



Missouri Home Energy Certification Program Guidelines

January, 2017

1. INTRODUCTION

The Missouri Home Energy Certification program (MHEC) provides for a voluntary approach to promote energy efficient homes through a clear and meaningful recognition program. The criteria for recognition have been determined by working with interested and affected parties. The Department of Economic Development-Division of Energy (DED-DE) has evaluated many existing residential energy programs that take into account all aspects of home energy use and how they can tie together to recognize a home's energy efficiency. The MHEC program brings a level of consistency to an often confusing energy efficiency program marketplace by linking a variety of home energy efficiency providers with a single platform. This consistency will decrease market confusion, increase the uptake of efficiency programs, and result in more efficient Missouri homes. The purpose of the MHEC program is to supply homeowners and potential home buyers with information about the energy efficiency of Missouri homes by providing recognition in the form of state-issued Gold certificates to the top performing tier of Missouri homes, and Silver certificates to homeowners who have improved their homes by a significant margin or have completed a majority of cost effective energy efficiency measures.

For the Gold certificates, there are two pathways to achieve certification. The first approach utilizes existing rating systems, the U.S. Department of Energy (DOE) Home Energy Score (HEScore), Home Energy Rating System (HERS) Index, and Columbia Water & Light's Efficiency Score (CWL Efficiency Score), to set the threshold for efficiency, and the second approach recognizes homes that have installed significant assets to the 2012 International Energy Conservation Code (2012 IECC) level or have achieved Energy Star Certified Home designation on or after January 1, 2017.

For Silver certificates, homes may be recognized that have significantly improved their energy efficiency or have completed a majority of the cost-effective energy efficiency measures. The approach will be measured using the HEScore, HERS Index, CWL Efficiency Score, or as modeled by an approved software program. To earn the Silver certificate, homeowners must have participated in an approved Missouri program or received a qualified energy audit.

In designing the MHEC program, the DED-DE faced a fundamental decision about whether to recognize energy savings associated with improvements made to existing homes or whether to recognize homes that achieve a high level of overall efficiency. DED-DE decided to recognize both highly efficient homes and homes that have participated in energy upgrade programs. Recognizing homes with high energy ratings and efficient assets allows for an apples-to-apples objective comparison between any two new or existing homes. Awarding certificates based on improvements resulting from Home Performance with ENERGY STAR programs and other residential energy upgrade programs encourages homeowner investment in energy efficiency.

The MHEC program seeks to leverage existing residential energy efficiency programs to the greatest extent possible, including but not limited to, Home Performance with ENERGY STAR programs, ENERGY STAR Certified Homes programs, municipal and electric cooperative audit programs, investor-owned utility residential programs, and new home programs. Additionally, the program will work directly with the existing Missouri workforce including Missouri Home Energy Auditors, Building Performance Institute (BPI) Certified Professionals, HERS Raters, Home Energy Score Qualified Assessors, and others invested in improving the efficiency of Missouri homes.

Recent studies provide evidence that home buyers value energy efficiency in their purchasing decisions. Broad adoption of this program will come from effective public education, marketing, and close integration with the real estate industry. DED-DE is working with real estate agents, home inspectors, assessors and others in the real estate industry to align the certificate with Real Estate Industry Transaction Standards, the Appraisal Institute's Green and Energy Efficient Addendum, and efforts to 'green' regional Multiple Listing Services (MLSs) in the long term. This approach will help Missouri homeowners to recapture the value of their investments in efficiency.

2. STAKEHOLDER APPROACH

DED-DE engaged statewide stakeholders in a process to help shape the development of the MHEC program. DED-DE held meetings across the state and conference calls for stakeholders' input. Stakeholders as diverse as Home Performance with ENERGY STAR program administrators, nonprofits, investor-owned utilities, cooperative utilities, energy auditors, contractors, real estate agents, home appraisers and members of financial institutions were invited to participate in sharing best practices, providing support and guiding development of the MHEC program.

Throughout the process, stakeholders identified consensus items to build around and potential contentious items for further deliberation. A very engaged and energetic group, the stakeholders gave enthused and impassioned insights into the future of residential energy efficiency in Missouri. This program is the result.

