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December 14, 2007
Chapter Seven

RESNET Standards

700 RESNET NATIONAL STANDARD FOR HOME ENERGY ASSESSMENTS

701 GENERAL PROVISIONS

701.1 Purpose

The provisions of this Standard are intended to define a framework for a home energy assessment process, consisting of three phases (survey, audit, and comprehensive assessment). An accredited provider may follow this standard to produce uniform, comprehensive energy assessments for existing residential buildings. This Standard is intended to facilitate investments by homeowners to produce the following outcomes:

- Increase the energy efficiency of homes
- Increase the comfort of homes
- Increase the durability of homes
- Ensure that energy improvement recommendations are portrayed with reasonable and consistent projections of energy savings
- Reduce the risk that energy improvement recommendations will contribute to potential health, safety, or building durability problems
- Reduce waste and pollution, protecting the environment

701.1.1 Relationship to Other Standards. This Chapter is a companion Chapter to the “National Accreditation Procedures for Home Energy Rating Systems” (Chapter 1 of this Standard), “National Rater Training and Certifying Standard (Chapter 2 of this Standard), and “NATIONAL ENERGY RATING TECHNICAL STANDARDS” (Chapter 3 of this Standard) as promulgated and maintained by the Residential Energy Services Network (RESNET) and recognized by the mortgage industry.

701.1.2 Relationship to State Law. This Standard specifically recognizes that some state laws or regulations have additional requirements to those specified in this document. To the extent that such state laws or regulations differ from these Standards, state law or regulation shall govern.

701.2 Scope

701.2.1 Application of Standards

This Standard applies to existing site-constructed or manufactured, single- and multi-family residential buildings three stories or less in height, excepting hotels and motels.

702 DEFINITIONS AND ACRONYMS

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Accreditation Procedures – The set of standards and procedures entitled “Mortgage Industry National Accreditation Procedures for Home Energy Rating Systems” as published and maintained by RESNET (Chapter 1 of this Standard).

Baseline Checkup – See *Energy Survey*.

BPI: Building Performance Institute

Certified Building Analyst (BA): An individual who successfully passes the BPI written and field examination requirements for certification

Certified Home Energy Rater: An individual who is certified by an accredited home energy rating provider to inspect a home in order to evaluate the minimum rated features established by RESNET and prepare an energy efficiency rating according to Chapters One and Three of the RESNET Mortgage Industry National Home Energy Rating Standards.

Comprehensive Home Performance Assessment: A thorough assessment process consistent with this standard. The Comprehensive Home Performance Assessment includes the evaluation, diagnosis and proposed treatment of an existing home. A homeowner may elect to go through this process with or without a prior energy audit or survey.

Data Collection: The gathering of energy use history and other relevant building data and occupant-supplied information.

Diagnosis: Professional judgment and analysis that is applied with the intent of identifying one or more causes of energy loss, comfort complaints, unsafe combustion equipment operation, or other problems.

Energy Audit – A module of the national home energy assessment process defined by this standard intended to assess both the general energy performance of the home and the level of the commitment by the homeowner. May include data collection contributing to further analysis, or generally identify symptoms of home performance problems. The intent of the audit is to refer homeowners to the next level if it is determined that the home needs further analysis, and the homeowner is motivated enough to invest in further analysis and making recommended improvements. The auditor would educate the homeowner regarding the benefits of a whole house approach to improving the home’s energy performance. This phase is not required if the homeowner wishes to directly pursue a comprehensive home energy assessment.

Energy Efficiency Rating or Energy Rating – See *Home Energy Rating*

Energy Saving Measure or Feature – Any material, component, device,

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system, construction method, process or combination thereof that will result in a reduction of energy use.

Energy Survey: (also called “Baseline Checkup”) An energy review of a home performed by a non-professional (like a homeowner performing an on-line do-it-yourself review). A report that shows a general range of homes energy efficiency and a look up matrix based regional zones and climate

Evaluation: A review of the data collected from any preceding survey or audit, on-site data collection and/or performance testing, and analysis of the home’s existing condition, to determine energy savings and potential improvements.

