Borealis Lighting
Advancing America Forward with Energy and Economic Opportunities
September 11, 2012

BOREALIS℠
Green Lighting for the Future

Sandra Goeken Miles 630-551-1533, or e-mail to: smiles@polybrite.com

The Perfect Storm

Political

- Global Pressures from UN/Copenhagen
- Decrease use of foreign oil
- Sustainability initiatives promoted by government
- Banning of the incandescent

Economic

- Still in a recession
- Economics force reduction

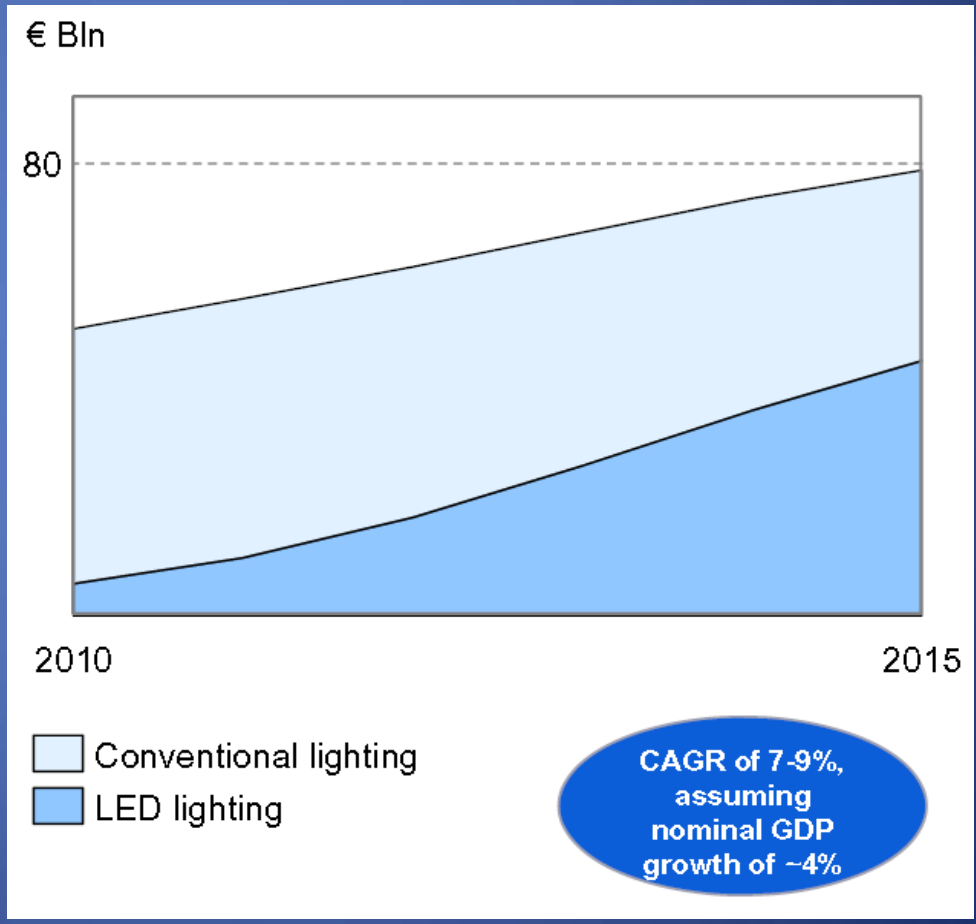
Social

- Climate change embraced
- Green “movement” popularity

Global LED Lighting Forecast

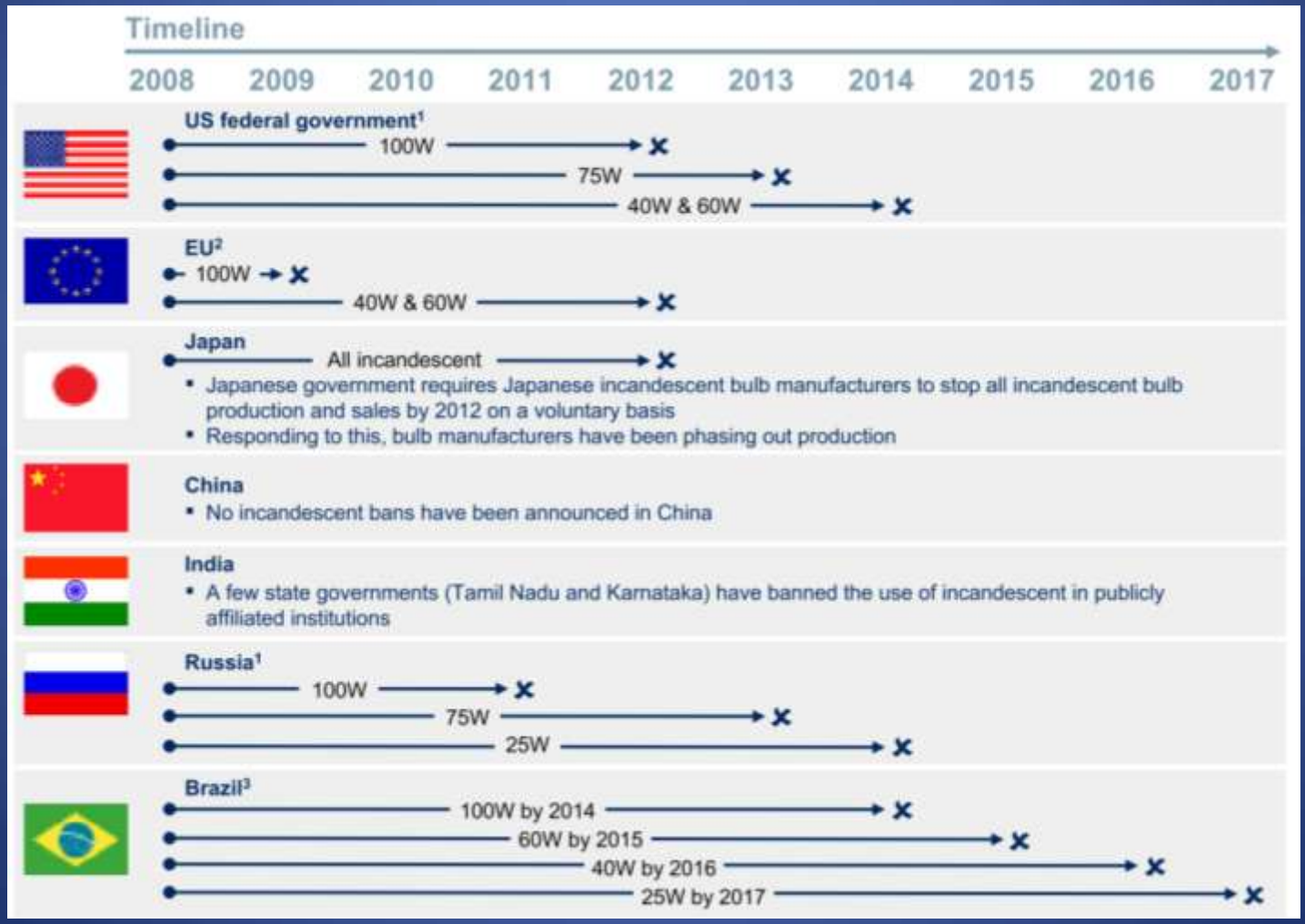
LED Lighting will account for 50% of the global market by 2015.

