



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Illuminating the Path to Energy Savings: Solid State Lighting

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The Macro Perspective

- National Energy Consumption
- Electricity Production
- Lighting Energy Consumption
 - 8% of Energy
 - 22% of Electricity





EERE Mission

Office of Energy Efficiency and Renewable Energy Mission Statement

The EERE mission is to strengthen America's energy security, environmental quality, and economic vitality in public-private partnerships that: enhance energy efficiency and productivity; bring clean, reliable and affordable energy technologies to the marketplace; and make a difference in the everyday lives of Americans by enhancing their energy choices and their quality of life.



Solid State Lighting Products Today....



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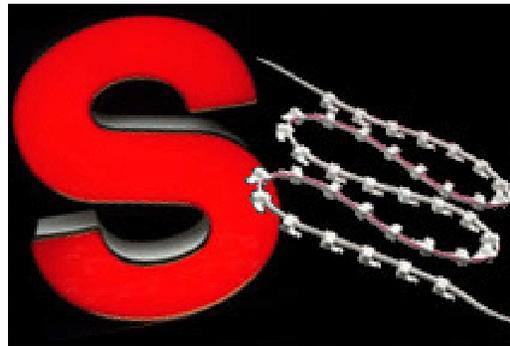
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More Solid State Lighting Products Today



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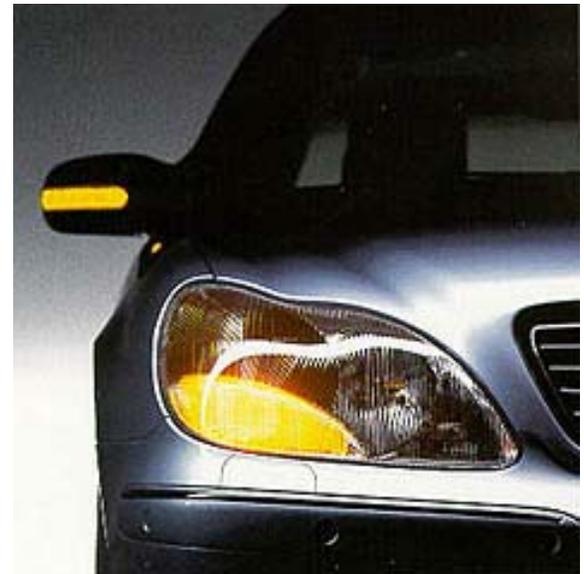
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Compelling Benefits of SSL Technology

Light Emitting Diodes



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Organic Light Emitting Diodes

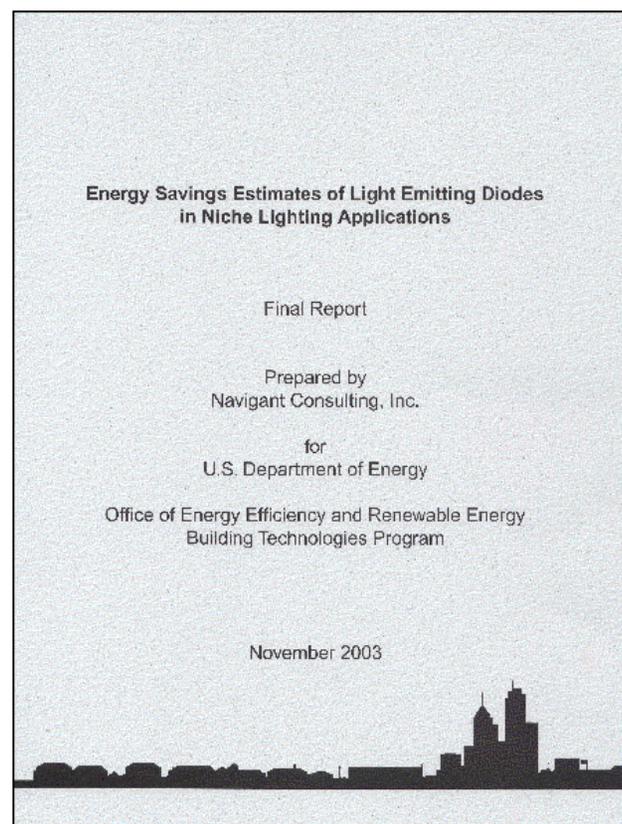


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Energy Savings Estimates of Light Emitting Diodes in Niche Lighting Applications