HERS – Home Energy Rating System

HERS Index – A numerical integer value produced by a Home Energy Rating that represents the relative energy use of a Rated Home as compared to the energy use of the HERS Reference Home, and where an Index value of 100 represents the energy use of the HERS Reference Home and an Index value of 0 (zero) represents a home that uses zero net purchased energy.

HERS Provider – A person or organization that develops, manages, and operates a home energy rating system.

Home – A building with one or more dwelling units that has three or fewer stories above grade, or a single dwelling unit within a building of three or fewer stories above grade.

Home Energy Rating: An unbiased indication of a home’s relative energy performance based on consistent inspection procedures, operating assumptions, climate data and calculation methods.

Home Energy Rating System or HERS – The materials and procedures needed to operate a home energy rating program, including but not limited to: marketing materials, training materials, publications, rating software, quality control system, data collection and maintenance systems, agreements, data collection sheets, home owner reports, and other related materials and services.

Home Performance Analyst: The person qualified to conduct a Comprehensive Home Energy Assessment. (At the time of this publication this classification is in the process of being defined and adopted by RESET and BPI)

Home Performance with Energy Star (HpwES): A national program developed by the Environmental Protection Agency (EPA) and the Department of Energy (DOE), that offers a comprehensive, whole-house approach to improving energy efficiency and comfort of homes, while maintaining or improving safety .

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Performance Testing: testing conducted to evaluate the performance of a system or component, compared to specified performance metrics.

Prioritization: The process in which potential measures for a home are ranked by priority regarding energy savings potential, energy efficiency retrofit opportunity, durability, and motivation of the homeowner.

Qualified Contractor: A contractor trained and certified by a RESNET recognized organization to complete home performance work.

Rating Software – A computerized procedure for calculating a home's energy efficiency rating, annual energy consumption, and annual energy costs, that is accredited by RESNET.

RESNET – Residential Energy Services Network

703 National Comprehensive Home Energy Assessment Procedures

703.1 Energy Survey (or Baseline Checkup): The survey shall produce a report that shows a general range of a home's energy efficiency based on specific criteria (insulation, equipment age, general condition, energy costs) and a lookup matrix based on regional norms and climate, as approved by RESNET. Examples include the U.S. Department of Energy's Home Energy Saver and the Environmental Protection Agency's Home Energy Yardstick. The survey is not required if the homeowner wishes to directly pursue an Energy Audit or a Comprehensive Home Energy Assessment.

703.2 Energy Audit The audit shall include a visual inspection of the dwelling unit, and documentation of its general condition from a thermal, structural, appliance, lighting and safety perspective. The audit shall include a review of utility billing history. The audit is a visual inspection only and does not include the use of a blower door, duct leakage test, or an infrared camera. An audit does not require a previous Energy Survey, nor is it a prerequisite for the Comprehensive Home Energy Assessment.

703.2.1 The energy auditor shall interview the homeowner regarding energy and comfort problems. The energy auditor shall explain the limitations of the audit and provide an overview of the comprehensive energy assessment phase. The interview shall include, but is not limited to, the following subject areas:

703.2.1.1 Comfort complaints, including areas of the home that are too hot or too cold.

703.2.1.2 Energy billing concerns

703.2.1.3 The potential for the homeowner to move directly to a comprehensive home energy assessment.

703.2.2 The energy auditor shall inform the homeowner of low cost/no cost

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improvements that the homeowner can implement.

703.2.3 The energy auditor shall request copies of utility bills or written permission to obtain the energy use information from the utility company, and use them to produce an estimate of generalized end-uses (base, heating, and cooling).

703.2.4 The energy auditor shall advise the homeowner on where to locate qualified individuals to conduct a comprehensive home energy assessment.