Lighting market described as “extremely dynamic” and predicted an annual growth of 7-9% per annum between 2010 and 2015 to a value of $108B.



Source: Philips Lighting global market study 2009, updated for 2010

Incandescent Ban is now a Global Movement



SOURCE: McKinsey Global Lighting Market Model; McKinsey Global Lighting Professionals & Consumer Survey

Goeken Group Corp.

Telecommunications pioneer John D. “Jack” Goeken
- known worldwide in the communications industry,
and as an innovative entrepreneur.
Dr. Goeken is Chairman and CEO of Goeken Group Corp.,
and founded the following companies

1963 MCI Second largest phone company - $35 billion annual revenues
1969 ***SAFP*** (Spectrum Analysis & Frequency Planning)
1970 ***CML*** A domestic satellite company made up of Comsat, MCI & Lockheed

1974 FTD Mercury Network Largest on-line computer network – 25 million terminals

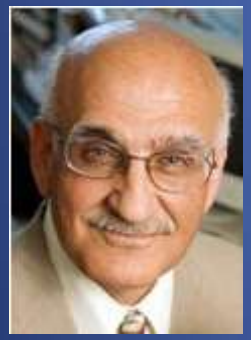
1976 **BTC Business Telecommunications Corp**., Chicago - Milwaukee
1976 **Railfone** Telephone service to rail passengers – still in operation for over 30 years.

1977 Airfone First commercial air-to-ground telephone system

1989 In-Flight Phone Corporation First fully digital air-to-ground telephone service
1995 **Goeken Group Corp**. Specializing in health, safety and lighting

PolyBrite International – Borealis Lighting

Carl Scianna: Pioneered and patented the technology that serves as the cornerstone of PolyBrite's product lines. This optical illumination technology, combining LED technology with a unique polymer intensifies and disperses light through a variety of lens shapes, sizes, flexes and finishes. Mr. Scianna oversees all aspects of PolyBrite's operations, including research & development, product design, manufacturing and quality control.



Dr. Munir Nayfeh: Founded NanoSi Advanced Technology, Inc. and invented patented process for creating silicon nanoparticles. Munir Nayfeh is also a Professor of Physics at the University of Illinois at Urbana-Champaign ("UIUC"). In October of 2006, Dr. Nayfeh partnered with PolyBrite and began integrating his NanoSi's silicon nanoparticle technology into PolyBrite's LED products. This technology improves the brightness and composition of light, making it look whiter and less blue, and filters residual ultraviolet light.

Speaker John Dennis Hastert: Served as Speaker of the House from 1999 to 2007 and a Republican representative of the 14th Congressional District of Illinois from 1987 to 2007. Known for being "greener than many of his fellow colleagues in the House," Speaker Hastert continued his quest to promote LED technology and joined Goeken Group as a Strategic Advisor on March 21, 2008.

Longest LED Experience in Industry

1995 Launch Customer = US Government

- Air Craft Carriers
- Nuclear Submarine
- Military Helicopters

Current LED Product Range

Why Borealis lamps are different?

- State-of-the-art LEDs
- Polymer Lens
  Light Dispersion
- Electronics
- Heat Management
- Dimmable
- Unbreakable
- Optic Lens

Burn out: Weak links affect HB-LED lifetime

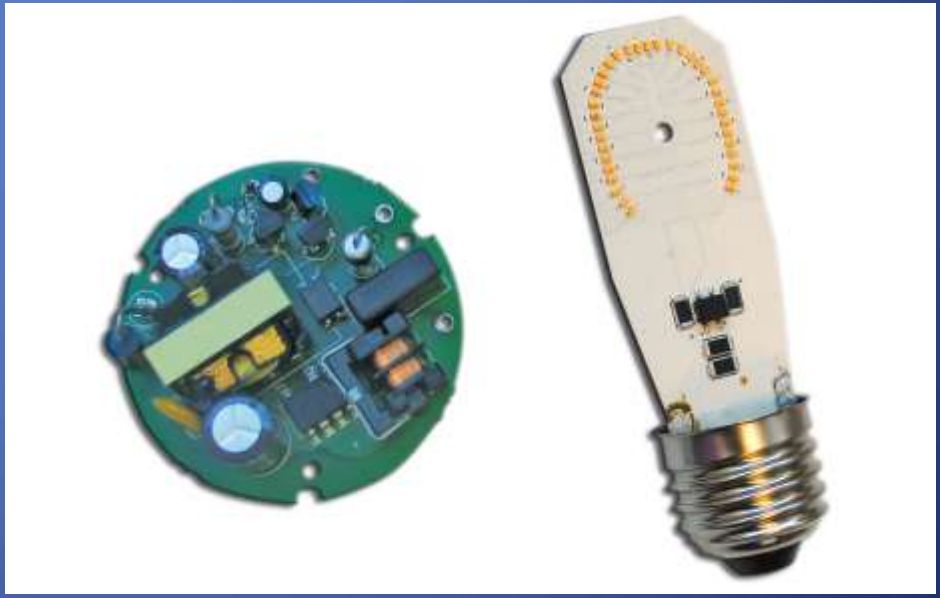
By Margery Conner, Technical Editors, EDN, 2/18/2010

edn.com

"High-brightness LEDs for solid state lighting can last 50,000 hours or more, but the components surrounding them generate heat that can cause early failures. Proper selection of capacitors and other components, along with thermal management, can help save your LEDs from an early demise"

"People see capacitors as being the Achilles' heel of SSL"

– Geof Potter, a power technologist at Texas Instruments



Previous **Current**

True A19 and B10 Shape
Patented Filament Look

Patented Low Power LEDs in sequence

- Looks exactly like incandescent filament burning
- More efficient
- Moves heat into base
- Low cost to manufacture

Non Visible Heat Sink Technology

Current Competition*

- Expensive to produce
- Heavy to support
- Bulky and hard to fit

Borealis PAR Lamps

- No visible heat sink of fins
- Lightweight
- Same form fit as traditional lamp

*Lighting Sciences – PAR38

Borealis
Canopy/Tunnel/Street Light/High Bay
The most versatile LED HID replacement fixture on the market

NO other LED High Bay can be fit to all these applications

75W (Avg.) LED Canopy Light
Replaced a 150W & 175W CMH
30 Fixtures
255,000 Kwh Saved = $29,415
Total Savings = $40,997
ROI: 2.56 Years

Unilever

BOREALIS℠
INNOVATIVE LED LIGHTING

LED Street Lighting

Borealis LED Street Lighting is the environmentally friendly, energy savings replacement solution for conventional HPS or HID street lamps. Borealis LED Lighting provides a sharp, accurate color rendering of objects which creates better visibility enhancing safety outdoors. By providing more control over what is illuminated, Borealis reduces light pollution making it ideal for public lighting. Borealis lighting features an instant "on" with no cold starting as compared to HPS lights, and is better equipped to withstand extreme temperature variations, reducing maintenance and bulb replacement. Motion sensors and lighting controls can also be used with Borealis to further reduce operating costs.

