Residential RGGI Options for FY14 Workshop 1

July 11, 2013

Welcome!

Agenda

- Welcome and Introductions — 15 Minutes
  - Introductions
  - Objectives
  - Process
- Context — 30 Minutes
  - RGGI Law
  - Amount of Funds Available
  - Triennial Plan
  - Principles and Best Practices
- Analysis and Discussion of Key Criteria — 75 Minutes
  - Benefit-to-Cost Ratios
  - Lower Heating Demand
  - Lower Heating Costs
  - GHG Savings
  - Group Discussion, Comments
- Building Envelope Measures — 60 Minutes
  - Program Description
  - Program Results
  - Q&A

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Objectives

- Overall Process Objectives
  1. Gather stakeholder input on the development of Trust's program design for the use of RGGI funds targeting "measures that lower residential heating energy demand and reduce greenhouse gas emissions."
  2. Get program incentives "on the street" in advance of heating season.

- Workshop 1 Objectives
  1. Roll out the Stakeholder Process
  2. Establish common understandings among Trust and stakeholders regarding applicable context (statute, Triennial Plan, opportunities)
  3. Share initial data/analysis on key criteria (costs, savings) for sample measures
  4. Solicit feedback on measure definitions, measure assumptions for analysis on key criteria.
  5. Provide briefing and Q&A on existing Trust Building Envelope Measures

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Process - Input

- Similar to Triennial Plan
  - EMT staff to work with Board to generate Straw Proposals
  - Brief stakeholders on relevant context:
    - Statute
    - Precedent programs in ME, elsewhere
    - Cost-effectiveness, Economics
    - GHG impacts
  - Receive stakeholder input
    - At workshops
    - Through written comments
  - Involve outside experts as appropriate
  - 2-3 workshops

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Process - Timeline

- July
  - Gather input from prominent stakeholder groups
  - I.D. and Research Issues, provide analysis
  - Develop Staff "straw proposals"
  - Hold 3 roundtable discussions / workshops
- August - Sept
  - Decide program design
  - Draft program guidelines
  - Outreach to vendors / contractors (conf calls, workshop trainings)
  - Determine parties to involve in delivery of:
    - Marketing / outreach
    - Screening/approval of individual measures or projects
    - Processing/payment of incentives
- October
  - Incentives on the street

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Context

RGGI Statute – Funding Allocation to Residential Heating

35-A MRSA 10109(4)(A):

- For FY 14, 15 and 16,
  - 35% of the funds received by the Trust during those years must be used for "measures that lower residential heating energy demand and reduce greenhouse gas emissions"
  - "The measures that lower residential heating demand must be fuel-neutral and may include, but are not limited to,
    - energy efficiency improvements to residential buildings and upgrades to efficient heating systems
    - that will reduce residential energy costs and greenhouse gas emissions …."

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RGGI Statute – Priority of Use

35-A MRSA 10109(4)(A) (continued):

[T]he trust shall fund conservation programs that give priority to measures with the highest benefit-to-cost ratio,

- as long as cost-effective collateral efficiency opportunities are not lost,

and that:

(1) Reliably reduce greenhouse gas production and heating energy costs by fossil fuel combustion in the State at the lowest cost in funds from the trust fund per unit of emissions; or

(2) Reliably reduce the consumption of electricity in the State at the lowest cost in funds from the trust fund per kilowatt-hour saved.

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RGGI Statute – Other Guidance on Fund Use

35-A MRSA 10109(4)

…

C. The board may target bid competitions in areas or to participants as they consider necessary ….

…

G. In order to minimize administrative costs and maximize program participation and effectiveness, the trustees shall, to the greatest extent feasible, coordinate the delivery of and make complementary the energy efficiency programs under this section and other programs under this chapter.

…

H. The trust shall consider delivery of efficiency programs by means of contracts with service providers that participate in competitive bid processes for reducing energy consumption within individual market segments or for particular end uses.