3. MISSOURI HOME ENERGY CERTIFICATION

The success of the MHEC program rests on three pillars:

- 1) A strong technical underpinning with a systemic process to update technical specifications;
- 2) Dynamic and engaged partnerships; and
- 3) Strong marketing and effective public education.

4. THE FIRST PILLAR: TECHNICAL SPECIFICATIONS



To accomplish the first pillar, MHEC provides two pathways for certifications, Gold and Silver. A dual-pathway approach allows the state of Missouri to recognize the most efficient Missouri homes while encouraging residential energy efficient retrofits.

Both Gold and Silver certifications rely on nationally recognized residential energy efficiency programs, including the DOE Home Energy Score (HEScore), the Home Energy Rating System (HERS) Index, the 2012 International Energy Conservation Code (2012 IECC), Home Performance with ENERGY STAR and ENERGY STAR Certified Homes. The CWL

Efficiency Score, locally developed by Columbia Water & Light, is also included as explained below. Gold certification is awarded via achieving a highly efficient Missouri home as measured by HEScore, HERS, CWL Efficiency Score, attaining assets comparable to the 2012 IECC, or through ENERGY STAR certification. Silver certification is awarded for participating in one of the state's residential energy

efficiency upgrade programs and significantly improving energy efficiency or by completing a majority of recommended cost-effective energy efficiency measures. Applications submitted to DED-DE for either Gold Certification or Silver Certification must be prepared by a DED-DE Certified Missouri Home Energy Auditor (HEA) who ensures the accuracy of the information submitted. Regardless of the pathway to obtaining certification, the result is the same - a certificate issued by the state of Missouri indicating that the home is highly efficient.

4.1 GOLD CERTIFICATION: RECOGNITION BASED ON HIGH HOME ENERGY RATINGS

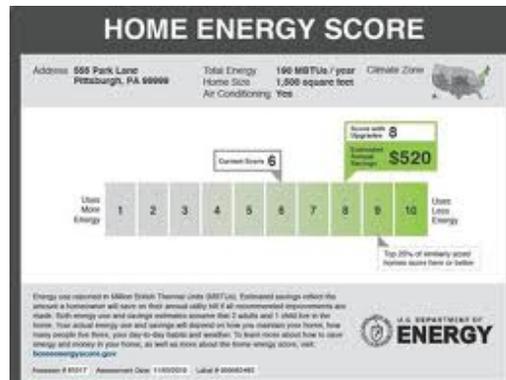
Gold certification recognizes homes that score an 8 or greater on the US DOE HEScore, a 65 or less on the HERS Index, or a CWL Efficiency Score backed by a HEScore of 8 or greater. Alternative scores and future scoring methods will be considered through the technical update process.

Home energy ratings, or asset scores, provide an opportunity to compare relative efficiencies of two homes scored with the same tool. Typically, scoring tools describe the efficiency of the assets and systems within a home. These tools provide a proxy for future energy use, albeit with limitations in predictive power as scoring tools typically do not account for occupant behavior.

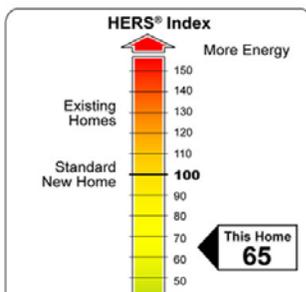
The US DOE HEScore, HERS Rating and CWL Efficiency Scores use different methods to estimate a home's unique energy usage and a brief description of each score follows:

4.1.1 US DOE HOME ENERGY SCORE

The HEScore was developed by the U.S. Department of Energy to simply and accurately relay relative information about the efficiency of individual homes on a national scale. Qualified Assessors gather information about a home in one short site visit and develop a score based on a 1-10 scale, along with a list of recommendations for further improving the home.



MHEC recognizes homes that receive a HEScore of 8 or greater with a Missouri Home Energy Gold Certificate. The HEScore must be verified by a DOE HEScore Qualified Assessor.



4.1.2 HERS INDEX

The Home Energy Rating System (HERS) Index is a nationally-recognized system for inspecting and calculating a home's energy performance. Unlike the HEScore, the HERS Index compares the subject home to a home built to the 2006 International Energy Conservation Code (IECC). A home with a comparable energy consumption as a 2006 IECC built home scores a 100, while a home that scores 150 uses 50% more energy than a 2006 IECC built home. More efficient homes are below 100 converging to zero with net zero energy homes.

