579,830	$ 23,858	$ 105,678	$ 709,366
CLC	$ 479,810	$ 164,621	$ 9,273,682	$ 568,714	$ 142,414	$ 10,629,241	$ 10,629,241	$ -	$ 2,161,710	$ 12,790,951
Total Electric	**$ 2,446,080**	**$ 1,989,681**	**$ 43,815,643**	**$ 13,406,420**	**$ 760,891**	**$ 62,418,715**	**$ 62,418,715**	**$ 5,196,159**	**$ 12,987,692**	**$ 80,602,566**
% of Total	3.9%	3.2%	70.2%	21.5%	1.2%	100.0%	77.4%	6.4%	16.1%	100.0%
% of Plan	137.7%	77.7%	116.0%	99.8%	26.7%	106.9%	106.9%	99.9%	125.9%	109.0%

	Participants				Savings					Lifetime Benefits				
Electric Utility	Participants	Number of Air Sealing Installations Completed	Number of Insulation Installations Completed	Number of Heating System Replacements	Annualized Summer Capacity (kW)	Energy (Annual MWh)	Energy (Lifetime MWh)	Avoided Gas (MMBTU)	No. 2 Distillate (MMBTU)	Sum of Total Gas Benefits	Total Electric Benefits (Capacity & Energy)	Sum of Total Other Resource Benefits	Sum of Total Non Resource Benefits	Sum of Total Benefits
National Grid	18,790	Note 1	Note 1	Note 1	659	15,565	126,055	1,010	169,087	$ 178,564	$ 12,774,459	$ 80,854,599	$ 62,419,210	$ 156,226,832
NSTAR	12,983				2,155	14,129	125,138	1,685	141,964	$ 309,876	$ 20,515,488	$ 69,025,118	$ 73,040,857	$ 162,891,339
WMECO	4,095				292	2,692	23,333	91	22,753	$ 4,603	$ 3,114,794	$ 13,442,407	$ 15,479,121	$ 32,040,925
Unitil	238	88	94	28	5	78	598	120	1,551	$ 23,686	$ 84,127	$ 784,300	$ 507,675	$ 1,399,788
CLC	5,954	1,983	2,112	244	164	3,460	30,553	21,543	27,778	$ 3,804,818	$ 3,191,895	$ 15,649,827	$ 18,561,107	$ 41,207,647
Total Electric	**42,060**	**2,071**	**2,206**	**272**	**3,275**	**35,924**	**305,677**	**24,449**	**363,133**	**$ 4,321,547**	**$ 39,680,763**	**$ 179,756,251**	**$ 170,007,970**	**$ 393,766,531**
% of Total										1.1%	10.1%	45.7%	43.2%	100.0%
% of Plan	94.7%				30.2%	86.2%	77.4%	48.8%	99.1%	157.6%	86.9%	97.7%	109.4%	101.5%

Electric Program Metrics		**Comment**
Average Total PA Spend per Participant	$1,484	
Average Incentive Received By Each Participant	$1,042	Maximum possible incentive for air sealing and insulation is about $2,500.
Participant Incentive as % of Total PA Spend	70.2%	29.8% of PA spend goes to overhead expenses
Average M&A Spend per Participant	$47	Average customer acquisition cost.
Participant Expenses as % of Total TRC Cost	16.1%	This program is highly subsidized; the program pays for 83.9% of all costs.
Average Annual kWh Savings per Participant	854	* Savings equivalent to 17.5 CFL bulbs. TRM assumes 48.7kWh/yr savings per screw-in CFL.
Total Lifetime MMBTU Savings	1,430,848	Combined lifetime savings of electricity, gas, and oil.
Total Resource Cost per Lifetime MMBTU Saved	$ 56.33	Equivalent to $0.192/kWh or $7.94/gallon #2 fuel oil
% of Participants implementing Air Sealing	4.9%	
% of Participants implementing Insulation	5.2%	
% of Participants implementing Heating Sys	0.6%	
Total Benefit to Cost Ratio	4.9	
Total Benefit to Cost Ratio (excl non-resource benefits)	2.8	
Average Electric Benefit per Participant	$ 943	
Average Resource Benefit per Participant	$ 4,274	
Average Non-Resource Benefit per Participant	$ 4,042	Thermal comfort, noise reduction, home durability, equipment maintenance, health benefits, and property value increase.
Average Total Benefit per Participant	$ 9,362	

Notes

1. Data not reported as number of participants.

The following analysis pertains to the Electric programs:

1. The program fell short by 5.3% in terms of the number of participants. The program served 42,060 households in 2012. With approximately 2.2M one to four family housing units in Massachusetts (according to the 2010 census), the program has served just 2% of the total potential.
2. Despite serving fewer participants than planned, the program administrators overspent their budgets by 6.9%.
3. Lifetime electricity savings were only 77.4% of the plan, and Annualized Summer Capacity was just 30.2% of the plan.
4. The utilities served fewer households than planned, overspent their budgets, and fell short in delivering savings, yet a total utility incentive of $5.2M (99.9% of plan) was paid.
5. The program is costly to administer. Just $0.70 of every dollar collected from ratepayers is returned in the form of incentives. The program overhead costs are 29.8%.
6. The program services are highly subsidized, making them appear less as incentives and more as hand-outs. Participants are required to pay, on average, just 16.1% of the cost of the products and services they received. Why then are the implementation rates for major measures so low?
7. The non-resource benefits, for example thermal comfort, noise reduction, home durability, equipment maintenance, health benefits, and property value increase amount to $4,042 per participant!! These benefits are not being accounted for properly; they are being claimed by the Program Administrators for each customer that has a Home Energy Assessment completed, regardless of whether they have had any air sealing or insulation measures installed. For each HEA performed, annual benefits of $130 are claimed for 19

years, and a one-time benefit of $600 is claimed, for a total of $3,067 in lifetime benefits. If a participant elects to have air sealing or insulation measures installed, no additional non-energy benefits of these types are claimed. Is it sensible that thermal comfort is improved, the home is quieter, the heating and cooling equipment operates better with less need for maintenance, the occupants are healthier, and the value of the property is increased, simply by having a MassSave Home Energy Assessment? The PAs and the DPU have been made aware of this practice, yet there does not appear to be any effort underway to correct this inaccurate (and potentially fraudulent) misrepresentation of program benefits.

8. The average incentive received by each participant is just $1,042. The maximum possible incentive that each participant is eligible to receive is $2,000 for insulation, plus no-cost air sealing, valued at perhaps an additional $500. This suggests that the program is achieving neither broad savings (i.e. most HEA participants elect to have major savings measures such as insulation installed) nor deep savings (i.e. each participant is having significant energy efficiency improvements made).

2012 Gas Program Plan

	Program Administrator Spend By Category						Total Costs			
Utility	Program Planning and Admin	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Administrator Spend	Total Program Administrator Spend	Utility Incentive	Participant Costs	Total TRC Costs
National Grid	$ 173,612	$ 403,778	$ 7,670,320	$ 5,352,602	$ 663,911	$ 14,264,223	$ 14,264,223	$ 517,561	$ 4,063,786	$ 18,845,570
NSTAR Gas	$ 424,299	$ 118,663	$ 4,062,180	$ 1,664,300	$ 359,085	$ 6,628,527	$ 6,628,527	$ 244,745	$ 2,405,265	$ 9,278,537
CMA	$ 352,125	$ 222,516	$ 3,866,964	$ 964,127	$ 195,287	$ 5,601,019	$ 5,601,019	$ 186,632	$ 2,526,335	$ 8,313,986
Unitil	$ 10,687	$ 7,243	$ 52,882	$ 18,261	$ 5,329	$ 94,402	$ 94,402	$ 4,888	$ 16,189	$ 115,479
Berkshire	$ 122,259	$ 44,362	$ 400,893	$ 264,696	$ 29,578	$ 861,788	$ 861,788	$ 32,887	$ 133,631	$ 1,028,306
NEG	$ 85,344	$ 11,366	$ 207,393	$ 115,247	$ 14,609	$ 433,959	$ 433,959	$ 9,663	$ 66,302	$ 509,924
Total Gas	**$ 1,168,326**	**$ 807,928**	**$ 16,260,632**	**$ 8,379,233**	**$ 1,267,799**	**$ 27,883,918**	**$ 27,883,918**	**$ 996,376**	**$ 9,211,508**	**$ 38,091,802**
% of Total	4.2%	2.9%	58.3%	30.1%	4.5%	100.0%	73.2%	2.6%	24.2%	100.0%

	Participants				Savings					Benefits (Lifetime $)				
Utility	Participants (Note 1)	Number of Air Sealing Installations Completed	Number of Insulation Installations Completed	Number of Heating System Replacements	Annualized Summer Capacity (kW)	Energy (Annual kWh)	Energy (Lifetime MWh)	Annual Therms	Lifetime Therms	Sum of Total Gas Benefits	Sum of Total Electric Benefits	Sum of Total Other Resource Benefits	Sum of Total Non Resource Benefits	Sum of Total Benefits
National Grid	11,200				-	-	-	1,303,949	30,223,872	$ 25,780,115	$ -	$ -	$ 6,479,372	$ 32,259,487
NSTAR Gas	6,000				-	-	-	635,804	13,854,173	$ 11,691,283	$ -	$ 27,115	$ 3,564,720	$ 15,283,118
CMA	3,630				2	3,879	-	464,461	10,450,368	$ 8,629,807	$ 3,190	$ 90,529	$ 1,724,142	$ 10,447,668
Unitil	-				-	-	-	7,715	-	$ 138,969	$ -	$ 2,695	$ 58,910	$ 200,574
Berkshire	625				-	-	-	68,881	1,446,510	$ 1,187,648	$ -	$ -	$ 333,789	$ 1,521,437
NEG	510				-	-	-	31,379	631,487	$ 572,200	$ -	$ 11,023	$ 180,404	$ 763,627
Total Gas	**21,965**				**2**	**3,879**	**-**	**2,512,189**	**56,606,410**	**$ 48,000,022**	**$ 3,190**	**$ 131,362**	**$ 12,341,337**	**$ 60,475,911**
% of Total										79.4%	0.0%	0.2%	20.4%	100.0%

2012 Gas Program Actuals (Evaluated)

	Program Administrator Spend By Category						Total Costs			
Gas Utility	Program Planning and Admin	Marketing and Advertising	Participant Incentive	Sales, Technical Assistance & Training	Evaluation and Market Research	Total Program Administrator Spend	Total Program Administrator Spend	Utility Incentive	Participant Costs	Total TRC Costs
National Grid	$ 450,965	$ 230,262	$ 12,020,486	$ 7,403,849	$ 242,145	$ 20,347,707	$ 20,347,707	$ 600,078	$ 5,078,827	$ 26,026,612
NSTAR Gas	$ 394,917	$ 104,109	$ 5,186,800	$ 1,954,044	$ 177,507	$ 7,817,377	$ 7,817,377	$ 229,147	$ 3,195,746	$ 11,242,270
CMA	$ 334,513	$ 126,074	$ 2,201,106	$ 1,290,306	$ 88,551	$ 4,040,550	$ 4,040,550	$ 100,740	$ 1,048,370	$ 5,189,660
Unitil	$ 7,856	$ 2,875	$ 80,758	$ 20,465	$ 7,581	$ 119,535	$ 119,535	$ 1,411	$ 24,319	$ 145,265
Berkshire	$ 129,832	$ 43,705	$ 720,793	$ 403,703	$ 9,379	$ 1,307,412	$ 1,307,412	$ 37,380	$ 735,867	$ 2,080,659
NEG	$ 103,269	$ 7,718	$ 196,019	$ 73,077	$ 15,360	$ 395,443	$ 395,443	$ 11,427	$ 147,657	$ 554,527
Total Gas	**$ 1,421,352**	**$ 514,743**	**$ 20,405,962**	**$ 11,145,444**	**$ 540,523**	**$ 34,028,024**	**$ 34,028,024**	**$ 980,183**	**$ 10,230,786**	**$ 45,238,993**
% of Total Spend	4.2%	1.5%	60.0%	32.8%	1.6%	100.0%	75.2%	2.2%	22.6%	100.0%
% of Annual Goal	121.7%	63.7%	125.5%	133.0%	42.6%	122.0%	122.0%	98.4%	111.1%	118.8%