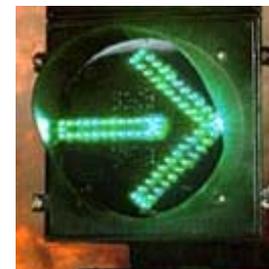
- Review current SSL niche markets
- Identify value propositions of SSL
- Estimate energy savings benefits today
- Estimate future potential if 100% of niche market switched to LED





Solid State Lighting - Niche Markets

- Sectors where SSL has penetrated the market
- Sectors where SSL is starting to gain market share



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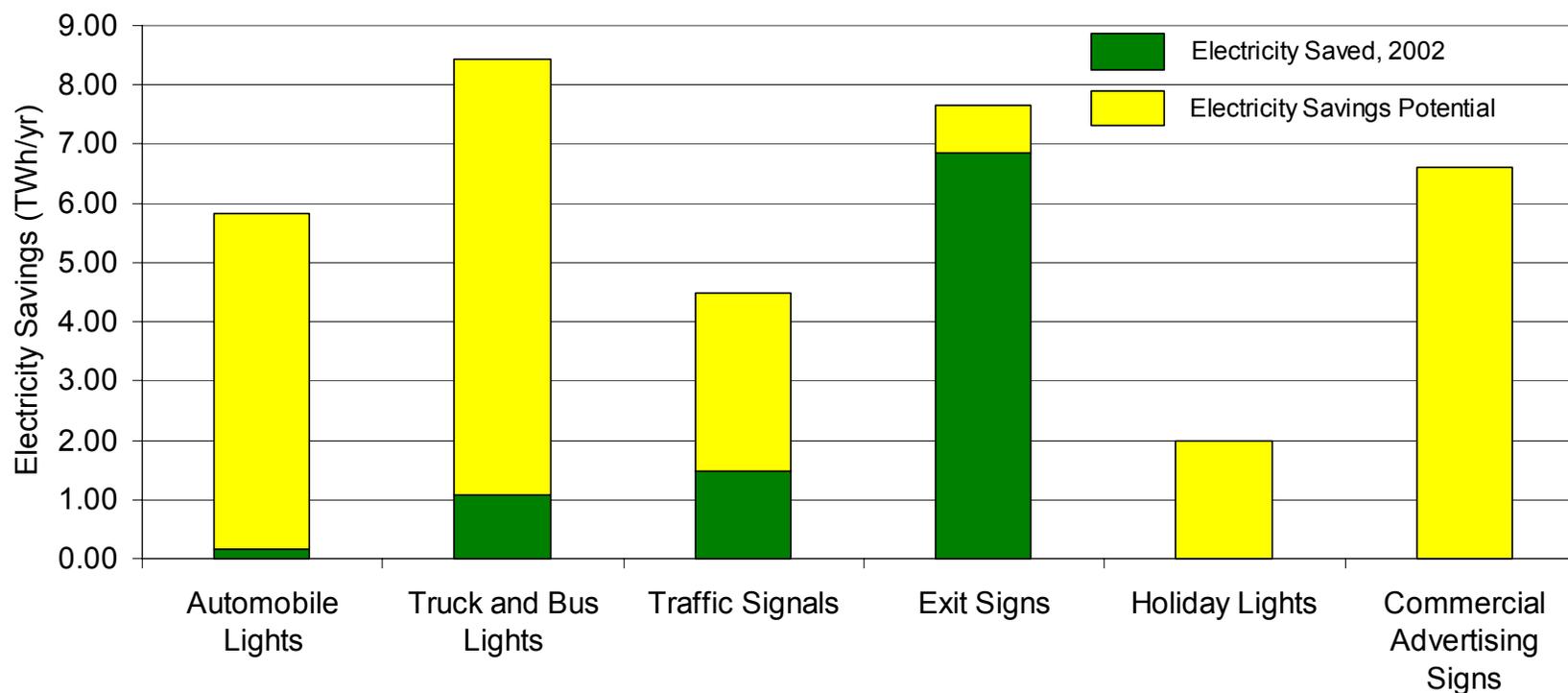
Al Jaber USAF Base, Kuwait, SSL Taxiway Edge Lighting



