



[CLICK TO VIEW](#)

[Table of Contents 2](#)

[List of Tables & Charts 3](#)

[Study Overview 4](#)

[Sample Text, Table
& Chart 5](#)

[Sample Profile, Table &
Forecast 6](#)

[Order Form & Corporate
Use License 7](#)

[About Freedonia,
Custom Research,
Related Studies, 8](#)

LEDs & High Efficiency Lighting

US Industry Study with Forecasts for **2017 & 2022**

Study #3068 | November 2013 | \$5300 | 333 pages

www.freedoniagroup.com



The Freedonia Group

767 Beta Drive

Cleveland, OH • 44143-2326 • USA

Toll Free US Tel: 800.927.5900 or +1 440.684.9600

Fax: +1 440.646.0484

E-mail: info@freedoniagroup.com

Table of Contents

EXECUTIVE SUMMARY

MARKET ENVIRONMENT

General	4
Demographic Trends	5
Macroeconomic Outlook	10
Consumer Income & Expenditure Outlook	13
Construction Trends	16
Residential Building Construction	19
Housing Outlook	22
Housing Stock	26
Improvements & Repairs	30
Nonresidential Building Construction	32
Construction Expenditures	33
Nonresidential Building Stock	35
Improvements & Repairs	37
Nonbuilding Construction	39
Highway Spending	41
Motor Vehicle Trends	43
Manufacturing Outlook	47
Pricing Trends	51
Environmental & Regulatory Issues	54
General Regulations & Standards	54
Energy-Efficiency Concerns	57
Energy Acts	57
American Recovery and Reinvestment Act of 2009	59
State Regulations	60
Energy-Efficient Lighting Programs	61
Other Environmental Concerns	62
Lamp & LED Industry Overview	63
Foreign Trade	65
Imports	66
Exports	67

TECHNOLOGY &

CRITICAL COMPONENTS

General	69
Light Source Characteristics	69
Luminous Efficacy	69
Light Quality	72
Lighting Fixtures	74
Other Light Source Characteristics	77
Remote Source Lighting	78
Fiber Optic	80
Product Characteristics & Performance	80
Markets	81
Prism Light Guides	82
Phosphors	84

Critical LED Components	86
Ballasts	89
Fluorescent	90
High Intensity Discharge	92

PRODUCTS

General	94
LEDs	96
Product Characteristics	100
Suppliers	104
High Efficiency High Intensity Discharge Lamps	104
Product Characteristics	107
Metal Halide Lamps	108
Product Characteristics	110
Suppliers	112
Sodium Vapor Lamps	112
Product Characteristics	114
Suppliers	116
High Efficiency Fluorescent Lamps	116
Product Characteristics	118
Compact Fluorescent Lamps	120
High Output Fluorescent Lamps	124
Energy-Efficient Fluorescent Lamps	126
Suppliers	129
Other High Efficiency Lighting Products	129
Product Characteristics	130
Suppliers	134

MARKETS

General	135
Buildings	138
Residential	140
Nonresidential	143
Office & Commercial	146
Institutional	148
Industrial	150
Other	152
Outdoor Lighting	154
Consumer Products	158
Motor Vehicles	161
Demand by Sector	164
Demand by Vehicle Class	166
Other Markets	168

REGIONS

General	171
Regional Demographic & Economic Trends	171
Population Patterns	172
Economic Outlook	175

Construction Activity	178
Housing	181
Regional Demand for High Efficiency Lighting	184
Northeast	187
New England	188
Middle Atlantic	189
Midwest	191
East North Central	195
West North Central	196
South	197
South Atlantic	199
East South Central	201
West South Central	202
West	203
Mountain	206
Pacific	207

INDUSTRY STRUCTURE

General	209
Industry Composition	210
Market Share	213
Product Development	218
Manufacturing	221
Marketing	223
Green Marketing	224
Consumer-Focused Strategies	225
Other Market-Specific Strategies	226
Distribution	228
Consumer	229
Nonresidential	231
OEM	233
Mergers & Acquisitions	233
Cooperative Agreements	236

