NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

Regional EM&V Forum
OVERVIEW

Incremental Cost Study
Phase 1 & Phase 2

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Mike Sherman, Nick Beaman (Navigant Consulting)
Dave Jacobson

INTRODUCTION

- Purpose of the Webinar is to:
  - familiarize you with the ICS resources
    - So you can easily make use of them when needed
- It makes sense to take incremental cost development on as a EM&V Forum Project

Study Sponsors

- BGE
- Berkshire Gas
- Columbia Gas
- DC SEU
- Efficiency VT
- First Energy
- National Grid
- New England Gas
- Northeast Utilities
- NSTAR
- NYPA
- NYSERDA
- PEPCO
- SMECO
- United Illuminating
- Vermont Gas

Overview

1. Study Purpose, Process and Measures (Denise Rouleau, NEEP Project Manager Consultant)
2. Method, Mechanics & Customizing (Mike Sherman, Navigant Consulting, Project Consultant Lead & Nick Beaman, Navigant Consulting)
3. How the Data is Being Used (Dave Jacobson, NEEP Technical Consultant)
4. Q&A

PURPOSE, PROCESS AND MEASURES

- Purpose
  - Develop incremental costs for common prescriptive EE measures across New England and Mid-Atlantic regions.
    - Gas/electric
    - Residential and commercial
  - The data would give program planners, administrators and evaluators and regulators the ability to:
    - Retrospectively assess cost-effectiveness
    - Prospectively estimate program portfolio
    - Assess incentive levels
- Process
  - Subcommittee direction on measures & characterization of the measures
  - Navigant Consulting chosen to do the work
  - Technical Advisory Group & other expert review as check (very interactive process)

INCREMENTAL COST STUDY ELEMENTS

- Phase 1: Developed incremental costs for 13 measures

- Phase 2:
  - Revisited five ICS 1 measures to confirm or modify costs
  - Researched an additional eight measures and reported costs for 5:
  - Measures investigated but not finalized include:

