

United States Market Forecast

Solid-State Lighting (SSL) General Lighting LED Lamp Consumption Market Review & Forecast (2010-2015)

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United States Market Review and Forecast This report, by ElectroniCast Consultants, provides the research findings of our study of the United States consumption of Light Emitting Diode (LED) lamps (also known as “consumer-level bulbs”), which are used in luminaires in stationary/fixed location (non-vehicle/non-portable) solid-state lighting (SSL) General Lighting applications. The lamps are used in new construction, as well as retrofitting/replacement of existing (installed-based) lamps.

General Lighting provides the main illumination of an area. In this study, we provide a market review for the year 2010 plus our forecast and analysis (2011-2015) of LED lamps used for general lighting, including interior and exterior decorative and functional lighting for residential, commercial and government areas.

For the purposes of this study, ElectroniCast Consultants includes Directional Lighting, Supplementary Lighting and Architectural Lighting in the General Lighting category. LEDs used in signage, displays and signal lighting are not included in the market forecast data for this study. Lighting used in theaters, photography, newsgathering (TV broadcasts, film, similar) and even lighting used in nightclubs on the dance floor are considered general Lighting.

LEDs are used in both functional and decorative light fixtures, with an advantage of energy savings. Compared to incandescent lighting, LED-based solid-state lighting (SSL) delivers visible light with reduced heat. In addition, its solid-state nature provides for greater resistance to shock, vibration, and wear, thereby significantly increasing its lifespan.

LED Level Quantified in the ElectroniCast Study Below, are five levels (or “food chain”) pertaining to the LED marketplace. For the purposes of this ElectroniCast study, we quantify and provide a market forecast for “Level 3”

Level 1 - The chip or die

Level 2 - The Packaged LED

Level 3 – Lamp (Consumer-Level Bulb, Globe, Linear Tube, Panel)

Level 4 - Luminaire (light fixture/lamp holder/fitting)

This report provides the 2010 market data review and 2011-2015 forecast by the following functions:

- Consumption Value (US\$)
- Quantity (number/units)
- Average Selling Prices (\$, each)

The value is determined by multiplying the number of units (lamps) by the average selling price (ASP) in US Dollars. The ASPs are not retail prices; the prices are based on the price of the LED lamp at the initial factory level (prior to FOB – Free On Board). The value is then based on the end-use application in the United States.

This study is based on analysis of information obtained continually over the past nine years, but updated through early-February 2011. During the market research process, ElectroniCast analysts performed interviews with authoritative and representative individuals in the LED and lighting industry, plus – R&D and factory/manufacturing, from the standpoint of both suppliers and users of LED and lighting illumination products.

Forecast Lighting Demand Growth Based on primary research (interviews and evaluations) with engineers and product planners, ElectroniCast Consultants can see ideas and then (eventually) concepts about 3-7 years before innovation solutions (products) are announced in the public domain. Once we feel confident that these ideas and concepts will become innovative solutions (new products), we set anticipated usage into the market forecast. Therefore, as we are looking as several years, many of the future products may not even be at the idea-stage yet. ElectroniCast Consultants, in effect, forecast lighting demand growth, which will drive demand for increased capability/capacity LEDs; therefore, we have expertise of what to look for. We help our clients find the next window of opportunity.

Market Forecast Product Categories This market forecast of United States consumption is presented for six major lamp-type categories. The lamp categories, in turn, may have multiple sub-categories, which are determined by physical size of the lamp (see Chapter 3 for explanation of size categories for PAR-types, General Service-types, Decorative-types, and MR compatible lamp-types).

Note: lower-level products, which are indented in the list shown in Table 1, are summed-up to the higher-level product category stated above it.

Table 1
ElectroniCast Market Forecast Data Base Hierachy Structure
U.S.A. LED Lamp Product Category List

Parabolic aluminized reflector (PAR)

PAR16
PAR20
PAR30
PAR38
PAR56
PAR64
PAR-Types: Other (Miscellaneous) Sizes

General Service (A-Type)

A15
A19 / Other A-Type

Decorative Types: Globe, Other (Candle, Fancy Round, Other)

Globe: G25
Globe: G80
Other Decorative

Multifaceted reflector (MR) Compatible

MR16
MR11 / Other MR

Linear / Tube

< 1200mm
> 1200mm

Street / Parking-lot / Campus / Similar (Parks, Walkways)

Increasingly, the automatic assembly and test manufacturing process for LED solid-state lighting products allow for mass-production capability. In addition, over the next few years, the average selling prices of the SSL general lighting products will be driven lower, as a result of production efficiencies, yield improvements (aided by quality controls), competition (both market competition and technology competition), marketing/sales distribution improvements, and other factors.

