

Full Reliable Charge in Extreme Temperatures

## Solar Light Systems Provide Crucial Light Sources in Remote Oil Fields

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**Jithesk Kumar, Sr.**

Engineer of Projects & Business at EcoSol

### Summary

- Kuwait Oil Company, the 10th largest oil company in the world, turns to solar power for lighting oil fields.
- EcoSol Energy Systems a leading energy, water and sustainability consulting headquartered Dubai, United Arab Emirates was tapped to develop a lighting system to keep the oil fields running safely and efficiently.
- Morningstar TRISTAR MPPT 60 Controllers, TRISTAR 45 (Load control) and EIA-485 / RS-232 communication adaptor were used in these lighting applications.

### Situation

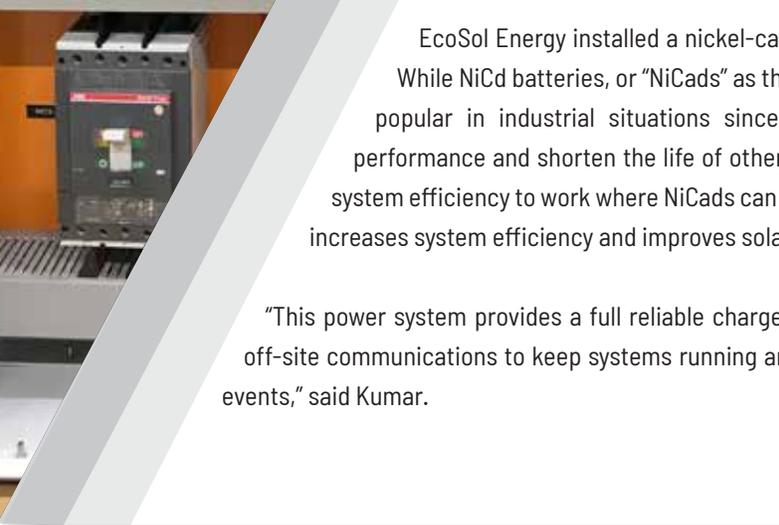
Situated in the far north of the Persian Gulf, Kuwait is a dry and arid country with extreme temperature shifts— from desert summers, in which the temperature is regularly over 100 degrees, to frigid winters that can dip well below freezing.

Kuwait's economy is heavily dependent on fossil fuels; oil accounts more almost half of its GDP and 95% of the government's income. Because oil is so vital, the government-owned Kuwait Petroleum Corporation oversees the production of crude oil through a network of subsidiaries.

### Project

One subsidiary, the Kuwait Oil Company, Ltd., is the 10th largest oil company in the world. Kuwait Oil Company relies on a reliable, steady source of electricity to power the exploration, drilling and production of oil and gas.

With most oil and gas sites located in remote areas with restricted access, Kuwait Oil requires backup battery solutions with high performance, total reliability and low maintenance to power essential equipment and systems. EcoSol Energy Systems a leading energy, water and sustainability consulting headquartered Dubai, United Arab Emirates was tapped to develop a lighting system to keep the oil fields running safely and efficiently.



## Project

Because oil & gas facilities are considered hazardous operating environments where an unprotected electrical device might have the potential to spark an explosion or cause a fire placing workers risk, oil companies require electronic products and enclosures designed to operate in such a way that is ignition and explosion proof. A series of global standards define hazardous conditions and requirements for electrical devices and systems (including solar electric) operating in them. The US and Canada use a hazardous locations classification system, while the rest of the world assigns a multiple, tiered "Zone System" to cover potentially explosive atmospheres. These zones are based predominantly on the International Electro-technical Commission (IEC) and the European Committee for Electro-technical Standardization (CENELEC) standards.

Along with maintaining compliance with the international Hazardous Zone classifications and standards, oil and gas company employees must perform constant risk assessment, and clear visibility is crucial to detecting small imperfections that could lead to catastrophic events. It all adds up to a complex safety regimen with high stakes and zero tolerance for failure. That's why ECOSOL ENERGY turned to Morningstar to keep their systems running without interruption.

"A single power failure can cause a ripple effect through our entire system, stalling operations, costing millions of dollars, and putting the safety of our workers at risk. The risk of accidental fire or explosion is always top-of-mind when selecting a power source," said Jithesh Kumar, Sr. Engineer of Projects & Business at EcoSol.

## Solution

EcoSol Energy installed a nickel-cadmium (NiCd) battery system with a Morningstar TRISTAR MPPT 60 Controllers. While NiCd batteries, or "NiCads" as they are popularly known, are rare in residential installations due to cost, they are popular in industrial situations since they can withstand very cold temperatures that would compromise the performance and shorten the life of other battery chemistries, which would need protection and heating which reduces system efficiency to work where NiCads can do the job without such assistance. Eliminating the need to warm batteries also increases system efficiency and improves solar harvesting— another point in their favor.

"This power system provides a full reliable charge in extreme temperatures, can withstand rugged wear-and-tear, and provides off-site communications to keep systems running and offer real-time alerts of minor issues before they escalate into catastrophic events," said Kumar.