	Participants				Savings					Benefits (Lifetime $)				
Gas Utility	Participants (Note 1)	Number of Air Sealing Installations Completed	Number of Insulation Installations Completed	Number of Heating System Replacements	Annualized Summer Capacity (kW)	Energy (Annual kWh)	Energy (Lifetime MWh)	Annual Therms	Lifetime Therms	Sum of Total Gas Benefits	Sum of Total Electric Benefits	Sum of Total Other Resource Benefits	Sum of Total Non Resource Benefits	Sum of Total Benefits
National Grid	19,323				-	-	-	1,512,375	32,120,270	$ 27,287,268	$ -	$ 1,471,854	$ 10,333,080	$ 39,092,202
NSTAR Gas	7,669				-	-	-	676,052	13,103,834	$ 11,050,457	$ -	$ 118,955	$ 5,090,590	$ 16,260,002
CMA	4,488				25	235,141	-	318,372	5,970,582	$ 5,029,391	$ 181,597	$ 101,908	$ 1,463,785	$ 6,776,681
Unitil	-				-	-	-	3,845	-	$ 77,861	$ -	$ -	$ 79	$ 77,940
Berkshire	832				-	-	-	86,778	1,735,439	$ 1,467,168	$ -	$ 8,149	$ 1,109,328	$ 2,584,645
NEG	416				-	-	-	34,918	647,539	$ 545,634	$ -	$ 6,951	$ 202,964	$ 755,549
Total Gas	**32,728**	**0**	**0**	**0**	**25**	**235,141**	**-**	**2,632,340**	**53,577,664**	**$ 45,457,779**	**$ 181,597**	**$ 1,707,817**	**$ 18,199,826**	**$ 65,547,019**
% of Total Spend										69.4%	0.3%	2.6%	27.8%	100.0%
% of Annual Goal	149.0%							104.8%	94.6%	94.7%	5692.7%	1300.1%	147.5%	108.4%

Gas Program Metrics		**Comment**
Average Total PA Spend per Participant	$1,040	
Average Incentive Received By Each Participant	$624	
Participant Incentive as % of Total PA Spend	60.0%	40.0% of PA spend goes to overhead expenses
Average M&A Spend per Participant	$16	Average customer acquisition cost.
Participant Expenses as % of Total TRC Cost	22.6%	This program is highly subsidized; the program pays for 77.4% of all costs.
Cost per Lifetime Therm Saved	$0.84	* EIA gas futures price $0.40 per therm
Average Annual Therms Saved per Participant	80	* TRM assumes 77 therms for attic insulation, 53 therms for air sealing, 99 therms for wall insulation, 2 for aerator, 12 for low flow shower heads
% of Participants implementing Air Sealing	0.0%	
% of Participants implementing Insulation	0.0%	
% of Participants implementing Heating Sys	0.0%	
Total Benefit to Cost Ratio	1.4	
Average Gas Benefit per Participant	$ 1,389	
Average Electric Benefit per Participant	$ 6	
Average Resource Benefit per Participant	$ 52	
Average Non-Resource Benefit per Participant	$ 556	Thermal comfort, noise reduction, home durability, health benefits, and property value increase.
Average Total Benefit per Participant	$ 2,003	

Notes

1. To avoid double counting, count only MassSave participants and not Wx participants.

The following analysis pertains to the Gas programs:

1. The program exceeded by 49% the number of participants. The program served 32,728 households in 2012. With approximately 1.2M housing units in Massachusetts heating with utility gas (according to the 2010 census), the program has served just 2.7% of the total potential.
2. The program administrators overspent their budgets by 22%.
3. Despite serving 10,763 participants more than planned, lifetime gas savings were only 94.6% of the plan.
4. The utilities served more households than planned, overspent their budgets, and fell short in delivering savings ($2,185 gas benefits per participant planned, but only $1,389 gas benefits per participant delivered), yet a total utility incentive of $980K (98.4% of plan) was paid.
5. The program is costly to administer. Just $0.60 of every dollar collected from ratepayers is returned in the form of incentives. The program overhead costs are 40%.
6. The program services are highly subsidized, making them appear less as incentives and more as hand-outs. Participants are required to pay, on average, just 22.6% of the cost of the products and services they received.
7. The average incentive received by each participant is just $624. The maximum possible incentive that each participant is eligible to receive is $2,000 for insulation, plus no-cost air sealing, valued at perhaps an additional $500. This suggests that the program is achieving neither broad savings (i.e. most HEA participants elect to have major savings

measures such as insulation installed) nor deep savings (i.e. each participant is having significant energy efficiency improvements made).

Recommendation: EEAC oversight of program performance is currently not adequate. Council members are unpaid volunteers, and therefore cannot devote the time necessary to conduct an extensive review of program finances and performance. Council consultants are hired by the administration, and therefore are unable to provide an unbiased review. With about $600M in annual expenditures, an annual independent, unbiased, independent review of program finances and results is clearly warranted.

New Paradigm Needed

The goal should be to create consumer demand pull instead of government push by educating customers about the value and benefits associated with energy efficiency. Program designers must wary about structuring programs that effectively "bribe" consumers into doing something that they otherwise see no value in. Instead, incentives should leverage additional contributions from willing customers, and not be "hand-outs". These programs should be expected to "seed" a market transformation, with the objective of being phased-out once successful. Aside from the low-income programs, they should not be viewed as everlasting social welfare programs.

The current program design is not delivering deep savings. Too much emphasis is placed on electricity savings, and insufficient emphasis exists for weatherization and HVAC. This may be due to the fact that the goals are based upon electricity savings as a percentage of electricity revenue. Weatherization and HVAC measures save significant amounts of oil (or gas), but not so much electricity. Several questions that one might ask are as follows:

1. In business, it is well known that the behavior that is measured and incentivized is the behavior that will ultimately result. Given that, should the goals be restated to place greater emphasis on fuel savings as well as electricity savings?
2. Why are the electric utilities responsible for designing and managing these programs? New York, for example, has created a quasi-government agency, NYSERDA, to oversee efficiency programs.
3. Electric efficiency programs have been in existence for over 20 years, and have only recently been modified to include weatherization and HVAC measures. Given that any single program is unlikely to excel in all areas, is it sensible to have separate specialized programs for lighting vs weatherization and HVAC measures?

A major paradigm shift is necessary if the utilities are to be able to meet or exceed aggressive savings targets going forward. The program managers use a tool known as the Cost/Benefit Screening Tool to plan and estimate savings and benefits that will be achieved by the three year plan. An example is shown below; this data excerpt is derived from the National Grid electric program for the year 2013. This table shows a subset of the program approved measures, along with the estimated participation rates, costs, and savings/benefits generated by each. The two rightmost columns show the cost per unit savings for each measure, and the total lifetime savings that will result. Note that the lifetime savings associated with insulation is more than 7 times greater than the savings associated with screw-in CFL bulbs. This is intuitive; space heating and cooling costs far outweigh lighting costs for the typical home, and so there is naturally a far greater opportunity for savings. Note also that the cost per MMBTU saved is nearly 2X higher for CFL bulbs as it is for air sealing and insulation. Again, this is intuitive; it is very costly to send an energy specialist to someone's home to change their light bulbs. Innovative thinking

must occur to develop lower cost methods for distributing lighting products. In fact, during a July 9th presentation (http://www.ma-eeac.org/Docs/3.1_Council%20Meeting%20Minutes/2013%20Minutes/7.9.2013/EEAC%20Consultant%20Team%20Presentation%20%20-%20EM&V%20Briefing%207-9-13.pdf) from the EM&V consultant to the EEAC it was noted that the percentage of residential lighting sockets that are occupied by high efficiency bulbs grew from 26% in 2009 to just 28% in 2012, despite tens of millions in program investment over that period. The conclusion presented was that the program is effectively replacing burned-out CFL bulbs with new ones. In summary, far greater savings could be achieved at a significantly lower cost to ratepayers by increasing the emphasis on weatherization and HVAC measures.

Measures, National Grid 2013 Electric Program	Participants	Measure Life (Years)	TRC Cost ($)	Incentive Cost ($)	Participant Cost ($)	Gross Annual Energy Savings (kWh)	Gross Annual Oil Savings (MMBTU)	Total Gross Annual Savings (MMBTU)	Annual Non-Resource Benefits ($)	One-Time Non-Resource Benefits ($)	Total Lifetime Savings (MMBTU)	Total Lifetime Non-Resource Benefits ($)	Measure Cost per MMBTU Saved ($)	Total Lifetime Program Savings (MMBTU)
MassSave HEA	18,500	19	$0	$0	$0	0	0	0.00000	$129.90	$599.40	0.0	$3,067.50	N/A	0
CFL, Screw-In	296,000	6	$9	$9	$0	35	0	0.11942	$0.00	$3.00	0.7	$3.00	$12.56	212,090
Thermostat, Oil	1,551	15	$92	$25	$67	0	3.4	3.40000	$0.00	$0.00	51.0	$0.00	$1.80	79,101
Boiler Reset Control	1,034	15	$300	$200	$100	0	4.7	4.70000	$0.00	$0.00	70.5	$0.00	$4.26	72,897
Duct Sealing, Oil	0	20	$950	$400	$550	0	4.1	4.10000	$0.00	$0.00	82.0	$0.00	$11.59	0
Duct Insulation, Oil	0	20	$550	$413	$138	0	7.7	7.70000	$0.00	$0.00	154.0	$0.00	$3.57	0
Air Sealing, Oil	2,068	15	$730	$730	$0	0	5.6	5.60000	$0.00	$0.00	84.0	$0.00	$8.69	173,712
Insulation, Oil	4,808	25	$2,000	$1,568	$432	224	12.2	12.96429	$0.00	$0.00	324.1	$0.00	$6.17	1,558,307
Heating System Replacement, Oil	4,136	18	$765	$475	$290	0	7.2	7.20000	$0.00	$0.00	129.6	$0.00	$5.90	536,026
Oil Boiler FHW, Early Retirement	590	10	$766	$750	$16	0	25.4	25.40000	$0.00	$0.00	254.0	$0.00	$3.02	149,860
Deep Energy Retrofit	56	25	$26,428	$22,464	$3,964	290	53.92	54.90948	$0.00	$0.00	1372.7	$0.00	$19.25	76,873

Compliance with Massachusetts Law

Massachusetts law requires that a building permit be acquired for any insulation work that is performed. The MassSave Home Energy Services Participation Agreement that contractors must

sign specifically assigns the responsibility for securing the permit to the contractor. The customer contract is executed between the customer and the Lead Vendor; in many cases the contractor who will perform the work is not even known at the time that the contract is signed. The installation contractor performs the work as a subcontractor to the Lead Vendor. The contractor is compensated a flat fee of $75, which must cover the actual permit cost paid to the municipality, plus the contractor's efforts to complete the forms, obtain the signatures, visit town hall, and attend the final inspection. This does not leave the contractor whole in many cases. Despite having a 100% on-site quality inspection rate, the current program provides no verification that the required permit was actually secured. A recent candid conversation with a senior executive for one of the program Lead Vendors indicated that an analysis of 300 weatherization projects revealed that just 30 jobs had acquired the permit. This information has been reported to both the Board of Building Regulations and Standards (BBRS) and the Office of the Attorney General. Despite several follow-up attempts, a response has never been received from either agency.

