



SOLAR ECO
SYSTEMS



SMART NODE TO SMART CITIES



SOLAR INNOVATIVE TECHNOLOGIES, Inc.



**YOU ARE ABOUT TO TAKE
THE FIRST STEP TOWARDS THE FUTURE**

This is our feature presentation for *SmartNodes* and may be your first stage to Smart Cities:



All of the above services without energy cost.

The perspectives on the growth and development of smart cities globally are quite positive. Recent studies estimate that by the year 2020, the Smart Cities Market will reach an approximate value of 1,500 billion dollars worldwide (Source: Frost and Sullivan)

The savings generated by providing technological infrastructure to smart cities can range between 20-60% in some items of expenditure according to the areas of the Smart Cities analyzed (mobility, sustainability and energy efficiency).

“ We do not inherit the earth from our ancestors; we borrow it from our children.

Native American Proverb

”



WELCOME TO SOLAR ECO SYSTEMS



SOLAR INNOVATIVE TECHNOLOGIES

We offer clean solar energy to reduce our clients' carbon footprint. Under exclusive agreements, Solar Eco Systems develops and Solar Innovative Technologies distributes self-sustaining solar LED streetlights. Through years of experience in the area of energy-efficiency, we have acquired a wealth of skill and know-how.

The implementation of major projects in the construction industry has led us to a deeper understanding of the requirements for streetlights that are independent from the power grid.

We combine a unique design with the latest in photovoltaic and LED technologies.

Our state-of-the-art products are engineered, developed and certified in Germany, and key materials are sourced from suppliers in Germany and the United States. Our ISO-certified manufacturing and assembly plant is based in Morocco.



In this brochure, we would like to share the benefits of our latest generation of energy-efficient, solar-powered LED lighting systems.

HOW SOLAR ENERGY IS CHANGING THE WORLD

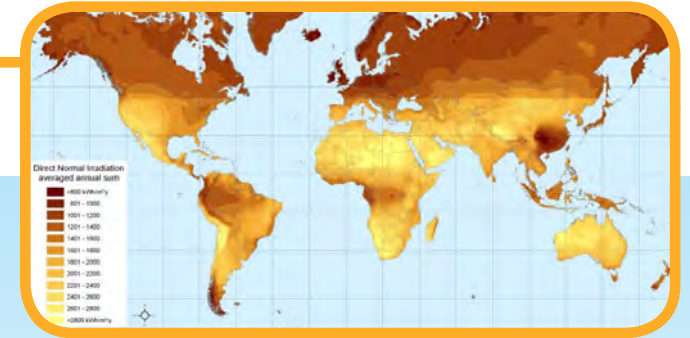
SOLAR ENERGY FOR A SUSTAINABLE FUTURE

Energy is at the root of widespread social, economic and climate problems. Therefore, there can be no doubt that solar power represents a key strategy for ensuring a sustainable future.

Besides being sustainable, solar power is renewable, meaning that we will never run out of it.



SOLAR POWER Saves \$ Billions



THE WORLD AS A SOLAR POWER PLANT: WHAT ARE WE WAITING FOR?

The map highlights the regions with abundant sunshine, which are perfectly suited for our solar technology, as a high annual rate of sunlight translates into significant solar potential. In the coming years, the region is ideally positioned for massive growth in the demand for solar photovoltaic (PV) power.

PROVIDES:

Energy reliability. Rising and setting of the sun consistent

Energy security. No one can go and turn sunlight into a monopoly

Energy Independence. This "fuel" is free for all to use.