MHEC recognizes homes that receive a HERS rating of 65 or less with a Missouri Home Energy Gold Certificate. The HERS score must be verified by a HERS Rater.



4.1.3 COLUMBIA WATER & LIGHT EFFICIENCY SCORE

The CWL Efficiency Score was developed by Columbia Water & Light and is derived from the HEScore. Unlike the HEScore or the HERS Index, the CWL Efficiency Score displays a home's level of energy efficiency as a percentage of completeness of that home making all cost-effective energy improvements.

MHEC recognizes homes that receive a CWL Efficiency Score by the included HEScore provided to the homeowners. The included HEScore would need to meet the requirements of section 4.1.1 to earn a Missouri Home Energy Gold Certificate. The Efficiency Rating included on the CWL Efficiency Score has been effective in encouraging the completion of cost-effective energy improvements. The CWL Efficiency Score must be verified by Columbia Water & Light.

It is important to note that these scores are not equivalent. It is cost prohibitive to reasonably compare two homes to one another scored with different tools. The HEScore, for example, is based on energy load calculations for specific homes, while the HERS Index provides individual home comparisons to code. So while it is not feasible to translate HERS into HEScore, there are specific levels within each scoring tool that indicate homes are more efficient than others. A home with a HEScore of greater than 8 or a HERS Index of less than 65, will be a recognition-worthy home in the top tier of energy efficiency.

4.2 GOLD CERTIFICATION: RECOGNITION BASED ON HIGHLY EFFICIENT HOME ENERGY ASSETS

In addition to the score-based approach, MHEC recognizes homes that have a sufficient number of energy efficient assets, based on the 2012 International Energy Conservation Code (2012 IECC) for climate zone 4 and having ENERGY STAR qualified heating and cooling systems. The 2012 IECC is the latest model energy code available for adoption across the nation and achieves a 30% improvement in energy savings over the 2006 IECC. This approach allows new homes built to the 2012 IECC to be recognized, but also homes that have undergone significant retrofits.

Proposed Asset Recognition Levels based on 2012 IECC for Climate Zone 4 and ENERGY STAR heating and cooling equipment	
Measure	Efficiency Target
Fenestration U-factor*	0.35 *(Double pane insulated window with thermal break)
Glazed fenestration SHGC*	Max 0.40 *(Tinted)
Wood frame wall R-value	R20 or R13+5
Ceiling R-value	R49
Basement wall and Crawl Space R-value	10/13: insulation down 10 ft. or full depth
Thermal Envelope Testing	3 ACH50
Duct Insulation	R6; exception: Ducts completely inside thermal envelope
Duct Leakage Requirements (if ducts are outside of conditioned space)	4 CFM25/100 sq. ft.
Lighting Equipment	Minimum 75 percent high-efficacy lamps
Gas Fired Furnace	ENERGY STAR (95% AFUE)
Central Air Conditioner	ENERGY STAR (14.5 SEER)
Heat Pump	ENERGY STAR (8.2 HSPF)
* denotes alternate requirements for existing homes	

MHEC also recognizes homes that have achieved ENERGY STAR Certified Homes designation under Version 3 of the program requirements. The cost and savings estimates study for ENERGY STAR Certified

Homes Version 3 demonstrated that certified homes could achieve energy savings ranging from 16% to 24% in climate zone 4 compared to 2009 IECC. The resultant energy savings are comparable with 2012 IECC since 2012 IECC has typically additional 20% energy savings for homes in climate zone 4 when compared to 2009 IECC. This approach thus allows new homes certified under ENERGY STAR Certified Homes on or after January 1, 2017 to be recognized.

4.3 SILVER CERTIFICATION: RECOGNITION BASED ON PARTICIPATING IN A HOME ENERGY UPGRADE PROGRAM

Additionally, homes may qualify for a Silver Certificate that have significantly improved energy efficiency levels or have completed a majority of the cost-effective energy efficiency measures through participation in an approved home energy upgrade program or verified with an audit. While not all homes that participate in these programs will be in the top tier of efficient Missouri homes, these homeowners will have taken significant steps to improve the comfort, safety, value and efficiency of their homes.

