NREL
NATIONAL RENEWABLE ENERGY LABORATORY






Energy Rating Index
Calculation Consistency

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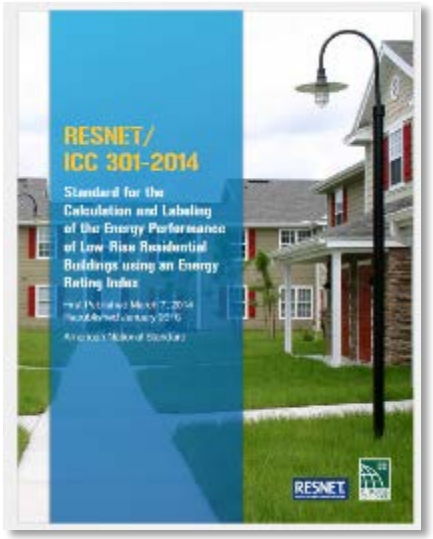
IECC Energy Rating Index, aka HERS Index

IECC Section 406 Energy Rating Index Compliance Alternative

406.3 Energy Rating Index. *The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301.*



Climate Zone	Energy Rating Index
1	57
2	57
3	57
4	62
5	61
6	61
7	58
8	58

Anatomy of a Home Energy Assessment Tool

		Example: Air Conditioner	Estimated influence on variability**	Keys to Improvement
User Interface	Typical residential assessment inputs	 SEER: 1 input Capacity: 1 input SHR: 1 input Total: 3 inputs	40% observation and input	Training and Interface Design
Input Translator	Assumptions about building details not observed or input	Many, many lines of software code that translate simplified inputs into detailed inputs	50% input translation	Common Rules or Shared Software Code
Simulation Engine	Detailed inputs needed to drive simulation*	Air Loop: 19 inputs Coil: 28 inputs Performance Curves: 50 inputs Fan: 13 inputs Total: > 100 inputs	10% simulation engine	Validation

*Similar inputs needed for any detailed simulation engine (e.g., EnergyPlus, DOE-2, ESP-r, etc.).

**Dave Roberts' generalized observational opinion.

RESNET Consistency Efforts

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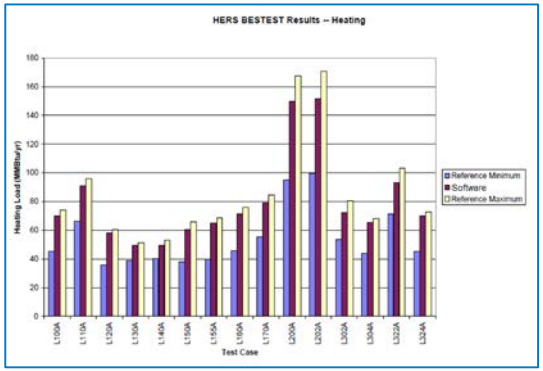
What Has RESNET Accomplished To Date

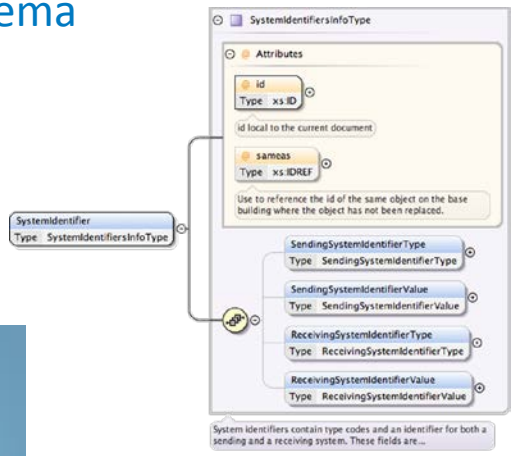
- Adoption of the RESNET Publication No. 002, "Procedures for Verification of RESNET Accredited HERS Software Tools"
- Established Limits on Input Variables for Whole-House Ventilation Systems
- Incorporated Bounds Checks into Software to Limit or Warn HERS Raters When Input Values are Beyond Reasonable Limits
- Established QAD Flags for Internal Inconsistencies that Should be Checked Prior to Entering a Building File into RESNET Registry

RESNET Consistency Efforts



Improvements Planned for 2018

- Tightening of the Boundaries of the Suite of HERS Software Program Tests
- Development of a RESNET Building Input Common Schema
- Formation of a Software Consistency Committee
- Hiring of Energy Modeling Director



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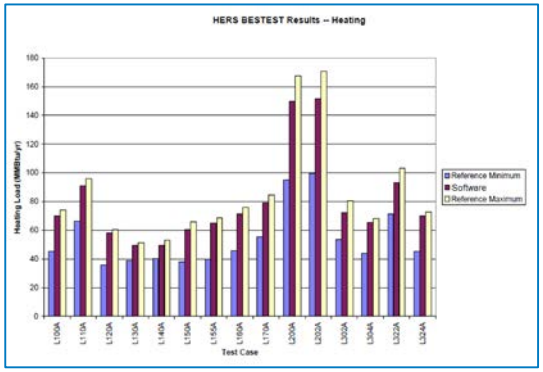

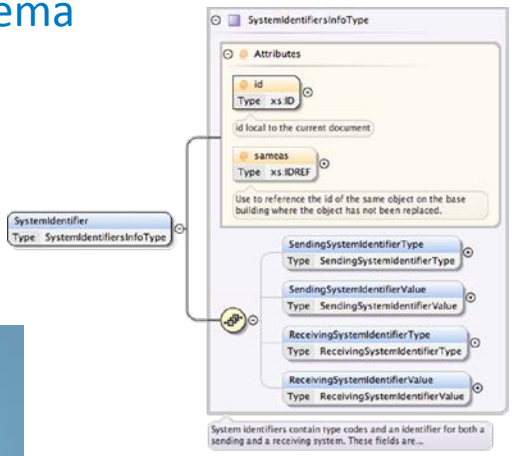

Formation of a Software Consistency Committee

Purpose:

- Proactively promote consistency through group discussion, updates to the RESNET modeling guidelines, recommended updates to Publication 002 test boundaries, and requests for Standards interpretations.

Members:

- Representatives of RESNET Accredited Software Programs (REM/Rate, Ecotrope, EnergyGauge USA, Wrightsoft)
- Subject Matter Experts (NREL, California Energy Commission)

Hiring an Energy Modeling Director

To support the SCC, RESNET will recruit a technical consultant with extensive knowledge of building energy software modeling, who will serve as the RESNET Energy Modeling Director

RFP currently out. Deadline for responses is August 15, 2018

RESNET Consistency Efforts

Throughout all these processes, RESNET will conduct periodic evaluation of the progress toward consistency of index scores among all the software providers. If it becomes clear that all these efforts will not achieve an acceptable level of consistency, RESNET will proceed to moving to a ***single engine*** for calculation of the HERS index scores.

RESNET blast email 6/4/18

NREL/DOE Open Source Engine

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Single engine solution

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NREL/DOE Open Source Engine

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Single engine solution

NREL/DOE Open Source Engine

Benefits

- ✓ **Accelerates new technologies** into software tools
- ✓ **Increases consistency** across DOE/industry programs
- ✓ **Reduces developer effort** to use EnergyPlus
- ✓ **Lowers industry-wide costs** of maintaining multiple engines
- ✓ **Allows private-sector competition** around innovations for user interface, business support, etc.

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Summary & Key Takeaways

1. RESNET processes are improving accuracy and consistency

2. NREL is leading an effort to cooperatively develop open source infrastructure to support calculation of ERI based on OS/E+