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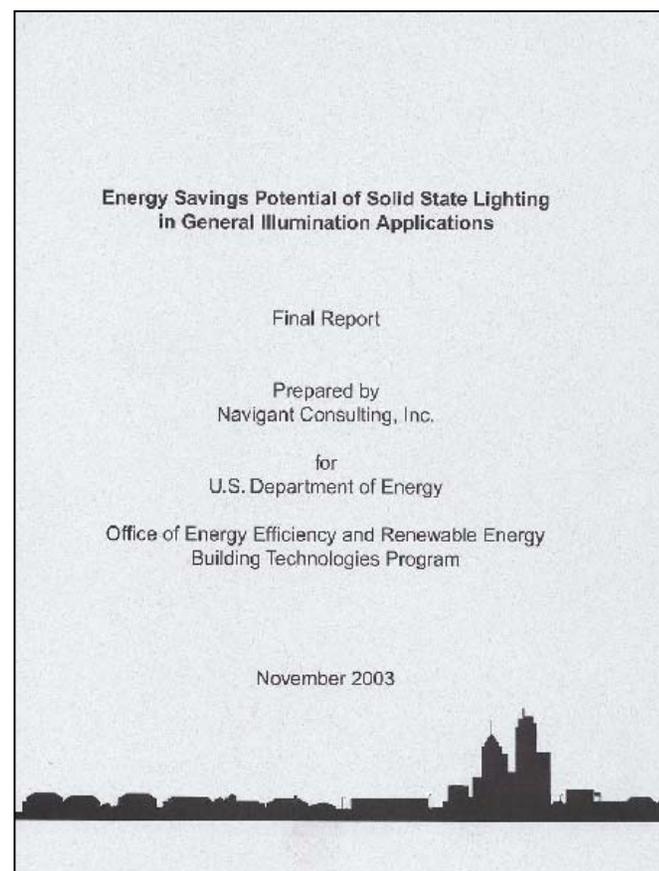
Solid State Lighting Niche Markets – Site Electricity





Energy Savings Potential of Solid State Lighting in General Illumination Applications

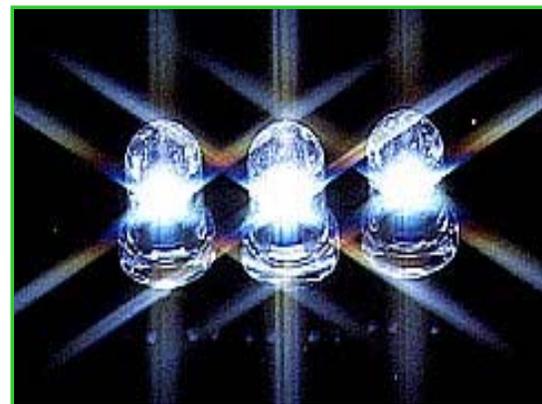
- Review SSL in white-light markets
- SSL in competition with conventional lighting technologies
- National energy savings estimate
- Analysis period 2005-2025





