



## IFC/GEF Efficient Lighting Initiative Voluntary Technical Specifications for Traffic Signals

### Background

Developing countries often share common market barriers to increased penetration of energy-efficient lighting in the residential, commercial and industrial sectors. Those barriers, which are typical of immature markets for energy-efficient technology, include inadequate information about the energy, economic and environmental benefits of efficient lighting, and a lack of credible sources of such information.

To address this barrier, ELI will develop and promote voluntary technical specifications that include rigorous quality criteria. ELI will also promote a labeling system to help consumers identify energy efficient lighting products that meet these specifications. Lighting products must also meet ELI's technical specifications before they may be included in ELI programs.

ELI programs will include a broad range of marketing, educational, market building, and financing activities, tailored in each ELI country to meet the needs of the local market. These activities are supported by US\$ 15 million in Global Environment Facility funding, and additional leveraged local and international funding. With these resources, ELI has the potential of making a major impact on the markets for lighting products in all seven countries. Lighting manufacturers whose products meet the ELI specifications are invited to launch product promotions and advertising campaigns in concert with ELI marketing.

Manufacturers that are interested in participating in ELI should review the relevant ELI voluntary technical specifications to determine whether their products comply. They should then review the ELI Qualification Protocol for guidance on how their lighting products can receive the ELI label and be promoted through ELI programs.

### Traffic Signals

With the growth of urban populations and automotive traffic in almost all countries, the electricity consumed to operate traffic signals has risen steadily. Traffic signals are typically on 24 hours per day and, in order to produce the usual trio of green, red and yellow lights, traffic signals typically employ colored lenses in front of high intensity incandescent lamps. These lenses significantly reduce the already low efficiency of the incandescent light source.

The traffic signal market in developed countries is currently undergoing a shift from incandescent to light emitting diode (LED)-based products. LEDs are energy efficient, durable and emit colored light, eliminating the need for colored lenses. The proposed ELI specification is technology specific and requires that to qualify for inclusion in ELI programs a traffic signal must use LEDs as the light source for the at least the red signal.

Attempts are underway to develop a single international specification for LED-based traffic signals, but different specifications currently dominate in the U.S., Europe and Japan. The differences are largely based on differences in required visibility or luminous flux. LEDs are so much more efficient at producing colored light than incandescent sources that any of the established international specification would be an appropriate choice for use in an ELI country.



Therefore, the proposed specification requires only that LED technology be used for the red signal, and that the traffic signal otherwise be in compliance with at least one of three existing regional standards. Although LED options are now available for all three traffic signal colors, red is the least expensive color of LED and changing the red lamp in an incandescent traffic signal to LED will achieve a significant share of the total potential energy savings from a complete change to LEDs. The choice of which established standard to comply with will depend upon established precedents or existing policy trends in each particular ELI country. For example, it is assumed that Latvia, Hungary and the Czech Republic will choose to follow the European Union standard as part of their overall efforts to harmonize with the EU.

Even greater savings can be achieved through a systems approach to traffic signals that optimizes that benefits of the LED technology with the luminaire design and signal switching equipment. Useful information, including copies of the specifications listed below, are available at from the Light Research Center's website – [www.lrc.rpi.edu](http://www.lrc.rpi.edu)

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## Definitions

### Traffic Signals

Automated or manually operated luminaires with colored lights used to control the flow of traffic.

### Light Emitting Diodes

LEDs are solid-state, semiconductor devices that convert electrical energy into visible light energy. LEDs are highly efficient because most of the energy emitted is within the visible range of the spectrum and little is emitted as heat.

### Traffic Signals

<b>Technology</b>	<b>Specification</b>
For at least the red signal lamp, but possibly also the yellow and green signal lamps	Exclusive use of light emitting diodes as the light source
<b>Application of Existing Standards</b>	<b>Specification</b>
For at least the red signal lamp, but possibly also the yellow and green signal lamps	Compliance with one or more of the three standards listed under <b>Reference Specifications</b> below.

### **Notes:**

This specification assumes that any traffic signal products promoted through ELI will also be in compliance with all existing local standards. Due to the technological differences between incandescent and LED lighting, it is possible that local standards may effectively exclude LED signals if they do not have specific provisions allowing them.

## Reference Specifications

- ITE Technical Council Committee. 1998. *Interim LED Purchase Specification: Vehicle Traffic control Signal Heads, Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules*. Washington: Institute of Transportation Engineers
- European Committee for Standardization. 1998. *European Standard: Traffic Control Equipment – Signal Heads (Draft)*. Ref. No. PREN 12368 E.
- Japanese Police Department. 1986. *Traffic Signal Specification* (in Japanese)