STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

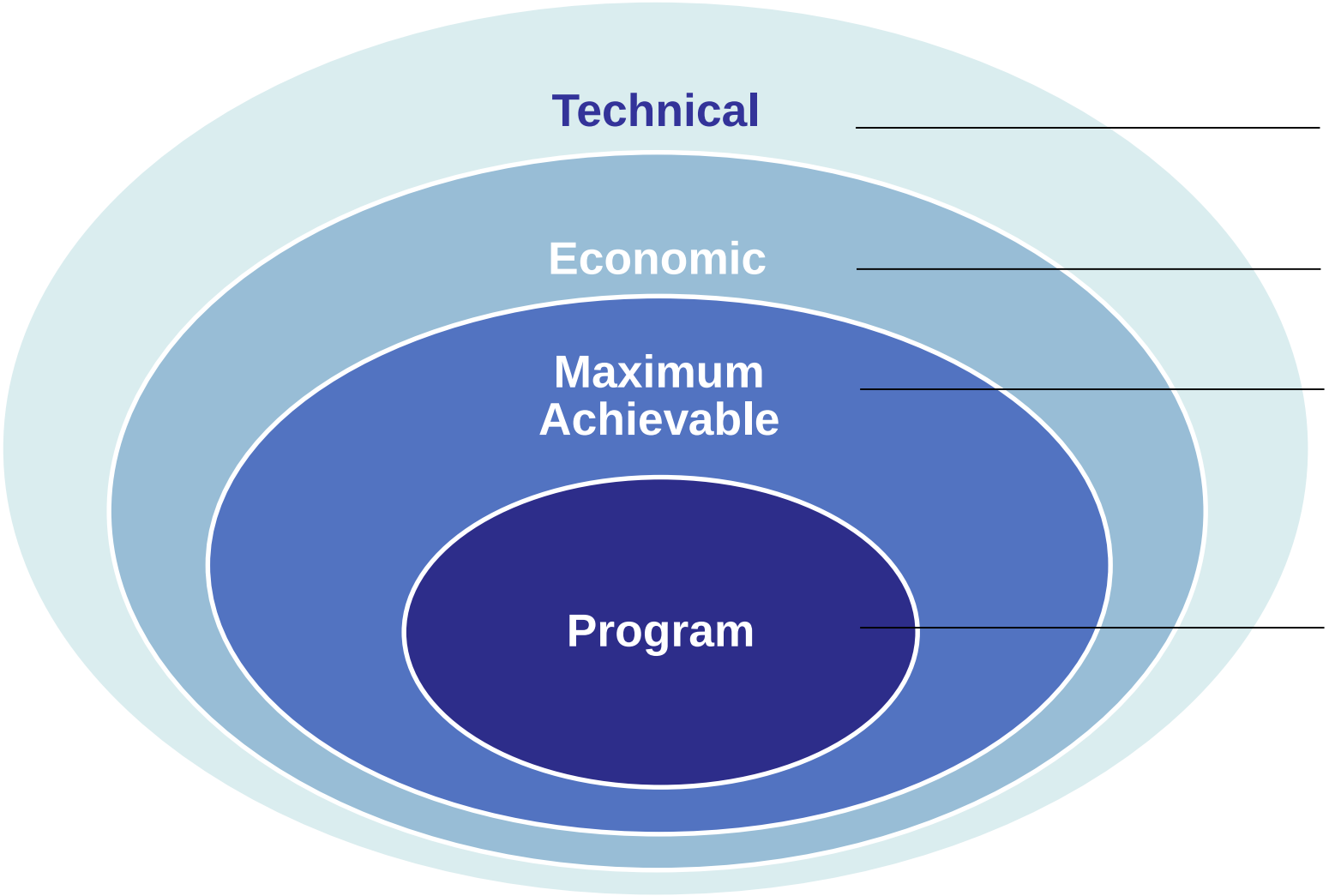
CONSULTANT TEAM

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

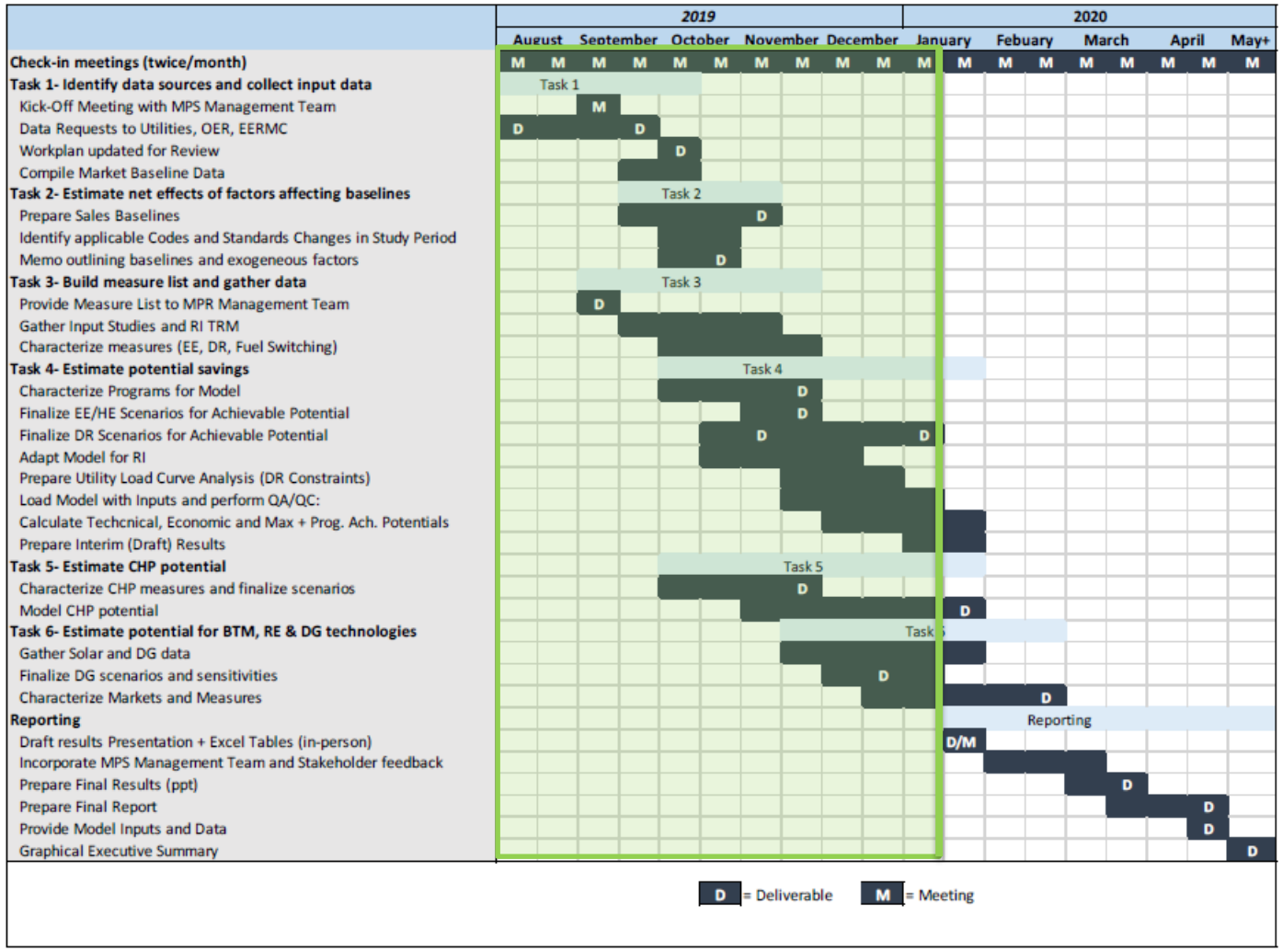
Potential Study Content

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



Applying MPS Results: Key Questions

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"?