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Other Statute Provisions

35-A MRSA 10104(4)

F. Goals of Triennial Plan

1. Reduce energy costs, including residential heating costs
2. Weatherize (Wx) substantially all homes whose owners/occupants are willing to share the costs of cost-effective home Wx

…

4. By 2020, achieving electricity and natural gas program savings of at least 20% and heating fuel savings of at least 20%
5. Creating jobs providing alternative energy and efficiency
6. Reducing GHG emissions from the heating and cooling of buildings consistent with State goals

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Triennial Plan 2 – Home Energy Savings Program (Existing)

- Residential Direct Install (RDI)
  - Air sealing with energy assessment and data report to EMT
  - $600 incentive (2x in Unitil territory)
- Revolving Loan Fund (e.g., PACE and PowerSaver Loans)
  - Any combination of energy upgrades saving 20% energy
  - Financing with long terms, 4.99% interest, no fees, kitchen table closing
  - QA/QC
- Website consumer information
  - Searchable list of registered vendors and BPI certified advisors
  - Candidate for home energy upgrade -- Self-screening calculator
  - Heating options – cost comparison calculator
  - Links to ENERGYSTAR product specs

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Triennial Plan 2 – Residential Heating Program Design in the event of additional funding

- HESP Straw Proposal
  - Ramp up to Wx 25,000 homes/year by end of FY16
- Continue Multi-Family Wx and Heating System Upgrades
- Residential Retail Products
  - Expand appliance program to offer incentives for more heating system measures

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Partial List of Principles / Best Practices

- Free-Ridership
  - Free riders are program participants who would have implemented the program measure or practice in the absence of the program."
  - Best Practices:
    - Avoid very low incentives (relative to total project cost) that attract a very large number of participants
    - Avoid giving incentives where the participants net benefits are very high
    - Monitor closely to see if a transformation (very high market saturation efficient models for a particular product) has occurred and
    - Exit the market when it has been transformed

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Partial List of Principles / Best Practices (2)

- Focus on Customer
  - One-stop shopping, integrated solutions
  - Facilitate customer choice
  - Target incentives, education, tech support for customers, building customer demand
    - Secondary priority is for suppliers, vendors, specific technologies
- Technology Neutral, Fuel Neutral
- Geographic Equity
  - Design a program that is accessible statewide
  - Offer added help to reach areas where access is restricted
- Cost-Effectiveness (see next slide)

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Cost-Effectiveness is where total benefits exceed total costs (B:C > 1.0)

- Total Benefits include:

  a. Reduced GHG emissions from locations in the State;

  b. Fossil fuel costs that will not be incurred as a result of the program or project, using estimated savings in oil, gas or other fossil fuel use, at estimated fossil fuel prices;

  c. Other resource benefits, such as the value of reduced water and sewer costs and reduced electrical consumption; and

  d. Non-resource benefits, such as reduced operations and maintenance costs, job training opportunities and workforce development, general economic development and environmental benefits, to the extent that such benefits can be accurately and reasonably quantified and attributed to the program or project.

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Cost-Effectiveness (2)

Total Costs include:

a. Measure costs, such as the incremental costs of an energy efficiency measure, including installation, over an equivalent baseline measurement, in the case of new construction or replacement programs. In the case of retrofit programs, measure costs are the full costs of the energy efficiency measure, including installation, less any salvage value for the replaced measure; and

b. Ongoing customer costs, including costs such as increased operation and maintenance costs and lost economic development opportunities, to the extent that such costs can be accurately and reasonably quantified and attributed to the program or project.

c. Direct program costs, including program design, administration, implementation, marketing, evaluation and other reasonably identifiable costs associated with the program or project

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RGGI Budgets

- Regional initiative (9 NE states) proposed lowered carbon cap
- Omnibus Energy Bill (Part D) contained adjustments to Maine's carbon allowance allocation to match proposed lower cap
- ME share of revenues forecasted to increase to:
  - $10-11 million for FY14
  - $ ___ million for FY15
- 35% for Residential Heating Program, approximately:
  - $3.5 million for FY14
  - $__ million for FY15
  - Note: $3.8 additional carry forward potentially available for FY14.

