Solid-State Lighting Program Strategy

Industry input from Roundtables and Workshops shape DOE priorities and solicitations
One R&D Workshop, One Plan, One Solicitation

• Two R&D workshops combined to one
  January     January
  June

• One R&D Plan
  Multiyear Program Plan
  Manufacturing Roadmap
  R&D Plan

• Three R&D focus areas addressed in a single funding opportunity
  ✓ Core Technology
  ✓ Product Development
  ✓ Manufacturing R&D
R&D Solicitation Goals

• Maximize the energy-efficiency of SSL products in the marketplace

• Remove market barriers through improvements to lifetime, color quality, and lighting system performance

• Reduce costs of SSL sources and luminaires

• Improve product consistency while maintaining high quality products

• Encourage the growth, leadership, and sustainability of domestic U.S. manufacturing within the SSL industry
Core Technology Research

• Applied research to fill SSL technology gaps, provide enabling knowledge or data

• Primarily improves efficiency and performance
  • Should address cost and manufacturability

• Guided by the priorities and targets of the R&D Plan

• Current solicitation
  • 2 years duration w/ annual decision point
  • Minimum 20% cost share
  • Up to $1.5 million Federal share

[Image: www.ssl.energy.gov/projects.html]
Product Development

- Use of applied research to develop or improve commercially viable SSL materials, devices, or systems
- Focus on a targeted market application with fully defined price, efficacy, and other performance parameters
- Guided by the priorities and targets of the R&D Plan
- Current solicitation
  - 18 months duration w/ decision point
  - Minimum 25% cost share
  - Up to $1.5 million Federal share OLED
  - Up to $500K Federal share LED

www.ssl.energy.gov/projects.html
Product Development – “Light the Space”

• Currently Topic Area 3 – LED Product Development-Novel LED Luminaire System

• Design/layout a space that utilizes the unique characteristics of solid-state lighting
  • Hospital patient/exam room (2014 solicitation)
  • Office lighting
  • School classroom

• Not meant to design a specific luminaire but rather a complimentary system of luminaires to meet the needs of the space
Manufacturing R&D

- R&D to achieve cost reductions through improvements in manufacturing, while maintaining or enhancing performance

- Focus on significant leaps in SSL manufacturing equipment, processes, or monitoring techniques, and on fostering U.S.-based manufacturing

- Guided by the priorities and targets of the R&D Plan

- Current solicitation
  - 18 months duration w/ decision point
  - Minimum 50% cost share
  - Up to $1.5 million Federal share

www.ssl.energy.gov/projects.html
Changes to the Funding Opportunity Process

- **Active Project Management Process**
  - 2nd year under process ........ and still evolving
    - Concept Papers
    - Reply to Reviewer Comments

- **Single Funding Opportunity**
  - Topics cover Core, Product, and Manufacturing priority gap areas
  - Project value, cost-share, and project durations are specific to topic area

- **End of the Exceptional Circumstances Determination**
  - Expires 2015
    - Awards from current funding opportunity will not be subject to EC
    - Spirit of US Manufacturing continues in funding opportunity
FY15 SSL Program Funding Opportunity

• One solicitation covers all three areas: Core Technology, Product Development, and Manufacturing R&D

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Collaboration & Coordination Create a Bridge

SSL Program R&D

Small Business Innovation Research (SBIR) Program

Energy Frontier Research Centers (EFRCs)

Advanced Research Projects Agency-Energy (ARPA-E)

Advanced Manufacturing Office

National Science Foundation SBIR Program
Highlight - New Projects - LED

• Core Technology R&D

• Product Development
  • Cree, Inc. - Scalable, Economical Fabrication Processes for Ultra-compact Warm-White LEDs
  • Momentive Performance Materials Quartz, Inc. - Next-Generation LED Package Architectures Enabled by Thermally Conductive Transparent Encapsulants
  • Philips Lumileds Lighting, LLC - High-Voltage LED Light Engine with Integrated Driver
  • Philips Research North America - Innovative Patient Room Lighting System with Integrated Spectrally Adaptive Control
Highlight - New Projects - OLED

• Core Technology R&D
  • **Pixelligent Technologies, LLC** - Advanced Light Extraction Structure for OLED Lighting
  • **Princeton University** - ITO-free White OLEDs on Flexible Substrates with Enhanced Light Outcoupling
  • **University of California-Los Angeles** - The Approach to Low-Cost High-Efficiency OLED Lighting

• Product Development
  • **OLEDWorks, LLC** - High-Performance OLED Panel and Luminaire
Moving Forward with OLEDs

- OLED Stakeholder Meeting
  - Conducted mid-October in Rochester NY
    - Report available at ssl.energy.gov
- Formation of the OLED Coalition
- Next Generation Luminaire™ - OLED Luminaire category
- Workshop tours w/ OLEDs
  - Acuity Brands - Center for Light&Space
- OLED demonstrations
- OLED Testing Collaboration
• Objective is to accelerate R&D developments in OLED lighting technology and manufacturing
  • Provides a pathway to prove-out and/or optimize components in a fully representative OLED
• Qualify as a testing laboratory
  • Open to any US-based organization w/ consistent OLED capabilities
  • Requires full OLED panels or subcomponent production/testing capability
• Have a component to be tested?
  • Provide technology description, maturation level, anticipated outcome, etc.
  • DOE funding to pay for testing – not material and shipping
• Progress to Date
  • One organization is “qualified” and under contract to test R&D products
  • Two OLED “components” are currently initiated for testing
• More at energy.gov/eere/ssl/oled-testing-opportunity
Increasing Academic Interest in SSL

- Plan to release new funding opportunity geared to increase academic participation in SSL
- Academic teams solve a problem utilizing novel aspects of SSL technology
- In sync with academic year
- Small-scale design efforts ($10-15K/project)
- Recognition of design at end of project cycle

This new concept is still in the development stage
Information, Resources, and Updates

www.ssl.energy.gov