THE LATEST LED TECHNOLOGY

ENERGY SAVINGS WITH THE LATEST LED TECHNOLOGY

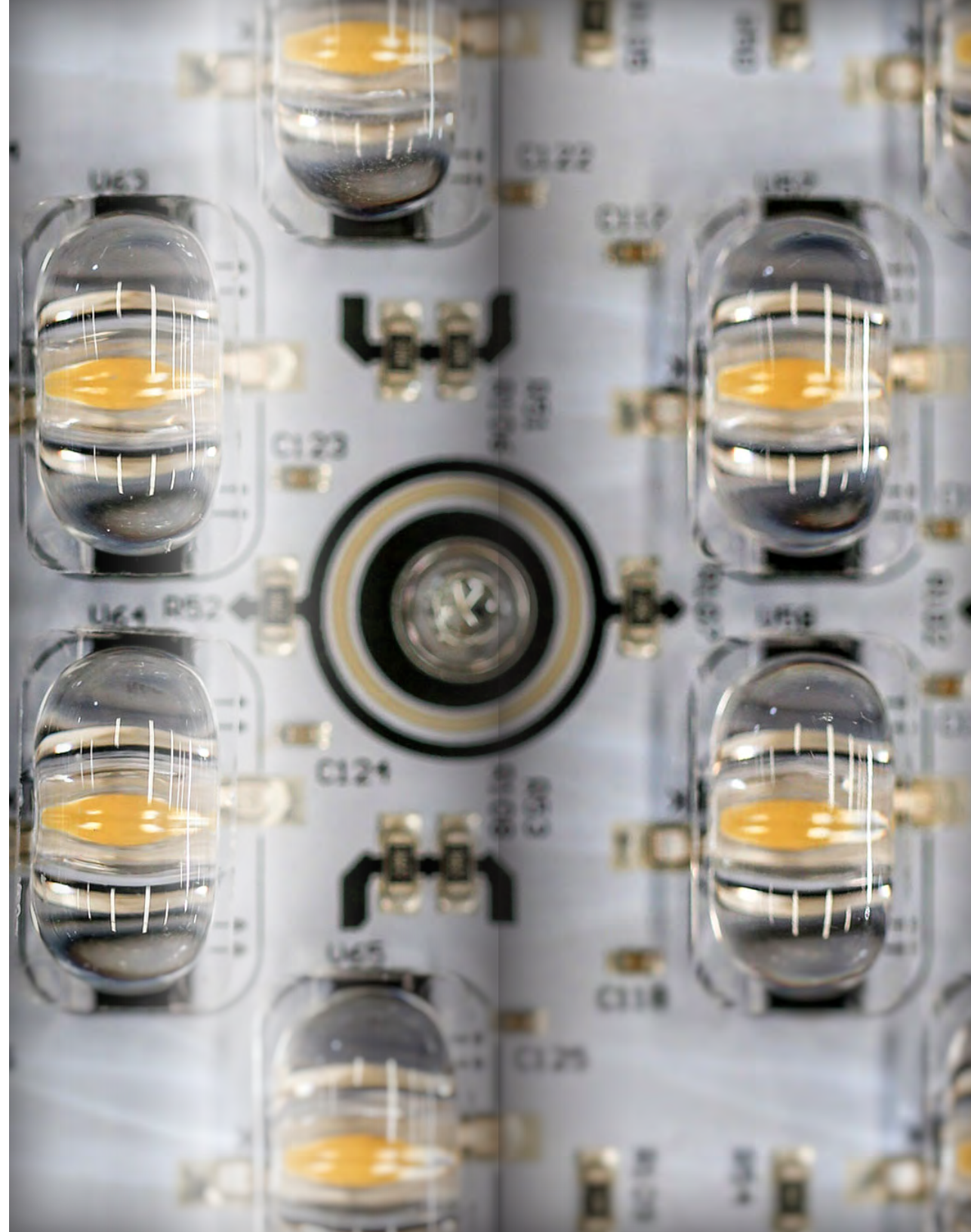
The latest-generation LED technology has a particularly high lighting efficiency, known as "luminous efficacy." These LEDs consume about **50 W less per bulb** than comparable systems.

The proprietary lens system focuses the light output and minimizes unwanted stray light, thus contributing to a further increase in efficiency, as the optimal number of LEDs to be installed can be precisely determined in advance.

Solar Eco Systems provides bright, targeted illumination that **reduces CO₂ emissions**. Switching from mercury vapor lamps to LEDs can represent **savings in energy costs of 70 percent or more**.