COMPANY PROFILES

Advanced Lighting Technologies	242
Bridgelux Incorporated	245
Bulbrite Industries	247
Cree Incorporated	248
Data Display Products	253
Dialight plc	254
EiKO Limited	256
Excelitas Technologies	258
Feit Electric	260
Fiat SpA	262
General Electric	264
Grupo Antolin-Irausa	269
Interlectric Corporation	271
Iwasaki Electric	272

(continued on following page)

[Click here to purchase online](#)

Table of Contents

(continued from previous page)

Koito Group	274
Kumho Electric	276
LEDtronics Incorporated.....	277
LG Electronics.....	279
Light Sources	281
Lighting Science Group	283
Lights of America.....	284
MaxLite Incorporated.....	286
National Cathode	288
Nichia Corporation	289
OSRAM Licht.....	291
Panasonic Corporation	297
Revstone Industries.....	299
Royal Philips.....	301
Samsung Electronics.....	306
Seoul Semiconductor	308
Siemens AG.....	310
Stanley Electric Company Limited	311
SunLED Company Limited	313
TCP International Holdings Limited.....	314
3M Company	317
Toshiba Corporation	319
Toyoda Gosei Company Limited	323
Trojan Incorporated.....	325
Ushio Incorporated	326
Varroc Group	329
Additional LED & High Efficiency Lighting Companies.....	331

List of Tables/Charts

EXECUTIVE SUMMARY

1 Summary Table.....	3
----------------------	---

MARKET ENVIRONMENT

1 Population & Households.....	9
2 Macroeconomic Indicators	13
3 Personal Consumption Expenditures	16
4 Construction Expenditures	19
5 Residential Building Construction Expenditures	21
6 New Housing Indicators	26
7 Housing Stock by Type	29
Cht Year of Construction of Housing Stock, 2012	30

8 Residential Improvement & Repair Expenditures	32
9 Nonresidential Building Construction Expenditures	35
10 Nonresidential Building Stock.....	37
11 Nonresidential Building Improvement & Repair Expenditures	39
12 Nonbuilding Construction Expenditures....	41
13 Highway Spending.....	43
14 Motor Vehicle Indicators.....	47
15 Manufacturers' Shipments	51
16 Selected High Efficiency Lighting Prices...53	
Cht Selected High Efficiency Lighting Prices, 2002-2022.....	53
17 Lighting Industry Demand	65
18 High Efficiency Lighting Foreign Trade	66

TECHNOLOGY & CRITICAL COMPONENTS

Cht Luminous Efficacy of Selected Light Sources	72
Cht Light Quality of Selected Light Sources....	74
1 Critical LED Component Demand	88
2 High Efficiency Ballast Demand	90

PRODUCTS

1 High Efficiency Lighting Supply & Demand.....	95
Cht High Efficiency Lighting Demand by Product, 2012	96
2 LED Demand by Type & Market.....	100
3 High Efficiency High Intensity Discharge Lamp Demand by Type & Market	107
4 Metal Halide Lamp Demand	110
5 Sodium Vapor Lamp Demand	114
6 High Efficiency Fluorescent Lighting Demand by Type & Market	118
7 Compact Fluorescent Lamp Demand by Type	124
8 High Output Fluorescent Lamp Demand..	126
9 Energy-Efficiency Fluorescent Lamp Demand by Type	128
10 Other High Efficiency Lighting Demand by Market	130

MARKETS

1 High Efficiency Lighting Demand by Market	137
Cht High Efficiency Lighting Demand by Market, 2012	137

2 Buildings Market for High Efficiency Lighting.....	139
3 Residential Buildings Market for High Efficiency Lighting.....	143
4 Nonresidential Buildings Market for High Efficiency Lighting.....	146
5 Office & Commercial Buildings Market for High Efficiency Lighting.....	148
6 Institutional Buildings Market for High Efficiency Lighting.....	150
7 Industrial Buildings Market for High Efficiency Lighting.....	152
8 Other Nonresidential Buildings Market for High Efficiency Lighting.....	154
9 Outdoor Lighting Market for High Efficiency Lighting.....	158
10 Consumer Product Market for High Efficiency Lighting.....	160
11 Motor Vehicle Market for High Efficiency Lighting.....	163
12 High Efficiency Motor Vehicle Lighting Demand by Sector.....	166
13 High Efficiency Motor Vehicle Lighting Demand by Vehicle Class	168
14 Other Markets for High Efficiency Lighting	170