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Analysis and Discussion of Key Criteria

- Benefit-to-Cost Ratios
- Lower Heating Demand
- Lower Heating Costs
- GHG Savings
- Group Discussion, Comments

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Some Assumptions

- Avg. home uses
  - 900 gal./year
  - #2 distillate (fuel oil)
  - 75% efficient boiler
- CO2 Reductions
  - 72 kg CO2/MMBtu of avoided #2 Oil
  - 1000 kG / Metric Tonne
  - Source: Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006. February 2008. Annex 2, page A-43, Table A-32. http://www.epa.gov/climatechange/emissions/usinventoryreport.html;
  - Emissions in NE for CO2/MMBtu of Electricity per ISO http://www.iso-ne.org/genrtion_resrcs/reports/emission/final_2010_emissions_report_v2.pdf
- Prices
  - Per recent heating season prices quoted in Maine (e.g., $3.75/gal #2)
  - Installed costs of equipment/insulation per Efficiency Maine program records for HESP, PACE, Air Sealing Promotion

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DRAFT Benefit-to-Cost Ratios, by Measure (Total Benefits vs. Total Costs, Lifetime, Assuming change from average #2 oil system)

Measure	Benefit-to-Cost Ratio
Basic Air Sealing	5.99
Heat pump (single zone, 50% of load)	5.48
Pellet Stove (50% of load)	4.15
ES Propane	4.15
Heat Pump (whole home)	3.92
Attic Insulation	3.63
ES Natural Gas Boiler	2.84
Wall Insulation	2.81
Basement Insulation	2.04
Heat Pump Water Heater	1.70
EPA Pellet Boiler 83% AFUE	1.46
ES Oil Boiler 87% AFUE	0.78
Solar PV/thermal 3kw	0.63
Electric Resistance	(1.42)

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DRAFT Simple Payback, by Measure

(Does not reflect Trust or tax incentives; Assumes change from average #2 oil system)

Measure	Assumed Installed Cost	Simple Payback (Years)
Basic Air Sealing	$ 600	2.5
Heat pump (single zone, 50% of load)	$ 3,500	2.7
Pellet Stove (50% of load)	$ 4,000	3.6
ES Propane	$ 2,500	3.6
Heat Pump (whole home)	$ 8,000	3.8
Attic Insulation	$ 1,300	4.1
ES Natural Gas Boiler	$ 10,000	5.3
Wall Insulation	$ 1,600	5.3
Basement Insulation	$ 1,800	7.3
Heat Pump Water Heater	$ 1,500	8.8
EPA Pellet Boiler 83% AFUE	$ 18,000	10.3
ES Oil Boiler 87% AFUE	$ 9,000	19.3
Solar PV/thermal 3kw	$ 12,000	23.8
Electric Resistance	$ 5,000	(10.5)

DRAFT Reduced GHG, by Measure (Envelope)

Measure (Adding this measure to Avg. #2 Oil System)	CO2 Saved Over 25 Yrs (Tonnes)	Cost/tonne CO2 w/$600 rebate ($)
Attic Insulation	**29.8**	**20.15**
Wall Insulation	**29.6**	**20.29**
Basement Insulation	**25.7**	**23.32**
Basic Air Sealing	**21.4**	**28.04**

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DRAFT Reduced GHG, by Measure (Equipment)

Measure (Switching to this measure from Avg. #2 Oil System)	CO2 Saved Over 15 Yrs (Tonnes)	Cost/tonne CO2 w/$600 rebate ($)
EPA Pellet Boiler 83% AFUE	125.1	4.80
Heat Pump Whole Home	111.7	5.37
Pellet Stove 75% AFUE	65.5	9.16
ES Natural Gas Boiler 95%	58.5	10.26
ES Propane Boiler 95%	43.7	13.74
Heat Pump Mini Split	27.9	21.50
ES Oil Boiler 87% AFUE	18.9	31.76
Solar PV/thermal 3kw	10.1	59.26
Heat Pump Water Heater	3.9	152.09

Discussion, Questions, Comments

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