MHEC recognizes homes where energy efficiency has been improved by a significant margin or a majority of cost-effective energy efficiency measures have been completed as measured by: a HEScore reflecting that most cost effective improvements have been implemented, a 20 point decrease on the HERS Index, a 90% efficiency rating on the CWL Efficiency Score, or with 20% savings as modeled by an approved software program. MHEC will work with Missouri's Home Performance with ENERGY STAR program sponsors to recognize participants with a Silver Certificate who have energy savings of at least 20%. All homes that receive Silver Certification must have participated in an approved Missouri program, or have had a recent energy audit. DED-DE will evaluate other Missouri home energy upgrade programs, such as utility audit programs, on the basis of a participating home's energy savings and whether a mechanism exists to ensure quality.

4.4 CONFIRMATION AND QUALITY ASSURANCE PROCESS

It is critically important to ensure certificates are issued only to homes that meet the requirements established by the state of Missouri. To accomplish this, MHEC includes a quality assurance (QA) system where 100% file review is conducted on candidate homes to ensure they meet the technical requirements as reported to DED-DE. For field review, DED-DE will leverage the existing QA infrastructure. The scoring systems selected can only be offered by qualified individuals participating in programs with on-site QA in place. For instance, the HEScore requires that program sponsors perform on-site QA on a minimum of 5% of all scores. Similarly, HERS raters are the only ones qualified to offer HERS ratings, and they undergo on-site QA. Lastly, every home receiving the CWL Efficiency Score currently receives on-site QA inspections from Columbia Water and Light.

The 2012 IECC and ENERGY STAR heating and cooling-based approach does not require an existing program infrastructure, making the MHEC program completely accessible to any Missourian interested in participating, regardless of local program offerings. This also means that there is not a pre-existing on-site QA infrastructure. In order to overcome this, MHEC provides that only HEScore Qualified Assessors, HERS raters, BPI certified individuals, Missouri Home Energy Auditors or local code officials are permitted to complete this prescriptive path to a Missouri Home Energy Gold Certificate. These individuals have received appropriate training to recognize the efficient assets in the home. DED-DE may check appropriate credentials for individuals submitting work for certification and maintain a network of those individuals.

DED-DE may inspect 5% of the homes going through the prescriptive approach. Where on-site inspection is completed (i.e. during code inspections, HEScore QA or Home Performance with ENERGY STAR program inspections), the inspection will count toward achieving an overall 5% on-site QA. When existing

inspections are not sufficient to cover the 5% requirement, DED-DE may send a representative to make up the difference and inspect for installed assets.

Lastly, DED-DE will fully leverage QA provided by Home Performance with ENERGY STAR, or other qualifying home energy upgrade program sponsors.

4.5 UPDATES AND PROGRAM IMPROVEMENTS

The certificate requirements represent a starting point for the Missouri Home Energy Certification Program. While the combined score and prescriptive pathways represent a laudable level of efficiency for the Gold Certificate, they will need to be updated as new technologies are developed. Similarly, the Silver Certificate's qualifying home energy upgrade programs will need to be updated as new programs are created. This program will evolve as the energy efficiency environment changes and efficiency becomes more broadly adopted. DED-DE will have a standing technical committee to review certificate requirements on a biannual basis to fulfill a technical update process and ensure that the MHEC continues to recognize the most efficient Missouri homes.

5. THE SECOND PILLAR: KEY PARTNERSHIPS

The second pillar of dynamic and engaged partnerships relies on the continuing support of the MHEC program from stakeholders across the state. The MHEC program provides an opportunity to add value to existing program infrastructures by creating a consistent statewide platform to recognize the efforts by programs, utilities and homeowners to make Missouri homes more energy efficient. As more partners take advantage of the MHEC program, the market awareness of both the certificate and residential energy efficiency in general will expand. The MHEC program is designed to have a minimal impact on existing program process and workflows. No additional site visits are required of program partners, though further coordination on data and marketing will be vital to the success of the MHEC program. Existing programs that offer HEScore, HERS Ratings and/or the Efficiency Score are asked to aggregate qualifying home applications, send them to DED-DE for statewide certification, share which homes have received onsite QA and promote the statewide effort to homeowners. Home Performance with ENERGY STAR program sponsors are asked to share participant addresses and promote the program to homeowners.