703.2.5 Minimum Features of Energy Audit

703.2.5.1 The energy auditor shall complete a standardized audit form developed by the Residential Energy Services Network. The audit form will require the auditor to visually review the home and to measure or estimate the following features:

- 703.2.5.1.1 R-values of wall/ceiling/floor insulation
- 703.2.5.1.2 Square footage and age of home
- 703.2.5.1.3 Type of windows: glazing type(s) and frame material(s)
- 703.2.5.1.4 Type, model number, and location of heating/cooling system(s),
- 703.2.5.1.5 Type of ductwork, location and R-value of duct insulation
- 703.2.5.1.6 Type of foundation is crawl, basement, or slab
- 703.2.5.1.7 Checklist of common air-leakage sites indicating likely opportunities
- 703.2.5.1.8 Age and estimated efficiency of major appliances such as dishwashers, refrigerators, freezers, washing machines and dryers.
- 703.2.5.1.9 Number and type of hardwired incandescent light fixtures and screw-in bulbs portable lamps
- 703.2.5.1.10 Visual indications of condensation in the attic
- 703.2.5.1.11 Presence and location of exhaust fans, and determination of whether they are vented outdoors
- 703.2.5.1.12 Number and type of water fixtures (faucets, showerheads)
- 703.2.5.1.13 Presence and type(s) of combustion equipment; identification of visually identifiable problems including flame rollout, blocked chimney, and rotting or missing vent connector.
- 703.2.5.1.14 Conduct carbon monoxide reading

703.2.5.2 The following elements are outside the scope of an energy audit:

- 703.2.5.2.1 The use of blower doors, duct leakage test equipment or an infrared camera
- 703.2.5.2.2 Any other diagnostic testing of the home

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703.2.5.2.3 Quantification of any levels of airtightness, duct tightness, or ventilation. Energy savings estimates may only be generalized and presented with the qualification that a comprehensive assessment should be obtained in order to validate the savings estimates.

703.2.5.2.4 Combustion appliance testing

703.2.6 Minimum Energy Audit Report

703.2.6.1 At the completion of the audit the energy auditor shall provide the homeowner standardized report developed by RESNET or by a program provider with the approval of RESNET, and signed by the energy auditor. The report would provide information to the homeowner about:

703.2.6.1.1 Whole-house solutions overview of how the home works as a system and how to prioritize actions to yield deep energy savings

703.2.6.1.2 Promote quality installation of HVAC equipment including: proper sizing of equipment, duct sealing, and refrigerant charge and air flow.

703.2.6.1.3 Promote building envelope air sealing and proper levels of insulation.

703.2.6.1.4 Overview of ENERGY STAR or better products and appliances

703.2.6.1.5 Where to obtain a comprehensive home energy assessment.

703.2.6.1.6 Address non-energy benefits of improving the energy efficiency of the home including reduction of carbon emissions

703.2.6.1.7 General statement regarding opportunities to improve the thermal envelope, mechanical equipment, lighting and/or appliances in the home.

703.2.6.1.8 A safety notification form that is filled out and presented only when obvious problems are observed in accordance with 703.2.5.1.13.

703.2.7 Limitations

703.2.7.1 The energy auditor shall not make the following recommendations to a homeowner as part of an energy audit:

703.2.7.1.1 Detailed recommendation of improvements.

703.2.7.1.2 Written work scope for improvements.

703.3 Comprehensive Home Performance Assessment

The Comprehensive Home Performance Assessment includes an evaluation, diagnosis and proposed treatment of an existing home. The evaluation shall include a review of the data collected from any previous energy audit, any further required measurement and performance testing, combustion appliance testing,

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and an analysis of the home's energy performance. The diagnosis and proposed treatment determines the scope of work for the home. The Home Performance Analyst, Home Energy Rater or Building Analyst shall guide the homeowner to a qualified contractor certified by a program such as Home Performance with ENERGY STAR or the Building Performance Institute to complete the required treatment. A homeowner may elect to go through this process with or without a prior energy survey.