Recommendation: Any expenditure of public monies must be in full compliance with all Massachusetts laws!! Steps must be taken to ensure that every insulation project is completed only after securing the necessary permit. As the principle party, the Lead Vendor should be responsible for securing and paying for the building permit. An alternative solution would be to compensate contractors for the actual permit costs plus a reasonable acquisition fee, and implement a system whereby verification of the permit takes place.

Cost Effectiveness Testing

The Green Communities Act (GCA) justifiably requires that energy efficiency programs are cost-effective, i.e. that the dollar value of the benefits exceed the cost of the programs. However, there are at least five different standard cost-effectiveness tests that are used by programs throughout the nation, and the GCA does not mandate the use of any particular test or tests. The DPU has ordered that the Total Resource Cost (TRC) test be used, which takes a societal perspective by including costs and benefits for all stakeholders, including utilities, program participants, and non-participants. There has been much public debate by energy efficiency experts concerning the TRC test. First, it is considered to be overly conservative in that it includes all costs, which are easy to quantify, and not necessarily all benefits, some of which are very subjective and intangible. The value of non-energy benefits such as eliminating an ice dam problem, solving a mold issue, or improving the enjoyment of one's home are unique, and can only be determined by the individual themselves. The second issue is that it also counts program participants' contributions; for example, a customer who implements a $3,000 insulation project would receive a program rebate of $2,000 and would need to contribute $1,000 out-of-pocket. The TRC test views this as a $3,000 total cost despite that the program costs were only $2,000. This has the effect of restricting the availability of certain measures that were deemed to be not cost-effective by the PAs; as an example, spray polyurethane foam is not offered to MassSave customers despite its high thermal performance and energy saving potential. Many customers want other options, and are willing to supplement program funds with their own money, but are prevented from doing so. Instead, they must choose from a limited menu of program-approved measures. A viable alternative to the TRC test that is recommended by many industry experts is the Program Administrator (PA) cost-effectiveness test, which considers only costs and benefits

incurred by the program itself. In the previous example, the total cost would be just the $2000 program expense. The customer's $1,000 out-of-pocket cost is not considered. Many would also argue that the government has no business determining how individuals spend their own money. Adoption of the PA cost test will improve customer satisfaction by increasing the number of customer choices, and will save significant program costs by eliminating the need to fund consultant studies related to identifying and valuing non-energy benefits.

Analysis of the valuation of non-energy benefits that were used to develop the 2013-2015 three year plan reveals that there are many inconsistencies between various programs. For example, thermal comfort is valued at $125 annually for electric program participants, but only $25 annually for gas program participants. The values were apparently determined through customer surveys. The AG representative to the EEAC cited this issue in his initial brief, and called for utilities to harmonize the value of non-energy benefits across all programs.

Recommendation: Several effective savings measures are currently excluded from the MassSave program because they have been determined to not be cost-effective, according to the TRC test. One specific example is spray polyurethane foam, which can be an effective means to achieve air tight houses with high R values. Many consumers are willing to supplement program incentives with their own funds, but are prevented from doing so. The result is that customer choices are limited, and the savings associated with any of these types of projects are not captured by the MassSave programs. A nationwide dialog concerning cost-effectiveness testing (especially relative to the shortcomings of the TRC test) is underway among energy efficiency experts; as a leader, Massachusetts must participate, and continually re-evaluate its own position and policies. It is recommended to amend Chapter 25, section 19, paragraph (c) by adding this verbiage after the last sentence: "The department may use a variety of cost-effectiveness tests

when evaluating programs, however, since these programs are intended to encourage and leverage additional participant investments in energy efficiency, and because the value of many of the participant benefits are intangible and can only be determined by the individual participants themselves, the final determination of program cost-effectiveness shall utilize a test that considers only Program Administrator costs and benefits, societal benefits (e.g. environmental), participant energy and resource benefits, and not participant expenses and benefits.".

Eliminating the need to try to assign values to these intangible benefits and harmonizing them across all programs will result in significant administrative savings for the programs, thereby improving the rate of return for ratepayers.

Depth of Savings and HES Program Performance

The "EEAC Resolution Concerning Its Priorities to Guide the Development, Implementation, and Evaluation of the PA Efficiency Plans" states:

- The PAs shall strive to provide customer rebate/incentives that **encourage deeper energy savings**, and should consider a performance-based incentive structure.
- The PAs are encouraged to **explore various customer financial contributions to the audits**, ranging from free audits to a market driven audit system, whereby the customer is charged upfront for the cost of the audit, but if the customer proceeds with the work, then the cost of the audit is deducted from the cost of the work.

Currently, homeowners are eligible to receive incentives from the program every calendar year. Many homeowners take advantage of this fact by implementing energy efficiency projects over multiple years, thereby receiving multiple incentive payments. For example, they might insulate

their attic this year, insulate the walls next years, and insulate the rim joist in the third year; each year they would qualify for a 75% rebate up to $2,000. This approach drives up program administrative expenses by requiring yearly site visits. This is not the intent of the program; 0% interest HEAT loans are the intended mechanism for consumers to implement many measures simultaneously, with no up-front expense, while retaining positive cash flow. Many states place a cap on the total incentive that each participant is eligible to receive. Oregon also limits incentives to once per measure per property address, regardless of property ownership. For example, 125 Main Street could receive a rebate of $0.25 per square foot for attic insulation just one single time, even if the home changes ownership.

Many states use a tiered approach for incentives, in order to encourage homeowners to achieve higher levels of performance. For example, Vermont offers increasing incentives for better air sealing results, as verified through blower door testing. A $250 rebate is offered for greater than 10% reduction in air infiltration; an additional $250 is offered for between 20% to 35% reduction, or an additional $500 rebate is offered for greater than 35% reduction. Such an approach results in greater savings per participant.

Recommendations: . Subsection (c) of section 19 of chapter 25 of the General Laws, should be amended to include the following language: "… rebate incentives provided to program participants shall be aimed at encouraging significant investments in energy efficiency, shall be available to participants in a tiered and performance-based structure that provides a base incentive for meeting minimum standards of energy efficiency performance, and bonus incentives for achieving incremental performance targets, and each incentive shall not be granted to a program participant more than once per property address."

Many states target a portion of their promotional campaign at high energy users. New Hampshire, for example, bases qualification for program participation upon a measure of energy usage known as the Home Heating Index. It is reasonable to assume that greater savings can be achieved by targeting high users. In Massachusetts, the programs devote a significant percentage of marketing toward "hard-to-reach" customers. Consumer awareness of programs is already high, so one might argue that "hard-to-reach" customers are actually unwilling customers, and instead, more efforts should be devoted to convincing existing willing customers to implement major savings measures.

Other Concerns

- Low performance of weatherization programs; low implementation rates for major savings measures such as air sealing, insulation, and boiler replacement. Also low average savings per participant.
- Poor leveraging of customer contributions. Participant expenses average less than 25% of the total cost. Despite this high level of subsidy, implementation rates are unacceptably low. Rather than revise the program design, or pilot new market approaches, the PAs are considering increasing the incentive levels even further. Comparison of incentives with other New England states is certainly recommended.
- High administrative cost of 100% quality control inspections, and lack of transparency of inspection results and contractor scores. Ratepayers are funding these inspections but do not enjoy the benefit of being able to consider quality scores when selecting a contractor to work on their home.

- Low participation rates of contractors. Contractors are viewed by the PAs as expendable resources and not as valued partners. Many insulation contractors have opted out of the HES program, and now the PAs are planning to retrain roofers to perform weatherization, for example.
- Accuracy of modeled savings vs utility bill analysis. Savings and benefits numbers that are published by the PAs and DOER are deemed or modeled, and not based upon actual energy usage via bill analysis, etc. Data is manually entered and subject to human error.

System Benefit Charge for Fuel Oil

A $0.025 per gallon surcharge on #2 fuel oil is being proposed by some as a means to raise additional money to fund energy efficiency programs.

- Approximately 51% of Massachusetts homes use oil as the heating fuel. Most of these homes are in cities and towns that are served by the five investor-owned electric utilities. The average electric ratepayer is already paying approximately $100 per year for these programs via the electricity system benefit charge. An oil surcharge would represent double-dipping.
- Aside from those residents who reside in a town served by a municipal electric utility AND who heat with oil, this additional surcharge will not result in the inclusion of new program participants who are not already eligible to participate.

- The cost of fuel oil (per BTU) is already almost double that of natural gas. Current economic conditions are not suitable for the implementation of additional fees for homeowners.
- The administrative expenses for the MassSave Home Energy Services program are approximately 40%. Just 60% of the total funds collected are returned to rate payers in the form of rebates and incentives. Until program overhead is streamlined and reduced, it is not reasonable to ask rate payers to pay more.
- Historical reports for the gas and electric programs reveals that the existing approved budgets are not being fully spent. It is not reasonable to further increase program budgets until the existing budgets are being adequately leveraged.
- Conservation Services Group, the largest Lead Vendor for the MassSave Home Energy Services program, is a strong proponent of this additional surcharge. According to its executives, the company revenue associated with the Massachusetts HES program was $16.5M in 2009. Additional energy efficiency program funding resulting from a SBC on fuel oil would result in significant financial windfall for the company at the expense of independent small businesses.

Recommendation: The Massachusetts legislature should oppose any initiative to implement a per-gallon surcharge on heating fuel for the purpose of energy efficiency.

5. Robert Calnan, Calnan's Energy Systems Inc.

Rebate incentives are provided to encourage energy conservation and to leverage consumers contributions. Currently the cost of the average weatherization project is less than the incentive provided.

Massachusetts building code requires a building permit for retrofit attic and wall insulation, It is the law. The lead vendor should be required to obtain the permit not the contractor. The agreement is between the customer and the lead vendor. Currently the contractor is responsible for acquiring the permit. The Mass Save program has a fixed price for permits. Most often the actual cost of the permit exceeds the amount the contractor is paid to obtain it. Also, cities and towns have different requirements for obtaining permits, and in some cased, up to three trips to city or town hall are required. This may explain why a large number of Mass Save jobs have no permits. The lead vendor should require proof of a building permit as part of the payment process.

The Mass Save Program limits the customers choices by determining that some measures are not cost effective according to the TRC test. With a maximum rebate of $2000, the cost of a measure would not increase the rebate amount. If the customer's choice is to spray polyurethane foam and the job cost is $10,000, the maximum rebate amount would still remain at $2000. The energy savings using this measure is substantially higher than any of the other Mass Save options. The savings of a measure not available as part of the Mass Save program won't be captured and counted by the Mass Save program.

The rebate is currently available once a year. This may explain the small average project size. The customer breaks the insulation project into smaller sections and receives a 75% rebate

each year until the project is complete. If the customer is eligible for only one rebate they would complete the entire job or a larger portion of the project. The customer would have no incentive to delay the completion of the project and the delay of savings directly related to the project.

