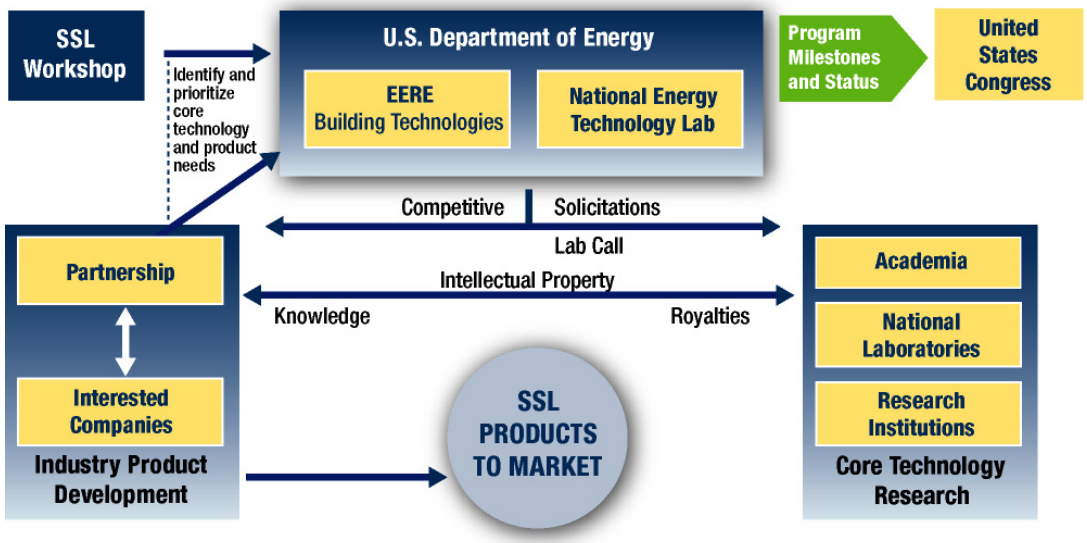
Operational Plan for DOE Solid-State Lighting Research and Development

The U.S. Department of Energy (DOE) supports domestic research, development, demonstration, and commercial application of advanced solid-state lighting (SSL) technologies that are significantly more energy efficient than current lighting technologies. Guided by a Government-industry partnership, the mission is to create a new U.S.-led market for high efficiency, general illumination products through the advancement of semiconductor technologies—to save energy, reduce costs, and enhance the quality of the lighted environment. DOE has set aggressive targets for SSL research and development (R&D): By 2025, to develop advanced SSL technologies that, compared to conventional lighting technologies, are much more energy efficient, longer lasting, and cost-competitive. DOE is targeting a product system efficiency of 50 percent with lighting that accurately reproduces sunlight spectrum.

DOE has structured an operational plan for SSL R&D (see Figure 1) that features two concurrent, interactive pathways. **Core Technology Research** is conducted primarily by academia, national laboratories, and research institutions. **Product Development** is conducted primarily by industry. Although the pathways and participants described here are typical, some crossover does occur. For example, a product development project conducted by industry may include focused, short-term applied research, as long as its relevance to a specific product is clearly identified and the industry organization abides by the solicitation provisions. For more detailed definition of the SSL R&D pathways, see DOE's SSL website at *www.netl.doe.gov/ssl/definition.html*. The operational structure also includes innovative intellectual property provisions and an **SSL Partnership** that provides significant input to shape Core Technology Research and Product Development priorities.

OPERATIONAL PLAN FOR SSL R&D (Figure 1)



SSL Partnership. In 2004, DOE competitively selected an SSL Partnership composed of manufacturers and allies that are individually or collaboratively capable of manufacturing and marketing the desired SSL products. Partnership members must comply with pertinent DOE guidelines on U.S.-based research and product development. A key function of the SSL Partnership related to R&D is to provide input to shape Core Technology Research and Product Development priorities. As SSL technologies mature, identified research gaps are filled through Core Technology Research—allowing the SSL industry to continue the product development process, while much-needed breakthrough technologies are created in parallel. The Partnership members confer among themselves and communicate technical guidance to DOE program managers, who in turn use this feedback and input from DOE workshop participants to shape DOE SSL R&D solicitations.

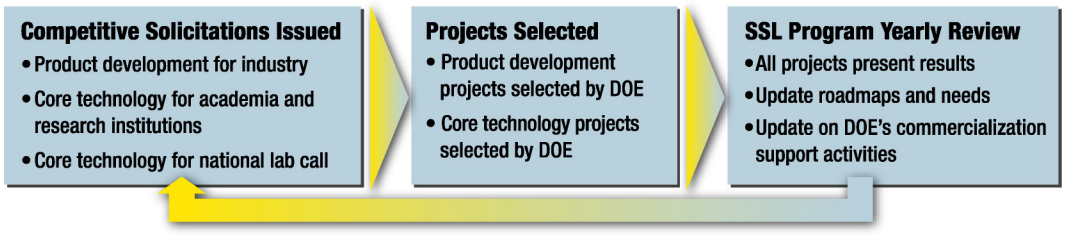
Core Technology Research. Core Technology Research provides the focused research needed to advance SSL technology—research that is typically longer-term in nature and not the focus of sustained industry investment. DOE funds these research efforts primarily at universities, national laboratories, and other research institutions through one or more competitive solicitations. Core Technology Research supports the SSL program by providing problem-solving research to overcome technical barriers. Participants in the Core Technology Research program perform work subject to what is termed an "exceptional circumstance" to the Bayh-Dole Act, and any resultant intellectual property is open, with negotiated royalties, to all Partnership members with a non-exclusive license. Core Technology Research projects are subject to peer review by DOE.

Product Development. DOE solicits proposals from interested companies (or teams of companies) for product development, demonstrations, and market conditioning. DOE expects these proposals to include comprehensive work plans to develop a specific SSL product or product family. Since the ultimate goal is to manufacture energy-efficient, high-performance SSL products, each work plan should address the abilities of each participant or manufacturer throughout the development process. These offerors must not only have all the technical requirements to develop the desired SSL technology, but also must have reasonable access to manufacturing capabilities (substantially in the U.S.) and targeted markets identified to quickly move their SSL product from the industry laboratory to the marketplace. Product Development projects are subject to peer review by DOE.

High-Level Timeline. Figure 2 details the high-level timeline for the SSL R&D operational plan. Each year, DOE expects to issue at least three competitive solicitations: the Core Technology Research Solicitation, Core Technology to National Labs (Lab Call), and the SSL Product Development Solicitation. A number of annual meetings are held to provide regular DOE management and review checks, and to keep all interested parties adequately informed. More specifically, these meetings:

- Provide a general review of progress on the individual projects (open meeting)
- Review/update the R&D plan for upcoming "statement of needs" in future solicitations (open meeting)
- At DOE's discretion, provide a peer review of DOE SSL R&D projects
- Provide individual project reviews by DOE

R&D OPERATIONAL PLAN PROCESS (Figure 2)



This document provides an overview of the high-level structure of the DOE SSL R&D program. More detailed program documents, such as annual solicitations and cooperative agreements, take precedence over information in this document.