Specifications

- Efficacy: >80 LPW
- Power Consumption: 60W – 270W
- Initial Flux: 5400 lm – 22800 lm
- CCT: 4500°K – 5500°K - Pure White
  6000°K – 7000°K - Cool White
- CRI: Ra>75
- Power factor: >0.99
- Input voltage: 100 – 277V_{AC}, 50/60 Hz*
- Working Conditions: 50,000 hrs
  Temperature -40°F~122°F, Humidity 10%~95%

Features

- 150W–400W HPS replacement*
- Typical mounting height of 15–50 feet*
- Patented heat dissipation design, achieves optimum efficiency
- UL E340511 - Light-emitting-diode Surface Mounted Luminaires
- IP rating: IP66 - water and vapor tight
- Lab listed and testing in accordance with IES standards CE/LVD, CE/EMC, RoHS
- Knuckle angle can be adjusted from 0 to 90°
- Die-cast Aluminum housing available in black or white. Custom built colors available
- Wireless control system available for additional energy saving
- Models available with photosensor
- Vandal resistant
- 5 year warranty

* Depending on model

c UL us LISTED

Borealis Streetlights at Village of Oswego

250W Sodium Vapor (298 Watts withBallast)

Borealis 120W LED Street Light

Test: To see what wattage equivalent would match.

Findings: Borealis can go with significantly lower wattage unit and still be brighter than what they have.

Borealis and Municipalities
City of Naperville Test Results


Naperville

City Testing New LED Light Fixtures Along Diehl Road

Public Input on the Lights Being Accepted Through January 2010


BOREALIS

Green Lighting for the Future

PolyBrite International Announces Greener Results in Borealis LED Streetlight Testing

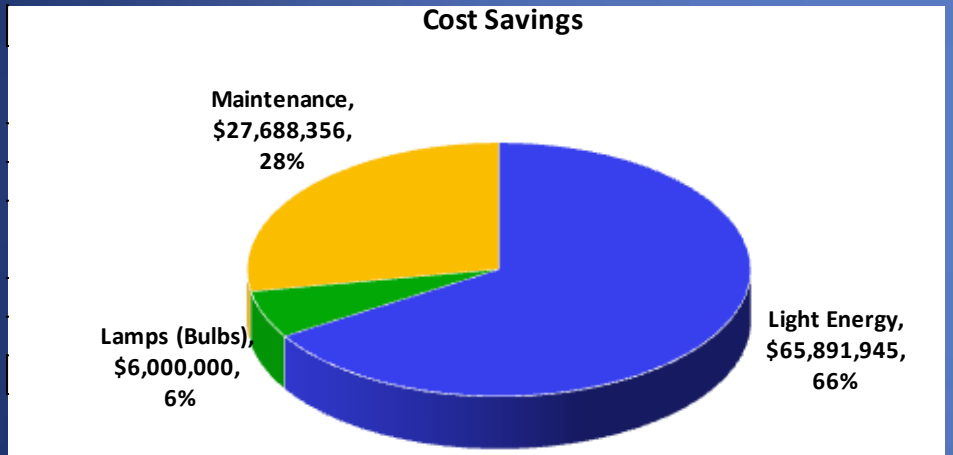
City of Naperville LED Test Site Meter Reading

				Monthly Consumption		Monthly Savings
				LED	HPS	
Installed meters 6/8/09						
Reading #1 7/5/2009	LED South	HPS North				
	00255 KWH		00618 KWH			
	1.07 KW		2.60 KW			
Reading #2 8/17/2009	LED South	HPS North				
	00660 KWH	01610 KWH		405	992	59.2%
	1.07 KW	2.61 KW				
	uth	HPS North				
	kwh		02194 kwh	242	584	58.6%
	w		2.59kw			
	uth	HPS North				
	kwh		03086 kwh	382	892	57.2%
	w		2.57kw			

City of Naperville's
Test Data Shows
Nearly 60% Savings
Of Energy Consumption

City/County of 1,000,000 Population: Retrofit 54,000 Streetlights

Assume an equal mix of 400W, 250W, and 175W Metal Halide Streetlights replaced by LED Streetlights. Useful Life of LEDs = 11.4 Years, useful life of MH Lights = 4.1 Years



COST SAVINGS ANALYSIS	*1st Year*	*Useful Life*
Light Energy Savings	$5,053,644	$65,891,945
HVAC Energy Savings	$0	$0
Product Savings *(Lamps)*	$525,600	$6,000,000
Maintenance Savings *(Installation + Ballast Replacement and Labor)*	$2,425,500	$27,688,356
TOTAL SAVINGS *(Energy, Product & Maint)*	**$8,004,744**	**$99,580,301**

INVESTMENT ANALYSIS	*Payback*	*IRR*
Investment After Rebate =	***$32,287,831***	
Light Energy Savings	6.39 Years	18.0%
Light & HVAC Energy Savings	6.39 Years	18.0%
TOTAL SAVINGS *(Energy, Product & Maint)*	**4.03 Years**	**21.9%**
Leaseback Annual Payment	**$7,242,483**	

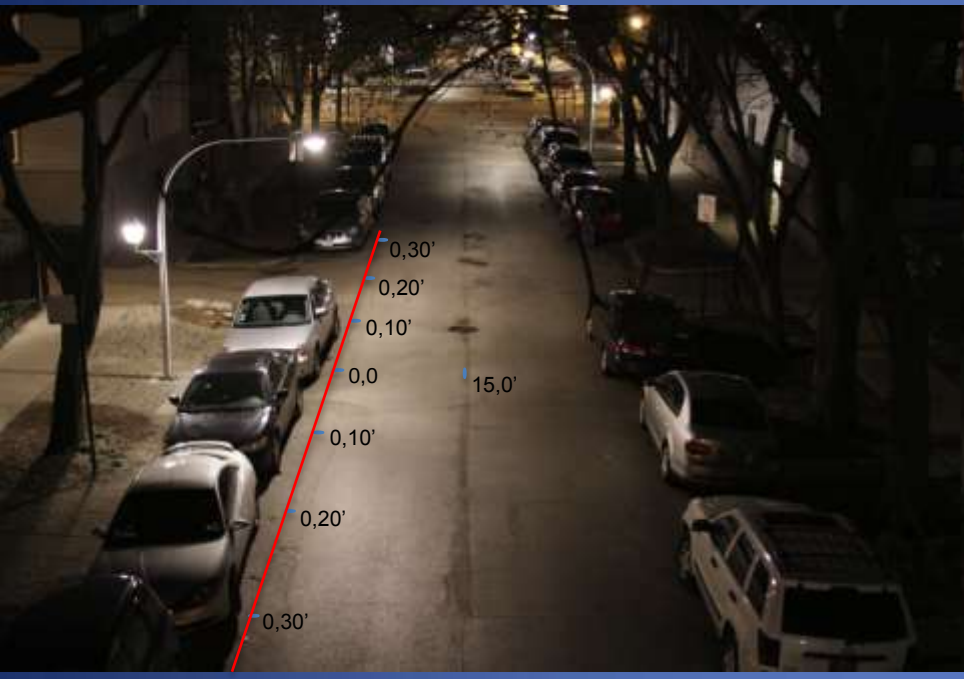
Leaseback for 54,000 Streetlights: Positive Cashflow from Year 1!

