# Missouri Home Energy Auditor Certification Program Guidance

Division of Energy 11/2016

## Background

Senate Bill (SB) 1181, signed into law in July 2008, established 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 taxpayers may claim the tax deduction beginning with the 2009 tax year. The tax deduction ends December 31, 2020 (SB 729, 2014). In order to claim the tax deduction, the audit must be performed by an energy auditor certified by the Missouri Department of Economic Development. The law directs the Department of Economic Development to develop criteria and requirements for certification of home energy auditors and states that the applicants shall provide the department with an application, documentation and 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 department does not charge a fee for Missouri certification.

The U.S. Environmental Protection Agency (EPA) requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in pre-1978 homes, child care facilities and schools be certified by EPA and that they use certified renovators who are trained by EPA-approved training providers to follow lead-safe work practices, per: 40 CFR Part 745 - Lead-Based Paint Rule.

The Missouri Department of Economic Development is implementing the requirements of the law as explained below.

## Energy Auditor Training

Residential

To qualify for residential auditor certification through this program, the applicant must successfully complete training and receive certification through at least one of the following training programs:

- Building Performance Institute (BPI) as a Certified Building Analyst, a Certified Energy Auditor, or as a Quality Control Inspector;
- Residential Energy Network (RESNET) as a Certified Rater; or
- Certification through other DED approved programs.

Commercial

To qualify for commercial building energy auditor certification through this program, the applicant must be a licensed Professional Engineer in Missouri with building energy efficiency experience and must have successfully achieved certification through one of the following:

- ASHRAE
  - Building Energy Assessment Professional (BEAP)
  - Building Commissioning Professional (BCxP)
- Association of Energy Engineers (AEE)
  - Certified Energy Auditor (CEA)
  - Certified Building Commissioning Professional (CBCP)
- Building Commissioning Association (BCxA)
  - Certified Commissioning Professional (CCP)
- National Environmental Balancing Bureau (NEBB)
  - Commissioning Process Professional (CxPP)
- Certification through other DED approved programs

Once individuals have successfully completed one of the above, in order to obtain Home Energy Auditor (HEA) certification, they must apply to the Department of Economic Development - Division of Energy.

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 - 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; and 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; and preventive measures - insulation,

low 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; and 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; and 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; and determining degree days.

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

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

- Windows and Doors - function, types, construction, U values and 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 and 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 and 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 and correcting deficiencies.

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

The applicant will demonstrate competence by successful completion of a written exam and a DED-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 (Individuals)

Recertification is required every three years. The minimum recertification requirement consists of recertification by the original certifying agency (e.g., BPI, RESNET, ASHRAE, or other), and submitting a new application and supporting documents. If the original certifying agency does not specify renewal requirements, the minimum requirements will consist of a DED-approved written exam and a field exam administered by one of the certifying agencies.

## Desired Training

The following training topics are desired for certification. Training in one or more of these topics will assist individuals 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, and sources of information.
- Appliance efficiency - Energy Star labeled appliances, manufacturer data, and sources of information.
- Water heater, heating system and cooling system efficiencies - manufacturer data, and 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

A successful residential auditor should have access to and be familiar with the use of the following tools:

- Fan Assisted Whole House Pressurization Device (blower door)
- Combustion Gas Analyzer
- Fan Assisted Duct Pressurization Device or Pressure Pan
- Digital Carbon Monoxide Analyzer
- Digital Thermometer
- Gas Leak Detection Device
- Diagnostic Smoke

A successful commercial building auditor should have access to and be familiar with the use of the following tools:

- Light Level Meter
- Data Loggers
- Chemical Smoke Kit
- Temperature Measuring Instrument
- Psychrometer
- Infrared Thermal Imaging
- Digital Multimeter
- Power Quality Analyzer
- Combustion Gas Analyzer

- Air Velocity Measuring Instrument

The department does not require the use of any specific equipment for an energy audit. Those are the recommendation lists only.

## Certification

Applicants with existing certification as described above shall complete an application form (Missouri Certified Home Energy Auditor Application - MO 780-2011 or Form MO 780-2011C) and provide information as prescribed by the department. Information to be provided includes but is not limited to:

Contact name and address; existing certification information; business information (if applicable); and proof of liability insurance (if applicable).

The application form instructs the applicant to attach several items related to operating a business. These items are required if the individual is operating their own business but not if the applicant is the employee of another business.

If the individual seeking certification is operating their own business, they must check with the local city and/or county to determine whether a business license is required. The individual must check with the Secretary of State's office to determine if business name registration is required. If a license and/or business name registration is required, it must be obtained before you may be certified.

The Missouri Business Portal, a single point of entry for business registration, filings, licenses and permits for doing business in the State of Missouri is located at: business.mo.gov/.

The department will review the information provided and upon approval will provide a written notice that the applicant meets the certification requirements.

## Other Training Programs (Institutions)

An organization, business or entity that provides or desires to provide formal training and testing for home energy auditors may apply to the Department of Economic Development to become a certified HEA trainer. 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. The institution training program certification will be valid for a period of three years, at which time the department will re-evaluate the institution program for renewal.

The institution or entity applying for certification based on a training program other than programs previously certified by DED, must submit an application (Missouri Certified Home Energy Auditor Application, Training Institution MO 780-2013) to the department. Information to be provided includes but is not limited to:

Name of the training institution; contact person information; name of training program; location

of training; length of training course; number of years the program has been offered; frequency of training; state charter number; availability of training equipment; course content; instructor information; copy of training curriculum and description of training content; copy of written exam; description of field exam; and proof of liability insurance (required).

The application form instructs the applicant to attach several items related to operating a business. The business is the training institution. The applicant should attach as many of the items as are available to help establish the authenticity of the training program.

The institution seeking certification must check with the local city and county to determine whether a business license is required. The individual must check with the Secretary of State's office to determine if business name registration is required. If a license and/or business name registration is required, they must be acquired prior to receiving certification by the department.

The Missouri Business Portal, a single point of entry for business registration, filings, licenses and permits for doing business in the State of Missouri is located at: business.mo.gov/.

## Recertification (Institutions)

Recertification of institutions (other than BPI and RESNET) is required every three years. The recertification will follow the same procedures as an original application.

## Application Forms

Application forms for Missouri Home Energy Auditor (DED Approved Certification), Form MO 780-2011 (residential building energy auditor), Form MO 780-2011C (commercial building energy auditor) and Missouri Home Energy Auditor (Training Institution), Form MO 780-2013, are available on the Missouri Department of Economic Development website: http://ded.mo.gov/division-of-energy/residential/home-energy-audits---missouri-personal-income-tax-deduction-for-home-energy-audits.

## For More Information

For more information, please contact:

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