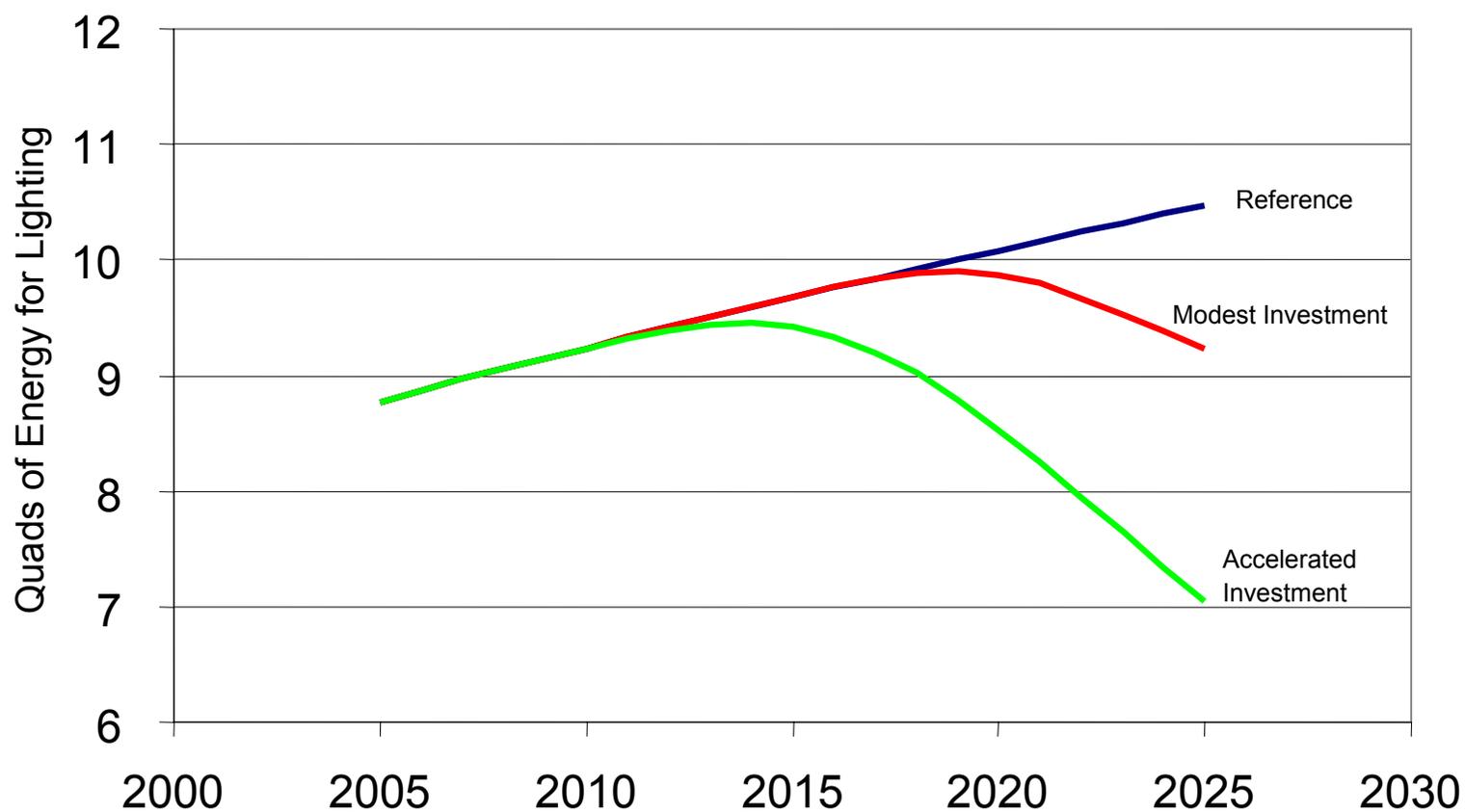
Solid State Lighting – The Potential

- What is the energy savings potential of SSL?
- Two SSL performance improvement scenarios:
 - “Modest” Investment ~\$50m/year
 - “Accelerated” Investment ~\$100m/year
- Lighting service demand forecasted
- Market competition to provide the lumens of lighting service, driven by paybacks