Not all rate payers that pay the Energy Efficiency Charge on their electric or gas bill have access to the rebates available through Mass Save, If they are renters and need attic or wall insulation they are not eligible. Under no circumstances should the Massachusetts Legislature approve a per-gallon surcharge on heating fuel for the purpose of energy efficiency.

ISSUE THREE: Encouraging Business Development and Job Creation in Massachusetts

1. Elliott Jacobson, Action, Inc.

Care should be taken with respect to the impact of economic development policies on low-income families. Economic development and jobs are important goals for state policy, but the relationship between them and energy rates is uncertain.

State policy has created a strong and robust energy efficiency industry that has been an effective job-creator. Quantifying net job creation is not an exact science, but one conservative analysis shows 17.4 FTE jobs per year per million dollars spent on energy efficiency[18], or 5.5 jobs net of those that might be created by equivalent investment elsewhere in the economy.

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[18] John Davulis, "Maine's Green Economy: An Overview of Renewable Energy and Energy Efficiency Sectors" (Maine Center for Workforce Research and Information, 2010) (using data from Kevin Doyle, Final Report of Investigation into Residential Energy Workforce Needs, New England Clean Energy Council, May 26, 2009). Another analysis estimates two times this level. Jamie Howland, et al., "Energy Efficiency: Engine of Economic Growth" (Environment Northeast, 2009).

Translating these estimates to the 2013 utility-funded low-income budget of $88.5 million demonstrates that the low-income programs alone create hundreds of jobs with fair wages annually. A state-supported LEAN solar domestic hot water (SDHW) project has helped create a SDHW industry by reorganizing the approach to that work and helping to identify the most economic sites.

State supported LEAN projects have developed and promoted such innovative energy efficiency technologies for installation in the field as 96%-efficient space heaters, outdoor boiler resets, Solar Domestic Hot Water, PhotoVoltaics, heat pump water heaters, indirect water heating tanks, LED lighting, multi-family bi-level stairway lighting and occupancy sensors, and smart power strips. New technologies currently under investigation include super-insulation and advanced pellet stoves for space heating.

The continuance of programs that reduce energy cost and use, along with providing meaningful jobs that positively affect the environment, are vital to the future of better energy policies for all. The above mentioned efforts and installations are a meaningful part of the clean energy progress in Massachusetts.

2. Robert Kaufmann, Boson University

As described in the body of the report**,** the MassCEC provides support for clean energy innovation at many stages, including start-ups. The effectiveness of these efforts should be measured by following up with firms to which the MassCEC has awarded funds. Specifically, the MassCEC surveys firms to which it has awarded funds.

Based on this information, the MassCEC should evaluate the fraction of awardees that remain after one, year, three years, five years, etc. For firms that remain in business, the

MassCEC should compile information on how many people are employed and revenues (gross and net). Furthermore, the MassCEC should find out whether the firms have attracted additional funding, either from other governmental agencies, such as the US DOE or ARPA-E or from the private market, such as venture capitalists. The ability to attract funds from outside the state represent an important source of growth to the local economy; these funds would not flow into the state economy otherwise.

Data from firm-level surveys have to be collected and presented very carefully. Much of this information is proprietary, and fragile start-up firms will be reluctant to share. In addition, information should be presented thoughtfully. To avoid issues of confidentiality, there is no need to present information on how individual grantees prospered or failed. Indeed, focus on individual outcomes may be misleading. At early stages, awards from MassCEC programs can be viewed as lottery tickets; only one or two 'winners' may be needed for the entire program to be a success. For example, public records track First Fuel, that received a $250K start-up award from MassCEC three years ago and subsequently generated more than $12 million in outside funds from venture capital. This firm now employs about twenty five people in Massachusetts. This one grant alone would generate a benefit top cost return of about fifty to one.

3. Bob Rio, Associated Industries of Massachusetts

The relationship between government policies and overall net job creation can be very difficult to analyze, since survey methodologies are often inexact or self-fulfilling. Various surveys have indicated that the clean energy economy employs multiple thousands of people in the state.

However, while the data is in and of itself is probably accurate, conclusions from the data should be taken with a grain of salt, and policy makers should be careful not to take the results

out of context. Without knowing the source of the funds that generate these clean energy jobs, it is difficult if not impossible to determine why these jobs are created in Massachusetts. In addition, the government picking winners and losers has always been controversial and not widely supported.

For instance, many green jobs are created at research universities. While these jobs are important, the likelihood is that the majority of these jobs would have been created anyway, since Massachusetts institutions are renowned the world for their research talent. Further, some jobs resulted from the influx of federal stimulus funds which may have inflated the jobs numbers for a particular period. Finally, jobs in such industries as legal/consulting/electrician firms may in fact not represent new jobs, just a transfer from one specialty to another.

As an example, the recent Massachusetts clean jobs report, indicate that there were 70,000 individuals employed in clean tech in Massachusetts. An analysis of the data show how conclusion can be established without a factual basis. Moreover, "jobs in an industry" should not be confused with "new" jobs in Massachusetts.

A recent analysis done for the energy efficiency program showed that in 2011 the EE program employs a minimum of 2300 FTE jobs directly. Since these energy efficiency jobs probably did not exist before the subsidies, they were probably newly created. However, these numbers also account for plumbers or electrician putting in new boilers and wiring, something they typically do anyway.

Finally, the notion of net jobs is also difficult to understand. Unlike tax policies, where people pay taxes that are typically fungible and go to various programs, money which is spent on clean tech comes from ratepayers as a tax on their electric rates. Perhaps this is good for the company receiving this largesse, but not so for the company that now lost some of its

competitive edge supporting politically favored industries. (This taking from Paul to give to Peter was the subject of an exhaustive study in Spain and its commitment to wind and solar power. There it was found that on a net basis jobs were lost, not gained.)

Picking winners and losers should not be the role of government, especially where the definitions of who exactly is eligible to receive benefits can be somewhat fluid based on political expediency. For instance, while solar installation jobs are "green jobs" and receive program support, companies which recycle paper are not considered "green jobs" for purposes of government outreach. There are many of these sustainable green jobs in Massachusetts and they deserve such recognition.

Encouraging business development and creating jobs is not about transferring money to favored industries at the expense of others, and then making a claim that jobs are being created. It is about making the business environment amendable for everyone. The best way to do that is to treat businesses fairly and equitably.

4. Tom Regh, Progressive Energy Services, LLC

Metrics

I believe the following metrics would be appropriate and useful:

- Cost/job created (i.e. the year-over-year incremental total expenditures of clean energy programs divided by the incremental FTE employment growth)
- # of participating contractors and their FTE staffing levels
- # of businesses receiving program $
- Lead vendor and utility FTE staffing level and total salary pool
- Job placement statistics and starting compensation from Green training programs

- Workers comp and state unemployment insurance (UI) payments by participating contractors as an indicator of total wages paid

Competition

Both the Department of Public Utilities and the Office of the Massachusetts Attorney General have longstanding and open support for competitive markets.

The Green Communities Act directed the Investor-Owned Utilities (IOUs) to develop three-year plans for energy efficiency. It mandated that these plans utilize competitive procurement processes to maximum extent practicable, and to minimize administrative costs to the maximum extent practicable. It created the Department of Energy Resources (DOER) and the Energy Efficiency Advisory Council (EEAC) and charged them with review and approval of these plans. On March 24, 2009, shortly after it was initially formed, the Council released its own self-stated objectives, the "EEAC Resolution Concerning Its Priorities to Guide the Development, Implementation, and Evaluation of the PA Efficiency Plans". In that document, the Council outlined what it believed were the most important principles, including:

- In order to make the best use of various technologies and service providers available in the marketplace, the Council asserts that it is essential that PAs engage in **open, transparent and competitive solicitation processes**.
- The Council believes that a **robust marketplace is essential** to expanding the total energy efficiency efforts to achieve our long term goals.
- Energy efficiency programs should be managed in a manner to ensure the maximized use of customer funds for programs while **minimizing overhead and administrative costs**.

- Delivery of successful programs relies on a robust, **high-quality, equity-based workforce**.
- PAs are encouraged to explore a **market-driven contractor model** to create an **independent network of contractor auditors and implementers**.

The Council has fallen short in implementing almost every one of these objectives, especially as related to the HES program. The design of that particular program is based upon a system in which no competition exists whatsoever. Customers have no options for soliciting multiple independent energy efficiency proposals, and instead must accept the one-size-fits-all approach promoted by the HES program. All participating contractors are essentially subcontractors to the Lead Vendor, and must work for the same low fixed prices. The price list was developed through collusion among the utilities. An excerpt from a May 2011 memo from the EEAC consultant even stated, "While the original plan had been to coordinate pricing between NSTAR and NGRID, an executive decision was made in upper management at NSTAR and NGRID to discontinue any direct communication about measure pricing between the two companies in order to avoid any potential appearance of collusion." Furthermore, the pricing is completely arbitrary and was devised without reasonable input from contractors themselves. A request for information has been submitted to the DOER and the utilities, seeking a description of the pricing model that was used during the development of the contractor pricing, including assumptions about labor rates, material costs, crew sizes, productivity rates, employee benefits, overhead expenses, and profit. This information has not yet been provided. The fixed price strategy promotes the lowest common denominator (i.e. low performance, low quality, low customer service, and low contractor motivation), and ultimately may result in many top tier

contractors exiting the business. This will prove detrimental to the robustness of the industry overall, and to customers wanting choices about what is done to their home, and by whom.

In defense of the fixed price scheme, the PAs have cited that they had observed a 3x variance in per square foot installed insulation prices during the former Gas Weatherization program, which was based upon a competitive marketplace. Such a variance is to be expected and is a normal component of any free market which offers a broad spectrum of performance, quality, and service; simply consider any consumer item, for example cars, furniture, electronics, etc and this will become evident. The program unfortunately views weatherization as a commodity, with no differentiation on performance, quality, or service. Clearly, Massachusetts has a very diverse set of housing stock, with variations in age, size, price, style, construction, and condition; it is false to assume that every insulation project has the same needs and challenges.

The PAs have further indicated that price variation has an adverse impact on their ability to predict and control costs. That is because the rebates are tied to the job price. An alternative system in which the rebate is instead tied to the square footage of installed measure would resolve that issue. For example, the rebate might be $1.00 per square foot for R38 attic insulation, instead of today's 75% of the job price. Such a system is successfully being used in several other states, including Vermont and Oregon. It has the added benefit of being very easy and inexpensive to administer, since the PAs do not need to be concerned about maintaining and updating contractor price lists.

Participating contractors are essentially "employees" of the Lead Vendor, with no control over the amount of work received, the technical proposal, the specific services that may be provided, the fair price for the work, the payment schedule and terms, or the quality assurance.

The program has not developed an independent network of auditors and implementers. Finally, there has been no movement towards requiring a modest customer contribution towards the cost of the energy audit. These audits are viewed by many customers as simply a free handout, with some customers having assessments year after year.

Recommendations: Competitive markets best serve the needs of a diverse set of customers. It promotes high quality, good customer service, and the most favorable pricing. The weatherization industry is no different than other construction trades; permitting a utility monopoly over this industry is bad for rate payers and small businesses. It is expected that the energy efficiency surcharges and programs will be phased out over time, and we need to foster an industry that can stand on its own.

Fixed contractor prices have been unfairly and discriminately implemented only for contractors working in the residential weatherization sector. Commercial weatherization contractors and HVAC contractors are not subject to the same free-trade restraints. They must be eliminated and contractors should compete for work based on competitive pricing. To be able to better predict program administrator expenses, a rebate structure that is based upon the square footage of installed measure should be adopted, instead of the current rebate that is based upon job price. For example, a 1,200 square foot attic might be eligible for a rebate of $1.00 per square foot independent of the job price, instead of a rebate of 75% of the job price. This practice is common in many states.