Commercial Refrigeration Compressors
Boiler Controls
Energy Management Systems

- Researched premium pricing issue focused on residential AC

MEASURES

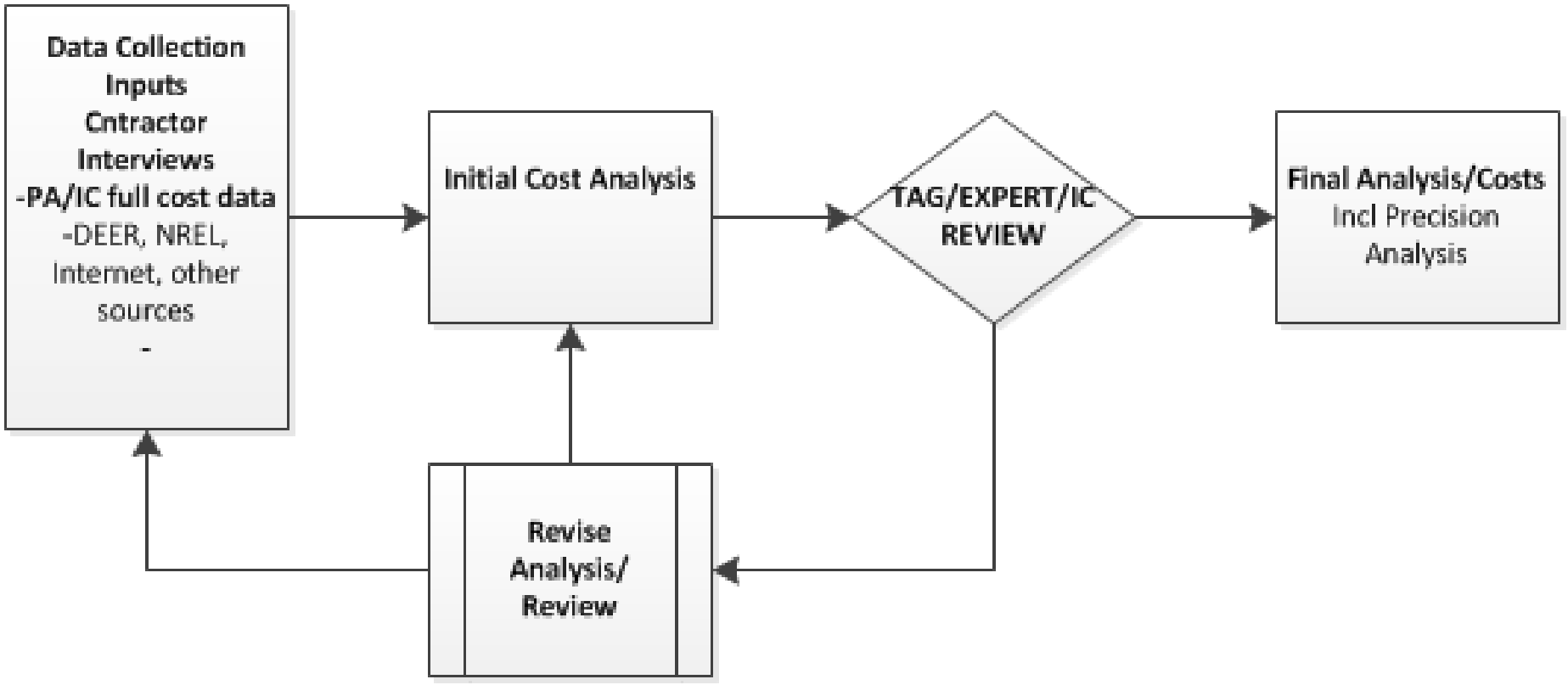
ICS REFERENCE DOCUMENT

	Measure	Sector	Fuel	Application	Cost Type	Source of Final Results	Measure Cost Shelf Life
	Phase 1: Measures September 2011						
1	Air Sealing	Res	Gas/	RET	Full	Phase 1	
2	Air Source Heat Pumps	Res	Electric	RET	Incr	Phase 1	
3	Boilers (300-2,500 kBtu//h)	C&I	Gas	ROB	Incr	Phase 1	
4	Boilers (<300 kBtu/h)	Res	Gas	ROB	Incr	Phase 1	
5	Central Air Conditioning	Res	Electric	ROB	Incr	Phase 1	Medium
6	Combination Heat Hot Water	Res	Gas	ROB/NC	Incr	Phase 2	Frequent
7	Furnace Including ECMs (60-120 kBtu/h)	Res	Gas	ROB	Incr	Phase 1	
8	Indirect Water Heaters (30-65 Gal)	Res	Gas	ROB/NC		Phase 1	
9	Insulation, Attic, Cellulose	Res	Gas	RET	Incr	Phase 2	Stable
10	Lighting Controls	C&I	Electric	RET/NC	Full	Phase 1	
11	On Demand (Tankless) Water Heaters	Res	Gas	ROB	Incr	Phase 2	
12	On Demand (Tankless) Water Heaters (Condensing)	Res	Gas	ROB	Incr	Phase 2	Medium
13	Unitary Air Conditioning	C&I	Electric	ROB/NC		Phase 1	
	Phase 2: Measures January 2013						
14	Dual Enthalpy Economizers	C&I	Electric	RET/NC	Incr, Full	Phase 2	Medium
15	Ductless Mini-Splits	Res	Electric	RET/NC	Incr, Full	Phase 2	Frequent
16	ENERGY STAR Ventilation Fans	Res	Electric	ROB/NC	Incr, Full	Phase 2	Medium
17	Prescriptive Chillers	C&I	Electric	ROB	Incr	Phase 2	Medium
18	Variable Frequency Drives	C&I	Electric	RET	Incr	Phase 2	Medium

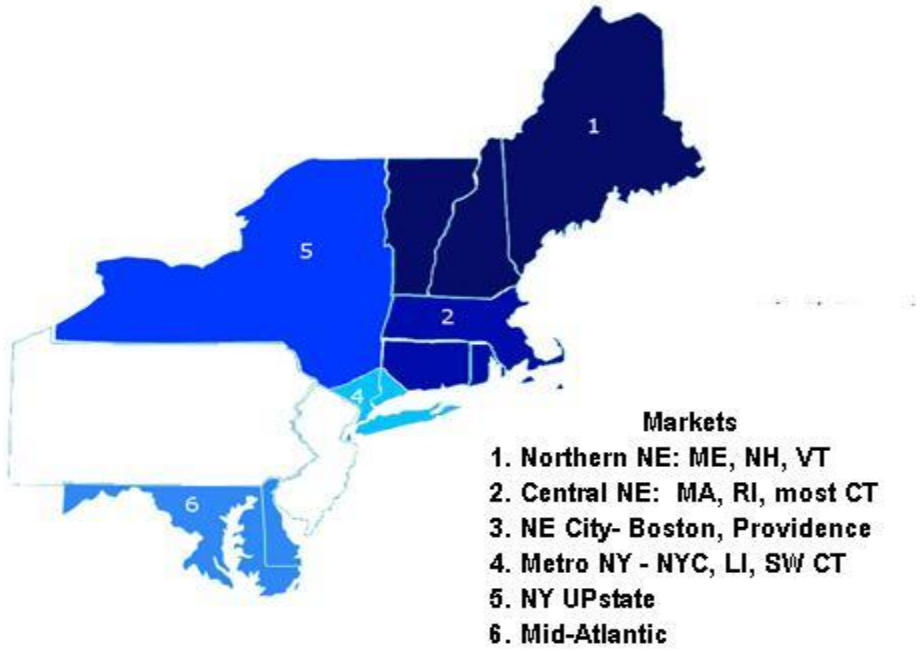
METHOD, MECHANICS & CUSTOMIZING
DESIGN FACTORS

