



Solar Powered Lighting Solutions

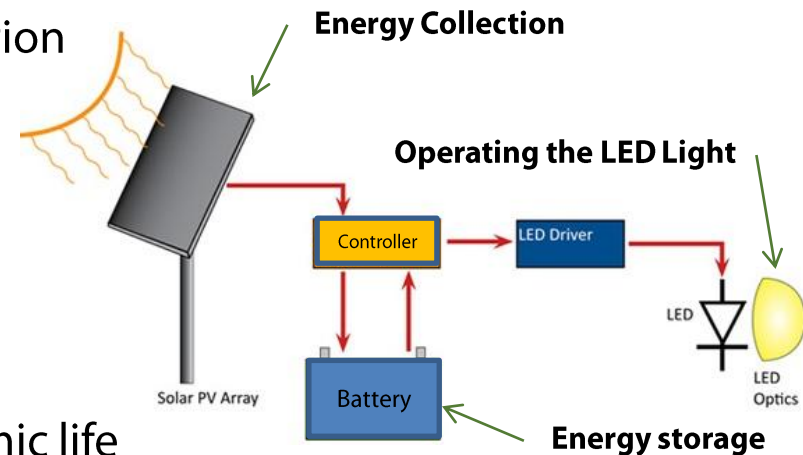
The future is already here...

Why using solar off grid solution

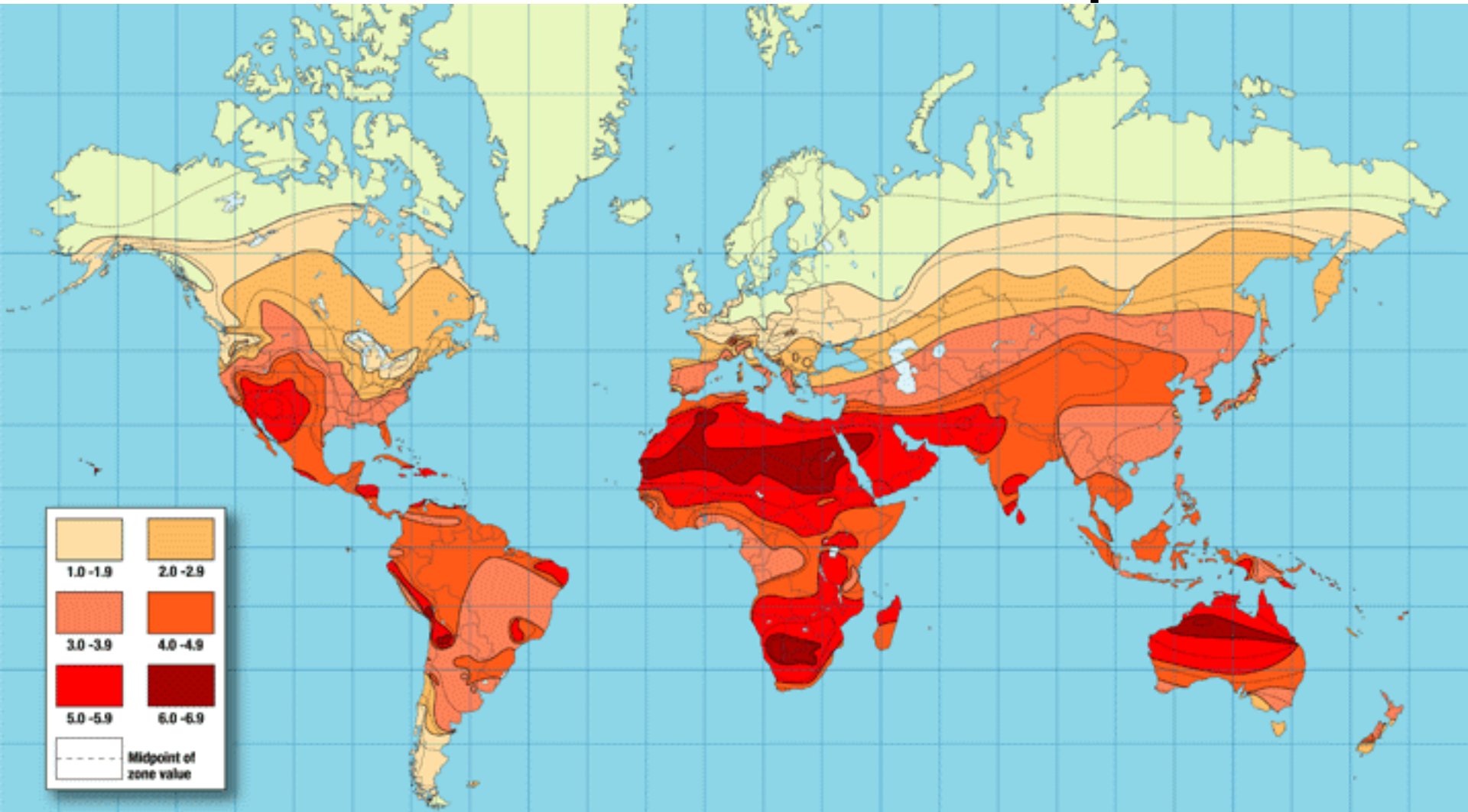
The sun is a direct and free source of energy. Leveraging renewable energy technologies, can convert that solar energy into electricity....