REGIONS

1 Population by Region.....	175
2 Gross Domestic Product by Region.....	178
3 Construction Expenditures by Region.....	181
4 Regional Housing Indicators	184
5 High Efficiency Lighting Demand by Region	186
Cht High Efficiency Lighting Demand by Region, 2012	186
6 Northeast: High Efficiency Demand by Subregion & Market.....	188
7 Midwest: High Efficiency Lighting Demand by Subregion & Market.....	194
8 South: High Efficiency Lighting Demand by Subregion & Market.....	199
9 West: High Efficiency Lighting Demand by Subregion & Market.....	205

INDUSTRY STRUCTURE

1 US High Efficiency Lighting Sales by Company, 2012.....	212
Cht High Efficiency Lighting Market Share by Company, 2012.....	214
2 Selected Acquisitions & Divestitures.....	235
3 Selected Cooperative Agreements.....	237

[Click here to purchase online](#)

Demand will be driven by rapid gains for LEDs, supported by both technological innovations and regulatory changes such as a ban on most general service incandescent lamps after 2013.

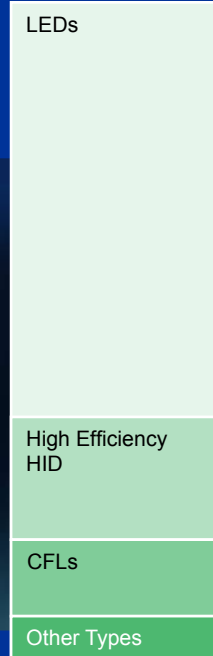
US demand to rise 10.4% annually through 2017

US demand for high efficiency lighting will increase over 10 percent annually to \$11.7 billion in 2017. The market will be driven by rapid gains for LEDs, supported by both technological innovations and the effects of regulatory changes. Most notable are the provisions of the Energy Independence and Security Act (EISA) of 2007, which effectively banned the manufacture and import of most general service incandescent lamps after 2013. In addition to the ban on 'light bulbs', high efficiency fluorescent lamps, particularly T5 fluorescent tubes, are increasingly expected to replace less efficient products.

Demand for LEDs to more than double

The market for LEDs is projected to more than double between 2012 and 2017. LED lighting products will take share from traditional lamps in nearly every major lighting market, with especially strong growth in outdoor lighting, residential, and nonresidential applications. LEDs will benefit from a shift toward high efficiency lighting in the residential market spurred by EISA and by increased cost competitiveness in a number of nonresidential and outdoor lighting applications. Ongoing improvements in light quality and long term performance will boost adoption rates.

US High Efficiency Lighting Demand, 2017 (\$11.7 billion)



High efficiency HIDs, fluorescents to see gains

Demand for both high efficiency HID and high efficiency fluorescent lamps will see increases through 2017, albeit at a much slower pace overall than the growth in LED lighting products. The high efficiency HID lamp market will benefit from relatively solid growth in the outdoor lighting market and increasing market penetration in the motor vehicle market. However, the market for HID lamps is expected to decline between 2017 and 2022, primarily due to the rising penetration levels of LED lighting in the outdoor market, which utilizes the most expensive high wattage types and will therefore cause big declines in value terms.

The rising penetration of energy efficient T5 lamps, in place of less efficient T8 and T12 products, will provide significant opportunities for high efficiency fluorescent lamps. However, CFL demand will decline through 2017 since 2012 represents an elevated base for CFLs that were replacing less efficient lamps facing regulatory phase out programs. While CFLs will continue to benefit from increased efficiency standards through 2014, by 2017 many of the inefficient products will have been replaced and the longer service lives of CFLs will restrain demand. CFLs are primarily used in the residential market, while other types of high efficiency fluorescent lamps are typically used in nonresidential buildings.