➔ *The proprietary lens system focuses the light output*

➔ *Savings in energy costs can reach 70 percent or more*



100%



Electromagnetic ballast with mercury vapor lamps

90%



Other lamp technologies (yellow light) SON-H, as a temporary solution

65%



New lamp (white light) & electronic ballast technology

70%



Newest HID lamp technology **30% of additional savings** in street lighting with new technology and new equipment

45%

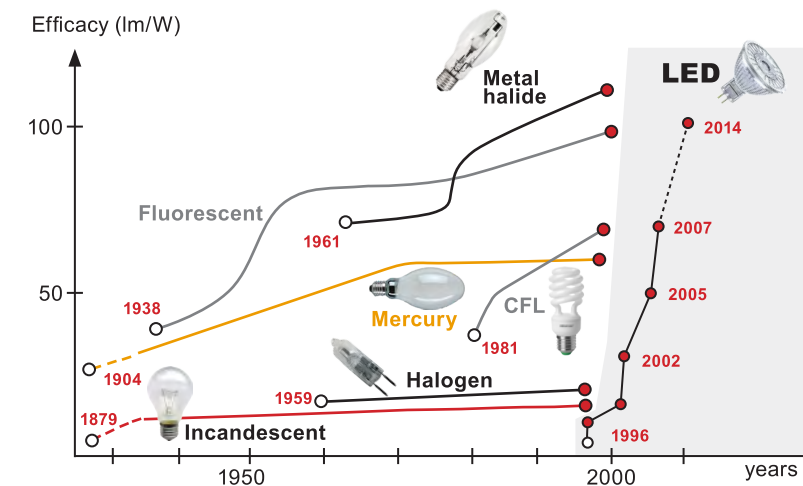


Other lamp technologies (yellow light) SON-H as a temporary solution

30%



Other lamp technologies (yellow light) SON-H as a temporary solution



NETWORK INDEPENDENT SYSTEM



Latest LED Technology

Photovoltaic Element

- Technical Container
- Power Management Unit
- Main Controller
- Communication Controller
- Deep Cycle Battery

POWER GRID INDEPENDENT SOLAR LIGHTING SYSTEM

CO₂ - Savings of 596 grams per KWh

INNOVATIVE LIGHTING CONCEPT

WHY SOLAR STREET LIGHTING?



Environmentally-friendly: Highly efficient photovoltaic technology



Economical: No electricity costs. Minimal installation costs



Aesthetical Unique, modern design



Efficient Modern LED Technology



Reliable in Operation controlled by a digital system



NO, laying of cables required



Minimal Operating and Maintenance Works: No electricity cost. Lower installation costs.



Long-lasting Illuminant estimated in 100,000 hours.



Zero Carbon-Dioxide emissions



Reduced UV emission, which attracts less insects

DESIGN AND TECHNOLOGY

UNIQUE DESIGN AND TECHNOLOGY

- Unique, modern design
- Photovoltaic Technology
- State of the art LED Technology
- Smart Energy control

POWER TUBE PV-MODULE

Picks up direct & indirect sunlight

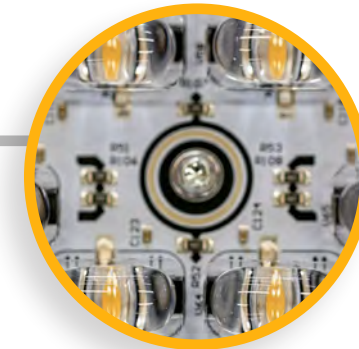
Multi-directional energy yield (360°)

Monocrystalline silicon cells (efficiency >23%)

Withstands high wind loads



LATEST LED TECHNOLOGY



- Exchangeable high-performance LEDs
- >100,000 hours lifetime
- Up to 160 Lumen / Watt
- Color temperature 2,500 - 4,000K
- Easy brightness control (0 to 100% dimmable)
- No light pollution

MAXIMUM ECONOMICAL BENEFITS

REDUCED SETUP COSTS

- No major excavation necessary
- No cables, wiring, meters or junction boxes needed
- Minimum planning costs