Chapter 25, section 19, paragraphs (a) and (b) should be amended by adding this verbiage after the last sentences: "Any licensed Massachusetts independent contractor who meets the insurance, training, and certification requirements established by the program shall be able to

independently contract with program participants, at a mutually agreed fair-market price, for the installation of program-approved measures, and offer all program incentives, including rebates and financing."

Contractor Participation in HEAT Loan Program

Currently, independent contractors are able to offer HEAT loans to customers for window replacement, but only participating MassSave HES contractors are able to offer HEAT loans for insulation. The result is that some customers will not implement the energy savings measures, and the savings for those customers that do are not captured by the MassSave program. This negatively impacts customers, independent contractors, and program administrators.

Recommendations: Program guidelines must be modified to permit any duly qualified and licensed contractor to offer HEAT loans to customers for weatherization projects, regardless of their participation in the MassSave Home Energy Services program.

Massachusetts Clean Energy Industry Report

In 2012, the Massachusetts Clean Energy Center released its report to gauge the size and growth of the clean energy sector in the Commonwealth. While the reported size and growth are both impressive, several caveats should be noted:

- The clean energy sector is highly subsidized compared with other industries. This level of spending would certainly be expected to result in creation of new jobs.
- The CEC jobs report is somewhat misleading since it does not report full-time equivalents. A person who spends just 10% of their efforts on clean energy is counted the same as a full-time clean energy employee.

- The claim about the clean energy sector representing 1.7% of total employment in the Commonwealth is overstated, since the 71,523 clean energy workers are not necessarily full-time.
- The claimed clean energy employment growth of 11.2% is also overstated when compared to 1.2% overall job growth. The report states that 26% of this growth is due to existing positions to which clean energy responsibilities had been added. The chart on page 5 suggests that the job growth rate was 11.2%, which is misleading.
- While the overall industry grew, Installation and Maintenance employment, a significant bellwether, actually shrank by almost 12%. The most significant growth occurred in support activities such as legal, finance, policy. This is consistent with the reported statistic that 58% of the new clean energy hires were required to have a bachelor's degree or beyond.
- There is no definition as to what constitutes a "quality" position in terms of minimum salary and benefits, and there is no comparison against that benchmark.

Recommendations: The 2013 report should be based upon full-time equivalent positions. The CEC should define a benchmark definition for a "quality" living-wage position in terms of salary and benefits, and survey employers to determine how many of the new positions meet or exceed the criteria. The report should also detail the cost of each new job created and compare that figure to other government jobs programs.

Non-Competitive Sole Sourcing for Municipal Projects

While virtually all public works projects are required to undergo a competitive bid process, Section 14a of Chapter 25A (the GCA) expressly provides an exception for energy conservation

projects with a total project cost under $100,000 that are contracted directly with electric and gas utilities or their subcontactors.

Recommendations: This exception discriminates unfairly against qualified independent contractors who would be able to provide the same services. Either the sole-sourcing exception must be eliminated entirely, or be modified to be applicable to any contractor.

6. Robert Calnan, Calnan's Energy Systems Inc.

There is no need for fixed contractor pricing. A free market will increase the quality, create solutions to customers unique weatherization projects, and reduce cost through competition. No two homes are exactly the same. The Mass Save fixed pricing assumes that each item on their price list and every square foot of wall or attic of every home area is the same. Not allowing the experienced contractors to determine the cost based on site conditions and previous experience may be the reason that many of the best contractors in the state choose not to participate in the Mass Save program.

If the rebate was based on the square foot and not a percentage of the dollar amount, there would be no need for fixed pricing, and every dollar spent would have a predictable return. Most other states use this method.

Commercial weatherization contractors and HVAC contractors are not subject to fixed pricing and both are able to offer rebates. Why is it necessary to have fixed pricing for residential weatherization? All qualified contractors should be able to offer the same rebates without having to be a Mass Save contractor, providing they meet all of the current standards and requirements. Currently the contractor must be a Mass Save contractor to offer the 0% Heat loan

if for example wall insulation is to be installed. The non Mass Save contractor is able to offer the same 0% Heat loan for replacement windows and heating and cooling contractors can also offer the same heat loan for heating and cooling systems without being a Mass Save contractor. Why?

The job creation numbers take credit for existing jobs. An existing job is not a created job. A number of jobs that were created by my company lasted 20-30 years with the same employees. They were good paying jobs with good benefits. Since the fixed pricing and the takeover of the insulation industry, all of these jobs described have been eliminated. My company could no longer bear the expense to cover the costs of my experienced employees due to the new low fixed prices and could not afford to participate in the Mass Save program. The contractors that currently participate in the Mass Save program typically pay their employees $10-12. per hour with no benefits.

ISSUE FOUR: Reducing Costs Associated with Energy Programs While Maximizing Benefits

1. Elliott Jacobson, Action, Inc.

Massachusetts Energy Efficiency programs are subject to thorough oversight of their costs, benefits, and quality. Low-income programs, for example, are subject to at least 120% quality control inspections, as well as at least 50% in-process quality control inspection. This rigorous, redundant quality control helps assure that planned savings are actually achieved. Internal oversight is provided by a growing array of collaborative committees and task forces, such as the Best Practices task force convened by LEAN and the Residential Management Committee convened by the PAs. Outside program oversight is conducted by the Department of

Housing and Community Development (DHCD), state and federal inspectors general and auditors, municipal building officials, the Energy Efficiency Advisory Council (EEAC) and its consultants, and the Department of Public Utilities (DPU).

GHG emission reductions due to efficiency are reported by PAs regularly and have been substantial, already providing, for example (together with renewables), a significant portion of required compliance with the Global Warming Solutions Act (GWSA). While there is evidence that energy efficiency and renewables reduce price volatility, it is very difficult to empirically separate those effects from effects of the general economy and other external factors. On average, the prices of renewables have declined substantially and some are approaching grid parity, particularly where accounting is taken of environmental and other non-energy values.

2. Robert Kaufmann, Boston University

Energy and environmental legislation in Massachusetts has three general goals; reduce energy consumption, reduce spending on energy, and reduce the emissions of carbon dioxide, which causes anthropogenic climate change. Although these three goals generally are consistent (reducing energy use tends to reduce emissions), the correspondence between the two is not one hundred percent. For example, increasing the use of natural gas reduces the emissions of carbon dioxide because natural gas has a lower carbon content than refined petroleum products (e.g. heating oil, motor gasoline) or coal. But natural gas consists largely of methane, which absorbs about twenty times more heat energy than a molecule of carbon dioxide. As such, methane leaks associated with natural gas use could more than offset a reduction in carbon emissions.

Similarly, switching between electricity and other fuels may not save energy and money (and reduce carbon emissions) if large amounts of fossil fuel are used to generate electricity.

These seeming contradictions create instances where a narrow interpretation of legislation could diminish its efficacy. To avoid such losses, a systems perspective should be used to evaluate implementation. Such a perspective will avoid decisions that satisfy a narrowly defined goal, but worsen conditions relative to other measures of success (the so-called silo problem). For example, I suggest that efforts to slow carbon dioxide emissions be evaluated based on their effect on the emission of all gases that cause anthropogenic climate change. This comparison is possible by measuring all emissions by their global warming potential (GWP). GWP measures the effectiveness with which a gas absorbs outgoing long-wave radiation (the basis for anthropogenic climate change) and the time that a gas remains in the atmosphere. Such measures are readily available because the physical characteristics of greenhouse gases are well understood. Similarly, data on the direct and indirect uses of energy are readily available and can be used to assess the net energy savings associated with a specific action.

Calculations regarding the effect of a specific action on the atmosphere's warming potential and net energy savings can be implemented using a systems perspective. I recognize such calculations cannot be mandated explicitly by legislation. Given the complexity of the social, economic, and environmental goals in Massachusetts, and the limits inherent in legal statutes, I suggest that the Legislature enable a commission that would evaluate the degree to which actions are or are not consistent with the totality of goals laid out by energy- and environmentally-related legislation. The commission would include experts who could evaluate the effects of an action with regard to greenhouse gas emissions and net energy savings. Their

findings could be used to determine whether a specific action is consistent with the general goals set forward in legislation.

I would also propose that those responsible for evaluating the implementation of energy and environmental should be encouraged/required to supplement on-going efforts with behavioral nudges. Behavioral nudges are simple changes that generate significant changes in the way that energy is used. In the near-term, several nudges could generate significant changes with very little cost. First, I suggest that state government buildings post energy related information in a very visible manner. Specifically, billboards or TV monitors in the building lobby should show simple measures of the building's energy use and how that building ranks relative to other government building. In addition, the monitors would post simple suggestions as to how government employees could reduce the building's energy use (e.g. turn off computers at night). Such efforts by the UK Government reduced energy use by about 14 percent at very little cost.

I would also suggest that utilities be required to calculate the rise/fall in monthly electricity prices that are associated with monthly weather patterns. That is, hot summers raise electricity demand, and higher demand leads to higher electricity prices. Conversely, warm winters reduce demand and lower prices. Making the price related information available to consumers will encourage energy conservation and reinforce the economic threat (or lack thereof) posed by on-going changes in climate.

3. Bob Rio, Associated Industries of Massachusetts, Inc.

As mentioned previously, the biggest failure of the Administration's energy policy is a lack of definition which leads to a lack of coordination. Each agency or organization which

manages the programs has their own goals, with very little coordination and transparency. Under current definitions, "energy programs" encompass everything from smart grid to renewable power to energy efficiency. Benefits, depending on the program, are likewise vague. Almost never is the ratepayer mentioned.

There is no central repository where all programs are tracked, itemized and available for ratepayer viewing. Until this exercise no one quantified each individual program and its net impact on ratepayers. Not only does this lack of transparency leave the ratepayer in the dark, but it also limits the ability of the ratepayer to make behavioral changes that may be beneficial. For instance, when companies make decision to invest in energy efficiency or other measure they obviously look at payback time. However, if they are unaware that transmission rates or other rates will be increasing at greater than inflation levels going forward, this would certainly be information important for long-term planning.

As to new programs, the Administration often claims that each program only adds a minor amount to each customer's bill. The truth for larger energy users is the opposite. The cumulative impact of these programs is huge and growing. Most are embedded in the distribution portion of the bill and will not be reduced for decades, basically adding permanent increases to a customer's bill.

As stated in previous sections, the Administration needs to stop compartmentalizing programs and consolidate some of the numerous clean energy programs so that they begin to work together and complement each other.

In addition, these departments should also align themselves with outside forces – for instance ISO-NE, companies developing deliverable compressed natural gas (CNG) and others.

Right now there does not appear to be this coordination and there is far too much rigidity in the programs.

