Emerging Technologies Program supports R&D of technologies and systems that are capable of substantially reducing building primary energy use, and accelerates their introduction into the marketplace.

**External Influences:** DOE budget, Spin-off products, Legislation, Market incentives, Private sector R&D, Energy prices, Legislation / Regulation

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<th>Sub-Programs</th>
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<tr>
<td>Solid State Lighting</td>
<td>Support R&amp;D of high efficiency next-generation technologies &amp; components</td>
<td>Competitive &amp; shared R&amp;D funding focused on energy efficiency performance by researchers in lab &amp; test facilities</td>
<td>Technical pathway &amp; research reports</td>
<td>Private sector has access to validated solutions to develop or improve technologies &amp; reduce cost</td>
<td>Private sector engages in targeted R&amp;D &amp; develops advanced, more cost-effective tech.</td>
<td><strong>Advanced energy efficient technologies</strong> are regularly innovated, widely available in the market, &amp; have similar or better life-cycle costs relative to conventional technologies.</td>
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<tr>
<td>HVAC, Water Heating &amp; Appliances</td>
<td>Improve performance &amp; cost of near term technologies &amp; reduce manufacturing costs</td>
<td>Competitive &amp; shared funding of field testing, modeling &amp; validation</td>
<td>Prototypes that fill technical gaps</td>
<td>Manufacturers aware of advanced tech. &amp; available reduced cost production solutions</td>
<td>Manufacturers produce highly energy efficient equipment &amp; push in the market</td>
<td><strong>Energy Efficient Buildings</strong> are designed or upgraded with communicative, energy efficient technologies &amp; controlled to optimize system operations &amp; grid integration, while minimizing energy use &amp; costs.</td>
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<td>Windows &amp; Building Envelope</td>
<td>Accelerate market entry &amp; availability of technologies &amp; processes</td>
<td>Manufacturing R&amp;D with emphasis on cost reduction with industry</td>
<td>Open-source sensor &amp; control platforms &amp; standardized communication protocols</td>
<td>Manufacturing advanced, reduced cost solutions</td>
<td>Building industry have solutions to install &amp; integrate products in buildings</td>
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<td>Sensors &amp; Controls</td>
<td>Improve energy modeling tools &amp; capabilities &amp; testing techniques</td>
<td>Pre-commercial technology demos with industry</td>
<td>Manufacturing R&amp;D with emphasis on cost reduction with industry</td>
<td>Tech. cost &amp; performance data &amp; demo reports</td>
<td>Building industry have solutions to install &amp; integrate products in buildings</td>
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<tr>
<td>Building Energy Modeling (BEM)</td>
<td>Improve energy modeling tools &amp; capabilities &amp; testing techniques</td>
<td>Development of installation &amp; verification techniques with industry</td>
<td>Installation &amp; verification techniques</td>
<td>Tech. &amp; market assessments</td>
<td>Building industry or engine developers have energy modeling tools to improve building or systems design</td>
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</tbody>
</table>

*Researchers are national labs, universities & research institutions*

**Impact**

Meet cost and performance R&D targets for SSL, HVAC, water heating, appliances, windows, building envelope, sensors & controls and BEM

Enable the development of cost-effective technologies that will be capable of reducing bldg. EUI 30% by 2020

Reduce EUI in all bldgs. 30% by 2030

Dec. 2015
Develop next-gen tech

- Next-gen tech & component R&D
  - Next-gen prototypes
  - Performance goals met
  - Private sector R&D

Improve near-term tech

- Cost reduction R&D
  - Reduced cost prototypes
  - Validated products
  - Adopted products

- Demonstrate pre-commercial technologies
  - Validated demo results

Provide modeling tools

- Update and validate key tools
  - Widely used modeling tools
  - Adopted tools
  - Wide use

**EXTERNAL INFLUENCES**
- DOE Budget
- Legislation / Regulation
- Spin-off Products
- Energy Prices
- Market Incentives
- Private R&D

**OBJECTIVE ACTIVITIES KEY OUTPUT SHORT-TERM OUTCOME MID-TERM OUTCOME LONG-TERM OUTCOME**

Updated Dec. 2015

**OBJECTIVE**

Advanced tech and tools in market on a national scale