



Quadrennial Technology Review 2015

**Chapter 5:** Increasing Efficiency of Building Systems and Technologies

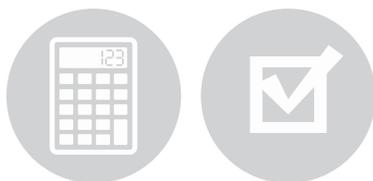
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# Supplemental Information



***Building Energy Technology  
Roadmaps***

*Building Technology Scenarios*



U.S. DEPARTMENT OF  
**ENERGY**



# Building Energy Technology Roadmaps

## Chapter 5: Supplemental Information

The Department of Energy (DOE) Building Technologies Office (BTO)<sup>1</sup> develops technology roadmaps and reports in consultation with industry, university, national laboratory, and other stakeholders and experts. These publications help guide research and development (R&D) investments by BTO and quantify the potential impact of these investments on primary energy consumption of residential and commercial buildings in the United States. Many of these publications, particularly the roadmaps, are regularly updated to reflect technology advances and other changes that affect BTO's R&D agenda. Feedback on the roadmaps and reports, and/or participation in their updates, is welcome. Please contact the relevant technology manager indicated on the BTO Web site.<sup>2</sup> All of these publications are available free of charge;<sup>3</sup> the specific roadmaps and reports cited in the Quadrennial Technology Review (QTR) are available at the Web sites indicated below.

### Thermal Comfort and Ventilation

- [“Research & Development Roadmap for Emerging HVAC Technologies”](#) (October 2014): Near-term and long-term R&D initiatives in heating, ventilation, and air conditioning (HVAC) technologies are described that can lead to substantial primary energy savings in residential and commercial USA buildings.
- [“Windows and Building Envelope Research and Development: Roadmap for Emerging Technologies”](#) (February 2014): The roadmap describes the technical and market challenges to be overcome, R&D activities and milestones, key stakeholders, and potential energy savings that could result if cost and performance targets are met for advanced windows and the opaque building envelope.
- [“Energy Savings Potential and RD&D Opportunities for Non-Vapor Compression HVAC Technologies”](#) (March 2014): This technology report identifies alternatives to vapor-compression technology in residential and commercial HVAC applications, characterizes them based on their energy-savings potential, and provides recommendations for their further development.
- [“Research & Development Roadmap for Emerging Water Heating Technologies”](#) (September 2014): Key R&D challenges in residential and commercial water heating technologies are described, including both electric and gas-fired technologies.

### Lighting

- [“Solid-State Lighting R&D Plan”](#) (May 2015): The Solid-State Lighting (SSL) R&D Plan is a consolidation of DOE SSL Multi-Year Program Plan (MYPP) and DOE SSL Manufacturing R&D Roadmap that DOE has published and updated in previous years. The SSL R&D Plan provides analysis and direction for ongoing R&D activities to advance SSL technology and increase energy savings.
- [“SSL Market Studies”](#) (ongoing): A number of lighting market characterization studies, including “Adoption of Light-Emitting Diodes in Common Illumination Applications” (July 2015) and “Energy Savings Forecast of Solid-State Lighting in General Illumination Applications” (August 2014), are available. These studies are intended to present objective market analysis based on the most recent data that can be referenced and is available at the time of preparation of the reports. As new information becomes available, DOE will make efforts to update these studies as necessary.



## Appliances

- [“Research & Development Roadmap: Next-Generation Appliances”](#) (October 2014): The recommended initiatives in this roadmap target high-priority R&D, demonstration, and commercialization activities that, if pursued by DOE and its partners, could significantly reduce residential appliance energy consumption.
- [“Energy Savings Potential and Opportunities for High-Efficiency Electric Motors in Residential and Commercial Equipment”](#) (December 2013): This report describes the current state of motor technology and estimate opportunities for energy savings through application of more advanced technologies in a variety of residential and commercial end uses.

## System Level

- [“Buildings-to-Grid Technical Opportunities: Introduction and Vision”](#) (March 2014): BTO is coordinating strategies and activities with stakeholders to address the integration and optimization of homes and commercial buildings with the nation’s energy grid. This report introduces fundamental concepts of transaction-based energy systems, including the role of building technologies, and describes the opportunities they bring to the larger energy system.

## Endnotes

- <sup>1</sup> <http://energy.gov/eere/buildings/building-technologies-office>
- <sup>2</sup> <http://energy.gov/eere/buildings/emerging-technologies-team>
- <sup>3</sup> <http://energy.gov/eere/buildings/program-plans-implementation-and-results>