STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

CONSULTANT TEAM

Update on 2021-2023 Target Setting & LCP Standards

Presented By: EERMC Consultant Team

Date: February 27, 2020

Overview of *DRAFT* Recommendations Memo and Process leading to PUC submittal of Targets/LCP Standards

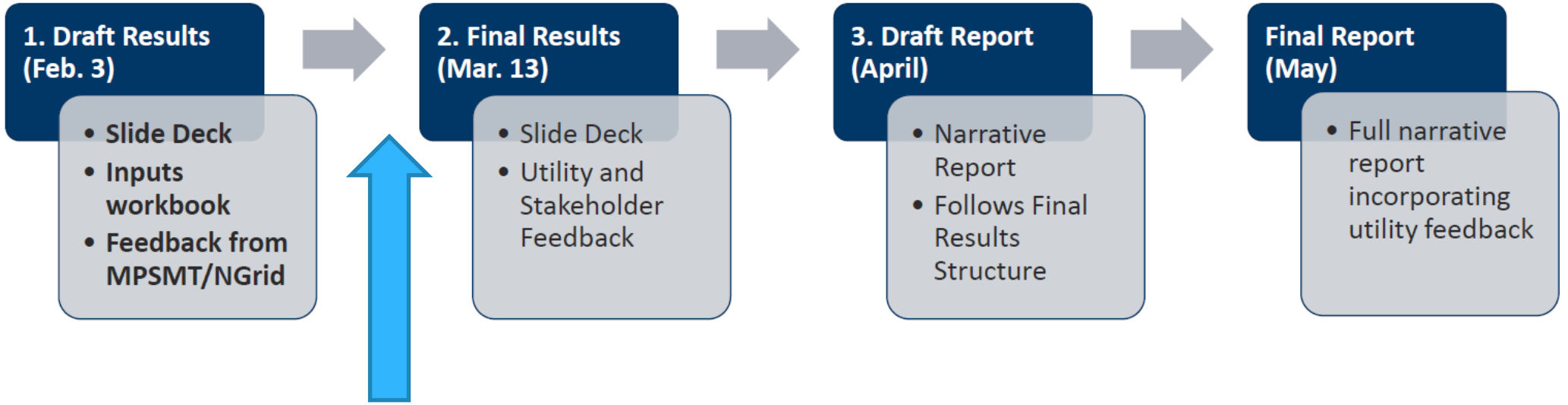
- Summary of PUC Technical Sessions held 2/26/2020
- Review of DRAFT Recommendations Memo and Cover letter for PUC filing, and associated cover memo from C-Team to EERMC
- Council input required to support C-Team's completion Of Recommendations Memo
  - Preferences for Savings Timeframe and Savings Units
  - Which elements of Potential Study to have targets set for:
    - Energy Efficiency
    - Combined Heat & Power (CHP)
    - Heating Electrification
    - Demand response
    - Distributed Generation
  - LCP Standards – objectives to be met in update

Market Potential Study Content

A comprehensive analysis of the technical, economic & achievable savings potential in RI for the period of 2021 -2023 covering:

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

Next steps



- **Tasks between Steps 1 and 2**: Gather feedback to incorporate into final results: (C-Team; OER; Division/Synapse; National Grid conducting detailed review of finding/assumptions)
  - Directional changes to the study inputs / settings
  - Areas that need further explanations
  - Changes to how results are presented (graphs, tables, etc.)
  - Emphasis on certain aspects

