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Comparison between solar LED street lights and conventional road lighting systems

System analysis

The different elements forming a solar street lighting pole:

Lighting
- Type of lighting: LED, Sodium (High or low pressure) mercury vapor
- Luminous efficiency (Lumens per watt)
- Life time
- Behavior in hot climate

Battery
- Type of battery AGM
- Maintenance-free
- Life time
- True Deep-Cycle Batteries

Solar panel
- Maximal efficiency for minimal area
- Low foot print can be realized by mono-crystalline and Polly crystalline technologies
- Poly crystalline being cheaper and having 25 years life is well suited for this application

Controller
- Maximal efficiency in PWM mode

Pole and box
- Solidity (resistance to weight and wind)
- Resistance to water and humidity

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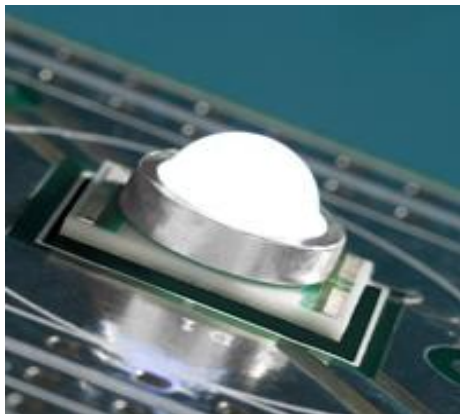
Sodium vapor	LED lamp	Mercury vapor lamp
Energy saving	Energy saving	Energy saving
Life 2500h	Life 100.000 h	Life 20.000h
Low cost	Hight cost	Medium cost
SOX-E	CREE LED X-LAMP	HQL type
CRI 0	CRI 75	CRI 45 (medium value)
Bad visual quality (light yallow-orange)	Good quaity (light white)	Good quaity (light white)



Color Rendering Index:

Color rendering index (CRI) is a measure of how well colors can be perceived using light from a source, relative to light from a reference source such as daylight or a blackbody of the same color temperature

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Zero cost of electricity and High economic returns
no bill because it is a stand-alone you can save about € 2,200 years / km of road section.

Maximum safety from electrical shock.
maximum safety against electric shock-induced, as the system and 24VDC supply voltage is not dangerous to humans.

Rehabilitation of old poles and underground cables by recycling.
reuse of pole at other sites, replacing existing with street lights solar. Recycling of copper and other metal components.

No excavations with zero problems relating to traffic.
zero cost and no excavation for the laying of cables for power lines both in low and medium voltage,no problem to vehicular traffic on the section covered.

Zero power lines maintenance
No problem of additional costs for maintenance and safety of the conduits and structures. maintenance rigurderà only streetlight on batteries every 12 months

Zero problems with black-out
No blackout resulted from lack of energy or damage to underground lines, in case of battery could only occur on the lamp only interested in leaving the other service. Furthermore, the minimum duration of the LED lamp and estimated at least 50,000 hours of operation of 11 years to average 12 hours per day

Very low installation cost
costs are only related to the concrete foundation and the rental of any machinery such as cranes or elevators for wiring no excavation

Zero CO2 emissions
no emissions of CO2 and respect for the environment, the materials used are recycled to 90%. offering a idea of providing a green urban management and environment care

Ability to reconfigure the positioning it
If you need changes to the road (crosses, squares or buildings) **can re position the lamps without having to change anything quickly and without cost of excavation.**

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Economic evaluation

		Solar Lamp (LED)	Street Lamp (LED)
Excavation line	13,00 €/Mt [1]	No	X
Wire	4,50€ /Mt [1]	No	X
Conduit	33,00 €/Mt [1]	No	X
Concrete foundation	180,00 €/Mc	X	X
Excavation for foundation	44,00 €/Mt	X	X
Recovery escavation	16,00 €/Mt	X	X
Electricity bill	48,00 €/year	No	X
Maintenance electric line	N/C [2]	No	X
Maintenance street lamp	15,00 €/Lamp/year	X	X
Cost lamp		1490,00 €	880,00 €
		1.745,00 €	1.925,50 €

[1] cosider is that the minimum section is **15 meters for any streetlight** (one lamp +n)

[2] the cost of maintenance is calculated based on the type of activity that is requested by the customer

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Conclusion

It is clear from this brief study the different technology, in favor of the LED also the economic viability and flexibility of solar lighting systems against traditional an AC power.

Due to the type of project you want affronatre it's obvious, depending on the type of environment and technical difficulties of laying 100 km of underground cables to the resulting costs, the use of solar lighting systems, in cosider of the total cost of 'work.

One must remember that for these distances should be making power station MT/BT if available national distribution network.

Good job!

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