Copyright 2013 The Freedonia Group, Inc.

[Click here to purchase online](#)

Sample Text, Table & Chart

MARKETS

Residential

Demand for high efficiency lighting products in motor vehicles totaled \$540 million in 2012, or eight percent of the total motor vehicle market. The motor vehicle market encompasses automobiles, light trucks and such other motor vehicles as medium- and heavy-duty trucks and buses. High efficiency lighting products are used for a wide range of interior and exterior lighting applications in these vehicles. Interior lighting applications include vanity lights, dome lights, and dashboard lights, as well as various dashboard lights used to illuminate the speedometer and other gauges and controls. Exterior vehicular lighting applications comprise headlamps, turn signals, parking lights, brake lights, fog lights, auxiliary lights as fog lights, vehicle-mounted spot lights, and off-road lights. On average, approximately 60 OEM light sources are used per motor vehicle, although this number is significantly higher for large vehicles such as heavy trucks and buses.

Demand for high efficiency lighting products used in motor vehicle applications is expected to increase to \$600 million in 2017. The market will be spurred by the production of new vehicles from the low 2012 level, as well as the replacement of vehicles in use, which will support the use of higher value products, such as LEDs, will also spur increases.

Historically, less efficient products such as halogen and incandescent lamps have accounted for the largest share of demand in the motor vehicle market. Halogen lamps used in headlights became popular in the US in the 1980s, as these lamps provided greater illumination than conventional incandescent lamps. Metal halide lamps -- a type of high efficiency HID lamp also referred to as xenon lamps in the motor vehicle market -- are expected to see strong growth through 2017 as they continue to take market share from halogen lamps in headlight applications.

Copyright 2013 The Freedonia Group, Inc.

**SAMPLE
TEXT**

TABLE IV-3

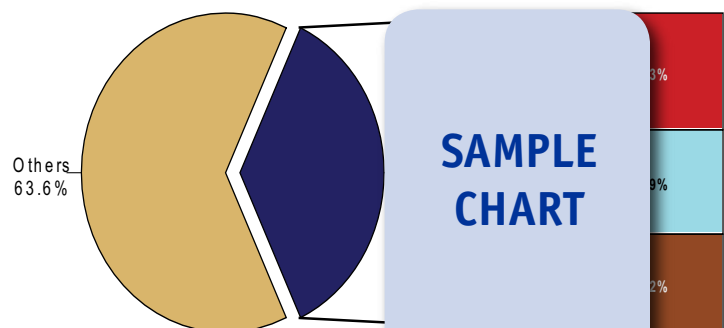
HIGH EFFICIENCY HIGH INTENSITY DISCHARGE LAMP DEMAND BY TYPE & MARKET (million dollars)

Item	2002	2007	2012	2017	2022
Highway Noncapital Spending (bil 2005 \$ HID/000\$ highway spending)					
High Efficiency HID Lamp Demand					
By Type:					
Metal Halide					
Sodium Vapor					
By Market:					
Nonresidential					
Outdoor Lighting					
Motor Vehicle					
Other					

**SAMPLE
TABLE**

CHART VII-1

HIGH EFFICIENCY LIGHTING MARKET SHARE BY COMPANY (\$7.1 billion, 2012)



**SAMPLE
CHART**

Sample Profile, Table & Forecast

TABLE VI-8
SOUTH: HIGH EFFICIENCY LIGHTING DEMAND
BY SUBREGION & MARKET
 (million dollars)

Item	2002	2007	2012	2017	2022
South GDP (bil \$)	300	350	400	450	500
\$ lighting/mil \$ GDP	0.01	0.01	0.01	0.01	0.01
South High Efficiency Light Demand	200	250	300	350	400
By Subregion:					
South Atlantic	100	120	140	160	180
East South Central	80	100	120	140	160
West South Central	120	150	180	210	240
By Market:					
Residential	100	120	140	160	180
Nonresidential	80	100	120	140	160
Motor Vehicle	100	120	140	160	180
Other	20	25	30	35	40
% South	20	25	30	35	40
Total High Efficiency Light Demand	200	250	300	350	400

**SAMPLE
PROFILE**

**SAMPLE
TABLE**

**STUDY
COVERAGE**

This Freedonia study, **LEDs & High Efficiency Lighting**, offers historical data (2002, 2007, 2012) plus forecasts for 2017 and 2022 by product, market and US region. The study also assesses key technological and critical components, details market environment factors, evaluates company market share and profiles 40 active competitors in the US industry.