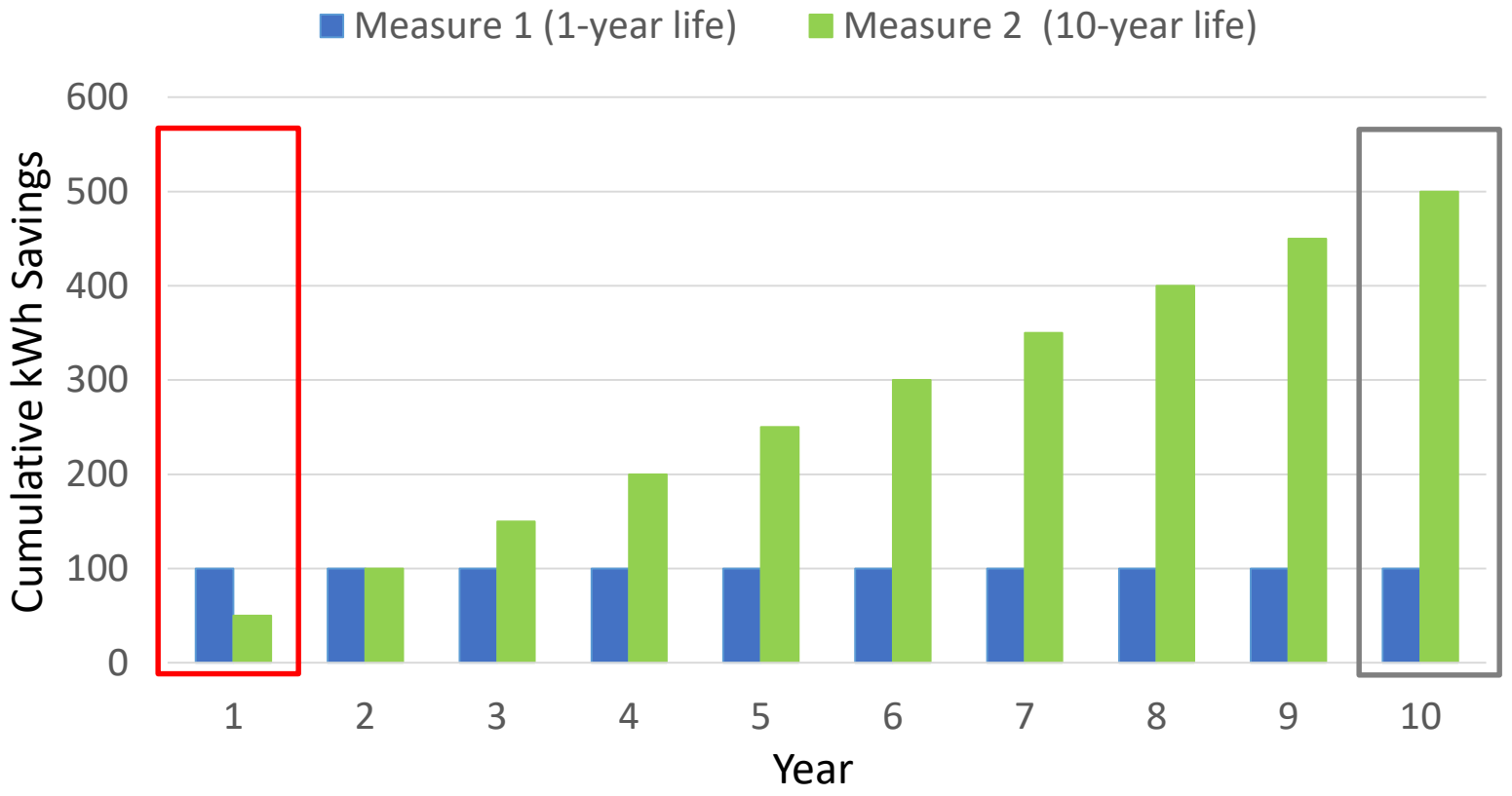
Savings Timeframe: Lifetime vs. Annual

- 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:
Example of variance from DRAFT results

2021 Annual Savings

	Measure	GWh
1	Home Energy Report	21.1
2	LED Specialty - Candelabras, Globes (Interior)	12.3
3	LED Specialty - Reflectors (Interior)	6.9
4	Refrigerator	2.9
5	Advanced Smart Strips	2.5
6	Electric Resistance to DMSHP	2.3
7	Mini-split Ductless Heat Pump (DMSHP)	2.0
8	Pool Pump	1.6
9	Refrigerator Recycle	1.3
10	Thermostat Wi-Fi	1.2

2021 Lifetime Savings

	Measure	GWh
1	Electric Resistance to DMSHP	42.0
2	LED Specialty - Candelabras, Globes (Interior)	36.9
3	Mini-split Ductless Heat Pump (DMSHP)	36.0
4	Refrigerator	35.0
5	Attic Insulation	23.8
6	Home Energy Report	21.1
7	LED Specialty - Reflectors (Interior)	20.7
8	Thermostat Wi-Fi	18.2
9	Pool Pump	16.0
10	Heat Pump Water Heater (HPWH)	15.5

Savings Timeframe Recommendation: Lifetime

- Widespread view that lifetime savings metrics encourage better deployment of efficiency resources
- Customer economics
- Discounting – suggest using RI test discount rate
- Savings persistence
  - True in both annual and lifetime in CBA step
  - EM&V processes should adjust for information we gain over time

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 Recommendation: MWh & MMBtu

1) Use Targets in **MWh & MMBtu 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

Targeting Max (with Clear Expectations)

- Max achievable is the most conceptually consistent with the target-setting process
  - Captures all possible cost-effective savings
  - Defers questions of prudency and reliability to 3-year plan process
  - Program constraints (e.g. workforce) can be built further into annual plans
  - ***Meets requirements of law to pursue ALL cost-effective savings less than the cost of supply***

- Recognize there will be discussion during planning processes

- National Grid may not reach this target in plans, but with satisfactory explanations, this can be perfectly acceptable

Upcoming Milestones

February

- 2/27 – EERMC meeting to present draft results (Dunsky) and Targets Recommendation Report outline (C-Team), and LCP Standards objectives

March

- 3/1 – 3/12 – C-Team/OER meetings with stakeholders and individual council members (schedules TBD)
- 3/13 – Dunsky submits Final Potential Study Results
- 3/13 – C-Team submits Targets Recommendations Report to EERMC
- 3/19 – EERMC meeting - Vote on 3-year Savings Targets
  - LCP Standards recommendations may move to April vote

QUESTIONS?

APPENDICES

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
    - Must do full source analysis for all fuels to ensure fair comparison

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.