	Lease Payment	Savings Using LED Streetlights	Positive Cashflow Benefit
Year 1	$7,242,483	$8,004,744	$762,261
Year 2	$7,242,483	$8,156,353	$913,870
Year 3	$7,242,483	$8,312,511	$1,070,028
Year 4	$7,242,483	$8,473,353	$1,230,870
Year 5	$7,242,483	$8,639,021	$1,396,537
Year 6		$8,809,658	$8,809,658
Year 7		$8,985,415	$8,985,415
Year 8		$9,166,445	$9,166,445
Year 9		$9,352,905	$9,352,905
Year 10		$9,544,959	$9,544,959
Year 11.4 (Useful Life)		$12,595,278	$12,595,278
	$36,212,417	**$100,040,643**	**$63,828,226**

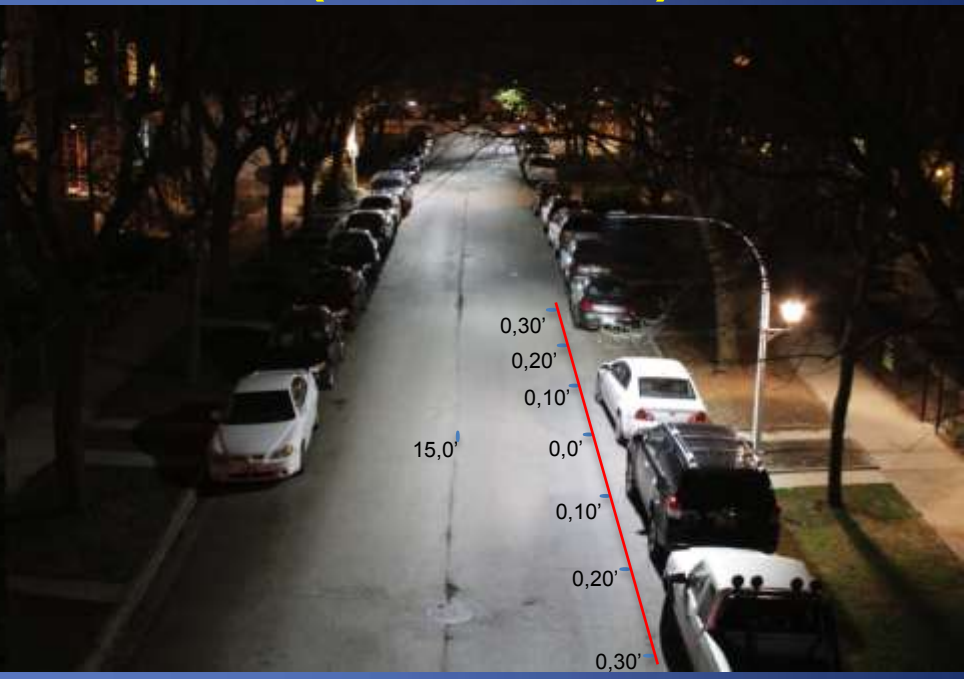
Borealis Test in Chicago:

Light meter readings were taken under the fixture,
at 10', 20' & 30' lateral to the fixture, and center of the road

(Philips CMH)



(Borealis LED)



Results: 200% Better Lighting!

Location	Borealis	Philips
Directly Underneath Streetlight (0,0')	8.8 fc	4.4 fc
Centerline, 15 Feet in front of Streetlight (15,0')	6.3 fc	3.0 fc
10 Feet Lateral from Streetlight (0,10')	6.2 fc	4.4 fc
20 Feet Lateral from Streetlight (0,20')	2.9 fc	2.5 fc
30 Feet Lateral from Streetlight (0,30')	1.4 fc	0.5 fc

Partnering with a Fortune 200: 20 Year Program to Convert and Manage 127,000 Street Lights!

Table Compares Current System to a Funded LED Program

- Funded program spaces out LED purchase cost over multiple
- Includes electricity savings and maintenance savings from going with LEDs
- Positive Cashflow: NO OUT OF POCKET $$ for the City!
- Phased-in implementation leads to better and better savings
- Includes effect of rising energy costs

	Current Streetlight System		LED Streetlight Funded Program		Savings!
Year 1	$42.6M		$28.1M		$14.5M
Year 2	$43.8M		$23.97M		$19.83M
Year 3	$45.23M		$24.85M		$20.38M
…	…		…		…
…	…		…		…
Twenty Year Total	**$1,149M**	**–**	**$524M**	**=**	**$625M**

Financing Options

Benefits

- Does not create Statutory Debt (Bonds)
- Low, Tax-Exempt Rates
- Provides Financing with a $1 payoff at contract completion
- Includes installation and other soft costs
- Non Funding Clause = Not Debt
- Automatic annual renewals as budgets get renewed every year
- Can do 2 -20 year…..15 year average
- 50 states – Different forms for each State

Potential Clients

- Who Qualifies?
  - State
  - Cities
  - Towns
  - Counties
  - School districts
  - Special purpose districts (fire, 9-1-1, utility, water, etc.)
  - Hospitals, agencies, authorities, boards and commissions

Parking Garage: Borealis 60 Watt Canopy Light Vs. 198 Watt Metal Halide

	175 Watt MH (198 Watt total)	61 Watt Borealis Canopy Light
		
Lumens	14,000	5,147
Four feet down, directly under (fc)	23	65
Floor, directly under (fc)	8.5	22
Eight feet over, four feet off the floor (fc)	24	24
Average fc	18.5	37
% Difference		200.0%

Before:

- 440 Metal Halides at 198 Watts
- 763,000 kiloWatthours

After:

- 440 LEDs at 61 Watts
- 235,000 kiloWatthours
- 200% Better Footcandels!

Savings:

- **528,000 kiloWatthours!**
- **2.5 Year Payback**
- **$411,000 Saved over 6 Years**

Large Illinois Hospital
Complete LED Replacement!

- Large Hospital Campus, 8 Buildings
- Old T12 Fluorescents throughout, frequent replacements, difficult to maintain, inconsistent color temperature
- Inconsistent performance and look to Outdoor Lighting as well




- **Solution:** Over 30,000 Borealis LED Lights!
- **Investment:** Over $1.5 million
- **Savings:** 4.7 Million KiloWattHours per Year!
- **Energy Savings per Year:** Over $400,000
- Huge additional replacement and maintenance savings
- Payback approx. three years

BOREALIS℠
INNOVATIVE LED LIGHTING

LED Lighting Panels

Borealis LED panel lighting has been designed to replace traditional power consuming fluorescent and incandescent lighting in standard drop ceiling and surface mount fixtures. Borealis LED panels significantly reduce energy consumption and provide uniform light with no glare. The fully interchangeable panels are easy to install and have no bulbs or ballasts to replace resulting in lower maintenance costs. The Borealis panels have no mercury, no hazardous gases and no disposal requirements, eliminating recycling costs associated with traditional tube lighting.

