Missouri Home Energy Auditor Certification

Missouri Department of Natural Resources
September 29, 2008

Background

Senate Bill 1181, signed into law in July 2008, establishes a Missouri income tax deduction for the cost of a home energy audit or the cost of implementing energy-efficiency recommendations contained in an energy audit or both. Missouri residents may claim the tax deduction beginning with the 2009 tax year. In order to claim the tax deduction, the audit must be performed by an energy auditor certified by the Missouri Department of Natural Resources. The new law directs the Department of Natural Resources to develop criteria and requirements for certification of home energy auditors and states that the applicants shall provide the department with an application, documentation or other information the department may require. The department may establish periodic requirements for qualified home energy auditors to maintain certification, and the department shall provide successful applicants with written notice that the applicant meets the certification requirements.

The Missouri Department of Natural Resources proposes to implement the requirements of the new law as explained below.

Energy Auditor Training Criteria

The following are the proposed minimum training requirements for Missouri certification as a home energy auditor:

Professionals desiring to obtain full certification as a home energy auditor in Missouri may qualify through two avenues:

1. Successful completion of a training program, a written exam and a field exam approved by the Department of Natural Resources as explained later in this document, or

2. Successful completion of a written exam and a field exam approved by the Department of Natural Resources.

Acceptable training programs shall include a minimum of three days of instruction that includes the following subject areas:

- Energy Audits - an energy audit is an inspection, survey and analysis of energy flows in a building, process or system with the objective of understanding the energy dynamics of the system under study. Typically an energy audit is

conducted to seek opportunities to reduce the amount of energy input into the system without negatively affecting the output(s). When the object of study is an occupied building then reducing energy consumption while maintaining or improving human comfort, health and safety are of primary concern. Beyond simply identifying the sources of energy use, an energy audit seeks to prioritize the energy uses according to the greatest to least cost effective opportunities for energy savings.

- Building Envelope - buildings and their systems, analyzing building systems, An energy audit of a home may involve recording various characteristics of the building envelope including the walls, ceilings, floors, doors, windows, and skylights. For each of these components the area and resistance to heat flow (R-value) is measured or estimated. The leakage rate or infiltration of air through the building envelope is of concern which is strongly affected by window construction and quality of door seals such as weather-stripping. The audit may also assess the efficiency, physical condition, and programming of mechanical systems such as the heating, ventilation, air conditioning equipment, and thermostat.

- Building Science – basic components of the house shell, the water boundary - roof, siding, foundation and slab floor, the thermal boundary - areas of the house you are going to condition, continuity of the insulation, the air barrier - walls, ceilings and floors. Basics of home construction.

- Heat Flow Principles - types of heat transfer; conduction, convection and radiation.

- Conduction - transfer of heat through a substance or between substances in contact with each other, factors in conduction - difference in temperature, length of time, area in common, resistance to heat flow and conductivity; preventive measures - insulation, low e insulated windows, storm windows, storm doors;

- Convection - transfer of heat by the movement of the heated fluid, factors in convection - volume of air, air changes per hour, heating capacity of air, difference in temperature, length of time; preventive measures - weather stripping, house wrap, caulk, and expanding foam;

- Radiation - transfer of heat in the form of electromagnetic energy through space, characteristics of radiation, conversion of radiated energy to heat; preventive measures- low e insulated windows, blinds and awnings.

- Quantifying Building Energy Flows - formulas for area, volume, resistance to heat flow and conductivity, thermal transmittance, and infiltration loss. Determining degree days,

- Ventilation Requirements - air quality, combustion support, moisture, moisture sources, moisture problems, reducing moisture problems.

- Heat Loss and savings calculations - thermal comfort, system and envelope efficiency, environmental conditions, fundamentals of heat loads, measurements, calculations.

- Windows and Doors - function, types, construction, U values, unintentional openings.

- Air leakage test (blower door) - using a blower door to measure air flow and locate air leaks. Applicable ASHRAE standards, conducting zonal pressure differential tests, use of a smoke pencil, determining significant misalignments of pressure and thermal boundaries and ways to mitigate them, comparing CFM readings to required ventilation rates using appropriate methodologies.

- Heating and cooling distribution system (ductwork) - measuring duct leakage, leakage to inside, leakage to outside, alternative test methods.

- Insulation - thermal boundary, types of insulation, R-Values, default R-values, problem areas, moisture, water leakage, condensation, determining the condition of the installation, correcting deficiencies.

- Health and safety (combustion) - residential heating and combustion systems, measuring carbon monoxide, spillage and draft tests, and gas supply safety.

- Written Audit Reports - training regarding items to include in written reports to be given to home owners

The applicant will demonstrate competence by successful completion of a written exam and a DNR approved field exam in which the applicant successfully completes a thorough, whole-house energy audit of at least one home.

A field exam is a very important part of the certification criteria. This is an actual demonstration that the potential auditor is competent, can handle the equipment, and can obtain meaningful results. A field exam as part of certification is essential to demonstrate that the examinee has skill and proficiency.

Recertification will be required every three years. The minimum recertification requirement will consist of a minimum of 10 hours of continuing education during the three-year period or successful completion of a written exam and a field exam. Continuing education units shall meet the standards established by the Missouri Department of Natural Resources.