LESS MAINTENANCE

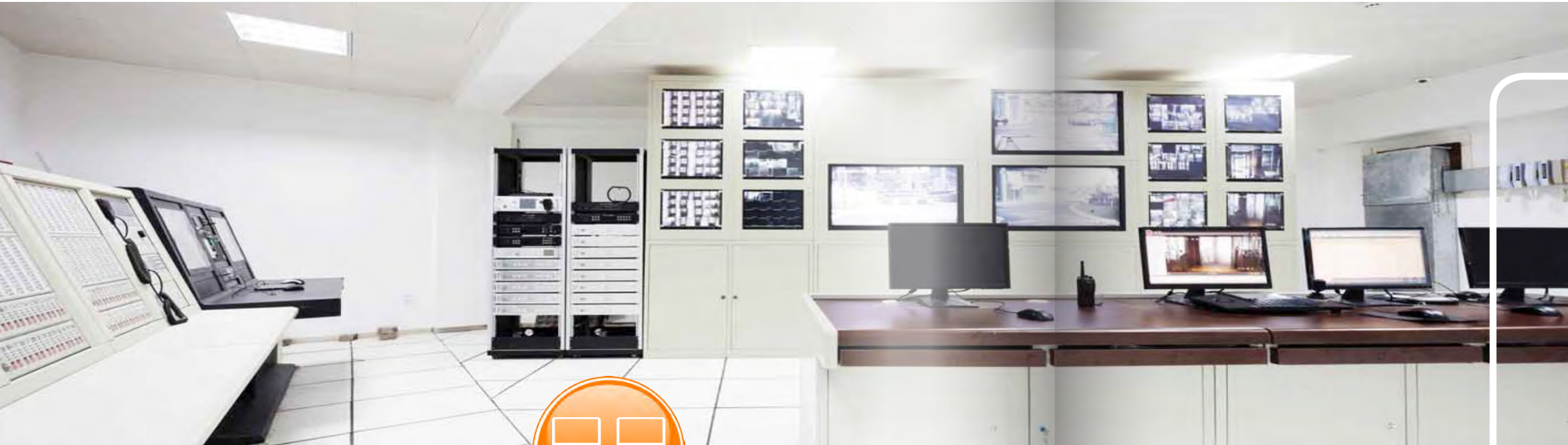
- Self-cleaning vertical PV module
- No need to replace lamps
- No need to service LEDs

SUSTAINABLE & ECO-FRIENDLY

- Zero CO₂ emissions
- Reduction in CO₂ of 2,000 kg per light
- No energy costs



SMART MONITORING AND CONTROL SYSTEM



INTELLIGENT COMMUNICATION AND ENERGY MANAGEMENT

- Peer-to-peer communication
- Remote control and maintenance system
- Statistical analysis of operating and lightening data
- Optimized battery management system
- Maximum energy yield with MPP tracking
- Communication between light and service center via gateway
- Built-in sensors for automatic security alerts
- Integrated motion detector

POWER CONTROL UNIT

- Self-programming
- Smart monitoring and control system
- Perfect battery/charging management
- MPP tracking for maximum energy yield
- PWM brightness control



OPTIONAL SURVEILLANCE SYSTEM

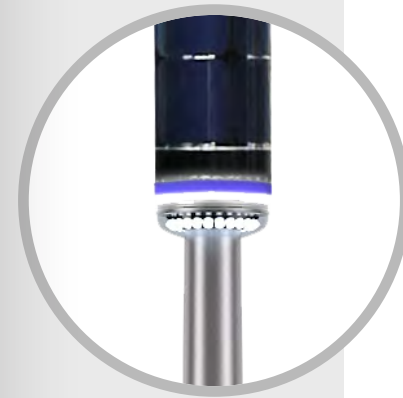


INTEGRATED HIGH-RESOLUTION CAMERA (OPTIONAL)

- No central recording software or hardware required
- Direct recording to any IT storage device
- Compatible with thermal or infrared camera
- Interchangeable lenses to fulfill custom needs
- Low power consumption
- High-resolution, super-wide video camera, instead of multi-camera system
- Outstanding image quality without zoom; very good contrast
- Separate day and night sensors
- No heating necessary; no moving parts
- No iris or mechanical filter; full backlight brilliance
- Very good color reproduction, even in dark areas

Discreet integration in lamp post or head





NOOR SOLAR LIGHT

**HIGH PERFORMANCE AND RELIABILITY
IN ALL ALL KINDS OF WEATHER**

Ideal for boardwalks and pedestrian lanes.

Noor is a stand-alone solar light designed for use in outdoor residential and municipal lighting. Equipped with advanced modern LED and photovoltaic technology, Noor provides uniform light distribution that's ideal for parks, plazas, promenades and parking areas.