Environmentally Friendly
- No mercury or hazardous gases
- No disposal requirements

Energy Savings
- Up to 90% less heat
- Low Power Consumption

Easy installation
Low maintenance - No bulbs or ballasts to replace
Average LED lifespan up to 50,000 hours vs. average fluorescent lifespan of 10,000 hours
Even Light distribution - No glare as found in fluorescent fixtures
Dimming Capacity - 0 – 10V dimmer
All UL Certified Components
Meets NEMA Codes

Uses:
Office Lighting – Commercial Lighting
Warehouse Lighting – Retail Lighting
Home Lighting – Hotel Lighting
School Facility Lighting

Environmentally Friendly
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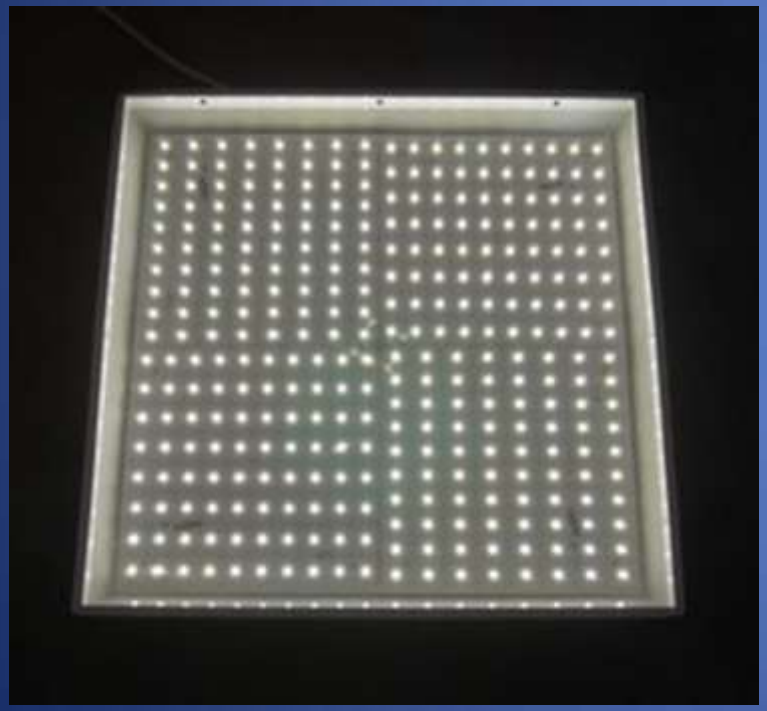
Even Light distribution - No glare as found in fluorescent fixtures
Dimming Capacity - 0 – 10V dimmer
All UL Certified Components
Meets NEMA Codes

Uses:
Office Lighting – Commercial Lighting
Warehouse Lighting – Retail Lighting
Home Lighting – Hotel Lighting
School Facility Lighting

- 1000 in Stock and Ready to Ship
- 49 Watts
- 230V
- UL Listed and Approved
- Dimmable
- Warm White 3,840 Lumens,
- Cool White 4,160 Lumens

Diffuser Polymer Lens

Covers Samsung HDTV LED Chips in Flat Panel
Complies with AARA – Made in America



Fiesta Lincoln Showroom

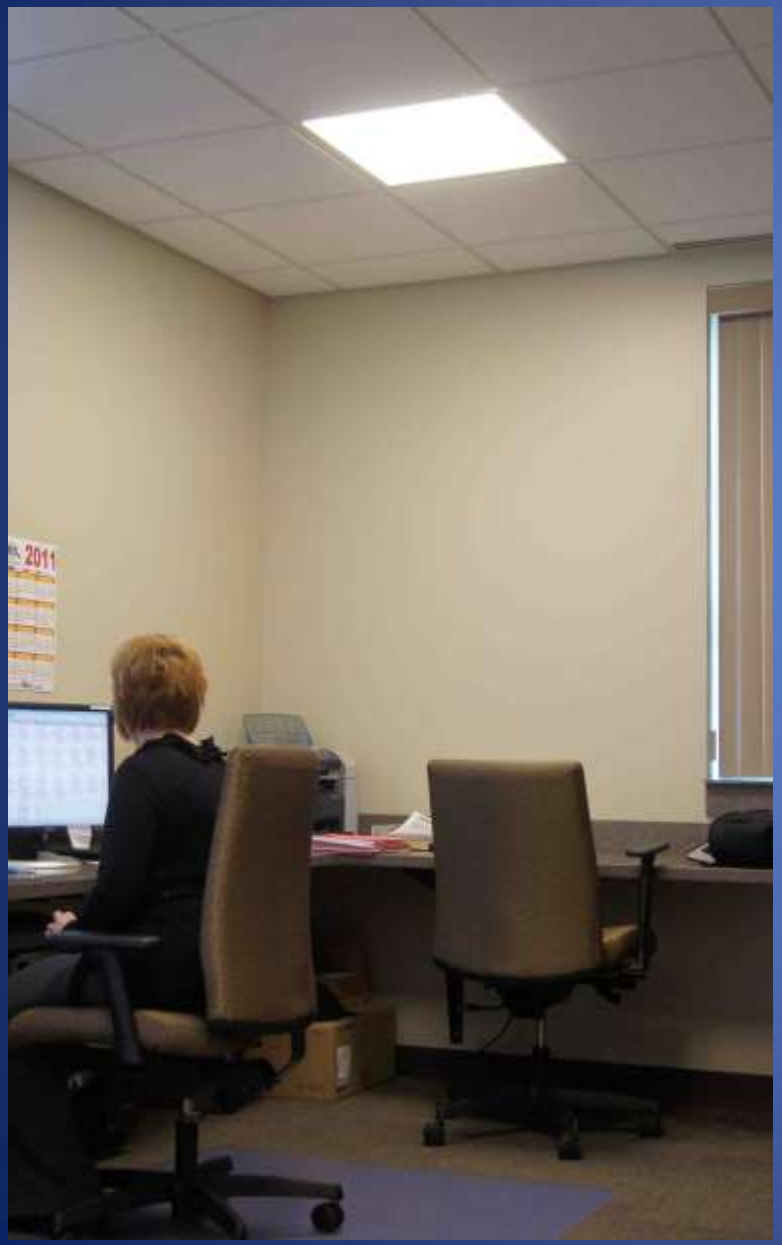
Largest Ford Dealership in Arizona
1720 S. Mesa Drive, Mesa, Arizona
Borealis Lighting Flat Panel Installation

Before
Metal Halide Flat Panels
400 Watts

After
Borealis Lighting Flat Panels
98 Watts

- **Improved CRI**
- **Pops color better**
- **Adds sparkle**
- **Better light spread**

The Minooka Fire Protection District



<u>BOREALIS LED 2X2 Flat Panels</u>

Warm White
4100k
49 watts
3840 lumens
78 lm/w
80+ CRI
100-277V
0.9 Power Factor
Dimmable: 0-10V