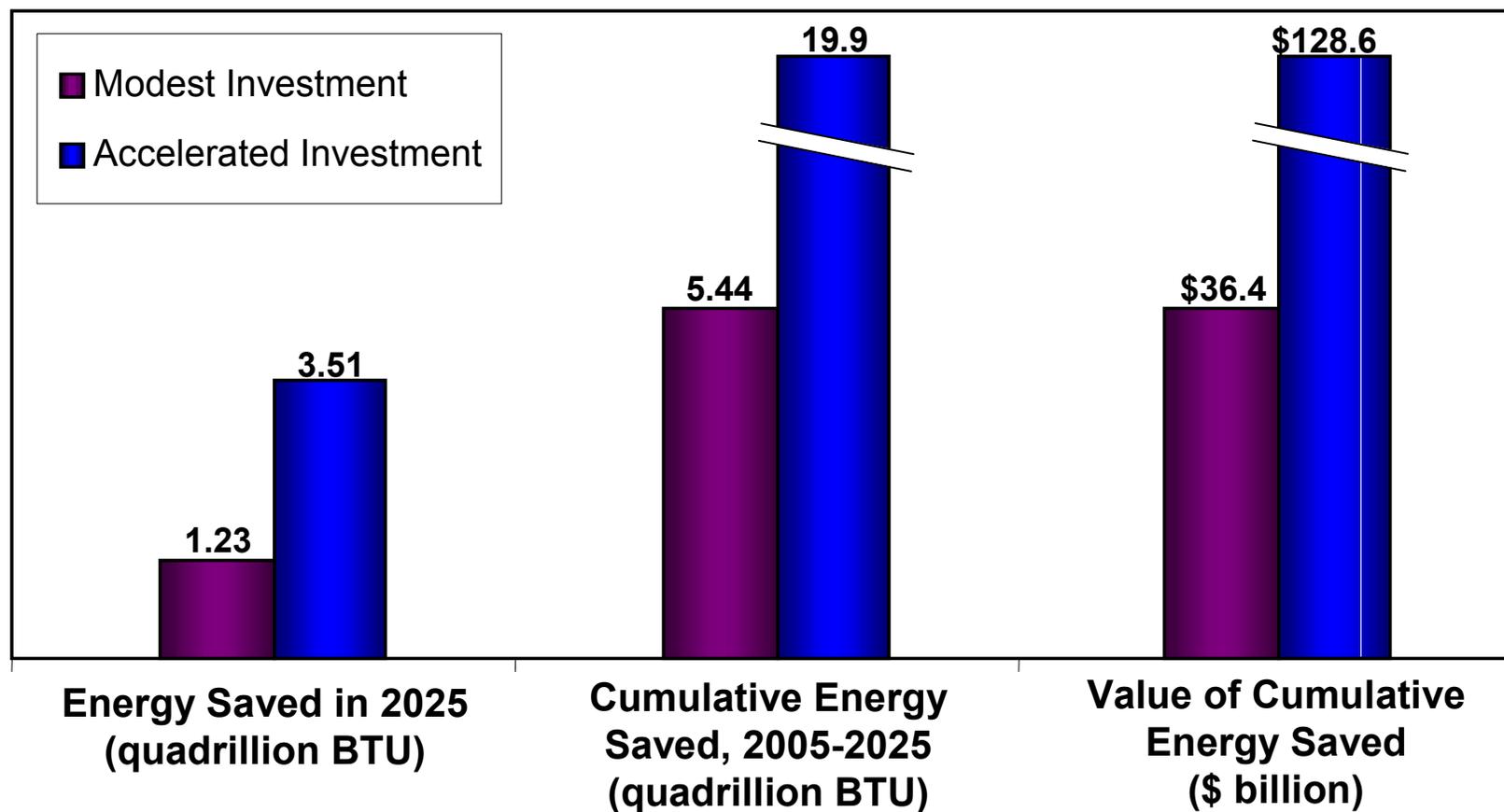


National Energy Consumption for Lighting





Estimated Energy Savings Potential of SSL



Note: Approximately \$6.6 billion per quad of electrical energy. Savings figure does not deduct any of the additional consumer costs, capital equipment costs, infrastructure conversion costs or other expenses associated with a conversion to SSL.



DOE Activities to Date

- Co-operatively planned R&D
- Competitive funding
- SSL R&D budget growth
- Set four world records





Why accelerate SSL R&D now?

- U.S. has pioneered invention
- Highly efficient light source
- White-light sources higher risk
- National initiative will keep the U.S. in pole position





How do we get there from here?

- Government – Industry R&D Partnership
- Cooperation to solve problems
 - Prioritize
 - Accelerate R&D
 - Niche Markets
 - Products
 - General Illumination





Thank You and Keep Working Hard

- Tremendous energy savings potential
- Four world records
- Niche markets are developing
- General illumination awaits
- Lets make it happen together!





DOE Solid State Lighting Program

DOE Solid State Lighting Program Goal Statement

By 2015, develop advanced solid state lighting technologies that, compared to conventional lighting technologies, are much more energy efficient, longer lasting, and cost-competitive by targeting a product system efficiency of 50 percent with lighting that accurately reproduces sunlight spectrum.