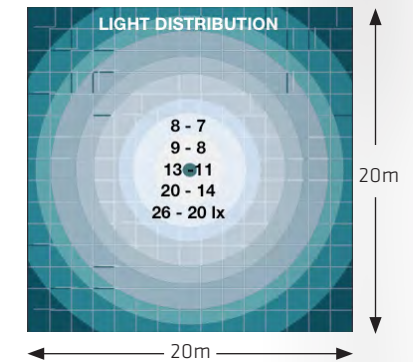
Thanks to its unique design and energy-management system, Noor ensures high performance and reliability, regardless of weather conditions or low solar irradiance.

Illuminance at full operation 72 LEDs /6,313 lm

Distance (meters)	Area sqm	Eav (lx)	Emin (lx)
10	70	34	8.8
15	105	29	7.6
20	140	26	6.1
25	175	23	3.0
30	210	20	1.5
40	280	15	0.4
50	350	12	0.1

Eav (lx) luminance - Emin (lx) minimum illuminance.

Illuminance in operation depending on local site conditions (average daylight available and customer specific lighting times).





SHEMS SOLAR LIGHT

THE LATEST IN LED TECHNOLOGY

Shems is a stand-alone solar light designed for use in outdoor residential and municipal lighting, such as promenades.

Equipped with advanced LED and photovoltaic technology, Shems provides uniform light distribution that's ideal for bicycle paths and pavement.

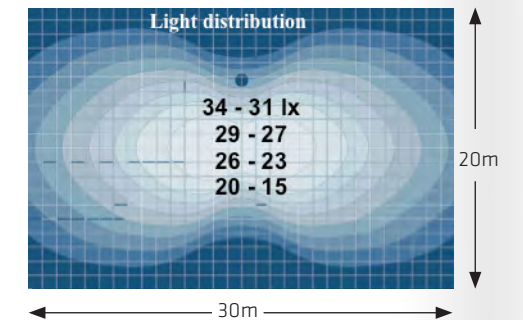
Thanks to its unique design and outstanding energy-management system, Shems ensures high performance and reliability, regardless of weather conditions or low solar irradiance.



Illuminance at full operation 180 LEDs plus 60 RGB LEDs/3,900 lm

Distance (meters)	Area (sqm)	Eav (lx)	Emin (lx)
10	100	26	4
12	144	20	2
15	225	14	0.9
17	289	11	0.6
20	400	8.6	0.4
22	484	7.3	0.3

Eav (lx) luminance - Emin (lx) minimum illuminance.
 Illuminance in operation depending on local site conditions (average daylight available and customer specific lighting times).



Light distribution aligned lengthwise
 Light-spot height 6.26 m 72 LEDs/6,313 lm



TAQA SOLAR LIGHT

PRECISE, UNIFORM LIGHT DISTRIBUTION

Taqa is a stand-alone solar light designed for use in outdoor residential and municipal lighting.

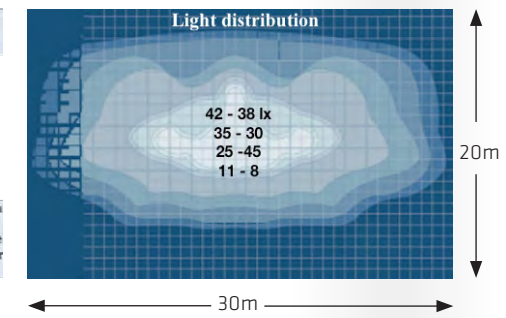
Equipped with advanced LED and photovoltaic technology, Taqa provides uniform light distribution that's ideal for street and roadway applications.

Thanks to its unique energy-management system, Taqa ensures high performance and reliability, regardless of weather conditions or low solar irradiance.



Illuminance at full operation 144 LEDs /12,626 lm			
Distance (meters)	Area (sqm)	Eav (lx)	Emin (lx)
10	60	42	21.0
15	90	28	15.0
20	120	21	10.0
25	150	17	8.1
30	180	14	4.1
40	240	10	0.6
50	300	8.2	0.2

Eav (lx) luminance - Emin (lx) minimum illuminance.
Illuminance in operation depending on local site conditions (average daylight available and customer specific lighting times).



Light distribution aligned lengthwise
Light-spot height 8.6 m 144 LEDs/12,626 lm

SMART NODE TO SMART CITIES

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