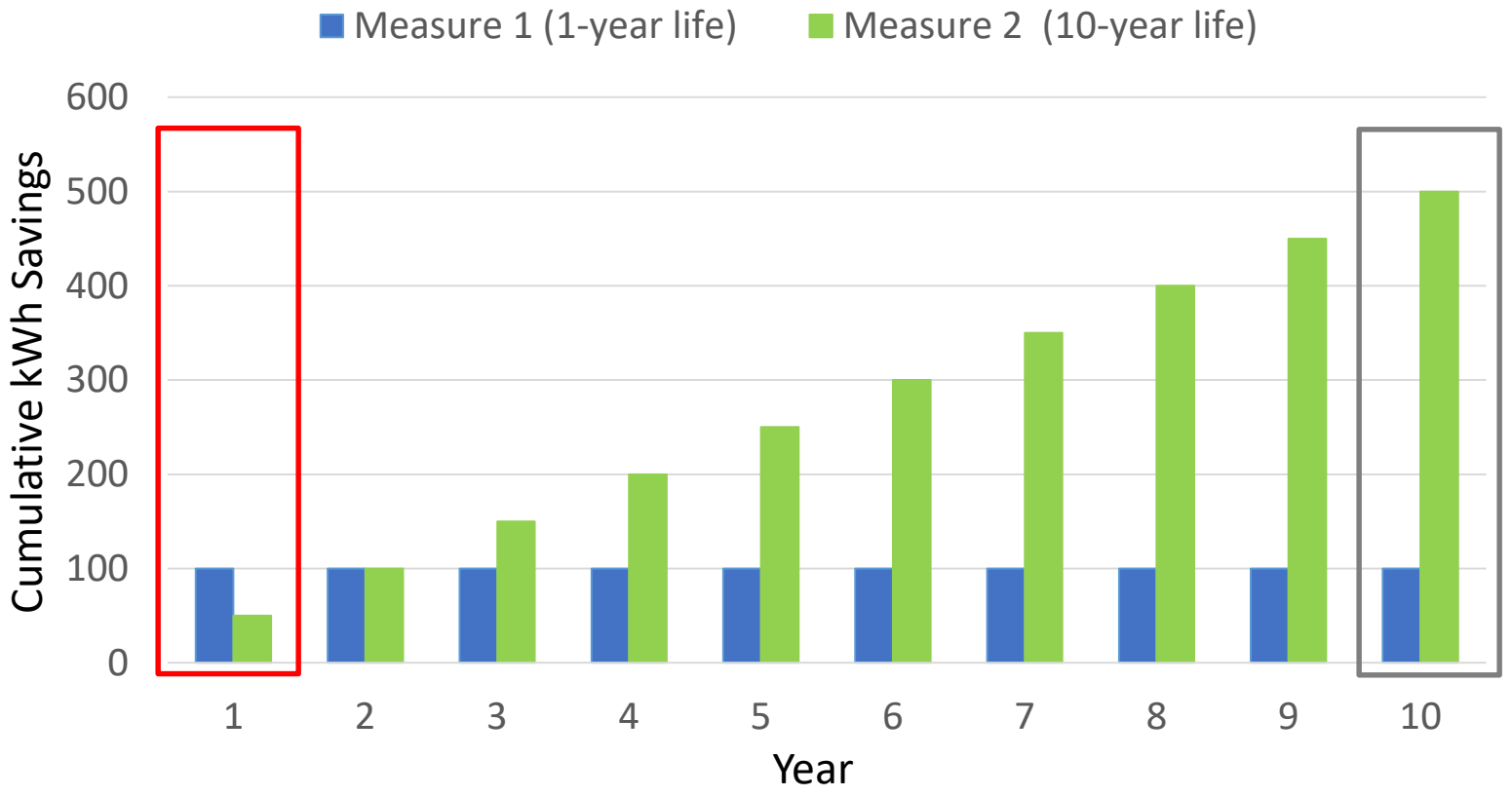
Savings Timeframe: Lifetime vs. Annual

- 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



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

Savings Units: MMBtus vs. kWh/therms

- 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 1, 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

QUESTIONS?