

STATE OF RHODE ISLAND ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

CONSULTANT TEAM

Update on Market Potential Study Process

Presented By: EERMC Consultant Team

Date: January 16, 2020



RI Market Potential Study (MPS)



Theoretical maximum amount of energy that could be displaced by efficiency

Subset that is cost-effective under the RI Test

Subset that is achievable considering market barriers and program costs under the most aggressive programs possible

Subset of achievable, given constraints in implementing a particular portfolio of programs



Potential Study Content

A comprehensive analysis of the technical, economic & achievable savings potential in RI for the period of 2021-2026, covering:

- Electric
- Natural gas
- Delivered fuels (oil & propane)
- Demand response
- Combined heat & power
- Behind-the-meter renewables





Progress to Date

Gather Data Sources

Develop Baseline Scenario

Build Measure List

Estimate Potential Savings

	2019					2020								
	August	September	October	Novemb	oer De	cember	Janu	uary	Febu	ary	Marc	ch	April	May
Check-in meetings (twice/month)	MM	MM	MM	MI	и м	1 M	м	м	м	Μ	M	м	M	м м
Task 1- Identify data sources and collect input data	Tas	<1												
Kick-Off Meeting with MPS Management Team		M												
Data Requests to Utilities, OER, EERMC	D	D												
Workplan updated for Review			D											
Compile Market Baseline Data														
Task 2- Estimate net effects of factors affecting baselines			Task 2											
Prepare Sales Baselines				D										
Identify applicable Codes and Standards Changes in Study Period														
Memo outlining baselines and exogeneous factors			D											
Task 3- Build measure list and gather data			Task 3											
Provide Measure List to MPR Management Team		D												
Gather Input Studies and RI TRM														
Characterize measures (EE, DR, Fuel Switching)														
Task 4- Estimate potential savings				Task 4										
Characterize Programs for Model					D									
Finalize EE/HE Scenarios for Achievable Potential					D									
Finalize DR Scenarios for Achievable Potential				D			D							
Adapt Model for RI														
Prepare Utility Load Curve Analysis (DR Constraints)														
Load Model with Inputs and perform QA/QC:														
Calculate Techcnical, Economic and Max + Prog. Ach. Potentials														
Prepare Interim (Draft) Results														
Task 5- Estimate CHP potential				Ta	sk 5									
Characterize CHP measures and finalize scenarios					D									
Model CHP potential								D						
Task 6- Estimate potential for BTM, RE & DG technologies							Task	5						
Gather Solar and DG data														
Finalize DG scenarios and sensitivities						D								
Characterize Markets and Measures										D				
Reporting										Report	ting			
Draft results Presentation + Excel Tables (in-person)								D/M						
Incorporate MPS Management Team and Stakeholder feedback										_				
Prepare Final Results (ppt)												D		
Prepare Final Report														D
Provide Model Inputs and Data														D
Graphical Executive Summary														D



1) Savings Timeframe: Lifetime or annual?

2) Savings Units: kWh/therms or MMBtus?

3) Savings Targets: Balancing program and max achievable? Accounting for "prudent & reliable"?



Savings Timeframe: Lifetime vs. Annual

- Historically, targets have been set for annual electric (MWh) and natural gas (therms) savings
 - Lifetime values were calculated, but not binding
- Lifetime metric more supportive of deeper savings
 - Better captures measures with longer lifetimes
 - Fully communicates EE benefits
 - 'cost per kwh' from lifetime more analogous to electric bill rates
- Annual incentivizes measures with more limited lifetimes
 - E.g. behavioral programs w/1-yr life over boiler replacement w/25-yr life



Savings Timeframe: Illustrative Example

Measure 1 (1-year life)
Measure 2 (10-year life)



If both measures cost \$100:

= Counted for Annual Savings
 Measure 1 saves 100 kWh @\$1/kWh
 Measure 2 saves 50 kWh @\$2/kWh

= Counted for Lifetime Savings
 Measure 1 saves 100 kWh @\$1/kWh
 Measure 2 saves 500 kWh @\$0.2/kWh

Critical Point: Lifetime savings are the true total savings produced by an efficiency measure. Only counting first-year savings ignores long-term savings available from long-lived measures.