Market Opportunity Analysis – Market Dynamics The study process by ElectroniCast Consultants takes into account the following points:

- Standards (including general regulations & standards, environmental issues, etc.)
- Policies and schemes for promoting the penetration of LED lighting
- Industry trends in LED lighting fixtures
- Distribution Channel (DIY stores, other stores, Web-based, other)
- LED Lighting industry competitive environment

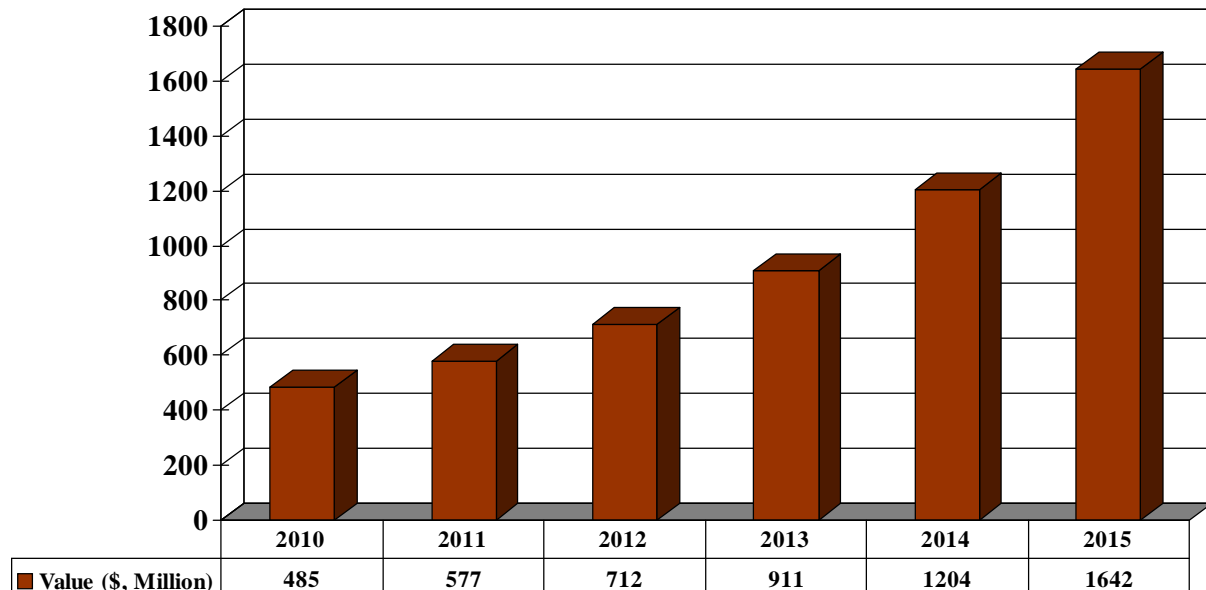
Total cost of ownership (TCO) is a Major Market Driver The use of LED-based lamps in SSL General lighting is driven by promised savings in maintenance/ labor, as well as “Green-Tech” (ecology-oriented) issues. The lamps are used in new construction, as well as retrofitting/replacement of existing (installed-based) lamps. The Total Cost of Ownership (TCO) is a key marketing dynamic relative to LED Lamps, which typically have a premium price point versus other lighting solutions. Some of the key elements incorporated in the cost of ownership for LED-based lamps vehicle include:

- Depreciation Costs (LEDs last longer)
- Energy Costs (LEDs use less energy)
- Repairs (Especially true as a comparison vs. Ballasts in fluorescent tubes)
- Funding programs and other government-based financial incentives
- Maintenance Costs (Lower labor costs/less lamp replacements)

Opportunity Costs are also in the TCO mix; since ElectroniCast takes into account that using LED (energy-efficient lighting and other carbon footprint/pollution issues) depicts the organization, which installs them, as a good corporate citizen.

In 2010, the United States consumption value of specified LED lamps, which are used in SSL General Lighting, was \$485 million; ElectroniCast forecasts the consumption value will reach \$1.64 billion installed in the year 2015 representing an average annual growth rate of 27.6 percent (2010-2015).

**LED Lamps Used in Solid-State Light (SSL) General Lighting
U.S.A. Market Forecast
Source: ElectroniCast Consultants)**



United States of America
Solid-State Lighting General Lighting LED Lamp Consumption
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