4. Tom Regh, Progressive Energy Services, LLC

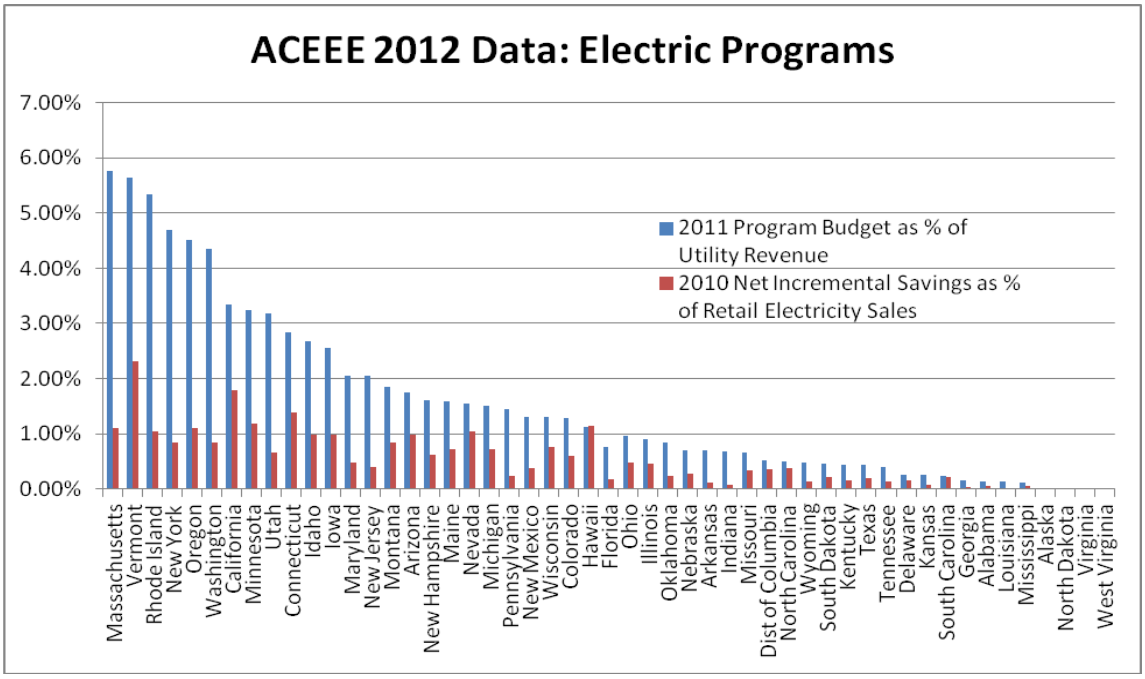
Metrics

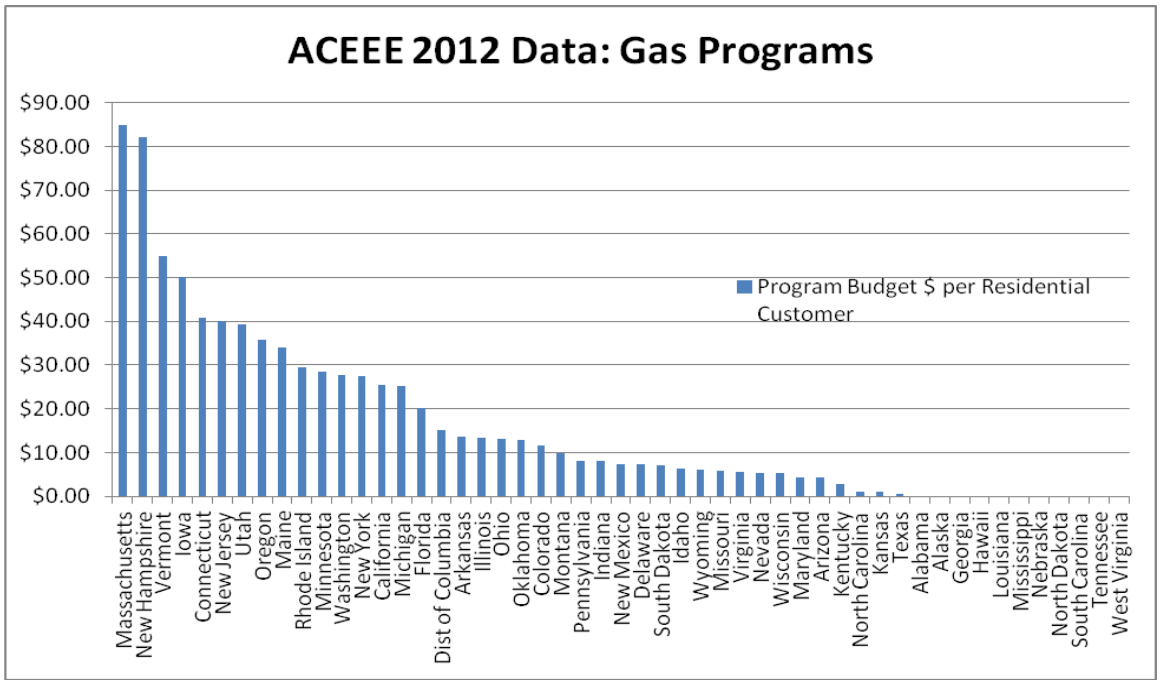
I believe the following metrics would be appropriate and useful for all core initiatives, including residential, low-income, and commercial/industrial:

- Number of participants
- Quantity of each approved measure installed (e.g. air sealing, insulation, thermostat, etc)
- Total quarterly program funding by category and expenditures by budget category
- Average Marketing and Advertising spend per participant (customer acquisition cost)
- Average total program spend per participant
- Average participant expenses (customer contribution)
- Average incentive per participant
- Participant incentives as a percentage of total program spend
- Average annual and lifetime kWh savings per participant
- Average annual and lifetime therm savings per participant
- Average annual and lifetime electric benefits per participant
- Average annual and lifetime gas benefits per participant
- Average annual and lifetime resource benefits per participant
- Average annual and lifetime non-resource benefits per participant
- Cost per lifetime MMBTU savings (including electricity, gas, propane, and oil savings)

High Administrative Costs

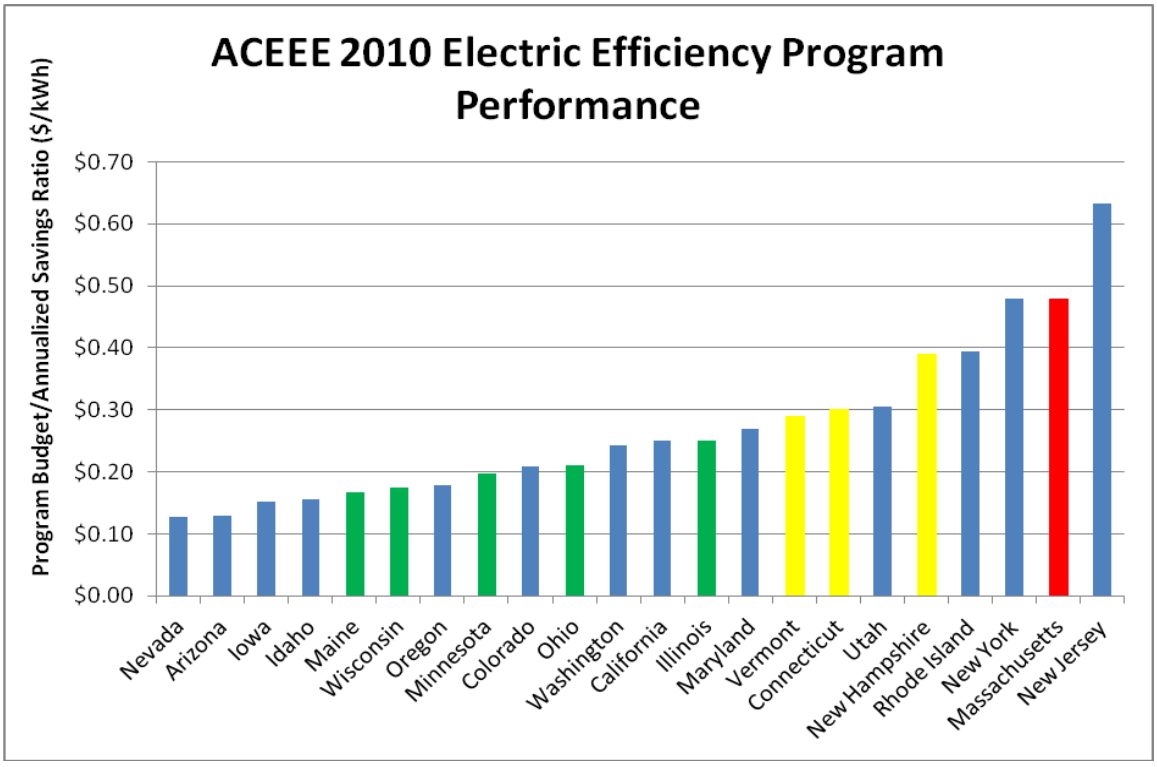
Program administrators and state policy makers frequently cite the recognition by the American Council for an Energy Efficient Economy (ACEEE) of Massachusetts as #1 in the nation for energy efficiency for the last two years. While this is a significant achievement, the sound bite should not be universally proclaimed as a favorable endorsement of all things related to energy efficiency in the Commonwealth. It is important to understand the context and rationale behind the ACEEE scoring system. A full 74% of the total possible number of points is related to policy issues, 16% is attributable to the size of gas and electric efficiency program budgets, and only 10% is related to the savings performance of electric programs (i.e. electricity savings as a percentage of electricity revenue). Gas program savings are not even considered, and therefore no points may be earned in this category. It is interesting to note that while Massachusetts ranks #1 overall, we rank #7 in terms of the savings performance. The Commonwealth ranks #1 in electricity program spending (program budget as a percentage of electricity revenue) than any other state, and it also ranks #1 in gas program spending (program budget per residential gas customer), at more than 5x the national average. The simple truth is that the administration deserves credit for its nation-leading policy making, but has not implemented programs that achieve high levels of savings at minimal cost.





The ACEEE report lists 22 states that have electricity program budgets that exceed 1% of total electricity revenue; these can be considered the states that are serious about saving energy. A performance ratio can be calculated by dividing the total program budget by the annual kWh

savings achieved; a lower ratio indicates savings achieved at a lower per unit cost. Of these 22 states, Massachusetts has the second worst budget/savings ratio, at about $0.48/kWh saved.



Recommendations:

- Despite the legislative mandate of the GCA, program administrators have not been successful at delivering programs that maximize the return for ratepayers while minimizing overhead and administrative costs. As a further protection for ratepayers a legislative cap on these expenses should be implemented; Chapter 25, section 19, paragraphs (a) and (b) should be amended by adding this verbiage after the last sentences: "A minimum of 75% of total program funding shall be allocated for participant grants, rebates, and/or incentives. "

- Eliminate "double-dipping" by limiting measure incentives to once per address. As an example, an attic insulation rebate of $0.25 per square foot could only be received once per property address, regardless of ownership.
- If the PAs maintain that there is a need for 100% inspection of every installation, then some careful thought is in order. Why are there so many quality issues? You get what you pay for, so is the contractor pricing sufficient to obtain the desired quality level? Is there high contractor turnover that is limiting the experience level of participating contractors? How many contractors have elected not to participate in the program, and why? Contractor training and certification requirements are increasing over time, so what is the justification for the increase from a 10% random inspection level just two years ago? The recommendation is to save significant program expenses by reverting back to a 10% inspection level, and increasing the frequency of inspections only in cases where persistent issues are found. Contractors who are unable to resolve issues should be disciplined or eliminated.
- Make available to ratepayers, as a matter of public record, the results of contractor quality inspections and tier rankings. This information was collected and paid for using public monies and therefore should be in the public domain. Ratepayers have the right to know who is working on their home.
- As many independent businesses are forced to identify and implement cost cutting measures in a difficult economy, so too should the utilities be mandated to establish cost reduction working groups that seek ways to lower the cost of administering these programs. This group should report periodically to the EEAC.

