



VERMONT ENERGY
INVESTMENT CORPORATION

Illinois Statewide Technical Reference Manual

Stakeholder Advisory Group Meeting
April 17th, 2012 (9:00 – 10:00)

Erin Carroll & Shawn Enterline
Vermont Energy Investment Corporation



Agenda

- Comment Review (9:00 – 10:00)
 - Prior & Recent Consensus Items
 - Ongoing Issues to Resolve
 - Summary of comments on the current draft.
- SAG Update (10:00 – 12:00)
 - TRM Purpose & Development Process (Annette)
 - TRM Content (Shawn)
 - Residential Measures
 - Commercial Measures
 - Front Matter
 - TRM Approval, Use, Update Procedure



Prior Consensus Items

- Interactive Effects
 - Incorporated in all individual, prescriptive measures.
- Organizational Structure of TRM
 - Market, End Use, Technology
- Program Design
 - Measure characterizations are program neutral, but provide specific inputs for different, existing programs.
- TRM Update Procedure
 - Geared to existing regulatory process
- Weather Data Sources & Weather Sensitive Loadshapes



Recent Process Consensus

- TRM Use by Utilities
 - Is not mandatory.
- TRM Update Timing
 - The TRM may be updated at any time.
- Implementation Timing
 - PY5 - June 1, 2012
 - March 1st for next PY.
- TRM Maintenance and “Keeper”
 - The TRM Administrator is responsible, and proceeds in concert with the SAG.
- Cost Effectiveness Screening
 - The TRM’s incremental costs are the defaults that are to be used in screening if a custom cost is not available.
- Communicating Eval. Results
 - All evaluation results are communicated to SAG and the TRM Administrator for prioritization and inclusion in the next TRM.



Using the TRM (Consensus)

- Is not mandatory, in general.
 - But it is the default source absent specific and superior information.
 - The utilities may take on more risk that non-TRM savings claims are too high.
- In Implementation and Reporting
 - Where TRM values are not used for Rx measures, the reports must identify the instances.
- In Evaluation
 - Evaluators have discretion in deciding what to evaluate, in general.
- In Planning
 - The TRM is the default source absent specific and superior information or new (future) measures that are not yet included in the TRM.



Evaluation & the TRM (Consensus)

- Verification = Retrospective
 - Focus is on correct TRM application.
 - For example, was the correct building type selected?
 - Results in a realization rate.
- Evaluation = Prospective
 - Focus is on inputs & algorithms and processes & impacts.
 - For example, are the hours of operation assumptions correct?
 - Results in new net-to-gross ratios, inputs, algorithms and/or processes.
- All evaluation is at the program (not measure) level.
 - Therefore, evaluation is not bound by the TRM. The TRM is bound by evaluations.



Front Matter Issues to Resolve

- How to proceed to legitimize the TRM?
 - Seek an ICC Order the first time.
 - Thereafter, by stakeholder stipulation and a joint informational filing.
- Specific Roles and Responsibilities vis a vi the TRM.
 - ICC, ICC Staff, Implementers, SAG, Evaluators, TRM Administrator



Measure Consensus Progress

- Commercial
 - Commercial Lighting TRM Structure
 - Boiler/furnace algorithm
 - Steam trap measure
 - High Efficiency prewash spray nozzle
- Residential
 - Thermostats
 - Faucets and Aerators
- Custom Protocols

Outstanding Measure Comments

- Commercial
 - Steam Cooker
 - Tankless Hot Water Heater – O&M costs
 - Revised boiler/furnace EFLH hours (proposed in addendum)
 - Commercial lighting primary HOU (not all data received yet)
 - Lighting baseline shift methodology (proposed in draft)
- Residential
 - Aerators & Showerheads
 - Appliance Recycling & Evaluation Completion
 - Cooling (electric) savings on thermostats
 - Heating assumptions for boilers and furnaces.
 - Lighting In-Service Rate

Summary of Friday's Comments

- HIM (TBD after Friday's due date for comments.)
- LIM (TBD after Friday's due date for comments.)
- Front Matter (TBD after Friday's due date for comments.)



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TRM Purpose

- Common, State-Wide Reference
- Transparency into Energy Savings Claims
- Accurate and Reliable
- Support Cost Effectiveness Screening



What is in the TRM?

- 521 pages
- 91 Measures
 - 53 Commercial Measures
 - 38 Residential Measures
- 13 End Uses
 - 7 Commercial
 - 6 Residential
- 2 Market Sectors
- Hundreds of comments
 - Algorithms
 - Inputs
 - Process

End Uses in the TRM

Non-Commercial Market Sector	Commercial Market Sector
Appliances	Agricultural Equipment
Consumer Electronics	Food Service Equipment
Hot Water	HVAC
HVAC	Lighting
Lighting	Miscellaneous
Shell	Refrigeration
	Water Heating & Distribution



How did we get here?

Kickoff Meeting
~ 11/28/11

Weekly Meetings
~ Dec-Present

HIM TRM Draft Delivered
~ 1/27/12

Comment Incorporation
~ Jan - Feb



TRM Development Process

All comments received.