Home energy auditors, assessors, contractors, real estate agents and others invested in residential energy efficiency will be called on to educate their customers about the certification and how to integrate it with the real estate industry.

6. THE THIRD PILLAR: MARKETING AND EFFECTIVE PUBLIC EDUCATION

The third pillar of marketing and effective public education will help ensure that the MHEC program meets its stated goal of promoting energy efficient homes. By recognizing homes that achieve a high level of energy efficiency, the state of Missouri is in the unique position to not only reward these homeowners but engage homeowners who would like to improve the energy efficiency of their homes. As homeowners learn about the MHEC and consequently make the decision to undergo a home energy upgrade, the certificate may drive demand for energy audits, retrofit work and energy scores. By allowing the MHEC to be an entry point for conversations about home energy use, the program may ultimately transform the Missouri market for the Missouri energy auditor and contractor workforce, creating local jobs and strengthening the Missouri economy while saving energy in homes affected by the program.

Because the MHEC involves a diverse group of stakeholders, the state of Missouri can leverage existing outreach channels rather than relying on an expensive mass-marketing campaign. Many customers may be reached at little expense to the state of Missouri by allowing HEScore Qualified Assessors, HERS

Raters and Columbia Water & Light to co-brand respective marketing materials as partners with the MHEC program. A page on the state website, coupled with a presence at community outreach events, can spark high interest among proactive homeowners, who then spread the word through their own networks of friends and neighbors.

Another key distribution channel for the MHEC program will be the real estate industry. Recent studies have shown that homeowners make energy upgrade decisions based on increasing comfort, health and safety, and that homebuyers are increasingly willing to pay a premium to purchase energy efficient homes. A National Association of Homebuilders (NAHB) study showed that people looking to purchase homes were willing to pay a 2-3% premium for energy efficient homes, while a California study showed that Californian homebuyers will pay a 9% premium for homes that have third-party green certifications, similar to the one developed for the MHEC program. One clear mechanism to involve residential energy efficiency programs in the real estate industry is through green Multiple Listing Services (MLS). Today, Missouri has “green” fields in five of the eight MLSs. Collaboration with the real estate industry on data standards will ensure that the new Missouri Home Energy Certification can easily be uploaded to the searchable fields of an MLS, streamlining the process to find homes that have participated in the program. Additionally, DED-DE encourages appraisers to utilize the Appraisal Institute’s Residential Green and Energy Efficient Addendum to ensure the value of the energy efficient home is captured.

7. SUMMARY

The net result of the Missouri Home Energy Certification program is to recognize the most energy efficient Missouri homes in a simple and clear manner and provide appropriate value signals on the worth of efficient homes to the real estate industry and Missouri homeowners.

Homeowners are able to earn a Missouri Home Energy Certificate through the following pathways:

1. Gold
 - a. Achieving a high home energy rating by earning an 8 or greater on the DOE HEScore individually or as included in the CWL Efficiency Score, or a 65 or less on the HERS Index.
 - b. Demonstrating highly efficient home energy assets that meet the requirements of the IECC 2012 Energy Code or achieve ENERGY STAR Certified Home designation on or after January 1, 2017.
2. Silver
 - a. Improving a home’s energy efficiency significantly or by completing a majority of the cost effective energy efficiency measures as measured by an HEScore reflecting that most cost effective measures have been implemented, a 20 point decrease on the HERS Index, a 90% efficiency rating on the CWL Efficiency Score, or with 20% savings as modeled by an approved software program. Homeowners are encouraged to participate in a Missouri energy efficiency upgrade program such as Home Performance with ENERGY STAR or have an energy audit completed by a HERS Rater or Missouri Home Energy Auditor.

The success of the MHEC program rests on the three pillars of a strong technical underpinning, dynamic partnerships and a commitment to effective public education. By implementing these three pillars through the mechanisms outlined herein, the state of Missouri will create and maintain a dynamic home energy certification program that empowers Missouri homeowners to recognize the value of their energy efficient homes. This coordination will lessen market confusion, drive uptake in efficiency programs and result in more efficient Missouri homes.