Over-Statement of Program Savings and Benefits

The Program Administrators (PAs) use a tool known as the Cost Benefit Screening Model to estimate, and in some cases to report, savings and benefits achieved by energy efficiency measures and programs. Savings and benefits fall into three categories; electricity savings, resource savings (e.g. oil, gas, or water), and non-resource benefits. The latter category represents intangible benefits such as improved thermal comfort, noise reduction, reduced maintenance, increased home value, and increased national security. The dollar values assigned by the PAs to each benefit are based upon industry studies. There are however, two problems with this approach. First, the true value of these benefits is very subjective, and can really only be determined by the building owner or occupant. Thermal comfort, for example, may not be very important to a landlord, but would likely be very important to the occupant. The second issue is that the value of these benefits is not even consistent between the electric and gas programs. For example, thermal comfort is assigned an annual benefit of $125 per year of measure life but only $25 per year for gas programs. Each program-approved measure (e.g. a home energy assessment, CFL bulbs, or insulation) may be assigned either a recurring annual non-resource benefit, a one-time non-resource benefit, or both. Recurring benefits are multiplied by the measure life, in years, and added to the one-time benefit to calculate the total lifetime benefit. During a thorough investigation of the Cost Benefit Screening Model, some accounting irregularities were discovered which have significant negative impacts on the previously reported and future planned performance of the MassSave Home Energy Services program. The Home Energy Assessment (HEA) occurs as one of the first steps in the process; a program Energy Professional visits the customer's home to determine the need for energy efficiency improvements. The HEA itself does not result in any significant savings, other than perhaps a very small energy savings due to customer education and behavior modification. The true

savings and benefits are only achieved when energy efficiency measures are actually installed, including installation of energy efficient lighting, air sealing, insulation, or replacement of hot water and heating systems. The Cost Benefit Screening Model that was recently approved by the DPU as part of the 2013-2015 Three Year Plan does not account accurately for non-resource savings, as follows. All non-resource benefits are claimed by the program when the HEA is completed, regardless of whether any actual improvements were implemented by the customer. Furthermore, there are no non-resource benefits accrued when they should be, i.e. when a customer elects to install insulation, perform air sealing, or upgrade their heating system. The measure life of an HEA is specified as 19 years with the result that over $3000 of non-energy benefits are being claimed without basis. This accounting irregularity has the effect of overstating the savings and benefits achieved by the Home Energy Services program, and under-estimating the cost-effectiveness of air sealing and insulation measures. The magnitude of this error is extraordinary, as only about 20% of customers who elect to have a home energy assessment performed actually follow-up by implementing major savings measures. The measure life of 19 years for a Home Energy Assessment is also questionable. The average length of home ownership is assumed to be about seven years. There are also no known program limitations that prevent customers from having HEAs performed year-after-year, and certainly not before 19 years have passed. This leads to the conclusion that it is highly likely that non-resource savings are being counted multiple times.

Recommendations: The DPU is aware of this issue, and has a duty and obligation to ratepayers to open a docket for the purpose of investigating. HEA measure life must be reduced to a reasonable number, perhaps five years. Program limitations should be implemented to prevent a customer from having another HEA before the measure life is expired. Non-energy benefits must

be virtually eliminated from the HEA, and reassigned to the major savings measures where they justifiably belong. Existing Three Year Plans must be revised, perhaps triggering the need for a Mid-Term Modification, and all historical program performance reports must be revised, as necessary. Should the department decide not to initiate a review on its own, the legislature should enact legislation requiring such action.

Transparency

Program performance data is difficult to obtain, and usually requires "mining" through DPU dockets. Program administrators and the DOER have generally not been receptive or responsive to data requests by Commission members.

- Utilities have an approved budget of $37M annually for Program Planning and Administration, yet seem unwilling to provide requested information about program performance.
- Ratepayer visibility into energy efficiency and renewable bill surcharges. Surcharges are buried in the transmission portion of the bill and so the true costs of these programs is not clearly evident to gas and electric utility ratepayers.
- Lack of reporting standards for program performance.

Recommendations:

- All surcharges should be clearly itemized on customer bills, and not buried in the transmission portion of the bill.
- A reporting standard must be developed that is based on performance metrics, and shows trends.

5. Robert Calnan, Calnan's Energy System Inc.

Two years ago the Mass Save program inspected up to 10% of completed insulation projects. Currently the inspection rate is 100%. Is this increase in inspections due to a higher failure rate?

The rate payer should have access to the Tier ranking system of contractors implemented by the lead vendor. This information was paid with public monies and should be available to the public.

All energy efficiency charges on utility bills should be listed item by item and not buried in the transmission portion of the utility bill.

ISSUE FIVE: Reducing the Cost of Electricity for Commercial, Industrial and Residential customers

1. Elliott Jacobson, Action, Inc.

As natural gas prices have dropped sharply, we have become much more reliant on natural gas in recent years, replacing oil in providing heat and coal in fueling electricity generation. While the switches from oil and coal to natural gas have significant environmental benefits, we need to be cautious about reliance on any one fuel. Earlier choices to rely heavily on one fuel, such as uranium or oil, have had expensive and dislocating consequences when costs turned out to be substantially more than assumed. The same is likely to be true for natural gas because pipelines must be built to relieve supply constraints and the ultimate entry of US natural gas into world markets will raise US gas prices toward world prices as US policy changes to promote exports. Thus what we see now as the low-price side of price volatility should also

include the expectation that prices will rise, possibly sharply, under current policies. Efficiency and renewables have an important role in diversifying our energy resources in order to mitigate these effects of over-reliance on natural gas.

Cost-effective distributed technologies could have a mixed impact on energy prices. At sufficiently large scale, depending on regulatory policy and other external factors, distributed resources could increase grid costs to support those resources while depriving the grid of revenues. Increased costs and declining revenues are a recipe for increased rates, which could trigger additional flight to newly cost-effective distributed resources – which could support another round of increased grid costs, declining revenues, and increased rates. This spiral could ultimately threaten the economics of the existing grid and its captive customers.

In the short run, of course, participants in energy efficiency programs and adopters of distributed technologies will fare better economically than those who forego these technologies.

2. Robert Kaufmann, Boston University

Efforts to reduce the price of electricity for consumers (and promote renewable power generation) should expand the services that the grid 'pays for.' Currently, electricity is priced in terms of kilowatt hours generated or consumed. But the quality of electricity also matters because performance levels of consumer devices/appliances fall and their lifetime shrinks as power surges, and interruptions move beyond acceptable ranges. In a world where patterns of consumption are unpredictable and difficult to change, the responsibility of ensuring the quality of power falls on the system operators and distribution companies. They maintain quality by building reserves of excess generation, transmission, and distribution resources to meet peak

loads. The large capital requirements and inefficient utilization of resources is translated into higher average prices to consumers.

The new cyber-physical infrastructure (aka, the Smart Grid) provides a rare opportunity to break out of this status quo. Through its ubiquitous use of sensors, pervasive connectivity, and embedded intelligence, quality-based electricity prices and the ability to convey these price signals to end-users has the potential to affect both their purchase and consumption behavior. More generally, the Smart Grid can spawn new investment in a wide array of distributed resources (smart loads, distributed generation, and storage) and change the way we mange those resources.

For example, distributed resources and generation, e.g., PHEV battery charging, roof top PV and the like, can be put into dual use so as to improve quality of electricity. Specifically, they can increase the 'quality' of electricity on the grid. Changing grid management so that the owners of distributed resources are paid for improving the quality of electric power would accomplish two goals. First, it would reduce the price of electricity because it would reduce the capital infrastructure that is needed to manage the quality of electric power that is available from the grid. Second, payments for these services would reduce the cost of distributed resources. This would accelerate the adoption of renewable resources and reduce the subsidies that are needed to reach specific goals.

The technical and economic nuances needed to pay for services that improve 'electricity quality' are not currently understood. Nonetheless, the Legislature should make it clear that such payments will be an integral part of a future 'Smart grid.' Such a signal will stimulate the research needed to support such payments.

3. Tom Regh, Progressive Energy Services, LLC

Metrics

I believe the following metrics would be appropriate and useful:

- Spread sheet or chart showing all bill surcharge rates (per kWh and per therm) for renewable and energy efficiency.
- Monthly and annual actual bill impact of renewable and efficiency surcharges for the average gas and electric user within each rate classification. Data should include assumptions about usage and rates.

Gas-Electric Problem

During the April 17th meeting, Commissioner Cash delivered a presentation entitled "Energy Reliability, Costs, and the Regional Market". In it, he described a phenomenon referred to as the "gas-electric problem". In 2012, approximately 43% of total capacity and 52% of electricity generation was based on natural gas as the fuel source, compared with just 18% and 15%, respectively, in the year 2000. While there have been some environmental benefits associated with this dramatic shift to cleaner fuel, it has also resulted in increased volatility in the wholesale electricity supply cost. Delivery of natural gas into Massachusetts is limited by existing gas pipelines, which are at or near capacity. During cold winter days, when there is increased demand due to space heating needs, gas prices can spike significantly, with a resulting spike in electricity prices. One example occurred in January 2013, during a prolonged cold spell; wholesale electricity prices spiked from about $40/MWh to over $80/MWh. The DPU cited fuel diversification and a system of incentives for usage during off-peak periods as possible remedies.

Another obvious solution that was not presented is to decrease gas demand by weatherizing significantly more numbers of buildings. This would have positive impact during both winter and summer peaks. Less gas usage for space heating during cold winter days would allow gas resources to be used for electricity generation; better insulated homes would also reduce cooling loads on hot summer days, so electricity demand for air conditioning would be lower, helping to reduce the peak demand.

Existing residential gas efficiency programs are under-performing. Recent analysis of the 2013 statewide first quarter report to the EEAC reveals the following performance metrics:

- The total program expenditures were $4,801,259, with 6,506 participants. The average total spend per participant was $738.
- Average Incentive per Participant is just $351. Current program incentives for weatherization include 75% rebate, up to $2,000 plus no-cost air sealing; therefore, we would expect the average incentive to be in the $2,000 to $2,500 range.
- The average annual therms saved per participant was just 83.
- The cost per lifetime therm saved was $0.46. By comparison, the Energy Information Administration (EIA) cites the current gas futures price at just $0.40 per therm.
- The Participant Incentives (customer rebates) amount to just 48% of the total program expenditures. Ratepayer funding is not being effectively leveraged to generate savings, and instead is being "burned up" through program administrative costs.

The Program Administrators have claimed that the performance of the gas efficiency programs is a result of recent lower gas prices, which are preventing consumers from insulating their homes due to longer investment payback periods. They have sought and been granted a savings "ramp-

up" period for the 2013-2015 three year plan. Weatherization techniques and materials are not new technology; PAs should be held accountable to deliver the savings despite lower gas prices. National research into energy efficiency programs has shown that most homeowners decide to implement major measures for reasons other than payback; for example, they may wish to solve an ice dam problem, reduce the likelihood of mold growth, or simply improve their comfort at home. In accordance with their "do and learn" philosophy, PAs should be trying new and innovative approaches, including pilot programs. The current approach cannot deliver the broad and deep savings that are necessary.

Recommendations:

The gas-electric problem contributes significantly to price volatility. One strategic component for minimizing its frequency and severity must be to aggressively expand the weatherization of a substantial number of homes and businesses that use natural gas as the heating fuel.

In order to accomplish that objective, program design changes are necessary to increase both the implementation rate for weatherization measures, and also the savings per project. Program administrators should leverage the expertise of installation contractors in program design committees, including the Residential Management Committee.