- Close focus on measures receiving incentives in current energy efficiency programs
- Create cost curves
- Transparent calculation methodology
  - Open workbook calculation
  - User friendly, customizable
- Close coordination with on the ground program implementation staff and measure experts.

Data Collection and Analysis

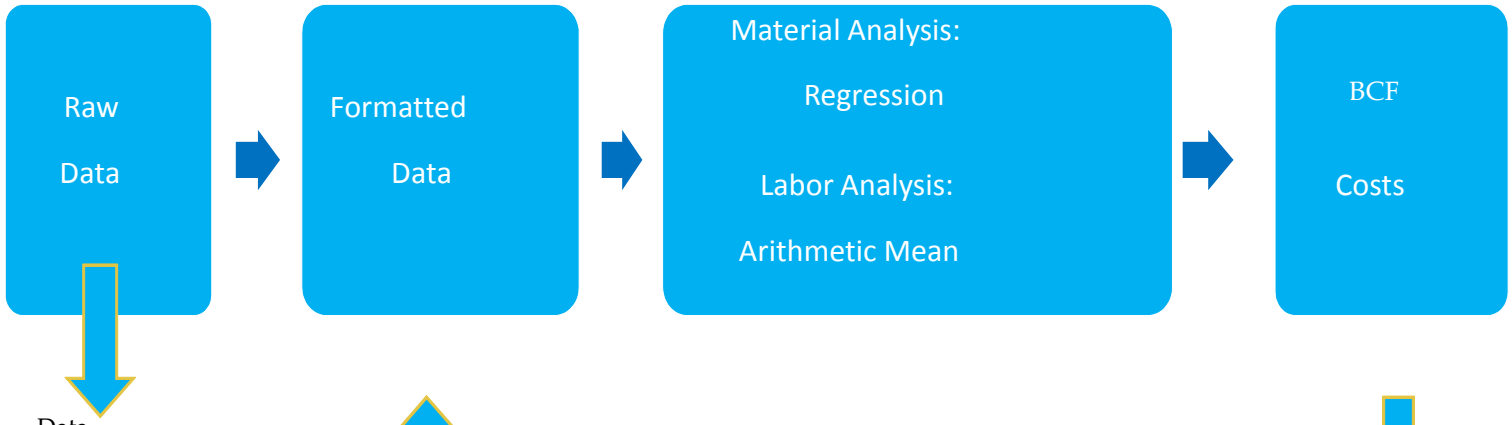


Markets in the ICS Region (Defined by R.S. Means)

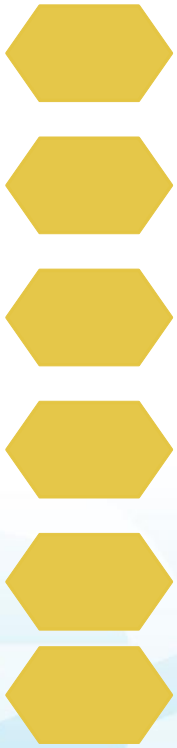


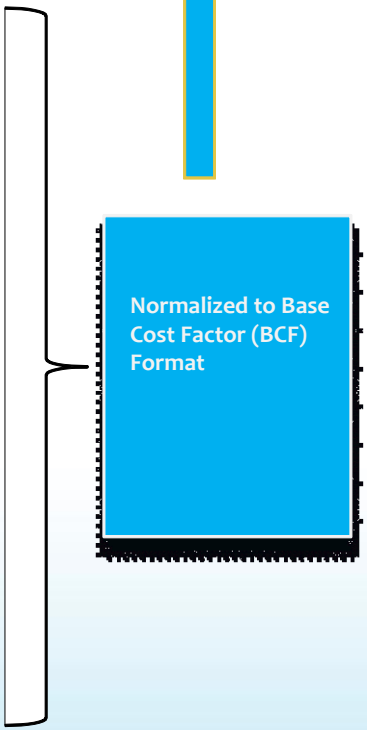
Market	Market Code	Market Territory	Base Cost Factor[1]
Northern New England	1	ME, VT, NH	0.85
Central/Southern New England	2	MA , RI, most CT	1.06
New England City	3	Boston, Providence	1.13
Metro New York	4	NYC, metro suburbs Southwest CT	1.29
Upstate New York	5	Albany, Buffalo, Rochester, balance of the state	1
Mid-Atlantic	6	MD, DE, DC	0.95
Base Cost Factor (BCF)*	-	-	1