703.3.1 The comprehensive home performance assessment shall consist of the following procedures:

703.3.1.1 The procedures adopted by the Building Performance Institute for the certified Building Analyst classification,

703.3.1.2 The procedures adopted by the Residential Energy Services Network for the certified home energy rater classification, or

703.3.1.3 The specifications required by the U.S. Environmental Protection Agency and Department of Energy for the Home Performance with ENERGY STAR Program.

704 Required Skills

704.1 Minimum skills and knowledge base required for an individual to conduct an Energy Audit (Energy Auditor)

704.1.1 Basics of heat transfer concepts

704.1.2 Basics of building performance testing

704.1.3 Basics of air distribution leakage

704.1.4 Calculating gross and net areas

704.1.5 Definitions/energy terminology

704.1.6 Basic combustion appliance concerns

704.1.7 Basics of envelope leakage, thermal bypass, thermal bridging

704.1.8 Determining envelope insulation

704.1.8.1 Presence/absence of insulation and when observable, the quality of its installation

704.1.8.2 Recommended levels of insulation by climate zone

704.1.9 Determining equipment model numbers and efficiencies from default tables

704.1.10 Household appliances – determine efficiency of vintage from model numbers

704.1.11 Energy units

704.1.12 Measuring building dimensions

704.1.13 Identification and documentation of energy audit inspected features of the home

704.1.14 Basics of specifications

704.1.15 Determining window and door efficiency

704.1.16 Determining building orientation and shading characteristics

704.1.17 Defining the thermal boundaries

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- 704.1.18 Basics of measure interaction, expected life, and bundling for optimal performance considering the house as a system and the emerging need for deep savings

704.2 Minimum certification required for an individual to conduct a Comprehensive Home Performance Assessment (Home Performance Analyst)

- 704.4.2.1 Shall be either:

- 704.2.1.1 A Building Analyst certified by the Building Performance Institute. In addition the certified Building Analyst shall be trained to complete the following functions:
- 704.4.2.1.1.1 Building simulation and performance modeling according to the requirements of the *Mortgage Industry National Home Energy Rating Systems Standards*.
 - 704.4.2.1.1.2 HERS index computations and reference home configuration
- 703.4.2.1.2 A Home Energy Rater certified by a RESNET accredited Rating Provider. The certified home energy rater shall be trained to complete the following functions:
- 703.4.2.1.2.1 Preparation of a detailed work scope
 - 703.4.2.1.2.2 Combustion appliance testing according to the BPI *Building Analyst Standards*
 - 703.4.2.1.2.3 Rater health and safety requirements

704.5 Accreditation Criteria of a Home Energy Audit Provider

704.5.1 A Home Energy Audit Provider shall be accredited by RESNET as a Rating Provider as specified in Section 102 of the *Mortgage Industry National Home Energy Rating Systems Standards*

704.5.2 Energy Auditor Certification Standard. Certification and recertification of energy auditors shall be made by accredited rating providers, which shall include the following provisions:

- 704.5.2.1 Certification as a Home Energy Rater through the RESNET

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Standards – or

704.5.2.2 Certification as a Building Analyst under the BPI Standards -
or

704.5.2.3 A rating provider shall provide documentation that their energy auditors meet the following energy auditor certification provisions:

704.5.2.3.1 Performance evaluation of ability to perform accurate energy audits. Each energy auditor shall complete a probationary period where close supervision is provided by the provider's QA designee. The probationary period covers a minimum of three inspections after which the QA Designee shall determine if additional training is needed.

704.5.2.3.2 Continuing Education. Energy auditors shall have 12 hours of continuing education and training units approved by the rating provider in every three year period. Ten hours of the training shall be approved by RESNET.

704.5.2.3.3 Energy Auditor Testing. All certified Energy Auditors shall take the national home energy auditor test administered by RESNET.