Advantages of solar outdoor solution

- No trenching, no metering, no wiring, no transformers, saving time...
- **No vandalism of cables..**
- Cost savings from day one due to ease of installation
- Can be installed in the most remote locations
- No cost for daily operation
- Free energy once installed – no electric bills.
- Will turn on even after cloudy days
- Will work even when electric power is out
- High efficiency
- Develop the infrastructure, the social and economic life
 - Reduce the criminality
 - Promote alphabetization
 - Increase the opening hours of shops
 - Reduce the rate of accidents and deaths on the road

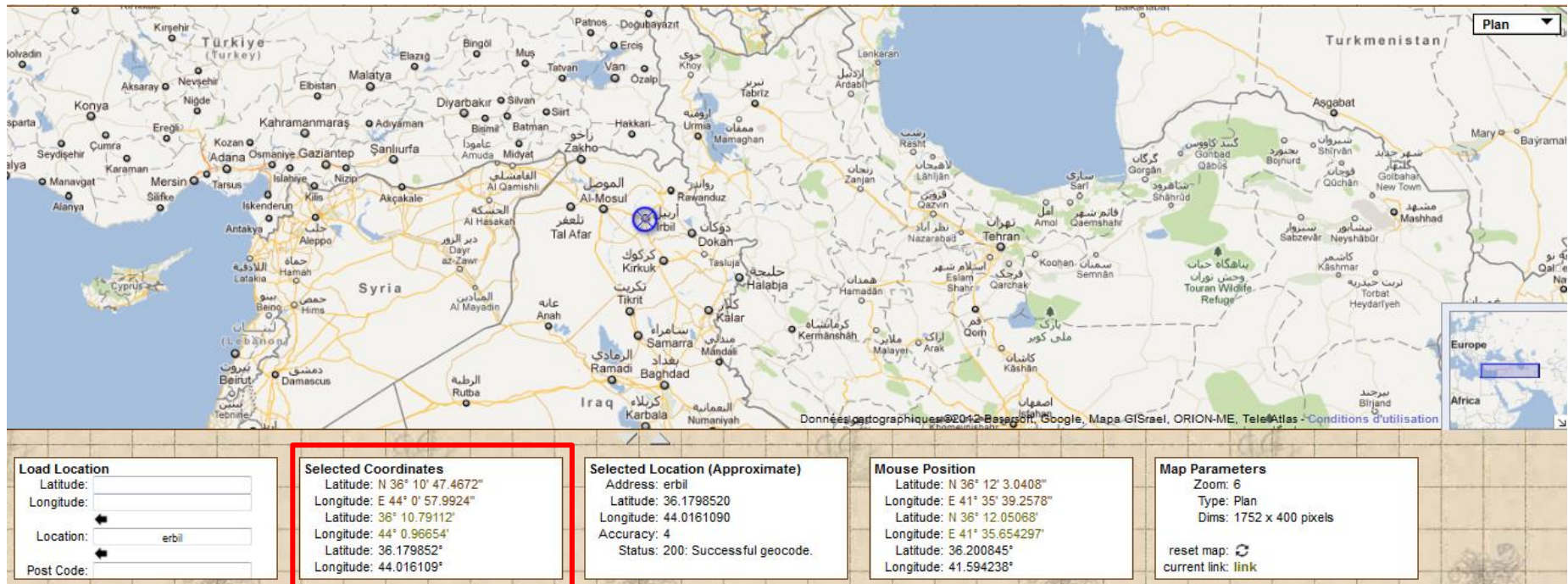


World insolation map



Excellent Sun insolation in Iraq specifically in Erbil with 4,3 Sunhours /day provided by NASA in the worst case in December : 1000w/m^2

Erbil localization



Erbil NASA Insolation data



NASA Surface meteorology and Solar Energy - Available Tables



Latitude **33.17** / Longitude **44.01** was chosen.

Solar Geometry:

Monthly Averaged Daylight Hours (hours)

Lat 33.17 Lon 44.01	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	10.2	11.0	11.9	12.9	13.8	14.3	14.1	13.3	12.4	11.3	10.5	10.0

Parameter Definition

Parameters for Tilted Solar Panels:

Monthly Averaged Radiation Incident On An Equator-Pointed Tilted Surface (kWh/m²/day)