COMPANY PROFILES

Bridgelux Incorporated

101 Portola Avenue
 Livermore, CA 94551
 925-583-8400
<http://www.br>

Annual Sales:

Employment:

Key Products:

Bridgelux is a vertically integrated manufacturer of solid state lighting systems. The privately held company has a plant in Livermore, California and sales, customer support, and other facilities in the US, France, China, Taiwan, and Hong Kong.

The Company is active in the US LED and high efficiency lighting industry via the manufacture of solid state LED arrays, which are engineered to replace incandescent, halogen, fluorescent, and high intensity discharge lighting products. These arrays are high performance, energy efficient lighting units that include gallium nitride (GaN)-on-silicone and GaN-on-sapphire types. Among Bridgelux's LED arrays are LS series miniaturized units, which can provide both diffuse and directional light in landscape, home, and retrofit lighting applications; ES series arrays that are 30 percent more energy efficient than other LED arrays; and RS series high light output units for retail, street, wide area, high bay, and commercial lighting end uses. The Company also makes VERO LED arrays for retail, industrial, retrofit, and other lighting applications. These arrays are suitable for interior and exterior use. In April 2012, the Company introduced VERO LED arrays for commercial lighting end uses. Bridgelux's HELIEON LED arrays are high efficiency, plug-and-play, solid state units that are suitable for decorative,

Copyright 2013 The Freedonia Group, Inc.

ONLINE: www.freedoniagroup.com

MAIL: Print out and complete the order form and send to The Freedonia Group (see address at the bottom of this form)

PHONE: Call toll free, 800.927.5900 (US) or + 1 440.684.9600

FAX: + 1 440.646.0484 (US)

EMAIL: info@freedoniagroup.com

Free Handling & Shipping

There is NO charge for handling or UPS shipping in the US. Expect delivery in 3 to 5 business days. Outside the US, Freedonia provides free airmail service. Express delivery is available at cost.

Orders Outside of the US

Checks must be made payable in US funds, drawn against a US bank and mailed directly to The Freedonia Group. For wire transfers please contact our customer service department at info@freedoniagroup.com. Credit cards accepted.

Credit Card Orders

For convenience, Freedonia accepts American Express, MasterCard or Visa. Credit card purchases must include account number, expiration date and authorized signature.

Save 15%

If you order three (3) different titles at the same time, you can receive a 15% discount. If your order is accompanied by a check or wire transfer, you may take a 5% cash discount (discounts do not apply to Corporate Use Licenses).

Corporate Use License

Now every decision maker in your organization can act on the key intelligence found in all Freedonia studies. For an additional \$2600, companies receive unlimited use of an electronic version (PDF) of the study. Place it on your intranet, e-mail it to coworkers around the world, or print it as many times as you like,

Click here to learn more about the Corporate Use License

ORDER FORM

F-WEB.3068

LEDs & High Efficiency Lighting..... \$5300

Corporate Use License (add to study price) * + \$2600

Additional Print Copies @ \$600 each *

Total (including selected option) \$

Enclosed is my check (5% discount) drawn on a US bank and payable to The Freedonia Group, Inc., in US funds (Ohio residents add 8% sales tax)

Bill my company American Express MasterCard Visa

Credit Card # grid

Expiration Date MM YY

Signature

Name

Title

Company

Division

Street (No PO Box please)

City/State/Zip

Country

Phone Fax

Email

* Please check appropriate option and sign below to order an electronic version of the study.

