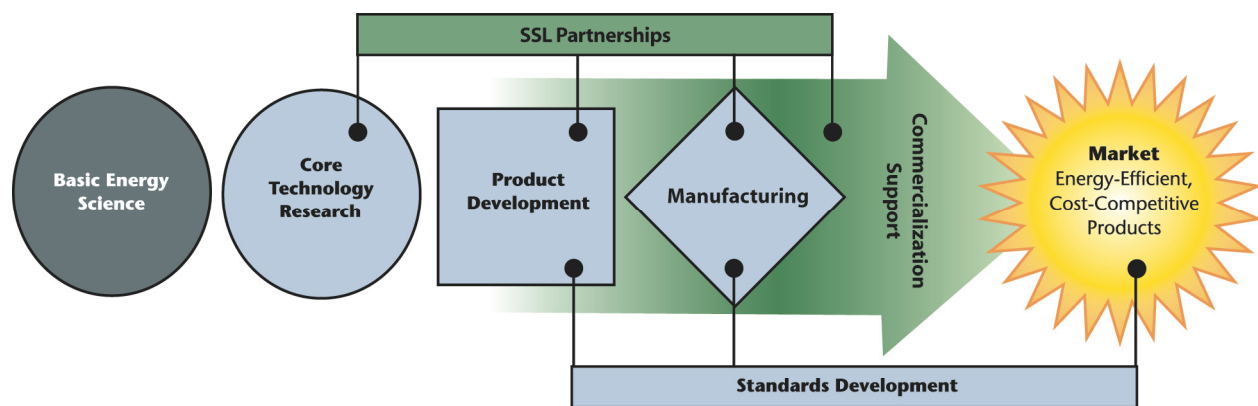




Guiding Technology Advances from Laboratory to Marketplace

The U.S. Department of Energy's solid-state lighting (SSL) portfolio draws on the Department's long-term relationships with the SSL industry and research community to guide SSL technology from laboratory to marketplace. DOE's comprehensive approach includes Basic Energy Science, Core Technology Research, Product Development, Manufacturing Support, Commercialization Support, SSL Partnerships, and Standards Development.

DOE SOLID-STATE LIGHTING PORTFOLIO



- DOE's **Basic Energy Sciences** program conducts basic research to advance fundamental understanding of materials behavior. Project results often have multiple applications, including SSL.
- **Core Technology Research** projects focus on applied research for technology development, with particular emphasis on meeting efficiency, performance, and cost targets.
- **Product Development** projects focus on using the knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems.
- **Manufacturing Support** accelerates SSL technology adoption through manufacturing improvements that reduce costs and enhance quality.
- To ensure that these investments lead to SSL technology commercialization, DOE has drawn on its ongoing relationships with the SSL industry and research community to develop appropriate **Commercialization Support** strategies.
- **SSL Partnerships** with the Next Generation Lighting Industry Alliance (NGLIA), the Illuminating Engineering Society of North America (IES), and the International Association of Lighting Designers (IALD) strengthen and support the DOE SSL portfolio.
- In addition, DOE is working with the National Electrical Manufacturers Association (NEMA), IES, and other standards-setting organizations to accelerate the **Standards Development** process.

Basic Research Advances Fundamental Understanding. Projects conducted by the Basic Energy Sciences program focus on basic scientific questions that underlie DOE mission needs. These projects target principles

of physics, chemistry, and the materials sciences, including knowledge of electronic and optical processes that enable development of new synthesis techniques and novel materials. www.science.doe.gov/bes

Core Technology Research Fills Knowledge Gaps. Conducted primarily by academia, national laboratories, and research institutions, Core Technology Research involves scientific research efforts to seek more comprehensive knowledge or understanding about a subject. These projects fill technology gaps, provide enabling knowledge or data, and represent a significant advance in our knowledge base. They focus on applied research for technology development, with particular emphasis on meeting technical targets for performance and cost. www.ssl.energy.gov/projects.html

Product Development Utilizes Knowledge Gains. Conducted primarily by industry, Product Development is the systematic use of knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems. Technical activities focus on a targeted market application with fully defined price, efficacy, and other performance parameters necessary for the success of the proposed product. Project activities range from product concept modeling through development of test models and field-ready prototypes. www.ssl.energy.gov/projects.html

Manufacturing Support Advances SSL Technology Adoption. Manufacturing support focuses on achieving significant cost reductions through improvements in manufacturing equipment, processes, or monitoring techniques. Projects address the technical challenges that must be overcome before prices fall to a level where SSL will become competitive with existing lighting on a first-cost basis. By advancing these activities, DOE can accelerate progress toward creating a U.S.-led market for high-efficiency light sources that save more energy, reduce costs, and have less environmental impact than other conventional light sources. www.ssl.energy.gov/projects.html

Commercialization Support Activities Facilitate Market Readiness. To ensure that DOE research and development investments lead to SSL technology commercialization, DOE has developed a national strategy to guide market introduction of SSL for general illumination. Working with a wide range of market-side partners, DOE activities include testing of commercially available SSL products; demonstrations to provide real-world experience and data on performance and cost effectiveness; ENERGY STAR[®] designation for SSL products; design competitions for SSL lighting fixtures and systems; and technical information resources on SSL technology issues, test procedures, and standards. www.ssl.energy.gov/market.html


SSL Partnerships Strengthen and Support the DOE SSL Portfolio. DOE's partnership with NGLIA enhances the manufacturing and commercialization focus of the DOE portfolio by utilizing the expertise of this organization of SSL manufacturers. DOE and IES partner on the development of strong lighting industry standards, including needed standards for SSL. DOE and IALD collaborate to promote lighting design principles and technologies that improve lighting quality and energy efficiency. www.ssl.energy.gov/partnerships.html

Standards Development Enables Meaningful Performance Measurement. LEDs differ significantly from traditional light sources, and new test procedures and industry standards are needed to measure their performance. DOE provides national leadership and support for this effort, working closely with IES, NEMA, NGLIA, the American National Standards Institute (ANSI), and other standards-setting organizations to accelerate the standards development process, facilitate ongoing collaboration, and offer technical assistance. New national standards and rating systems for SSL products began taking effect in 2008. www.ssl.energy.gov/standards.html

For more information on the DOE SSL program, see www.ssl.energy.gov.

EERE Information Center
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June 2009

 Printed with soy ink on recycled paper