Will County Government Building
Board Room
Flat Panel Replacements

Ceiling Height = 25 Feet

250 Watts dropped down to 50 Watts

Useful Life of 12,000 hours raised to 50,000 hours

Foot Candle Readings were Identical

Will County Board Room

Board Room

ROI = 1.49 Years	Initial Investment = $1,144	Savings = $10,030

2,000 Flat Panels in Building

ROI = 1.49 Years	Initial Investment = $571,800	Savings= $5,014,407

Borealis Lighting T8 Tubes

Available in 2, 4, 5, 6 and 8 ft. lengths

- 120 degree beam pattern
- Rotating ends
- LPW >90
- Power Factor: >0.94
- Operating temperature: -15C to 45C
- RoHS compliant
- Meets V1 flame rating
- ANSI/NF 2 food service standard
- IES LM-79 tested
- UL file numbers: E321474, E345269, E303143

Borealis LED Tube Surge Protection

1000V of electricity → Automatically turn off for 3 minutes → Automatically turn back on

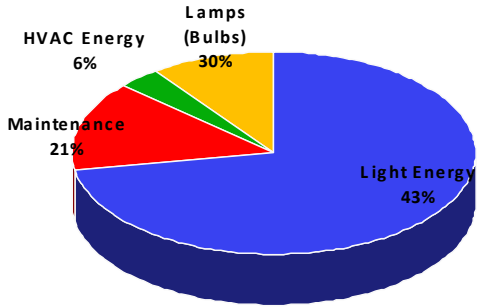
Chicago Mercantile Exchange

18W 4 Foot Tube Installation

New Construction
Scottsdale School District

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Current	Borealis
Product Quantity	4,350 lamps	3,550 lamps
ENERGY COST		
Watts Per Lamp *(Avg)*	134.3 W	47.2 W
Total kW	584 kW	168 kW
Hours in Application *(Avg)*	12.0 hours per day	
Annual Light Energy Consumption	2,514,120 kWh	728,832 kWh
Average Cost per kWh	$.1250 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	$314,265	$91,104
Ratio of Light to HVAC Energy Savings	20%	
PRODUCT & MAINTENANCE COST		
Average Product Cost	$7.23	$285.70
(i.e. Lamps)	*$31,450 total*	*$1,014,250 total*
Average Fixture Costs	*$432,500 total*	*$22,500 total*
Average Maintenance Cost	$22.18	$24.37
(i.e. Installation)	*$96,500 total*	*$86,500 total*
USEFUL LIFE		
Useful Life in Application	11,828 Hours	50,000 Hours
	2.71 Years	*11.46 Years*
# of times replaced	**Replaced 4.2x**	

Cost Savings



COST SAVINGS ANALYSIS	1st Year	Useful Life
Light Energy Savings	$223,161	$2,961,170
HVAC Energy Savings	$44,632	$592,234
Product Savings *(Lamps)*	$11,602	$132,952
Maintenance Savings *(Installation)*	$35,599	$407,945
TOTAL SAVINGS *(Energy, Product & M*	**$314,994**	**$4,094,301**

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	1,785,288 kWh	20,458,385 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide *(Global Warming)*	2,743,988 lbs	31,444,537 lbs
Sulfur Dioxide *(Acid Rain)*	17,460 lbs	200,083 lbs
Nitrogen Oxides *(Acid Rain & Smog)*	4,606 lbs	52,783 lbs
Environmental Benefit Equivalence		
Tree Plantings	374.2 acres	4,288.1 acres
Gasoline	141,764 gallons	1,624,537 gallons
Vehicles	**237.4 vehicles**	**237.4 vehicles**

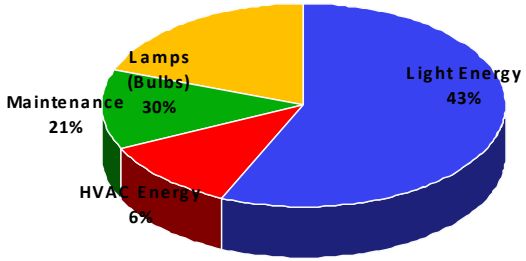
INVESTMENT ANALYSIS	Payback	IRR
Investment =	***$562,800***	
Light Energy Savings	2.52 Years	42.1%
Light & HVAC Energy Savings	2.10 Years	50.0%
TOTAL SAVINGS *(Energy, Product &M*	**1.79 Years**	**53.6%**

TOTAL COST OF OWNERSHIP ANALYSIS w/Lumen Output		
Total Cost of Ownership *w/Lumen O*	**$0.00/ml-hr**	**$0.00/ml-hr**
TOTAL SAVINGS *w/Lumen Output*		

Retrofit
Scottsdale School District

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Current	Borealis
Product Quantity	16,350 lamps	15,350 lamps
ENERGY COST		
Watts Per Lamp *(Avg)*	35.7 W	18.1 W
Total kW	584 kW	278 kW
Hours in Application *(Avg)*	12.0 hours per day	
Annual Light Energy Consumption	2,514,120 kWh	1,210,632 kWh
Average Cost per kWh	$.1250 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	$314,265	$151,329
Ratio of Light to HVAC Energy Savings	20%	
PRODUCT & MAINTENANCE COST		
Average Product Cost *(i.e. Lamps)*	$7.06 *$115,450 total*	$49.40 *$758,250 total*
Average Fixture Costs	*$0 total*	*$0 total*
Average Maintenance Cost *(i.e. Installation)*	$10.80 *$176,500 total*	$15.24 *$234,000 total*
USEFUL LIFE		
Useful Life in Application	11,954 Hours *2.73 Years*	50,000 Hours *11.43 Years*
# of times replaced	**Replaced 4.2x**	

Cost Savings



COST SAVINGS ANALYSIS	1st Year	Useful Life
Light Energy Savings	$162,936	$2,162,033
HVAC Energy Savings	$32,587	$432,407
Product Savings *(Lamps)*	$42,258	$482,888
Maintenance Savings *(Installation)*	$64,604	$738,239
TOTAL SAVINGS *(Energy, Product & M*	**$302,385**	**$3,815,565**

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	1,303,488 kWh	14,895,184 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide *(Global Warming)*	2,003,461 lbs	22,893,897 lbs
Sulfur Dioxide *(Acid Rain)*	12,748 lbs	145,675 lbs
Nitrogen Oxides *(Acid Rain & Smog)*	3,363 lbs	38,430 lbs
Environmental Benefit Equivalence		
Tree Plantings	273.2 acres	3,122.0 acres
Gasoline	103,506 gallons	1,182,780 gallons
Vehicles	**173.3 vehicles**	**173.3 vehicles**

INVESTMENT ANALYSIS	Payback	IRR
	Investment = $700,300	
Light Energy Savings	4.30 Years	25.8%
Light & HVAC Energy Savings	3.58 Years	30.5%
TOTAL SAVINGS *(Energy, Product & M*	**2.32 Years**	**36.9%**

TOTAL COST OF OWNERSHIP ANALYSIS w/Lumen Output		
Total Cost of Ownership *w/Lumen O*	**$0.00/mlhr**	**$0.00/mlhr**
TOTAL SAVINGS *w/Lumen Output*		

BOREALIS SM

Green Lighting for the Future

Borealis A19

EarthLED A19

LEDTronics A19

Philips A19

A19 Comparison

Heat Sink Blocks 360 Light Distribution

Hotel Room
LED A-19 vs 100 Watt Incandescent!