Specific program design suggestions for consideration include the following:

- Current MassSave Home Energy Assessments are too broad in scope. Significant time is spent on immediate savings measures such as light bulbs, thermostats, and low-flow shower heads, leaving insufficient time to perform a thorough inspection of the home's thermal envelope. PAs should consider separating the programs that cover the ISMs and thermal envelope.

- Convincing homeowners to invest in energy efficiency requires significant customer education about the benefits. PAs should better leverage the relationship between contractors and customers to improve implementation rates for weatherization.

ISSUE SIX: Increasing Electricity Reliability

1. Elliott Jacobson, Action, Inc.

As natural gas prices have dropped sharply, we have become much more reliant on natural gas in recent years, replacing oil in providing heat and coal in fueling electricity generation. While the switches from oil and coal to natural gas have significant environmental benefits, we need to be cautious about reliance on any one fuel. Earlier choices to rely heavily on one fuel, such as uranium or oil, have had expensive and dislocating consequences when costs turned out to be substantially more than assumed. The same is likely to be true for natural gas because pipelines must be built to relieve supply constraints and the ultimate entry of US natural gas into world markets will raise US gas prices toward world prices as US policy changes to promote exports. Thus what we see now as the low-price side of price volatility should also include the expectation that prices will rise, possibly sharply, under current policies. In addition, electricity reliability is negatively affected by constraints in deliverability of natural gas due to generators' failure to purchase gas on a firm basis, i.e., including the cost of pipeline expansion.

Efficiency and renewables have an important role in diversifying our energy resources in order to mitigate these effects of over-reliance on natural gas. Efficiency is by far the least-cost resource and contributes to reliability by its near-100% availability. On average, the prices of renewables have declined substantially and some are approaching grid parity, particularly where

accounting is taken of environmental and other non-energy values. While there is evidence that energy efficiency and renewables reduce price volatility, it is very difficult to empirically separate those effects from effects of the general economy and other external factors.

Cost-effective distributed technologies could have a mixed impact on energy prices. At sufficiently large scale, depending on regulatory policy and other external factors, distributed resources could increase grid costs to support those resources while depriving the grid of revenues. Increased costs and declining revenues are a recipe for increased rates, which could trigger additional flight to newly cost-effective distributed resources – which could support another round of increased grid costs, declining revenues, and increased rates. This spiral could ultimately threaten the economics of the existing grid and its captive customers. At the same time, the effect of distributed generation on reliability is uncertain – while in general a diversity of smaller generating resources may increase reliability, the increased complexity of operating a grid with an unprecedented multiplicity of resources and energy flows may have a negative impact on reliability.

2. Bob Rio, Associated Industries of Massachusetts, Inc.

As stated in the body of the report, overall grid reliability is the purview of ISO-NE. However, grid reliability is often one the goals mentioned for the energy policies of the Commonwealth. However, there is no apparent coordination between these programs and ISO-NE planning. Although a representative of ISO-NE was added to the EEAC just recently, there has been no independent verification that the policies of Massachusetts are making the grid any more reliable.

In fact, one could argue that the policies of Massachusetts are making the grid less reliable. By encouraging large amounts of renewables and on-site generation customers are

adding large amounts of intermittent power to the grid, with ISO left to pick up the pieces, which often requires the installation of very expensive back up power. This is adding expense to customer's bills which is often not captured when doing cost-benefit analysis of energy policies, particularly renewable policies.

While this may not be a huge issue at this time, as the amount of intermittent power is increased, the costs will escalate or the reliability of the grid will be compromised.

3. Tom Regh, Progressive Energy Services, LLC

Metrics

I believe the following metrics would be appropriate and useful:

- % availability
- # outages for storm events
- # outages for equipment failures
- Mean duration of outages
- Preventive maintenance budgeted and spent annually ($ and % of revenue)
- % of underground transmission lines

Part 5: Information Requests

Several Commission members submitted formal and informal requests to various EOEEA agencies in order to understand the broad subject matter under the purview of the Commission and to develop metrics for the Report. The following Commission members submitted formal requests.

For further detail, please follow the links:

1. Information Request by Thomas J. Regh, submitted on March 7th, 2013:

   See: ***http://www.mass.gov/eea/docs/eea/energy-policy-commission/regh-request-for-information-eprc-update.pdf***

2. Information Request by Robert Rio, submitted on May 8th, 2013:

   See: ***http://www.mass.gov/eea/docs/eea/energy-policy-commission/finalresponse-to-data-request-from-robert-rio-05-09-13.pdf***

Part 6: Meetings Schedule and Meeting Minutes

Thursday, January 10, 2013
2:00pm – 3:00pm
Executive Office of Energy and Environmental Affairs
OTA 9th Floor Conference Room

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-02-01-minutes.pdf

Thursday, January, 17, 2013
10:00am – 12:00pm
Executive Office of Energy and Environmental Affairs
DPU 5th Floor Hearing Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-01-17-minutes.pdf

Friday, February 1, 2013
10:00am - 11:30am
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-02-01-minutes.pdf

Friday, February 22, 2013
10:00am - 11:30am
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-02-22-minutes.pdf

Friday, March 8, 2013
10:00am - 11:30am
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room C

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-03-08-minutes.pdf

Wednesday, March 20, 2013
1:00pm - 2:30pm
Executive Office of Energy and Environmental Affairs
OTA 9th Floor Conference Room

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-03-20-minutes.pdf

Friday, March 29, 2013
11:30am - 12:30pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-03-29-minutes.pdf

Wednesday, April 3, 2013
1:00pm - 2:30pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room B

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-ap3-minutes.pdf

Wednesday, April 17, 2013
1:00pm – 2:30pm
Executive Office of Energy and Environmental Affairs
9th Floor OTA-Conference Room

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-04-17-eprc-minutes.pdf

Wednesday, May 1, 2013
1:00pm – 2:30pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room B

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-05-01-minutes.pdf

Wednesday May 15, 2013
2:00pm - 4:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/2013-may-eprc-minutes.pdf

Wednesday May 22, 2013
2:00pm - 4:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-minutes-may22.pdf

Wednesday May 29, 2013
1:00pm - 3:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-may29-minutes.pdf

Wednesday June 5, 2013
2:00pm - 4:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-june5-minutes.pdf

Wednesday June 12, 2013
12:00pm - 2:00pm
Executive Office of Energy and Environmental Affairs
9th Floor Legal Conference Room

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-june12-minutes.pdf

Wednesday June 19, 2013
1:00pm - 3:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-june19-minutes.pdf

Wednesday June 26, 2013
2:00pm - 4:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-june26-minutes.pdf

Wednesday July 17, 2013
2:00pm - 4:00pm
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room A

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-july-17-minutes.pdf

Wednesday, August 7, 2013
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D
2:00pm – 4:00pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-aug7-minutes.pdf

Wednesday, September 18, 2013
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D
2 p.m. – 5 pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-sept-18-minutes.pdf

Wednesday, September 25, 2013
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D
2:00pm – 5:00pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-sept-25-minutes.pdf

Wednesday, October 2, 2013
Executive Office of Energy and Environmental Affairs
2nd Floor Conference Room D
2:00pm – 5:00pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-oct2-minutes.pdf

Wednesday, October 9, 2013
Executive Office of Energy and Environmental Affairs
EEA (100 Cambridge Street, 9th Floor) OTA Conference Room
1:00pm – 5:00pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-oct9-minutes.pdf

Friday, October 18, 2013
Executive Office of Energy and Environmental Affairs
EEA (100 Cambridge Street, 9th Floor) Conference Room A
1:30pm – 4:00pm

Minutes available at: http://www.mass.gov/eea/docs/eea/energy-policy-commission/eprc-oct18-minutes.pdf

Wednesday, October 30, 2013
Executive Office of Energy and Environmental Affairs
EEA (100 Cambridge Street, 9th Floor) Conference Room C
2:00pm – 5:00pm

Minutes available at: http://www.mass.gov/eea/energy-utilities-clean-tech/energy-policy-commission/meetings-schedule.html

Part 7: Extension Letter to the Legislature

June 7, 2013

The Honorable Benjamin B. Downing
Chairman, Joint Committee on Telecommunications, Utilities and Energy
State House, Room 413F
Boston, MA 02133

The Honorable John D. Keenan
Chairman, Joint Committee on Telecommunications, Utilities and Energy
State House, Room 473B
Boston, MA 02133

Re: Energy Policy Review Commission

Dear Chairman Keenan and Chairman Downing:

I am writing on behalf of the Energy Policy Review Commission (Commission) to respectfully request an extension to the deadline for the Energy Policy Review Commission's report to the Legislature. The deadline for a report to the Legislature is June 30, 2013.

The Commission was created as part of Section 41of the Chapter 209 of the Acts of 2012. The Commission is chaired by the Secretary of the Executive Office of Energy and Environmental Affairs and consists of appointed representatives of the business community, the Attorney General's Office, academia and representatives from the Governor, Speaker of the House and the Senate.

As detailed in the Act, the Commission shall:

> "research and review the economic and environmental benefits, as well as, the economic and electricity cost implications of energy and electricity policies in the commonwealth. The commission shall report to the legislature recommendations on how to (i) further expand the commonwealth's renewable energy portfolio and promote energy efficiency; (ii) encourage business development and job creation; (iii) reduce the costs associated with energy programs funded, in whole or in part, by the commonwealth, while maximizing the benefit of these programs; (iv) reduce the cost of electricity for commercial industrial and residential customers; and (v)increase electricity reliability."

In addition, the Commission must "research, evaluate, consider and report on: (i) determining consistent metrics to be utilized to evaluate the success and cost-effectiveness of programs under chapter 169 of the acts of 2008; (ii) the associated economic and environmental impact of scheduled increases in demand resources, aggregate net metering capacity and renewable energy capacity; (iii) the structure of the regional wholesale electricity market and its impact on retail electricity costs; and (iv) the overall impact of the commonwealth's energy and electricity policies on economic growth in the commonwealth, specifically net job creation and business development, establishment and retention." Furthermore, the Commission must include

"an analysis of the estimated or actual economic and environmental benefits, as well as, economic cost, electricity cost and implication for electricity reliability of: (i) implementing administrative, regulatory and legislative rulemaking as it pertains to electricity and the structure of the wholesale electricity market; and (ii) meeting legislative and administrative goals and requirements related to greenhouse gas reductions, energy efficiency and renewable energy generation." Finally, the Commission was directed to hold two periods of public comment; one prior to the report being written, and a second period of comment. The deadline for a report to the Legislature is June 30, 2013.

The Commission has been working diligently over the course of 2013. As expected with such a diverse group of participants, there has been a steady dialogue between members of the Commission. The first public comment period of the initial outline of the report was closed on May 20, 2013, resulting in numerous comments that the Commission members are reviewing to make sure the public is well represented in the final report. At least 2,000 individuals and organizations received personal emails notifying them of their opportunity to comment on energy policy in the Commonwealth through the Commission.

While the Commission is making good progress and is in the final stages of writing the draft report, we are writing to request an extension from the June 30, 2013 deadline to ensure that the Commission (1) completes the public comment period on the draft report, as required by the legislation; and (2) thoroughly considers the public comments when finalizing the draft report including data gathering and analysis.

Based on the foregoing, we are asking that the deadline for the final report to be delivered to the Joint Committee on Telecommunications, Utilities and Energy on June 30, 2013 be extended to October 31, 2013. It is our intention to continue to meet regularly and to continue on the progress we have made.

We thank you in advance for considering our request to extend the deadline for this important document. Please feel free to contact me with questions or concerns on this or any other matter.

Sincerely,

Barbara Kates-Garnick

Barbara Kates-Garnick
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs