



ElectroniCast Consultants presents...

## European Solid-State Lighting General Lighting LED Lamp Market Forecast 2010-2015

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This report, by ElectroniCast Consultants, provides the research findings of our study of the European consumption of Light Emitting Diode Lamps (also known as “consumer-level bulbs” or “consumer-level globes”), which are used in luminaires in stationary (non-vehicle) solid-state lighting (SSL) General Lighting applications.

Solid State The term "solid state" refers to the fact that light in a light emitting diode (LED) is emitted from a solid object, that has do not contain moving parts or parts that can break, rupture, shatter, leak or contaminate the environment—a block of semiconductor—rather than from a vacuum or gas tube, as is the case in traditional incandescent light bulbs and fluorescent lamps.

General Lighting Stationary Applications The definition used by ElectroniCast for General Lighting is – lighting that is used to *provide the main illumination of an area*. ElectroniCast includes Directional Lighting, Supplementary Lighting and Architectural Lighting in the General Lighting category; however, “architainment” lighting, such as large display units are not considered in the General Lighting segment. LEDs used in signage, displays, signals, decorative Christmas/holiday lighting *are not included* in the market forecast data for this study.

LED lamps used in theaters, photography, news-gathering (TV broadcasts, film, similar) and even lighting used in nightclubs on the dance floor and in operation rooms (surgery) are considered in the General Lighting application.

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 4”

Level 1 - The chip or die

Level 2 - The LED component (component-level bulb)

Level 3 - LED array; may include optics, heat sink and/or power supply

**Level 4 - Lamp**

Level 5 - Luminaire (light fixture/lamp holder)

This report provides the 2010-2015 market data by the following functions:

- Consumption Value (US\$, Million)
- Quantity (number/units in Millions)
- Average Selling Prices (ASP US\$, 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; therefore, no shipping expenses are included). The value is then based on the end-use application in Europe.

This study is based on analysis of information obtained continually over the past eight years, but updated through the end of June of 2011. During this period, 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. The interviews were conducted principally with:

- Architectural lighting Designers/Installers concerns, Engineers, marketing personnel and management at manufacturers of LED lighting and related equipment, as well as other lighting technologies.
- Design group leaders, engineers, marketing personnel and market planners at major users and potential users of LEDs and lighting
- Other industry experts, including those focused on standards activities, trade associations, government and investments.

The interviews covered issues of technology, R&D support, pricing, contract size, reliability, documentation, installation/maintenance crafts, standards, supplier competition and other topics.

Market Forecast Product Categories This market forecast of European consumption is presented for five major lamp-type categories. The lamp categories, in turn, may have multiple sub-categories, which are determined by lamp luminous flux and/or the physical size of the lamp. 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**  
**European LED Lamp Product Category List**

Total Consumption: LED Lamps

**Parabolic aluminized reflector (PAR)**

PAR16

PAR20

PAR30

PAR38

PAR56

PAR64

PAR-Types: Other (Miscellaneous) Sizes

**General Service/Decorative: Mushroom, Fancy/Candle, Panel, Other**

**Multifaceted reflector (MR) Compatible**

MR16

MR11 / Other MR

**Linear / Tube**

< 1200mm

> 1200mm

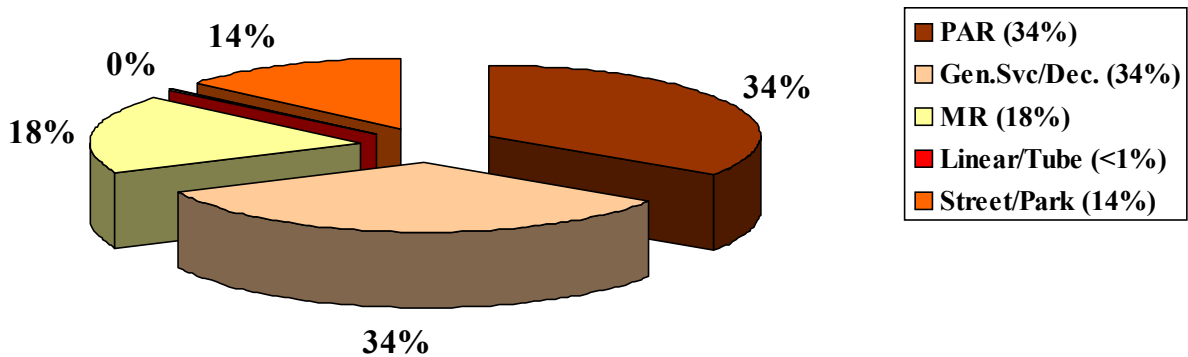
**Street / Parking-lot / Campus / Similar**

*Note: Market forecast data in this study report refers to consumption (use) for a particular calendar year; therefore, this data is not cumulative data. Market forecast data are provided in United States Dollars (US\$).*

According to the ElectroniCast study – In 2011, the Parabolic Aluminized Reflector (PAR) LED lamps and General service/Decorative consumer-level bulbs (lamps), are co-leaders of the relative market share of LED-based lamps consumed in Europe. The third-place position is held by Multifaceted reflector (MR) Compatible lamps, followed by street lighting and finally the linear/tube lamp product category.

The use of LED-based lamps in SSL – General lighting is driven by promised savings in using less energy, longer operating life, as well as maintenance/ labor, since LED lamps last longer than competing technologies, they do not need to be replaced as often and “Green-Tech” (ecology) issues.

**Figure 1**  
**LED Lamps Used in Solid-State Light (SSL) General Lighting**  
**European Market, By Product Category in 2011**  
**(Value Basis, Market Share %)**



**Source: ElectroniCast Consultants**

The increasing automatic assembly and test manufacturing process for selected LED solid-state lighting products allows 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 technological competition), marketing/sales distribution improvements, and other factors.

### Market Opportunity Analysis – Market Dynamics

The study process by ElectroniCast Consultants also covers the following points:

- Standards on or related to LED lighting (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

European Market Forecast by Regional Geoscheme The geoscheme was created on the basis of the classification M49 of the United Nations Statistics Division, which divides the world into 'macro-geographical regions' (United Nations Statistics Division - Standard Country and Area Codes Classifications) and sub-regions.

The scheme was devised for statistical purposes and is used for carrying out statistical analysis. The macro-geographical regions are arranged to the extent possible according to continents. Within these groupings, smaller, geographical sub-regions and selected economic and other groupings allow for detailed analysis.

According to the United Nations, the assignment of countries or areas to specific groupings is for statistical convenience and does not imply any assumption regarding political or other affiliation of countries or territories.

Europe is the world's second-smallest continent by surface area, covering about 10,180,000 square kilometers (3,930,000 square mi) or 2 percent of the Earth's surface and about 6.8 percent of its land area. Of Europe's approximately 50 states, Russia is the largest by both area and population (although the country has territory in both Europe and Asia), while the Vatican City is the smallest. Europe is the third-most populous continent after Asia and Africa, with a population of 731 million or about 11 percent of the world's population.

This market review and forecast report provides the total consumption of LED-based general lighting lamps in the Europe, segmented by the following four (4) sub-regions, as identified by the United Nations geoscheme (see Table 2):

**Table 2**  
**European Sub-Regions as identified by the United Nations Geoscheme**

<u>(1) Northern Europe</u>	<u>(2) Southern Europe</u>	<u>(3) Western Europe</u>
* Åland Islands	* Albania	* Austria
* Denmark	* Andorra	* Belgium
* Estonia	* Bosnia/Herzegovina	* France
* Faroe Islands	* Croatia	* Germany
* Finland	* Gibraltar	* Liechtenstein
* Guernsey	* Greece	* Luxembourg
* Iceland	* Italy	* Monaco
* Republic of Ireland	* Kosovo	* Netherlands
* Isle of Man	* Malta	* Switzerland
* Jersey	* Montenegro	
* Latvia	* Portugal	<u>(4) Eastern Europe</u>
* Lithuania	* Macedonia	* Belarus
* Norway	* San Marino	* Bulgaria
* Svalbard /Jan Mayen	* Serbia	* Czech Republic
* Sweden	* Slovenia	* Hungary
* United Kingdom	* Spain	* Moldova
	* Vatican City	* Poland
		* Romania
		* Russia
		* Slovakia
		* Ukraine

Market Forecast Application Categories This market forecast of European consumption is also presented by three major End-User categories:

- Government
- Commercial/Industrial
- Residential/Non-Specific

(See the Microsoft Excel worksheets in the addendum of the report on more detail showing the extensive market forecast database).

**– Tables of Contents –**

1.	Executive Summary	1-1
1.1	Overview	1-1
1.2	LED Chips Used in General Solid-State Lighting (SSL)	1-39
1.3	LED Lamps & Light Fixtures Used in General Lighting	1-43
1.4	Lighting Standards and Protocols	1-55
2.	LEDs – Technology Overview	2-1
3.	LED Lamp General lighting Consumption in the United States	3-1
3.1	Overview	3-1
3.2	Parabolic Aluminized Reflector (PAR) LED Lamps	3-63
3.3	General Service (A-Type): LED lamps	3-82
3.4	Multifaceted reflector (MR) Compatible LED Lamps	3-93
3.5	Linear/Tube LED Lamps	3-108
3.6	LED Lamps: Street-lighting/Parking-Lots/Campus/Parks/Similar	3-122
4.	Company Profiles of LED and Related Companies – (Over 270 Companies)	4-1
5.	Market Research Methodology	5-1
6.	Definitions	6-1
7.	ElectroniCast Market Forecast Data Base – Introduction/Explanation of Excel Worksheets	7-1
7.1	Overview	7-1
7.2	Tutorial of the Excel Worksheets	7-3

**– List of Tables –**

1.1.1	ElectroniCast Market Forecast Hierarchy Structure: LED Lamp Product Category List	1-3
1.1.2	European Sub-Regions as identified by the United Nations Geoscheme	1-9
1.1.3	Population in Northern Europe, by Country	1-10
1.1.4	Population in Southern Europe, by Country	1-11
1.1.5	Population in Western Europe, by Country	1-12
1.1.6	Population in Eastern Europe, by Country	1-12
1.1.7	LED Lamps Used in SSL General Lighting European Forecast, By End-User Category (\$ Million)	1-18
2.1	LED Color Variety – Selected Examples	2-9
2.1	LED Color Chart	2-11
3.1.1	LED Lamps in SSL General Lighting European Forecast, By End-User Category (\$ Million)	3-17
3.1.2	LED Lamps in SSL Gen. Lighting Northern European Forecast, By End-User Category (\$ Million)	3-18
3.1.3	LED Lamps in SSL Gen. Lighting Southern European Forecast, By End-User Category (\$ Million)	3-18
3.1.4	LED Lamps in SSL Gen. Lighting Western European Forecast, By End-User Category (\$ Million)	3-19
3.1.5	LED Lamps in SSL Gen. Lighting Eastern European Forecast, By End-User Category (\$ Million)	3-19
3.1.6	ElectroniCast Market Forecast Hierarchy Structure: LED Lamp Product Category List	3-20
3.1.7	LED Lamps in SSL General Lighting European Forecast, By Product Category (\$ Million)	3-22
3.1.8	LED Lamps in SSL General Lighting European Forecast, By Product Category (Quantity/Units)	3-22
3.1.9	LED Lamps in SSL General Lighting European Forecast, By Product Category (ASP, \$ Each)	3-23
3.1.10	Calculation of the Cost of Manufacturing Facility Downtime	3-45
3.1.11	Comparison of Lighting Technologies	3-46
3.2.1	PAR Lamp Designation and Nominal Diameter	3-63
3.2.2	PAR LED Lamps in SSL General Lighting European Forecast, By Product Category (\$ Million)	3-65
3.2.3	PAR LED Lamps in SSL General Lighting European Forecast, By Product (Quantity/Units)	3-66
3.2.4	PAR LED Lamps Used in SSL General Lighting European Forecast, By Product (ASP, \$ Each)	3-66
3.2.5	PAR LED Lamps in SSL General Lighting Northern European Forecast, By Product (all functions)	3-68
3.2.6	PAR LED Lamps in SSL General Lighting SSL Southern European Forecast, By Product, functions	3-69
3.2.7	PAR LED Lamps in SSL General Lighting Western European Forecast, By Product (all functions)	3-70
3.2.8	PAR LED Lamps in SSL General Lighting Eastern European Forecast, By Product (all functions)	3-71
3.2.9	LED Lamps Used in SSL General Lighting European Forecast, By End-User Category (\$ Million)	3-75
3.2.10	LED Lamps Used in SSL General Lighting Northern European Forecast, By End-User (\$ Million)	3-76
3.2.11	LED Lamps Used in SSL General Lighting Southern European Forecast, By End-User (\$ Million)	3-76
3.2.12	LED Lamps Used in SSL General Lighting Western European Forecast, By End-User (\$ Million)	3-77
3.2.13	LED Lamps Used in SSL General Lighting Eastern European Forecast, By End-User (\$ Million)	3-77

**– List of Tables – Continued**

3.3.1	General/Decorative LED Lamps in SSL Gen. Lighting European Forecast, By End-User (\$ Million)	3-90
3.3.2	General/Decorative LED Lamps in SSL Gen. Lighting Northern European, By End-User (\$ Million)	3-91
3.3.3	General/Decorative LED Lamps in SSL Gen. Lighting Southern European, By End-User (\$ Million)	3-91
3.3.4	General/Decorative LED Lamps in SSL Gen. Lighting Western European, By End-User (\$ Million)	3-92
3.3.5	General/Decorative LED Lamps in SSL Gen. Lighting Eastern European, By End-User (\$ Million)	3-92
3.4.1	MR-Compatible LED Lamps in SSL General Lighting European Forecast (all functions)	3-98
3.4.2	MR-Compatible LED Lamps in SSL General Lighting Northern European Forecast (all functions)	3-99
3.4.3	MR-Compatible LED Lamps in SSL General Lighting Southern European Forecast (all functions)	3-99
3.4.4	MR-Compatible LED Lamps in SSL General Lighting Western European Forecast (all functions)	3-100
3.4.5	MR-Compatible LED Lamps in SSL General Lighting Eastern European Forecast (all functions)	3-100
3.4.6	MR-Compatible LED Lamps in SSL General Lighting European Forecast, By End User (\$ Million)	3-105
3.4.7	MR-Compatible LED Lamps in SSL General Lighting Northern European, By End User (\$ Million)	3-105
3.4.8	MR-Compatible LED Lamps in SSL General Lighting Southern European, By End User (\$ Million)	3-106
3.4.9	MR-Compatible LED Lamps in SSL General Lighting Western European, By End User (\$ Million)	3-106
3.4.10	MR-Compatible LED Lamps in SSL General Lighting Eastern European, By End User (\$ Million)	3-107
3.5.1	Linear/Tube LED Lamps in SSL General Lighting European Forecast, by Product (all functions)	3-113
3.5.2	Linear/Tube LED Lamps in SSL General Lighting Northern European, by Product (all functions)	3-114
3.5.3	Linear/Tube LED Lamps in SSL General Lighting Southern European, by Product (all functions)	3-114
3.5.4	Linear/Tube LED Lamps in SSL General Lighting Western European, by Product (all functions)	3-115
3.5.5	Linear/Tube LED Lamps in SSL General Lighting Eastern European, by Product (all functions)	3-115
3.5.6	Linear/Tube LED Lamps in SSL General Lighting European Forecast, By End User (\$ Million)	3-119
3.5.7	Linear/Tube LED Lamps in SSL General Lighting Northern European, By End User (\$ Million)	3-120
3.5.8	Linear/Tube LED Lamps in SSL General Lighting Southern European, By End User (\$ Million)	3-120
3.5.9	Linear/Tube LED Lamps in SSL General Lighting Western European, By End User (\$ Million)	3-121
3.5.10	Linear/Tube LED Lamps in SSL General Lighting Eastern European, By End User (\$ Million)	3-121
3.6.1	LED Street Lamps in SSL General Lighting European Forecast, By End User (\$ Million)	3-131
3.6.2	LED Street Lamps in SSL General Lighting Northern European, By End User (\$ Million)	3-132
3.6.3	LED Street Lamps in SSL General Lighting Southern European, By End User (\$ Million)	3-132
3.6.4	LED Street Lamps in SSL General Lighting Western European, By End User (\$ Million)	3-133
3.6.5	LED Street Lamps in SSL General Lighting Eastern European, By End User (\$ Million)	3-133
7.1.1	ElectroniCast Market Forecast Database Product Category Hierarchy List	7-2
7.2.1	ElectroniCast Market Forecast Database Application Category Hierarchy List	7-3

**– List of Figures –**

1.1.1	LED Lamps in SSL General Lighting European Market Forecast (Value Basis, \$ Million)	1-4
1.1.2	LED Lamps in SSL General Lighting European Market Forecast (Quantity Basis, Million/Units)	1-5
1.1.3	LED Lamps in SSL General Lighting European Market Forecast, by Sub-Region (\$ Million)	1-13
1.1.4	LED Lamps in SSL General Lighting European Market Forecast, by Sub-Region (Million/Units)	1-14
1.1.5	LED Lamps in SSL General Lighting European Market Forecast, by Product (\$ Million)	1-15
1.1.6	LED Lamps in SSL General Lighting European Market Forecast, by Product (Million/Units)	1-16
1.1.7	LED Lamps in SSL General Lighting European Market Forecast, by Product (ASP, \$, each)	1-17
1.1.8	Single-die LED: 1000 lm at 100 lm/W at 3A	1-22
1.1.9	LED Packaged Chip/Bulb	1-23
1.1.10	LED Packaged Chip/Bulb	1-23
1.1.11	LED Packaged Chip/Bulb Surface Mount Variations	1-24
1.1.12	LED Packaged Chip/Bulb	1-25
1.1.13	High Brightness LED Packaged Chip/Bulb	1-26
1.2.1	Diagram of a typical LED chip	1-39
1.2.2	Diagram of a typical LED chip	1-40
1.2.3	LED Chip Cross-Sectional Structure	1-41
1.2.4	ESD Protection Diodes	1-42

**– List of Figures – Continued**

1.3.1	A19 Bulbs (Consumer-Level Bulb/LED Lamp)	1-44
1.3.2	Obstruction Bulbs (Lamps) - Flashing - 138 red or amber LEDs	1-45
1.3.3	LED Lamp – Down-light Retrofit Module	1-46
1.3.4	Miscellaneous LED Lamps	1-47
1.3.5	LED Light Bulb (Cool White)	1-48
1.3.6	Complete Fixture and Replacement Bulb - Streetlight (Lamp)	1-49
1.3.7	Samples of Lighting Fixture Types	1-51
2.1	LED Chromatic Chart	2-10
2.2	Evolution of Research Emphasis During Technology Life Cycle	2-12
2.3	LED Chip: Metal Layer (Thin Film Technology)	2-13
2.4	Vertical LED Chip	2-14
2.5	AC LED Technology on a Wafer	2-20
2.6	Ultra High Bright LED Chip	2-21
2.7	Ultra-Thin LED	2-24
2.8	Solid-State Lighting LED	2-25
2.9	LED Module with High Light Quality	2-26
2.10	Transparent and flexible inorganic, organic hybrid n-type: Thin Film Transistors (TFTs)	2-30
2.11	Lumiramic Phosphor Technology: Thin Film Flip Chip (TFFC) technology	2-31
2.12	Wire-to-Board LED Connector	2-34
2.13	Next-Generation Light Emitting Diode Module	2-38
2.14	4-Leaded RGB LED	2-40
2.15	Vertically Conducting Advanced LED Structure	2-44
2.16	AlGaInP LED Efficacy	2-46
3.1.1	LED-Based Street Lighting in the United Kingdom	3-6
3.1.2	LED-Based Operating Theater Lighting	3-25
3.1.3	LED-Based Operating Theater Lighting	3-26
3.1.4	LED-Based Operating Theater Lighting	3-27
3.1.5	LED-Based Airfield Runway Edge Lighting (Solar Powered)	3-32
3.1.6	LED-Based Solar Powered Airfield Light	3-33
3.1.7	LED Technology for Stage Lighting	3-37
3.1.8	Entertainment & Architectural Lighting: Multiple Color LED in a Surface-Mount (SMT) Package	3-38
3.1.9	Color Mixer Reflector for LED Technology Lighting	3-39
3.1.10	LED Technology for Under-Cabinet Lighting	3-41
3.1.11	LED-Based Linear Lamps used in Warehousing Application	3-42
3.1.15	48-inch Fluorescent Replacement Style LED Light Fixture	3-47
3.1.16	DIP T8 – Linear Tube Lamps With Plastic End-Caps	3-50
3.1.17	SMD T8 and T5 – LED Linear Tube Lamps With Plastic End-Caps	3-51
3.1.18	DIP-Type LED Linear Tube Lamps with Plastic End-Caps	3-54
3.1.19	DIP-Type LED Linear Tube Lamps with Metal End-Caps	3-55
3.1.20	SMD-Type LED Linear Tube Lamps with Metal End-Caps	3-56
3.1.21	SMD-Type High-Output LED Linear Tube Lamps with Plastic End-Caps	3-57
3.2.1	LED-Based PAR 30 Lamp	3-64
3.2.2	LED-Based PAR Lamps in SSL General Lighting European Forecast, by Sub-Region (\$ Million)	3-72
3.2.3	LED-Based PAR Lamps in SSL General Lighting European Forecast, by Sub-Region (Quantity)	3-73
3.2.4	LED-Based PAR Lamps in SSL General Lighting European Forecast, by Sub-Region (ASP, \$)	3-74
3.3.1	General Service LED-based Lamp (A-Style Bulb Category)	3-82
3.3.2	Decorative (Candle-Style) LED-based Lamp (C-Style Bulb Category)	3-83
3.3.3	LED Round Panel Light	3-84
3.3.4	General Service/Decorative LED Lamps in SSL General Lighting European Forecast (\$ Million)	3-86
3.3.5	Gen. Service/Dec. LED Lamps in SSL Gen. Lighting European Forecast, by Sub-Region (\$ Million)	3-87
3.3.6	Gen. Service/Dec. LED Lamps in SSL Gen. Lighting European Forecast, by Sub-Region (Quantity)	3-88
3.3.7	Gen. Service/Dec. LED Lamps in SSL Gen. Lighting European Forecast, by Sub-Region (ASP, \$)	3-89
3.4.1	1W 12V GU5.3 / 2 Pin MR16 LED Replacement Lamp	3-94
3.4.2	MR Compatible LED Lamps in SSL General Lighting European Forecast, by Product (\$ Million)	3-95
3.4.3	MR Compatible LED Lamps in SSL General Lighting European Forecast, by Product (Quantity)	3-96
3.4.4	MR Compatible LED Lamps in SSL General Lighting European Forecast, by Product (ASP, \$)	3-97
3.4.5	MR Compatible LED Lamps: SSL General Lighting European Forecast, by Sub-Region (\$ Million)	3-101
3.4.6	MR Compatible LED Lamps in SSL General Lighting European Forecast, by Product (Quantity)	3-102
3.4.7	MR Compatible LED Lamps in SSL General Lighting European Forecast, by Product (ASP, \$)	3-103

**– List of Figures – Continued**

3.5.1	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Product (\$ Million)	3-110
3.5.2	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Product (Quantity)	3-111
3.5.3	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Product (ASP, \$)	3-112
3.5.4	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Sub-Region (\$ Million)	3-116
3.5.5	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Sub-Region (Quantity)	3-117
3.5.6	Linear Tube LED Lamps in SSL General Lighting European Forecast, by Sub-Region (ASP, \$)	3-118
3.6.1	LED Street Lamps Undergoing Test Operations	3-122
3.6.2	LED Street Lamps in SSL General Lighting European Market Forecast (\$ Million)	3-125
3.6.3	LED Street Lamps in SSL General Lighting European Market Forecast (Quantity)	3-126
3.6.4	LED Street Lamps in SSL General Lighting European Market Forecast (ASP, \$ each)	3-127
3.6.5	LED Street Lamps in SSL General Lighting European Forecast, by Sub-Region (\$ Million)	3-128
3.6.6	LED Street Lamps in SSL General Lighting European Forecast, by Sub-Region (Quantity)	3-129
3.6.7	LED Street Lamps in SSL General Lighting European Forecast, by Sub-Region (ASP, \$)	3-130
4.1	PCB Assembly	4-23
4.2	LED Backlit Display	4-25
4.3	Rugged Touch Screen with NVIS Capability	4-40
4.4	LED Down light with 102 Lumens per Watt Fixture	4-54
4.5	LED Lighting Military Solutions	4-56
4.6	LED Lighting in Railway Station	4-59
4.7	LED Technology Safelight Design	4-70
4.8	LED Lighting (water flow stream)	4-74
4.9	NVIS/LED Control Panel	4-78
4.10	Integrated Weapons Delivery System	4-79
4.11	Cockpit Modular Display/Panel	4-88
4.12	Cockpit Large Area Display	4-89
4.13	Traffic Lamp LED	4-96
4.14	High Power LED Lamp	4-96
4.15	Surface Mount Type LED	4-97
4.16	Surface Mount Type LED	4-100
4.17	Exterior Aircraft LED Lighting	4-104
4.18	LED/CCD Barcode Readers	4-116
4.19	Surface-Mount Multi-layer Ceramic Packages	4-121
4.20	LED Linear Optical Array	4-127
4.21	Solid-State NVIS Lamps	4-139
4.22	LED Escalator Light	4-143
4.23	Nanostructures Designed for Different Color Emission	4-147
4.24	LED Array Lighting – Lamp	4-153
4.25	Light-Measurement Device	4-162
4.26	SSL LED: Replacement for Halogen Lamp in Spotlights	4-168
4.27	LED-Based Digital Billboard (Signage/Display)	4-184
4.28	Diagram of Backlight LED Drivers	4-187
4.29	Diagram of Multifunction Backlight LED Drivers	4-188
4.30	Diagram of White Backlight LED Drivers	4-199
4.31	Diagram White Backlight LED Drivers	4-190
4.32	Rotary Wing Aircraft Cockpit Display	4-192
4.33	Ultra-Thin LED	4-204
4.34	Quality Management System in LED Manufacturing	4-207
4.35	Military and Harsh-Environment LEDs	4-227
4.36	LED-Based Marine Biology Lighting Device	4-232
5.1	Market Research & Forecasting Methodology	5-3