Desired Training:

The following training topics are not required for certification. However, training in one or more of these topics will assist professionals that apply for certification to perform more thorough, whole-house assessments of a home's energy use and make resulting energy-efficiency recommendations.

- Lighting - types of lighting and controls, relative energy efficiencies of lighting types, Energy Star-labeled lights and fixtures, sources of information.

- Appliance efficiency - Energy Star labeled appliances, manufacturer data, sources of information.

- Water heater, heating system and cooling system efficiencies - manufacturer data, sources of information.

The desired areas of training will improve the performance of the auditor, but the information can be obtained by self study and does not have to be presented in a formal training session.

Auditor Equipment

The department does not require certified auditors to purchase specific equipment; however, the successful auditor should have access to the following tools:

*a. Fan Assisted Whole House Pressurization Device (blower door)
*b. Combustion Analyzer
c. Fan Assisted Duct Pressurization Device or Pressure Pan
d. Digital Carbon Monoxide Analyzer
e. Digital Thermometer
f. Gas Leak Detection Device
g. Diagnostic Smoke

*Highest priority equipment

The department does require the use of any specific equipment for a Home Energy Audit. This is a recommendation list only.

Commercial certifying agencies

The department has determined that two nationally recognized training and certification organizations have training, testing and certification protocols that meet the minimum Department of Natural Resources criteria described earlier in this document. These organizations are the Building Performance Institute Inc. (BPI) and the Residential Energy Network (RESNET).

The department will accept current certification by BPI as a Certified Building Analyst or RESNET as a Certified Rater as a valid Missouri Home Energy Auditor Certification.

BPI and RESNET maintain websites with information regarding certification and training opportunities from these organizations. The website addresses are:
BPI: http://www.bpi.org/content/home/index.php
RESNET: http://www.natresnet.org/

Other Training Programs

There may be an organization, business or entity that provides or desires to provide formal training and testing for home energy auditors other than the Missouri-recognized BPI or RESNET certification. Such entities may provide information as prescribed by the Department of Natural Resources about their program for department review. The department will evaluate the program in relationship to the Energy Auditor Training Criteria and availability of Auditor Equipment described above in this document and will notify the entity whether the training and testing program may be included as a Missouri-recognized certification program.

(Application being prepared to include information such as the following:

Contact name and information
Name of training program
Location of training
Frequency of training
Instructor experience, education, training
Length of training course
Copy of training curriculum and description of training content
Copy of written exam and description of field exam
Availability of training equipment
Description of how the training satisfies the DNR required training criteria)

There may be individuals who have received formal energy audit training and successfully passed a written test and a field test from an organization other than BPI or RESNET. Such individual may supply information as prescribed by the department and request that the department evaluate the training in relationship to the Energy Auditor Training Criteria and availability of Auditor Equipment described above in this document and determine whether the individual may be issued a Missouri-recognized certification.

(Application being prepared to include information such as the following:

Training Provider
Name and address
Contact name and information
Copy of training curriculum
Description of training content and subject areas
Copy of Training Certificate, Certification Number
Certification expiration date

Years experience as Home Energy Auditor
Attached copy of written Home Energy Audit performed by applicant)

Full Certification

Applicants with existing BPI or RESNET certification as described above shall complete an application form and provide information as prescribed by the department. The department will review information provided and, upon satisfactory review, will provide a written notice that the applicant meets the certification requirements.

Recertification will be required every three years. The minimum recertification requirement will consist of a minimum of 10 hours of continuing education during the three-year period or successful completion of a written exam and a field exam. Applicants desiring recertification will complete an application form and provide information as prescribed by the department. Continuing education units must be recognized by either BPI or RESNET.

Provisional Certification

The department recognizes some individuals who currently conduct home energy audits in Missouri do not have a BPI or RESNET certification and may have insufficient time to obtain one of these certifications by January 1, 2009. In recognition of these circumstances, for a period ending December 31, 2009, the department will issue provisional Missouri Home Energy Auditor certification to individuals that have at least two years experience as home energy auditors. Individuals seeking provisional certification will complete an application and provide information prescribed by the department for review.

> (Application form being prepared to request information including a minimum of one written energy audit, including energy-efficiency recommendations, completed by the applicant for provisional certification; and written information sufficient to demonstrate that the applicant is in the business of performing energy audits, such as company brochures, website links, business license, business name registration, proof of general or professional liability insurance of at least $500,000, etc.)

The department will provide individuals applying for certification as Missouri Home Energy Auditors (Provisional) with information regarding Health and Safety standards for home energy audits, and will require a signed statement that the applicant has read the information.

Application Forms

Application forms for Missouri Home Energy Auditor, Missouri Home Energy Auditor (Other Training), Missouri Home Energy Auditor (Other Training, Individual), and Missouri Home Energy Auditor (Provisional) will be available on the Missouri Department of Natural Resources website (after completion of application forms). You also may contact the Missouri Department of Natural Resources Energy Center, 573-751-2254, for a paper copy of the application form.

Comments

The department is seeking and accepting comments regarding the proposed Missouri Home Energy Auditor Certification Program until close of business, Tuesday, October 14, 2008. Please send your written comments to the following address:

Roger Korenberg
Missouri Department of Natural Resources Energy Center
P.O. Box 176
Jefferson City, MO 65102
or
Roger.Korenberg@dnr.mo.gov

If you have questions regarding this proposal, please contact Roger Korenberg at 573-526-1723.