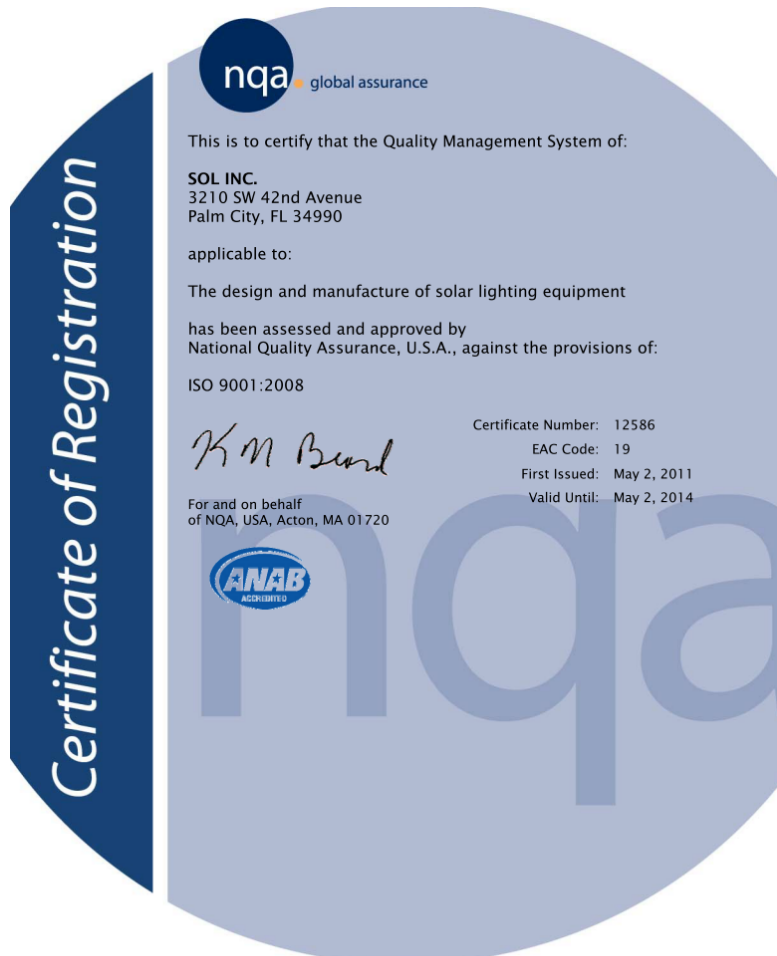
Lat 33.17 Lon 44.01	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
SSE HRZ	2.96	4.03	4.98	5.39	6.48	7.56	7.00	6.71	5.55	3.98	2.98	2.62	5.02
K	0.55	0.59	0.58	0.53	0.58	0.65	0.62	0.64	0.61	0.54	0.52	0.52	0.58
Diffuse	0.93	1.11	1.50	2.02	2.16	1.97	2.07	1.75	1.53	1.33	1.04	0.87	1.53
Direct	4.79	5.88	6.02	5.25	6.43	8.25	7.30	7.55	6.62	5.04	4.37	4.33	5.98
Tilt 0	2.91	4.00	4.92	5.27	6.45	7.51	6.96	6.68	5.47	3.95	2.92	2.59	4.97
Tilt 18	3.80	4.93	5.53	5.46	6.35	7.21	6.76	6.78	5.97	4.64	3.68	3.44	5.38
Tilt 33	4.32	5.41	5.71	5.33	5.91	6.55	6.22	6.47	6.04	4.95	4.10	3.95	5.41
Tilt 48	4.60	5.58	5.58	4.94	5.19	5.56	5.36	5.82	5.79	5.00	4.30	4.24	5.16
Tilt 90	3.98	4.44	3.77	2.74	2.43	2.26	2.34	2.88	3.60	3.76	3.61	3.76	3.29
OPT	4.64	5.58	5.71	5.46	6.47	7.51	6.97	6.80	6.06	5.01	4.31	4.29	5.73
OPT ANG	56.0	49.0	34.0	18.0	5.00	0.00	2.00	12.0	29.0	43.0	53.0	58.0	29.8

How to size a system ?

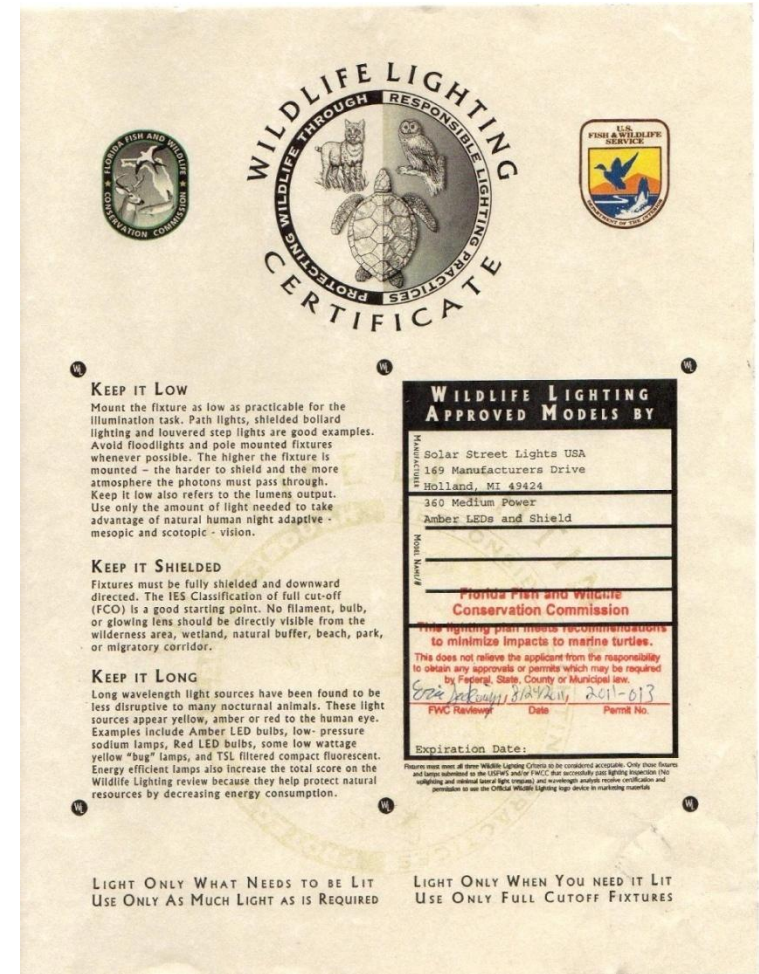
1. Geographic localization.. Needed to calculate the insolation : Latitude & Longitude
2. What is the application : street lighting, parking, pathways, public place, signage, etc.. ?
3. What are the dimensions of the area to light ? Is it a road, we need to know : quantity of lane, width of each lane, is there a median ? Ideally a pdf and dwg drawing.
4. Where can we install the poles ? On both side only, on one side only in the middle?
5. What level of Lux are you expecting? We can provide you with the IESNA standard!
6. How many hours the system will have to run per night ? 6 ,14 hours ! Are you interested by a dimmable version ?
7. How many days of backup ? 2, 4 days ?
8. Are you expecting a minimum height for the luminaire or can we optimized ?
9. Spacing between the poles ? Do you have any minimum distance ? Critical for uniformity..

Professional company and a true lighting specialist

Range of certificate Sol & Solar Street lights USA



This approval is subject to the company maintaining its system to the required standard, which will be monitored by NQA, USA, an accredited organization under the ANSI-ASQ National Accreditation Board.



Our common mission

To provide high quality, engineered systems that include solar induction lights, solar LED lights, and off-utility grid solar-power systems.

Our systems are engineered for long-term, reliable performance and are designed for a wide range of climates and operating environments.

We insist on delivering first class service in supporting on-site installation and provide the proper training on how to install the first solar lighting.



Common Applications

- Roadway: Collector, arterial, highway lighting
- Parking lot lighting
- Security camera and perimeter fence lighting
- Pathways/Trails: Emergency phones & lights
- University quad & campus lighting
- Remote areas such as mining and fire camps,
- DOT bridges with antiquated wires, stop sign lighting, cross-walks,
- Portable emergency lighting and power
- Net-metering projects



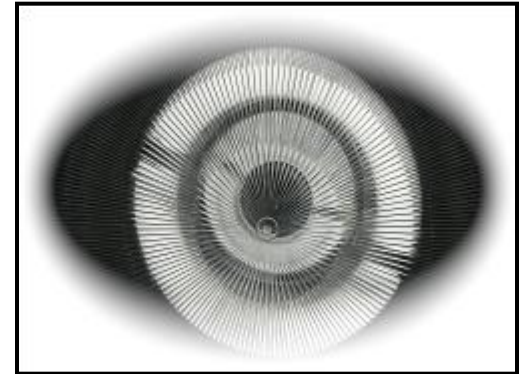
Choice of solar components

- Induction lamp
- LED luminaire
- Brilliant Sun system
- Solar panel
- Controller
- Batteries
- Battery box

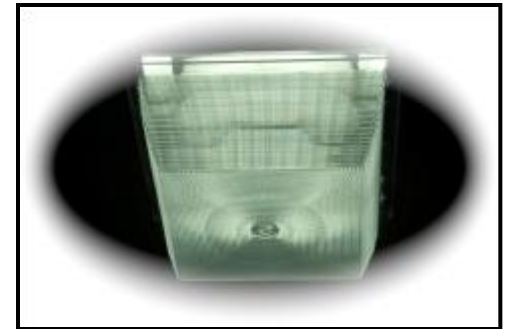


Induction lamps

Solar Street Lights USA™ has the latest generation of energy saving lamps with a durability of 100,000 hours and a 10 year warranty on each of its parts.



Our Induction Lights offer zero maintenance, a wider range of lighting, and many additional benefits.



Contributing To Reduce CO2 Emissions

Induction light fixtures

Fixtures are manufactured in Michigan and have been tested by a independent 3rd party lab per IESNA standards.

Fixtures won 2009 Best Practice Award in a joint demonstration program with UC Davis and California Lighting and Technology Center.

Proven and stable, adopted and used by roadway engine since 1991.

Electrode-less florescent style light and, lasts up to 100,000 hours, flicker resistant, instant on/off.

Superior color: 3600K to 6500K, high CRI 80 to 90; and High Lumens per Watt: 80 to 90.

Wide temperature tolerance - 40° F to +130° F.

Cobra Head and Shoebox style with Type II to Type IV light distribution, semi- and full-cutoff.

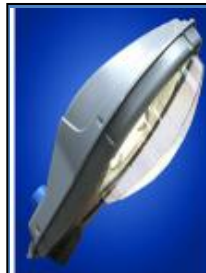
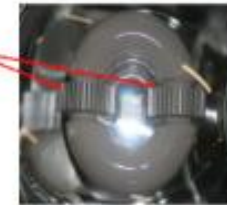
Motion sensor activated step-dimming.

Pre-installed light

Convenient Access
Simplifies installation

Hex bolts for arms

RF Generators
With built-in heat sinks
No internal electrodes
No lampholders to burn up



Smart Cobra Head

Type III Medium
Semi-Cut-off
DC: 40 & 70 Watt
AC: 40, 70, 100,
120 Watt



Classic Cobra Head

Type II
Full-Cut-off
DC: 40, 70, 100 Watt



Classic Shoe Box

Type IV
Semi-Cut-off
DC: 70, 100 Watt
DC Step-Dim: 100 to
50 Watt
AC: 70, 100, 200,
250 Watt

How does the induction lamp work

Step 1



High Frequency Generator

Generate Electricity.

Produces a 236Hz A the characteristics C supplied to the antenna. Contains an oscillator set to the primary coil.

Step 2

Induction coil without electrodes

Energy is discharged into the glass bulb.

Transfers energy from the high frequency generator to the bulb using an antenna formed by a primary induction coil and a ferrite core. This equipment also consists of a support for the antenna, a coaxial cable and magnetic rings conductors.

Step 3

Electron, Ion and Inert Gas Plasma.

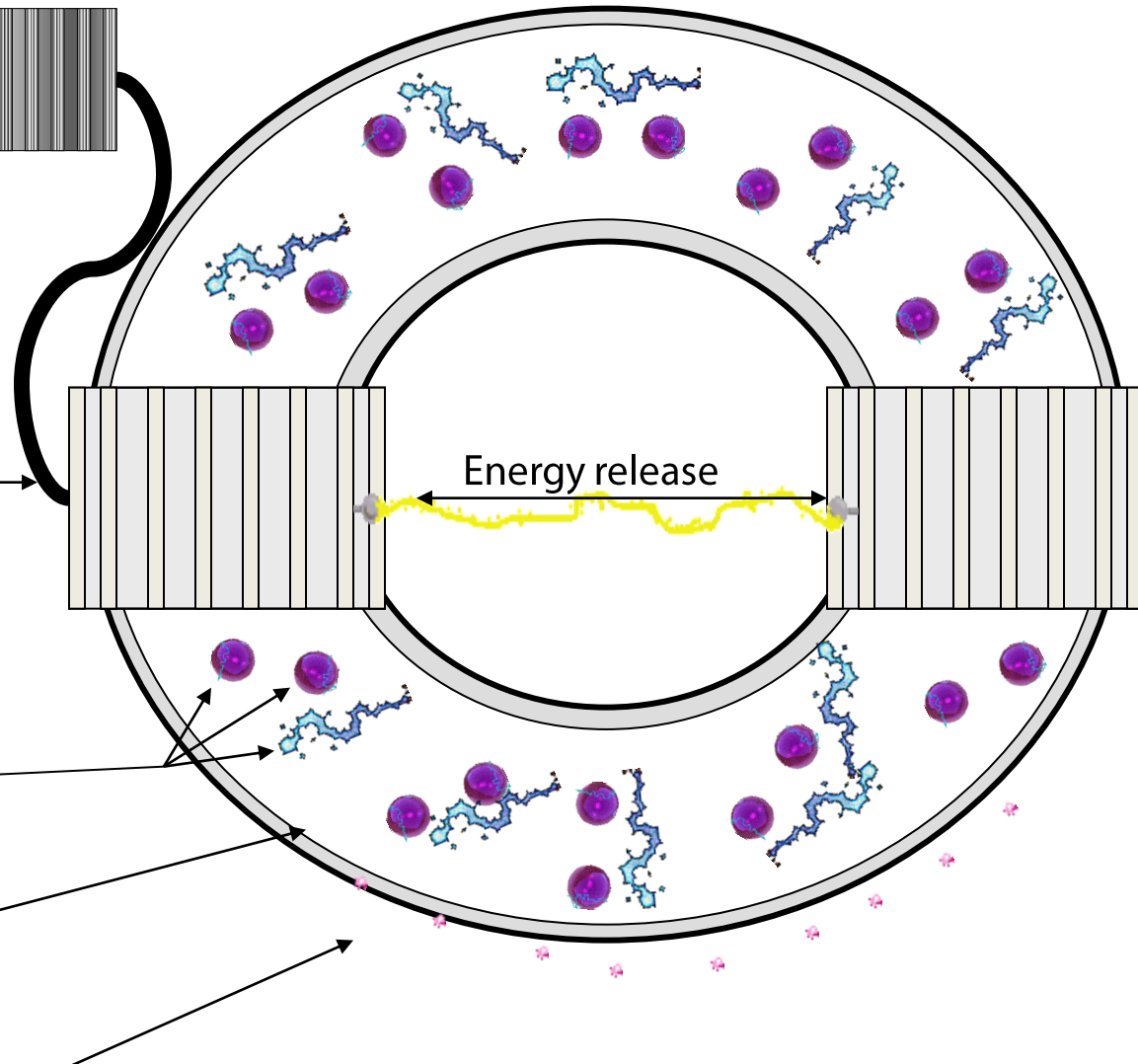
The argon gas hits against the mercury converts in Ultraviolet energy.

Step 4

Phosphor layer

Converts Visible Light Ultraviolet Radiation.

VISIBLE LIGHT



General benefit

ECONOMIC BENEFIT

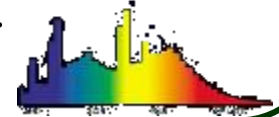
Savings in Energy and Maintenance

- Save from 32% to 73% depending on application of the lamp.
- Uses no ballast: it eliminates the expense of consumption of the ballast of 16-22%
- 100,000 hours lifetime
- Almost no maintenance
- 10 years warranty



ELECTRICALLY LUMINOUS

- INSTANT-ON
- 85v Voltage Protector – 230 V.
- <10% of Harmonics
- Power Factor of 95%
- Luminous Efficacy: Provides 80-95 lm/w
- 86-92% color reproduction.



SECURITY

- It is a safe lamp with corresponding protection index
- Not explosive, lamp has no filaments.
- Heat emitting less than 158 °F
- Electro Magnetic Compatibility, (EN55105 y GB17743-1999)
- Protected against vibration



ECOLOGICAL

- Luminical resource: Tri Phosphor.
- Use of 0.025 mg/m³ of Mercury
- UV emission: 0.5%
- IR emission: 0.4%.
- Generator made from Aluminum and Copper (recyclables)
- Light weight generator

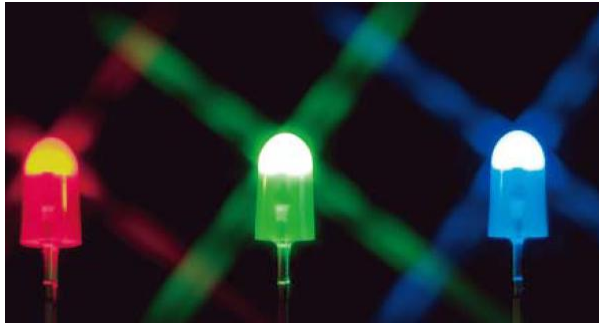


Led Technology

- Cooperating with Cree and Nichia High Brightness LEDs available
- Advantages of LEDs over other light sources
 - Long life greater than 100,000 hours of rated life
 - All digital, nothing to break
 - No Glass
 - No filament
 - No Gasses
 - Environmentally friendly
 - No Lead
 - No Mercury
 - All LEDs are not the same



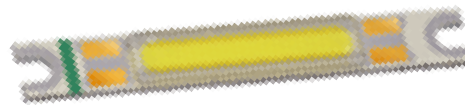
Types of LED



Bubble LED: 5mm, signal type
Design for Signage



Discrete High Brightness:
Designed for Lighting



Cluster LED: High Brightness Die
with unified phosphor
Design for Lighting

Led Luminaire Specifications

Electrical

- Driver Current 280 to 600mA
- Power from 22 to 200W

Fixture

- Weight: 8.2 to 11.4 Kg /18 to 25lb
- Width (maximum): 382 mm/15.0 in
- Length (maximum): 608 mm/23.9.2 in
- Height (maximum): 167 mm/6.57 in
- EPA: < 0.065m/< 0.699 ft2
- Cover Lens: Acrylic
- Housing: Single piece, die-cast aluminum
- Mounting: 1.625" to 2.375"/ 42 to 60 mm OD tenons

Performance / Photometrics

- Fixture Efficacy : 87 Lm/W
- Fixture Output : 7,500 Lm
- Telcordia MTBF (in Millions): 2.5 hrs
- Distribution: IES Type II, IES Type III
- Color Temperature (CCT): Standard 5,000 K
- Color Rendering Index (CRI) at 70

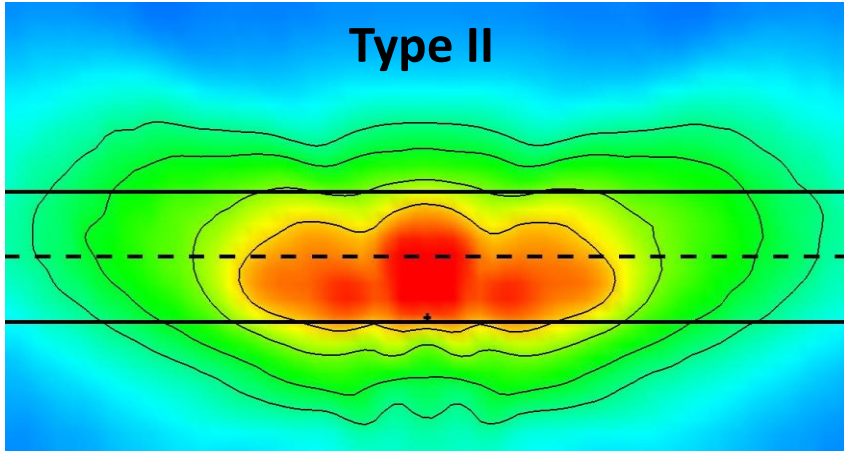
Operating Conditions

- Temperature (ambient): -40°C to +60°C
-40°F to +140°F



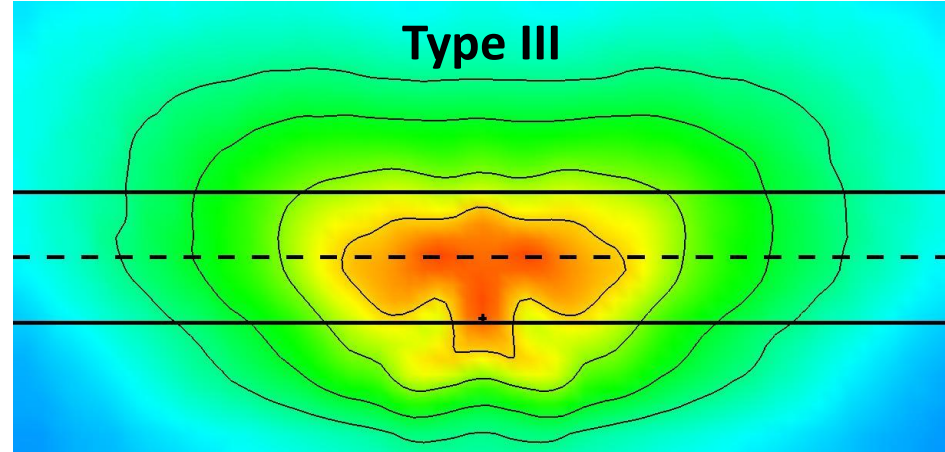
Light distribution : Best in class

Type II



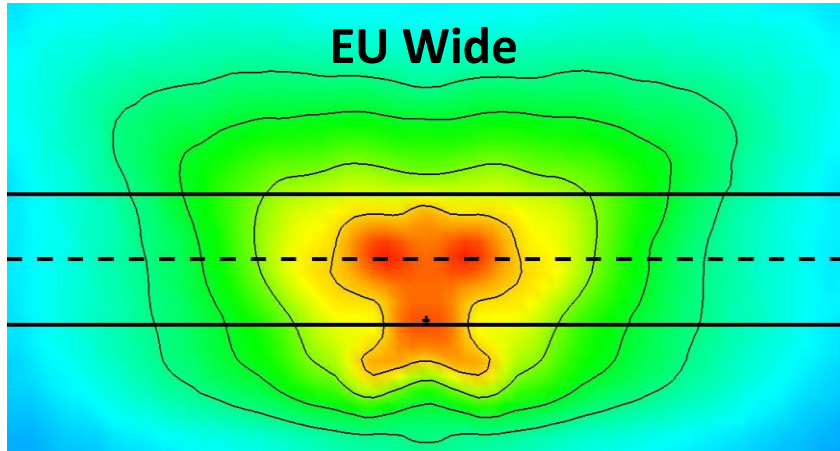
33ft -10m Roadway

Type III

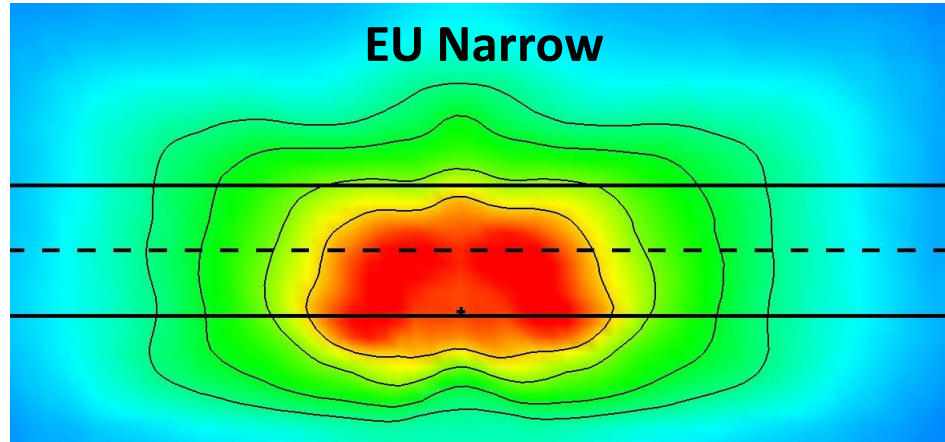


33ft -10m Roadway

EU Wide



EU Narrow



Brilliant Sun system

Used with GridFree™ and GridSmart™.

Heavy-duty design withstands large arrays up to 900watts and high wind loads to 150mph.

Architecturally pleasing design.

Made from heavy gauge steel and full-weldments; all hardware is stainless steel.

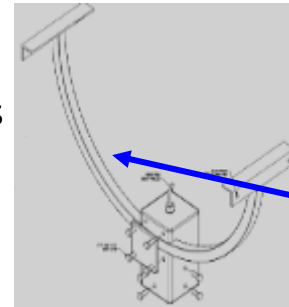
Rotates 360 degrees on it's axis and 180 degrees on the azimuth for easy and optimum orientation.

Only weighs 71lb – 30kg and easily installs on a 4inch - 10cm round tenon.

Wires from the array junction box feed through and into the mount's cavity for added protection.

Utilizes Unirac horizontal trusses which are robust yet simplifies panel installation.

Machined then galvanized, optional powder coat or baked urethane for enhanced look or protection.



Stainless Steel Hardware

1 3/8" x 1/4"
Square Steel Tube



Key components



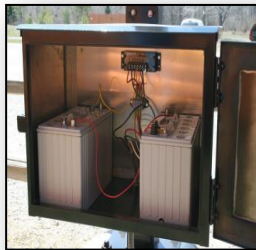
Solar Power Array Poly-crystallin
Highest Output Solar even at low
light level - Made in USA
Life 25years, 25years warranty



Batteries long life
12V -105Ah – **7 to 10 years life**
IEC 896-2, DIN 43534
Maintenance free
5000 cycle – 5 years*



Charger Controller - CPU
Pre-configured MPPT
Integrated solution, less cabling
Factory mounted in battery box
5 years warranty



Battery Box
Top or Bottom pole mounted version + underground
Heavy Duty 1/8" Aluminum - NEMA 3R rating, vented
Lockable front door with gaskets
Louvered air flow vents to dissipate heat
10 years warranty



Brilliant Sun system
Capturing the sun
Rotates 360 degrees on
axis and 180 degrees on
azimuth for easy and
optimum orientation.
10 years warranty



Plug&Play Wire Harnesses
Easy to connect "quick connect"
10 years warranty

Ligthing products offer

GridFree™ – Off utility-grid solar powered lighting system for streets and parking lots. Induction or LED.



PathLight™– Off utility-grid solar lights for trails, walking and bicycle paths. LED version only.



360 Medium Power™ Integrated Led grid solar powered lighting system for streets, parking, Gardens, Bus stations, Walkways



GridSmart™ – Utility Grid-tie solar electric powered lighting system for streets and parking lots. Induction or LED.



Roadway Beacons solar based MUTCD compliant 24 hour flashers, school zone and cross-walk lights.



PLB™ - Pathlight and lawn LED bollard.



GridFree™ – Off-Grid Solar Light

Street or parking lot applications.

Complete system, mounts on our pole or can be adapted to mount on other poles.

Cobra Head, Shoe Box Induction or LED fixture with Type II to IV light distribution.

Induction or LED luminaire.



Cobra Head



Shoe Box



SAT Model

Pathlight™ features:

- TPM designed for heights from 18 feet to 34 feet.
- Cobra Head, Shoe Box and led style fixtures
- Lumen output ranges from 3350 to 9000 lumens
- CRT is 5000K and the CRI is 80 plus.
- Lamp wattages from 22 to 200 Watts
- Full Cutoff (Dark Sky Compliant) or Semi-Cutoff fixtures.
- Brilliant Sun™ (Patented) kit upto 170mph wind.
- Meet IESNA recommended practices.
- GridFree takes less than an hour to mount
- 10 year system warranty.

PathLight™ – Off-Grid Solar Light

Trail, walking and bicycle paths applications mount 12 to 13 feet from the ground .

PathLight™ and PathLight™UE are compact solar lighting systems for private, commercial and government use.

They are a complete, off-the-shelf system and come with a colorized direct burial, glass-polyester filament wound mounting pole. Resist up to 90mph

The fixture is finished in bronze and the balance of the exterior structure is finished in brown.

The PathLight™ battery enclosure is mounted at the top of the pole or can be with PathLight™ UE underground

PathLight™ and PathLight™ UE are American-made products using domestic metals and material and are backed by a 5 year system warranty.



Pathlight™ features:

- LED Light fixtures : 10, 13, 20 and 28W
- Designed to operate dusk-to-dawn @ 100%
- High efficiency solar panel 60 & 90W
- Deep cycle gel-cell battery upto 105Ah
- UL approved underground battery enclosure
- Designed to meet IESNA standards,
- Dark-Sky Compliant fixture
- Maintenance free system

360 Medium Power™- Off-Grid Solar Light

Designed for intermediate applications :

Pathways, Parking lots, Private Gardens, Bus stations, Private drives, Walking paths, Agricultural.

Low cost one piece system comes completely assembled from the factory.

18 high powered Led's in a Type II or Type III light distribution pattern and an excellent uniformity.

Optional turtle friendly amber LEDs provide long-wavelength light for ecologically sensitive areas.

Technical Specifications

18 LED's provide up to 1600 lumens.

12 volt 108 ah deep cycle AGM battery

85 watt poly-crystal solar panel. 36 cells in series
PWM controller with selectable duty cycle

All aluminum battery enclosure

Unit weight 155 lbs

EPA 4.0

Optional powder coat color specification



Features

Installs in minutes.

All components integrated into a sleek one piece

High tech appearance, corrosion and
vandal resistant.

Battery and controller housed in an
aluminum enclosure

Grid-smart™ - Grid solar street light

“GridSmart™ Incorporate solar lights into the electrical grid and provide years of efficiency, maintenance-free lighting.

“GridSmart™ combines the reliability and exceptional performance of induction lights with advanced solar power generation.

GridSmart™ provides monitored/measured power to your local utility during the day instead of charging batteries.

Excess power (produced minus consumed) can be claimed as carbon credit or solar credits.

GridSmart™ is a unique, Made-in-America product especially designed to meet the demanding performance and lighting needs of roadway engineers, the military, landscape architects, and outdoor lighting professionals.



GridSmart™ features:

- Less than an hour to pole mount
- Can be used for retrofit applications
- Wattages range from a 25 to 250W
- Dusk-to-dawn at full power



New..solar lighting solution

Roadway Beacons – solar based MUTCD compliant 24 hour flashers, school zone and cross-walk lights.

Roadway Beacons include solar powered Advance Warning Beacons.:

24-hour warning flashers, school zone and cross-walk lights.

Roadway Beacon utilizes LED technology and is battery based.



PLB™ - Pathlight and lawn bollard.

This is a fully self-contained solar light. It is durable and designed to operate even in very cloudy environments.

It provides excellent low level, point-to-point lighting using the most sophisticated energy management system available in the world. Cost effective alternative to Grid counterparts.



WattMaker™ – Off utility-grid solar power system

Standard configurations range from 10Watts to 540Watts with 12/24/48VDC or 120AC output, other configurations available on a custom basis.

5-day quick ship on most standard configurations.

Pre-assembled and prepped sub-assemblies cut Installation errors and time.

Standard mounting for less than 265Watts is side-of-pole mount and “larger” systems use Brilliant Sun™ top-of-pole mount.

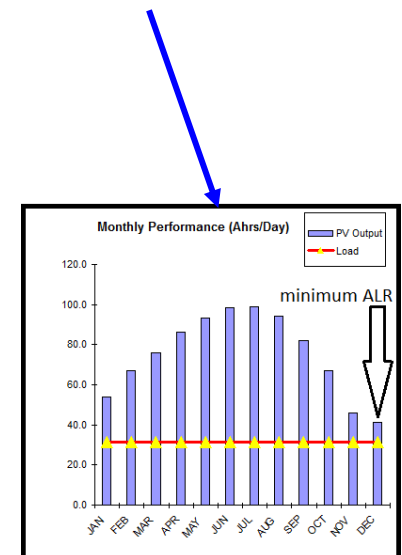
Mounts on a 3 ½” or 4” round pole or a wood pole with a band clamp.

Approximately 1-hour installation time.

Options include digital read-outs, specialized mounts, fan, radio, photo-sensor, motion-sensor and powder coating.



We provide proper sizing. Each system size is determined by load, location and duty cycle. All loads, active and quiescent loads are evaluated.



Warranty

- Solar panel: 20 years
- LED & Luminaire: 10 years
- Cables: 10 years
- Controller: 5 years
- *Batteries : 5 years
- Metal part : 10 years



Others Solar powered solutions

- Architectural solar lighting solution for pathways
- Mobile solar powered traffic light solution
- Mobile solar power system solutions : Solar Generators



Enlarging
the range

Architectural solar lighting solution for pathways

- Tubular construction
- Cree Led from 30 to 60W
- Solar panel of 210W
- Battery : Lithium based on requirements
- Design for pathway
- Exist in various colors
- Made in France : 5 years warranty batteries



Mobile Traffic product solutions

- Fast Set Up: Sets up in a matter of minutes
- Run Time: 5 days autonomy for 12 heads & 10 days autonomy for 6 heads with fully charged batteries, solar self sustaining throughout the year
- Versatility: 3-4 adjustable Signal heads, in each direction tow in tandem, small footprint 6' 6" wide
- Security: Tamper proof fasteners, lockable enclosures, removable hitch and controller security code.
- Solar: Adequate to provide year round operation, comes with 3 axis of adjustment.
- AGM / T-GEL Batteries: No maintenance, long life, no corrosion AGMs & T-GELs, charger included, 7-10 year anticipated life.
- Pre-timed Operation: Automatic & manual control options available
- Operator Interface: Simple to use Arm & Solar Deployment: 4 function handheld pendant operated electro-hydraulic lift (no winch or cable)
- Reflective Safety Tape To ensure visibility at night
- Variable timings and Signal Plans
- Made in India : 5 years warranty and 3 years on batteries



Mobile Power Solar system solutions

Provides instant AC power to remote locations & work zones.

Designed to replace grid power or Diesel generator. Reducing high costs of diesel installations and usage of grid power!

No maintenance Batteries

- 700 watts solar panel charge up to 10 AGM /T Gel batteries. No maintenance, 10 years of regular use.

Replace your noisy Generator

No noise, low cost vs generator, no maintenance and Green.

Charge, Haul, and Instant Use

- Dual AC/DC inverter charge and maintain system, it plugs into any outlet to charge in the event solar is difficult.
- Produce 3-8KW Hours per day with a reserve of 20 KW Hours (batteries) Tows with any vehicle and deploy with stabilizing jacks
- Adjustable solar Panels to 360° and at any tilt
- Small footprint: easy to maneuver and store.
- Made in India : 5 years warranty and 3 years on batteries