Savings Timeframe: Lifetime

• The Consultant Team has discussed with a range of stakeholders and reviewed other jurisdiction practices

• Widespread view that lifetime savings metrics encourage better deployment of efficiency resources

• Still some items to keep in mind, like customer economics & discounting



Savings Units: MMBtus vs. kWh/therms

- kWh/therms:
 - Easily calculated in MMBtus
 - Easier to include delivered fuel savings when appropriate
- MMBtu options:
 - A single MMBtu metric for the estimated sum across all fuels
 - A metric for each fuel that must be accounted for and met, adding up to a total MMBtu for portfolio
 - Mitigates efforts in one fuel or another becoming the primary driver to reach the aggregate amount



- Massachusetts is exploring this decision now
 - Primary driver has been 'netting' delivered fuel and electric savings
 - Heat pumps, but also weatherization
- Key Challenges being explored in MA study, which can help RI:
 - Measure savings at site (customer meter) or source (generation facility)
 - Heat rates, line losses, and emissions are needed to utilize source metrics, but are complex to measure accurately over time
 - Even with shared savings unit, fuel avoided costs still differ!



Savings Units: Site vs. Source

- Where in energy system should savings be measured?
 - Site: at meter for building where efficiency measure is installed
 - Easier to measure b/c does not account for some system-level dynamics
 - Customer-oriented, since these are the same kWh customers are buying
 - 'Winners' example: heat pumps
 - Source: facility where energy was generated
 - Fully accounts for electric fuel costs
 - 'Winners' example: CHP



Savings Units: Heat Rates, Line Losses, Emissions

- Heat Rates are used to measure the efficiency of converting a generation facility fuel (incl. CHP) into electricity (typically FF)
 - Fairly well-established, though vary for different plants/technologies
- Line Losses measure system efficiency for converting kWh generated at source facilities into kWh available at site meters
 - Fairly well-established, influenced by supply/demand; system build-out
- **Emissions** are connected to these, but vary according to marginal generation facility, mix of overall generation, PPAs, etc.
 - Complicated by reality that heat rates and line losses are typically estimated, and often averages. For emissions, *marginal* values are critical.



Savings Units: Balanced Approach

1) Use PIMs in **MWh/therms for** this three-year planning process

- 2) Start **reporting in MMBtus** in addition to binding MWh/therms
 - 'Apples to apples' comparison across fuels for intuitive ease
 - Better measure for delivered fuels heated homes weatherization
 - Useful metric for assessing net impacts of CHP projects
 - Sets the stage for easy adoption as PIM metric later, if warranted

3) Defer time investment in MMBtu methods until after MA study



Savings Targets: Balancing Program and Maximum Achievable

Program Achievable

- Constrained by historical program savings
- Implicitly constrained by historical budget levels
- The "art-science" balance more towards "art" in this scenario

Maximum Achievable

- Significantly higher savings than Program Achievable
- Most closely aligned with Least-Cost Procurement
- Still subject to realistic modeling constraints
- May take time to ramp programs toward this level



Savings Targets: Balancing Program and Maximum Achievable

• Balancing resource acquisition and market transformation

• Taking best advantage of natural building retrofit cycle

• Maintaining sustainable EE program lifecycle

• Supporting workforce development



Upcoming Milestones

Deliverables and milestones	Responsible	Target Delivery date							
REPORTING									
Draft results (ppt)	Dunsky	January 31, 2020*							
Consolidated feedback on draft results (10 bus. days)	MPSMT	February 14, 2020							
Final Results (ppt)	Dunsky	March 13, 2020							
Consolidated feedback on final results (8 bus. days)	MPSMT	March 25, 2020							
Draft Report (doc)	Dunsky	April 17, 2020*							
Consolidated feedback on draft report (10 bus. days)	MSPMT	May <mark>1,</mark> 2020							
Final Report (doc)	Dunsky	May 15, 2020*							
Draft and Final Graphical Executive Summary	Dunsky	TBD							

February Council Meeting (2/27)

- Review of draft results, incl. preliminary MPS Management Team comments *March Council Meeting (3/19)*
- Vote on 3-year Savings Targets
- Final results expected 1-2 weeks prior to Council Meeting





