BUILDING AMERICA TOP INNOVATIONS HALL OF FAME PROFILE

INNOVATIONS CATEGORY:
3. Effective Guidance and Tools Solutions
3.2 High-Performance Home Metrics

National Residential Efficiency Measures Database

The database provides comparable cost information for common energy efficiency measures.

The National Residential Efficiency Measures Database contains performance characteristics and cost estimates for nearly 3,000 energy retrofit measures. To date, it is used in four prominent DOE software packages to help optimize energy-efficiency recommendations.

BUILDING AMERICA TOP INNOVATIONS

Recognizing Top Innovations in Building Science – The U.S. Department of Energy's Building America program was started in 1995 to provide research and development to the residential new construction and remodeling industry. As a national center for world-class research, Building America funds integrated research in market-ready technology solutions through collaborative partnerships between building and remodeling industry leaders, nationally recognized building scientists, and the national laboratories. Building America Top Innovation Awards recognize those projects that have had a profound or transforming impact on the new and retrofit housing industries on the road to high-performance homes.

Robust cost data for energy-efficiency measures provide an essential framework for transforming the housing industry to high-performance homes. These data allow for effective optimization capabilities to guide builders, researchers, HERS raters, contractors, and designers.

Researchers at the U.S. Department of Energy (DOE)'s National Renewable Energy Laboratory (NREL) have developed a public database that characterizes the performance and costs of common residential energy-efficiency measures. The database, called the National Residential Efficiency Measures Database, can be found at www.buildingamerica.gov. The data are available for use in software programs that evaluate cost-effective measures to improve the energy efficiency of new and existing residential buildings.

This database

- Provides information in a standardized format.
- Improves the technical consistency and accuracy of software program results.
- Enables experts and stakeholders to view the retrofit information and provide comments to improve data quality.
- Supports building science research and development.
- Enhances the transparency of research results.

Users can view retrofit measures, download data, provide feedback, and contribute to the project by uploading retrofit project and measure cost data.

The database has been well received by the retrofit industry and is already being employed by the following DOE energy analysis software tools:

- ***Home Energy Scoring Tool***. Developed by Lawrence Berkeley National Laboratory (LBNL), this tool is used in DOE's Home Energy Score pilot program.
- ***Home Energy Saver***. Developed by LBNL, this tool recommends cost-effective energy-efficiency improvements to homeowners.
- ***Home Energy Saver Pro***. Developed by LBNL, this professional-grade tool for contractors recommends cost-effective energy efficiency improvements.

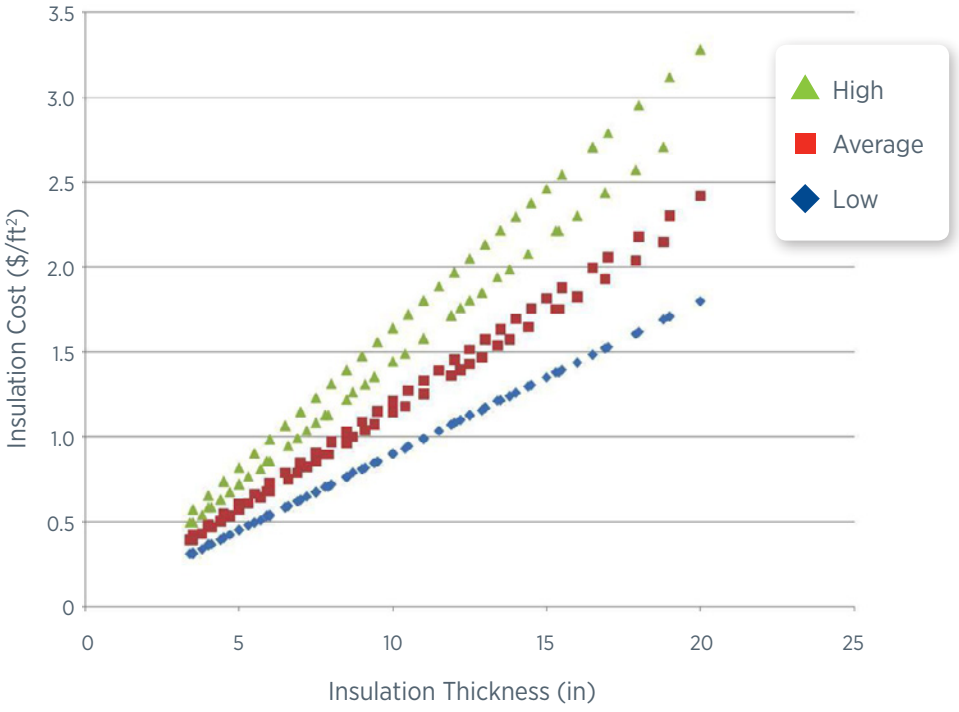
- ***BEopt***. Developed by NREL, this researcher-oriented tool determines optimal energy-efficient designs for new and existing homes; researchers use it to set DOE Building America Program research goals.

NREL continues to expand and enhance the database based on feedback from retrofit industry professionals. The laboratory:

- Works with private-sector energy analysis software tool developers to facilitate the use of the measures data in their tools.
- Adds best practice field guides that detail proper implementation of measures to reduce the risks associated with field installations.
- Adds more details about cost estimates to improve the accuracy of recommendations made to homeowners and highlight the issues that affect installation costs.

The database provides the ability to visualize data for quality assurance. As an example, the chart below shows the cost of insulation at various thicknesses.

Insulation Thickness & Cost



The database provides users with cost information for common energy-efficiency measures:

- Costs are aggregated and analyzed statistically.
- No individual data sources are included in the public database.
- Measure costs are developed using data from home performance contractors, the California Energy Commission's Database for Energy-Efficient Resources (DEER), RS Means, retailers, etc.
- Costs are generally normalized
  - $/ft² treated surface area
  - $/kBtuh heating/cooling capacity.

REFERENCES

NREL. 2012. *National Residential Efficiency Measures Database Aimed at Reducing Risk for Residential Retrofit Industry*, DOE/GO-102012-3229, prepared by the National Renewable Energy Laboratory for the U.S. Department of Energy, Building America. http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/tech_highlight_measures_db.pdf.

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

DOE Building Technologies Program
www.buildings.gov

Building America Solutions Center
www.buildingamerica.gov/solutionscenter

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