~3/2/12

Draft of Full TRM Delivered

~3/16/12

Comments on Full TRM Due

~4/13/12

Present TRM to SAG

~ 4/17/12



TRM Organization

1. Market Sector
 - Commercial
 - Noncommercial (Residential)
 2. End Use
 3. Technology / Measure
- *The TRM is “Program” neutral.*



TRM Contents

1. Front Matter (Shawn)
 - Using the TRM
 - Updating the TRM
 - Assumptions

2. Commercial Measures (Erin)
 - High Impact

3. Residential Measures (Sam)
 - High Impact

4. Appendices (Erin)
 - Net to Gross Ratios
 - C&I Custom Protocols

Most Commented Categories

- First Draft (High Impact Measures)
 - Variable Input Values (75%)
 - Definitions / Descriptions / Eligibility Criteria (15%)
 - Equation / Algorithm (10%)
- Second Draft
 - Front Matter, Roles and TRM Application
 - Low Impact Measures
 - Custom Protocols



Most Commented Measures

- Commercial (High Impact)
 1. Lighting (by far)
 2. Steam Trap
 3. Boiler Tune Up
 4. Prewash Spray Nozzles

- Residential (High Impact)
 1. Central AC
 2. Clothes Washers
 3. Aerators & Showerheads
 4. CFL
 5. Furnaces & Boilers



Front Matter Overview

- Introduction & Purpose
 - Development process & ICC policy on implementation.
- Using the TRM
 - Organization, Inputs, Stakeholder Roles, Evaluation, etc.
- TRM Update Process
 - Process flow and timing.
- Assumptions
 - Loadshapes, Glossary, Weather, Baselines, etc.

TRM Implementation Cycle

Cycle	EPY	GPY	Begins	Ends	Notes
1	1		6/1/2008	5/31/2009	The TRM does not apply to this cycle.
1	2		6/1/2009	5/31/2010	
1	3		6/1/2010	5/31/2011	
2	4	1	6/1/2011	5/31/2012	The TRM does not apply to this PY.
2	5	2	6/1/2012	5/31/2013	TRM finalized as of 3/1/2012 applies to PY5.
2	6	3	6/1/2013	5/31/2014	TRM finalized as of 3/1/2013 applies to PY6.
3	7	4	6/1/2014	5/31/2015	TRM finalized as of 3/1/2014 applies to PY7.
3	8	5	6/1/2015	5/31/2016	TRM finalized as of 3/1/2015 applies to PY8.
3	9	6	6/1/2016	5/31/2017	TRM finalized as of 3/1/2016 applies to PY9.



Roles & Responsibilities

- Evaluators
 - ✓ Verify program performance
- ICC Staff
 - ✓ Participate in SAG
- ICC
 - ✓ Decide non-consensus issues
- Implementer (Utility + DCEO)
 - ✓ Plan, Implement, Report
- TRM Administrator
 - ✓ Maintain TRM with the SAG
- Technical Advisory Committee (TAC)
 - ✓ Advise SAG on TRM technicals
- Other Stakeholders
 - ✓ Participate in SAG
 - Portfolio administrators, program implementers.



High Impact Commercial Measures

Section	End Use	Technology / Measure
5.1.3	Food Service	Commercial Steam Cooker
5.1.8	Food Service	High Efficiency Pre-Rinse Spray Valve
5.2.2	HVAC	Boiler Tune-up
5.2.3	HVAC	Boiler Lockout/Reset Controls
5.2.9	HVAC	High Efficiency Boilers
5.2.10	HVAC	High Efficiency Furnace
5.2.14	HVAC	Steam Trap Replacement or Repair
5.2.15	HVAC	Variable Speed Drives for HVAC
5.4.1	Lighting	CFL
5.4.2	Lighting	ILED
5.4.3	Lighting	High Performance T8 Fixtures and Lamps
5.4.4	Lighting	T5
5.4.5	Lighting	Lighting Controls
5.5.6	Lighting	Lighting Power Density Reduction
5.4.7	Lighting	LED Traffic and Pedestrian Signals
5.7.6	Hot Water	Tankless Water Heater

High Impact Residential Measures

Section	End Use	Technology / Measure
6.1.2	Appliances	Clothes Washer
6.1.8	Appliances	Refrigerator & Freezer Recy.
6.3.2	Hot Water	High Efficiency Water Heater
6.3.3	Hot Water	Heat Pump Water Heater
6.3.4	Hot Water	Faucet Aerator
6.3.5	Hot Water	Low Flow Showerhead
6.4.1	HVAC	Air Source Heat Pump
6.4.2	HVAC	Central Air Conditioning
6.4.4	HVAC	Furnace Blower Motor
6.4.5	HVAC	High Efficiency Boiler
6.4.6	HVAC	High Efficiency Furnace
6.4.10	HVAC	Programmable Thermostat
6.5.1	Lighting	Standard CFL
6.5.2	Lighting	Specialty CFL
6.5.5	Lighting	LED
6.6.1	Shell	Air Sealing
6.6.4	Shell	Wall and Ceiling Insulation
6.6.2	Shell	Basement Sidewall Insulation



Custom Protocols

8.5. C&I New Construction – Custom Measure Analysis Protocol

8.5.1. Section 1: Project Information

8.5.2. Section 2: Energy Consumption and Demand

8.5.2.1. Efficient Case

8.5.2.2. Baseline Case

8.5.2.3. Savings

8.5.3. Section 3: Project Variables

8.5.3.4. Load Characterization

8.5.3.5. Operating Conditions

8.5.3.6. Interactive Effects

8.5.3.7. Measure Life

8.5.3.8. Persistence

8.5.3.9. Related Variables

8.5.4. Section 4: Documentation and Metering

8.5.4.1. Modeling

8.5.4.2. Calculations

8.5.4.3. Documentation

8.5.4.4. Reporting



TRM Completion Outlook

Incorporate Comments By*

~5/4/12

Finish Comment Resolution

~5/18/12

Final TRM is Complete

~6/1/12

Technology Outlook Workshop

~ June

Questions or Comments?



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Variable Input Value Categories

- Algorithm Specific Inputs
- Baseline, Lifetime, Persistence, Operating Hours, Loadshape
- Cost Specification
- Weather Data