Sylvania Daylight Plus A19
100 Watts
1,400 Lumens

Borealis A19 40
7.5 watts
500 lumens

BOREALIS SM

Green Lighting for the Future

Borealis R20

EarthLED R20

LEDTronics R20

Philips R20

BOREALIS SM

Green Lighting for the Future

Borealis PAR30

EarthLED PAR30

LEDTronics PAR30

Philips PAR30

BOREALIS SM

Green Lighting for the Future

Borealis PAR38

iPAR-38™

EarthLED PAR38

Cree PAR38

LEDTronics PAR38

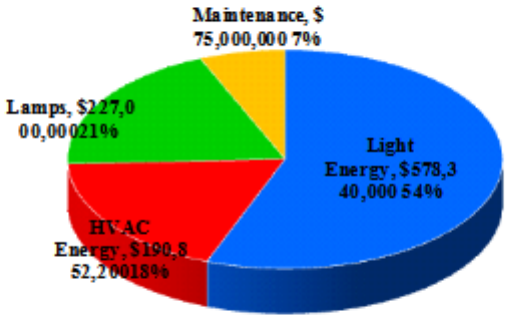
Philips PAR38

High End Retail PAR38 ROI Analysis

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Current	Borealis LED
Product Quantity	1,500,000 lamps	1,500,000 lamps
ENERGY COST		
Watts Per Lamp *(Avg)*	42.6 W	12.0 W
Total kW	63,900 kW	18,000 kW
Hours in Application *(Avg)*	12.0 hours per day	
Annual Light Energy Consumption	277,581,600 kWh	78,192,000 kWh
Average Cost per kWh	$.1260 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	$34,975,282	$9,852,192
Ratio of Light to HVAC Energy Savings	33%	
PRODUCT & MAINTENANCE COST		
Average Product Cost *(i.e. Lamps)*	$9.08 *$13,620,000 total*	$49.00 *$73,500,000 total*
Average Fixture Costs	*$0 total*	*$0 total*
Average Maintenance Cost *(i.e. Installation)*	$3.00 *$4,500,000 total*	$3.00 *$4,500,000 total*
USEFUL LIFE		
Useful Life in Application	6,800 Hours *1.57 Years*	100,000 Hours *23.02 Years*
REPLACEMENTS *(Existing lamps vs. new useful life)*	**Replaced 14.7 times**	

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	199,389,600 kWh	4,590,000,000 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide *(Global Warming)*	306,461,815 lbs	7,054,830,000 lbs
Sulfur Dioxide *(Acid Rain)*	1,950,030 lbs	44,890,200 lbs
Nitrogen Oxides *(Acid Rain & Smog)*	514,425 lbs	11,842,200 lbs
Environmental Benefit Equivalence		
Tree Plantings	41,792.1 acres	962,066.0 acres
Gasoline	15,832,910 gallons	364,477,681 gallons
Vehicles	26,510.5 vehicles	26,510.5 vehicles

COST SAVINGS



COST SAVINGS ANALYSIS	1st Year	Useful Life
Light Energy Savings	$25,123,090	$578,340,000
HVAC Energy Savings	$8,290,620	$190,852,200
Product Savings *(Lamps)*	$8,700,776	$200,294,118
Maintenance Savings *(Installation)*	$2,874,706	$66,176,471
TOTAL SAVINGS *(Energy, Product & Maintenance)*	**$44,989,192**	**$1,035,662,788**

INVESTMENT ANALYSIS	Payback	IRR
Investment = $78,000,000		
Light Energy Savings	3.10 Years	-0.3%
Light & HVAC Energy Savings	2.33 Years	19.0%
TOTAL SAVINGS *(Energy, Product & Maintenance)*	**1.73 Years**	**46.2%**

PolyBrite LEDs Light Governor's Mansion

LEDs MAGAZINE

June 4, 2012

After the SSL upgrade is complete, 95% of the Executive Mansion's indoor light fixtures will use LED sources, according to PolyBrite. The state is projecting that the SSL will last ten years and yield 80% energy savings.

Source: http://ledsmagazine.com/news/9/6/1

O'Hare Airport
United Airlines – Gate B15

Little Caesars Pizza

551 N. McLean Blvd.,
552 Elgin, Il. 60123

Borealis Lighting T8 Tubes

- Improved CRI
- Pops color better
- Adds sparkle
- Better light spread

Grand Victoria Casino Exterior Borealis B10s

- Tried Replacing One for One – Too Bright
- **Solution: Replace Every Other Bulb with LED!**
- 10,000 S6 Bulbs 40 lumens with only 5,000 Borealis B10s! 80+ lumens
- Invest $76,300, save $724,427 over the Useful Life of the LEDs!

Grand Victoria Casino - Exterior

Two Decks of the Riverboat, each with 5,000 bulbs, six watts per bulb. Expensive to change bulbs, lift required, all 10,000 bulbs replaced every year!!

Testing showed that only HALF AS MANY Borealis LED bulbs would be needed!

10,000 Six watt Bulbs replaced by 5,000 LEDs with 2 watts per bulb.

Investment: $76,000 for Borealis LEDs and installation of the LEDs in ***every other*** socket.
First Year Savings: $61,000, Payback in 1 Yr Three Months!!
Total Savings over 12 Year LED Life: over $720,00

UIC Lincoln Hall
Borealis PAR38 Lamps

Disney World

Animal Kingdom –Triceratops Ride
Borealis M-60

Disney cemented the LED M-60 lamps into the high-vibration ride and experienced no lamp failures in two years of service. The incandescent lamp that was previously used had difficulty lasting more than 10 days due to the high vibration and extreme conditions.

Dunkin Donuts – New Store installation Dec 2008

Wheaton, IL

McDonalds Menu Board Lighting

Field Museum

City of Chicago – Christmas Tree

9,000 Borealis bulbs

Daley Plaza, Chicago
Holiday Season, 2008/09

Used 68,000 fewer kWh of electricity than incandescent bulbs during the holiday season.

Reduced:
carbon dioxide emissions by 85,000 pounds,
nitrogen oxide emissions by 148 pounds and
sulfur dioxide emissions by 524 pounds.

Bulbs should last over 120 years

Beijing Olympics

Beijing – Birds Nest Stadium Signage

August 2008

Borealis

Modular Lighting System

Borealis 50,000 Hour Warranty

POLYBRITE INTERNATIONAL, INC. LIMITED WARRANTY
TERMS AND CONDITIONS

PolyBrite International, Inc. ("**PolyBrite**"), warrants, with the limitations set forth herein, the following PolyBrite product: A19; B10; PAR38; PAR30; R20; MR16; T8 LED Replacement Tubes; LED FLAT PANELS; STREET / PARKING / PATHWAY LIGHTS (the "Product"), installed pursuant to applicable PolyBrite specifications to be free from defects in all material and workmanship, and to operate for a period of Sixty (60) months.