Corporate Use License Agreement

The above captioned study may be stored on the company's intranet or shared directory, available to company employees. Copies of the study may be made, but the undersigned represents that distribution of the study will be limited to employees of the company.

Signature

Individual Use License Agreement

The undersigned hereby represents that the above captioned study will be used by only individual(s) who are employees of the company and that the study will not be loaded on a network for multiple users. In the event that usage of the study changes, the Company will promptly notify Freedonia of such change and will pay to Freedonia the appropriate fee based on Freedonia's standard fee schedule then in effect. Note: Entire company corporate use license, add \$2600; one additional user, add \$600; two additional users, add \$1200; three additional users, add \$1800.

Signature

OTHER STUDIES

World Major Household Appliances

This study analyzes the world major appliance industry. It presents historical demand data for 2002, 2007 and 2012, and forecasts for 2017 and 2022 by appliance product (refrigerators and freezers, clothes washers and dryers, cooking appliances, dishwashers), world region and major country. The study also considers market environment factors, details industry structure, evaluates company market share and profiles industry players.

#3098.....January 2014..... \$6400

Lamps

US demand for lamps is forecast to be restrained in unit terms, due to a ban on the manufacture and sale of most general service incandescent lamps by 2014. More expensive halogen lamps and high intensity discharge (HID) lamps will be the fastest growing products, causing total lamp demand to contract only slightly in value terms to \$7.2 billion in 2017. This study analyzes the \$7.4 billion US lamp industry, with forecasts for 2017 and 2022 by product and market. The study also evaluates company market share and profiles industry players.

#3054.....October 2013..... \$5300

SPECIAL OFFER:
Buy both *Lamps*
and *LEDs* studies
for \$8900 --
save \$1700!

World Lighting: Lamps & LEDs

World demand for lighting is projected to climb more than 12 percent annually through 2016 to \$78.3 billion. Market gains in developing countries will outpace sales in the US, Western Europe, and Japan. LED (or solid state) lighting devices will record by far the fastest global market gains. This study analyzes the \$43.9 billion global industry for lamps and LEDs used in lighting applications, with forecasts for 2016 and 2021 by product, market, world region and for 18 countries. The study also evaluates company market share and profiles industry participants.

#2979.....January 2013..... \$6200

World Lighting Fixtures

Global demand for lighting fixtures will climb 6.9 percent annually through 2016 to \$153 billion. China alone will account for over one third of all new demand, retaining its position as the largest national market. Nonportable indoor lighting fixtures will record the fastest gains, fueled by a recovery in residential construction spending. This study analyzes the \$109.5 billion world lighting fixture industry, with forecasts for 2016 and 2021 by product, market, world region and for 24 major countries. The study also evaluates company market share and profiles industry competitors.

#2946.....September 2012..... \$6300

About The Freedonia Group

The Freedonia Group, Inc., is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States, the emerging China market, and other world markets. Industries analyzed by Freedonia include:

- Chemicals • Plastics • Life Sciences • Packaging • Building Materials • Security & Electronics • Industrial Components & Equipment • Automotive & Transportation Equipment • Household Goods • Energy/Power Equipment

[Click here to learn more about Freedonia](#)

Freedonia Custom Research

Freedonia Custom Research delivers the same high quality, thorough and unbiased assessment of an industry or market as an industry study. Since the research initiative is based upon a company's specific needs, companies harness Freedonia's research capabilities and resources to answer unique questions. When you leverage the results of a Freedonia Custom Research engagement, you are able to obtain important answers to specific questions and issues associated with: mergers and acquisitions, new product launches/development, geographic expansion, entry into new markets, strategic business planning, and investment and funding decisions.

Freedonia Custom Research is ideal for companies seeking to make a strategic difference in the status quo and focus on future business growth. Working side by side with clients, Freedonia's team is able to define a research project that is custom-tailored to answer specific questions and provide the basis from which a company can make informed business decisions.

[Click here to learn more about Custom Research](#)



[Click here for complete title list](#)



[Click here to visit freedoniagroup.com](http://www.freedoniagroup.com)