

Easier Maintenance with a Lower Carbon Footprint

## Solar Simplifies Shell Oil at Sea with Fewer Emissions

"We were having an issue so I sent a general email to Morningstar. Even with the time difference between us and the U.S., just before I shut my laptop down, I saw a reply. The support engineer helped guide me in the right direction."

**Shell Electrical Engineer**

### Situation

More companies are developing climate-friendly policies and initiatives. While it may seem ironic, oil & gas providers are leading the pack. The reason is that oil & gas extraction and delivery infrastructure is almost always located away from grid electricity sources, so companies must rely on local electricity generation to maintain operations. They increasingly turn to solar power as an alternative to expensive and less-reliable generators. This is leading to oil & gas facilities ranking at the top for renewable energy adoption.

One example is Shell, which plans to aggressively reduce the net carbon footprint of its energy products. In April 2020, Shell announced an initiative to align with the stretched goal of the Paris Agreement, which seeks to limit the global average temperature rise to 1.5° C. Shell's goal is to reduce the net carbon footprint of the energy products it sells by approximately 65% by 2050. As an interim measure, it looks for a 30% reduction by 2035.

### Project

One way Shell is trying to fulfill its goals is by retrofitting its offshore facilities in the North Sea with solar power. These include oil rigs and Normally Unmanned Installations (NUIs).

Loads associated with these installations include about 24V of navigational aids, along with motors for hydraulic power units that run for about 15 minutes, attain pressure and then shut down. These rigs and NUIs serve as a junction to bring gas topside and measure/monitor pressure and the amount of gas produced before transporting it to the main production facility for processing and compression. In the end, the gas produced this way serves the United Kingdom's grid.

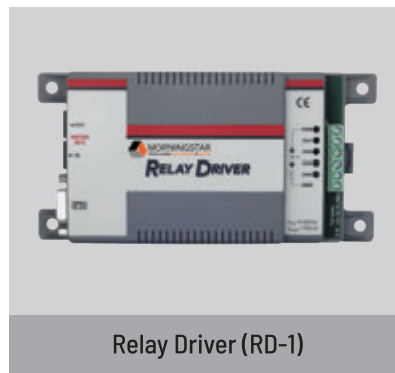
The rigs and NUIs have operated for decades; however, the harsh weather of the North Sea, with plenty of snow and cloud cover, makes even remote management difficult. Instead of continuing with two diesel generators constantly online, in 2015 Shell began to simplify the NUIs by removing process equipment that was no longer useful or redundant, and retrofitting with solar.

## Solution

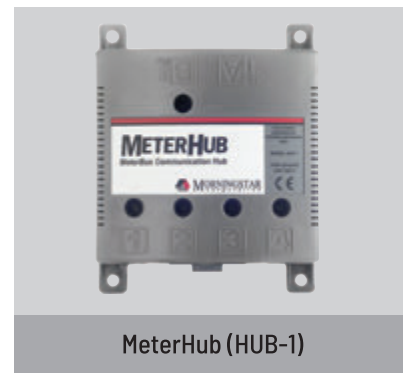
Tideland Signal, a Texas-based manufacturer of marine navigational aids, addressed the project by first building a massive solar system on one of the oil rigs.

Tideland designs systems to meet the European Union's ATEX-certification for use in hazardous locations. Among the components they selected for this project are Morningstar's TriStar charge controller (TS-MPPT-60) and accessories including Morningstar's Relay Driver (RD-1), MeterHub (HUB-1), RSC Adapter (RSC-1), and Remote Temperature Sensor (shown below). Together in the system, they provide ultra-reliable communication, locally-connected metering and Modbus connection to tie into SCADA systems for remote monitoring. The TriStar controllers are uniquely ideal for the application, built to reliably operate in the harsh environment. Even when an issue did occur, Shell's electrical engineers quickly obtained help from Morningstar—all the way across the ocean.

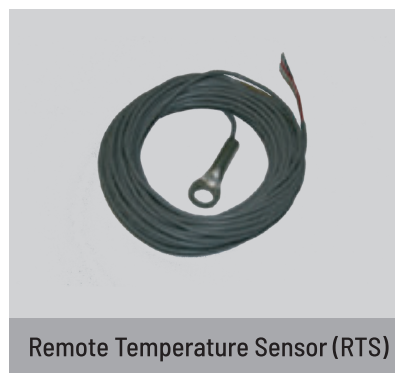
The solar installation makes it easier to maintain the NULs with simpler equipment and lower emissions. Now, generators are only used for emergencies.



Relay Driver (RD-1)



MeterHub (HUB-1)



Remote Temperature Sensor (RTS)



RSC Adapter (RSC-1)