The warranty period begins from the date of shipment. The warranty is subject to proper installation and maintenance in accordance with the specifications set forth in the documentation accompanying the Product. This warranty does not cover damages caused by improper maintenance or installation or damage due to installation in areas with other than normal temperatures and environmental conditions per application specifications. PolyBrite assumes no responsibility for any damage to people, property, apparatus or otherwise resulting from improper installation or maintenance of its Product. Warranty is void where ambient temperatures exceed the stated maximum applicable to individual Product specifications. This warranty does not cover damages caused by abuse, fire or acts of God, such as lightning, explosions, water leaks or acts of war.

Should a defect appear in the Product within the warranty period, PolyBrite will, at its option, repair or replace the Product without charge. **Such repair or replacement shall be the purchaser's exclusive remedy.**

Any material deemed defective must be returned, freight prepaid, to PolyBrite for evaluation. Collect return shipments will be refused.

Any tampering or modification(s) in circuitry or components by other than authorized PolyBrite personnel will void the warranty.

If replacement Product is shipped before defective Product is received for evaluation, the replacement Product will be invoiced at the net price in effect at that time and will be shipped freight-charged. These charges (excluding freight) will be credited if, upon receipt and evaluation of goods, a defect is determined.

No returned defective Product will be accepted without a returned Product authorization issued in writing by an authorized PolyBrite employee.

In no event shall PolyBrite be liable for back-charges of any kind, including, without limitation, labor charges for field repair or late penalties.

The foregoing warranty is in lieu of all other warranties expressed or implied, or merchantability, fitness for a particular purpose or any other thing. Except as stated in this warranty, PolyBrite shall not be liable for any defects in, or breach of any contract relating to, the quality or performance of PolyBrite's Product under any theory of law including, without limitation, contract, negligence, strict liability or misrepresentation. In no event shall PolyBrite be liable for incidental or consequential damages.

No agent, employee or representative of PolyBrite has any authority to bind PolyBrite to any affirmation, representation or warranty concerning goods sold by PolyBrite and unless an affirmation, representation or warranty is specifically included herein or in PolyBrite's sales acknowledgement, it does not form a part of the basis of any bargain between PolyBrite and purchaser and shall not be enforceable by purchaser.

PolyBrite's warranty coverage shall not apply to any equipment used in conjunction with PolyBrite Product.

Some states do not allow limitation on how long an implied warranty lasts, so the above limitation of incidental or consequential damages may not apply to you. This written warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Failure to comply with any of the stipulations set forth will void the warranty. Any exceptions to the foregoing warranty must be requested and accepted in writing prior to shipment.

BOREALIS℠
INNOVATIVE LED LIGHTING

by PolyBrite International, Inc.

1751 W. Diehl Road, Suite 110, Naperville IL 60563
Tel. 630-717-6700 Fax 630-717-5646

PB-war-04-01-12 v001

- Longest in Industry, Covers all Products
- Under Drive LEDs to Keep Heat Down and Preserve Life
- Dynamic Snubbing – LEDs are "Off" many times per second
- Thermal Management Extends LED Life
- L-70 at 50,000 Hours, 5.7 Years @ 24X7
- Predictive Failure Rate = 1.8%

17 Year Track Record in Excellence in Engineering

PolyBrite International

BOREALIS℠
Green Lighting for the Future

by PolyBrite International
A Goeken Group Company

1751 W. Diehl Road, Suite 110
Naperville, IL 60563
1-800-320-3801
www.borealislighting.com
Sandra Goeken Miles
smiles@polybrite.com

Borealis Lighting
Advancing America Forward with Energy and Economic Opportunities

September 11, 2012

BOREALIS℠
Green Lighting for the Future

Thank You!

Sandra Goeken Miles 630-551-1533, or e-mail to: smiles@polybrite.com

WHAT IF:

1,928,617 Households in the State of Kentucky switched to **1 LED Light Bulb:**

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	3,310,117 Tons
• Sulfur Dioxide (Acid Rain)	21,062 Tons
• Nitrogen Oxides (Acid Rain & Smog)	5,556 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	4,307,245,025 kWh
• Acres of Trees Planted	902,800 Acres
• Barrels of Gasoline Saved	8,143,452 Barrels
• Vehicles taken off the Road	572,684 Vehicles

Financial Impact

• Investment for LED Lighting	$63,644,361
• Total Savings for LED Lighting	$1,103,949,627
• Return on Investment for LED Lighting	2.85 Years

Every Kentucky Household Switched to 1 LED Bulb would save

$1.1 BILLION

KnoxHILLS
A Lend Lease Community

BOREALIS™
INNOVATIVE LED LIGHTING
by PolyBrite International, Inc.

WHAT IF:

1,928,617 Households in the State of Kentucky switched to **6 LED Light Bulbs:**

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	19,860,706 Tons
• Sulfur Dioxide (Acid Rain)	126,374 Tons
• Nitrogen Oxides (Acid Rain & Smog)	33,338 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	25,843,470,150 kWh
• Acres of Trees Planted	5,416,802 Acres
• Barrels of Gasoline Saved	48,860,712 Barrels
• Vehicles taken off the Road	3,436,108 vehicles

Financial Impact

• Investment for LED Lighting	$381,866,166
• Total Savings for LED Lighting	$6,623,697,754
• Return on Investment for LED Lighting	2.85 Years

Every Kentucky Household Switched to 6 LED Bulbs would save

$6.6 BILLION

KnoxHILLS
A Lend Lease Community

BOREALIS™
INNOVATIVE LED LIGHTING
by PolyBrite International, Inc.

WHAT IF:

All 117,538,000 Households in the United States switched to 1 LED Light Bulb:

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	201,732,428 Tons
• Sulfur Dioxide (Acid Rain)	1,283,632 Tons
• Nitrogen Oxides (Acid Rain & Smog)	338,626 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	262,501,533,333 kWh
• Acres of Trees Planted	55,020,435 Acres
• Barrels of Gasoline Saved	496,296,038 Barrels
• Vehicles taken off the Road	34,901,804 Vehicles

Financial Impact

• Investment for LED Lighting	$3,878,754,000
• Total Savings for LED Lighting	$67,279,308,549
• Return on Investment for LED Lighting	2.85 Years

Every Household in the United States Switched to 1 LED Bulb would save

$67.2 BILLION

KnoxHILLS
A Lend Lease Community

BOREALIS™
INNOVATIVE LED LIGHTING
by PolyBrite International, Inc.

WHAT IF:

All 117,538,000 Households in the United States switched to 6 LED Light Bulbs:

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	1,210,394,570 Tons
• Sulfur Dioxide (Acid Rain)	7,701,794 Tons
• Nitrogen Oxides (Acid Rain & Smog)	2,031,761 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	1,575,009,200,000 kWh
• Acres of Trees Planted	330,120,615 Acres
• Barrels of Gasoline Saved	2,977,776,228 Barrels
• Vehicles taken off the Road	209,410,825 Vehicles

Financial Impact

• Investment for LED Lighting	$23,272,524,000
• Total Savings for LED Lighting	$403,675,851,290
• Return on Investment for LED Lighting	2.85 Years

Every Household in the United States Switched to 6 LED Bulbs would save

$403.6 BILLION

KnoxHILLS
A Land Lease Community

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INNOVATIVE LED LIGHTING
by PolyBrite International, Inc.