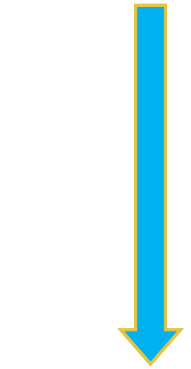
ANALYSIS FLOW



Data Collected by Market

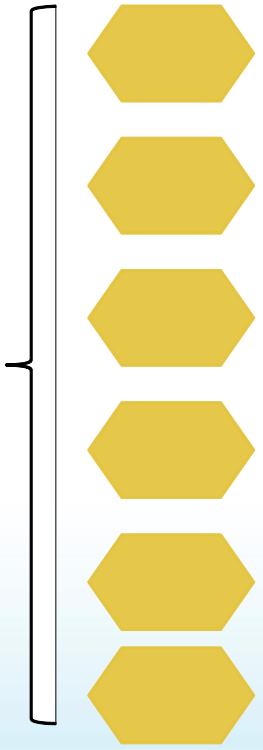






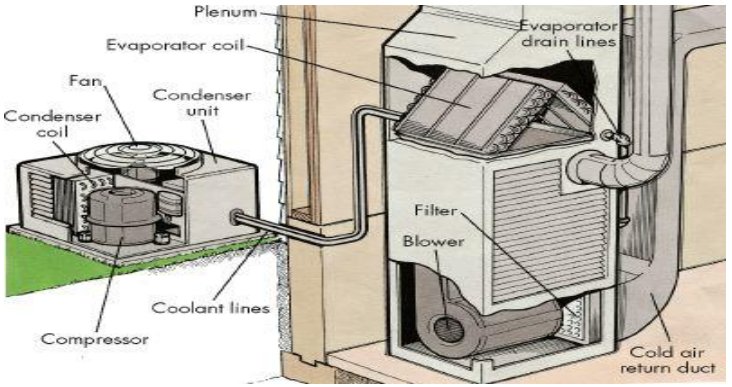
BCF Costs Converted to Market - Specific Costs

Markets



CENTRAL AC PREMIUM PRICING

- **Four Premium Features Were Identified:**
  - Durability and Appearance
  - Comfort and Noise Reduction
  - Improved Warranty
  - Improved Controls, Sensors, and Alarms



- **Q 1. Are EE central AC systems packaged with additional features that add to the unit cost?**
  - **YES**
- **Q 2. Can the costs of identified features be quantified?**
  - **NO, not with certainty at this time.**
- **Q 3. Can we establish a premium cost metric to quantify premium costs?**
  - **Further research would be needed to determine**

HOW THE DATA IS BEING USED

- Primary Uses for Measure Cost Data:
  - Measure screening for Cost Effectiveness
  - Setting Incentive levels
  - TRMs which include cost data (not all do)

HOW THE DATA IS BEING USED

- **New England Gas Program Administrators used data to:**
  - revise the incentive levels for Combination Boilers and Domestic Hot Water units
    - In 2011 Incentive was $1,600
    - After removal of some non-qualifying models from NEEP data set, incremental cost was determined to be $1,273- incentive was higher than incremental cost
    - Incentive lowered to below incremental cost - $1,200
  - revise the incentive levels for High Efficiency Gas Furnaces and Boilers
    - Used curve fits (incremental cost = f(efficiency, size))from study to extrapolate to newer more stringent efficiency levels than study covered

HOW THE DATA IS BEING USED

- **NYDPS** used:

New York State Public Service Commission
Ensuring Safe, Reliable Service and Just, Reasonable Rates since 1907

  - Data to develop forthcoming Screening Tool for Pre-Qualified /Prescriptive Incentives for Commercial Gas Hot Water Boilers
  - Curve fit of incremental cost for 10 sizes and two efficiency levels

NSTAR

- **NSTAR** used cost data for economizers to verify incentive levels

- **Efficiency Vermont** used data for:

Efficiency Vermont

  - For measure cost comparisons & research for preliminary analysis of custom projects
  - As supporting/supplemental info in the measure cost database
  - has/will be using the ICS data for TRM Development activities (e.g. Ductless Mini-Split data, etc.)

Reports and ICS Reference Sheet

can be found at:

http://neep.org/emv-forum/forum-products-and-guidelines

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