704.5.2.1.4 Recertification of auditors by the provider shall occur no less than every three years.

704.5.2.1.5 Energy Auditor Agreements. As a condition of energy auditor certification, each provider shall ensure that each certified energy auditor enters into a written agreement with the provider to provide energy audit field verification services in compliance with these standards. An un-executed copy of the energy auditor written agreement shall be provided to RESNET with the provider's accreditation application, and again within 60 days of making changes to the agreement. The written agreement shall, at a minimum require raters to:

704.5.2.1.5.1 Provide home energy rating and field verification services in compliance with these standards;

704.5.3.1.5.2 Provide accurate and fair energy audits

704.5.3.1.5.3 Comply with the RESNET Code of Ethics. The "RESNET Code of Ethics" is posted at <http://www.natresnet.org/ethics.htm>. The Code of Ethics shall be attached to the written agreement.

704.5.3 Minimum Standards for Home Energy Audit Program's Operation Policies and Procedures shall be submitted in written form to RESNET for approval, and shall at a minimum provide for the following:

704.5.3.1 Written conflict of interest provisions that prohibit undisclosed conflicts of interest, but may allow waiver with advanced disclosure. The "Home Energy Audit Standard Disclosure" form adopted

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by the RESNET Board of Directors shall be completed for each home that receives a home energy audit and shall be provided to the energy audit client and made available to the home owner/buyer. Each form shall include, at a minimum, the address of the home. Each form shall accurately reflect the proper disclosure for the home that it represents. For the purpose of completing this disclosure, "Rater's employer" includes any affiliate entities. Recognizing that a number of different relationships may exist between the Energy Auditor or the Energy Auditor's employer, other contractors that may complete work on the home, and the audit client and/or homeowner, the audit provider shall ensure that all disclosures are adequately addressed by the provider's quality assurance plan, in accordance with the relevant quality assurance provisions of the standards.

704.5.3.2 Written Energy Auditor discipline procedures that include progressive discipline involving probation, suspension, and termination.

704.5.3.3 A written energy audit quality control process that includes at a minimum the following:

704.5.3.3.1 The provider's quality assurance designee shall be responsible for the internal review of energy audits submitted by its energy auditors, including:

704.5.3.3.1 Review of energy audits conducted during the energy auditor's probation period. Prior to certifying an energy auditor candidate, the provider shall review at least three probationary audits performed by the energy auditor within 12 months.

704.5.3.3.2 Review of energy audit reports. For each energy auditor, the provider's quality assurance designee shall annually evaluate a minimum of 10% of each energy auditor's energy audit reports. The provider shall resolve any problems detected during these reviews. Excessive problems shall trigger field monitoring of the energy auditor.

704.5.3.3.3 Field review. For each energy auditor, the provider's quality assurance designee shall annually evaluate a minimum of 1% of each energy auditor's energy audits by conducting a field review. The provider shall resolve any problems detected during these reviews.

704.5.3.4 Energy Auditor Registry. The provider shall maintain a registry of all of its certified energy auditors. The provider will also keep on file the names and contact information for all, including company name, mailing address, voice phone number, fax number, and email address. Upon request, the provider shall provide to RESNET its registry of certified energy auditors.

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704.5.3.5 Complaint Response Process Each provider shall have a public available process for receiving complaints. The provider shall respond to and resolve complaints related to energy audits and reports. Providers shall ensure that energy auditors inform clients about the complaint process. Each provider shall retain records of complaints received and responses to complaints for a minimum of three years after the date of the complaint.

705. GENERAL LIMITATIONS AND EXCLUSIONS

705.1 General limitations:

705.1.1 The energy use information contained in the report does not constitute any warranty of energy cost or savings.

705.1.2 Inspections that are performed in accordance with these standards:

- Are not technically exhaustive.
- Will not identify concealed conditions or latent defects.
- The home energy auditor is not intended to be an inspection of the structural soundness of the home or any other attributes of the home other than the home's energy features.
- The home energy audit is not applicable to building design and construction features except those specified in the minimum required features listed in section 703.2.5.