

CASE STUDY

Wind and Solar Power for Coastal Lighting Systems



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The Requirement

The Town Council of Sheringham, a seaside town on the East Coast of England, found that when they needed to replace their ageing coastal street lights it would not be as simple as replacing the existing poles and lamps. A detailed survey of the promenade found that heavy duty electrical cabling had corroded over many years in the harsh salt water environment and so an alternative to digging up the long walkway to install expensive new cables needed to be found.

A brief investigation found that renewable energy might be used to provide power for independent lighting poles and an expert opinion was sought.



Bespoke Engineered Solution

Marlec have manufactured a range of hybrid wind/solar energy streetlights since 2001 and installed the "Green Column" successfully all over the UK. It is ideal for rural lighting in areas where grid power is not easily accessed and enables lamps to be installed at otherwise uneconomical positions. Marlec were approached to provide a bespoke wind and solar powered lighting solution for this extremely harsh marine environment.

On assessment of the site Marlec's engineers considered that a "tougher than usual" solution would be needed to durably withstand the nature of such an extreme high wind and salty environment. Taking the standard Green Column as a sound basis for a design, a tower was designed to withstand the high wind loads known to exist at this waterfront. The demand levels for lighting necessitated the use of a hybrid wind and solar charger and the Marlec engineers combines a 65W solar panel with their Rutland FM910-3 Windcharger which is specifically designed to withstand the forces of frequent high winds.



As a popular site for tourists Sheringham Town Council were mindful of maintaining the uniform and aesthetically pleasing light fittings used in the town. Marlec worked closely with Thorn Lighting and retro fitted low energy LEDs into matching lampheads. An additional key feature of this bespoke Green Column design is the Marlec hybrid wind and solar regulator with integrated lamp controller which could be programmed to switch off at 1am, a particular requirement for this council. Unlike most solar

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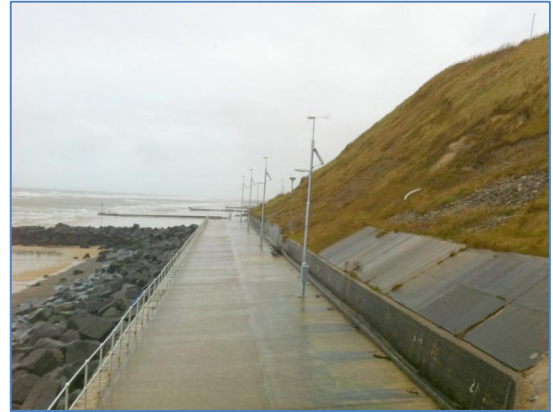
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streetlight controllers the Marlec designed device has the capability to set up two on/off times per day and cleverly responds to light levels to avoid "on" times during daylight.

A trial system was installed on the promenade for a 12 month evaluation. During this time it was exposed to winds recorded at over 120mph (192kmph) and coastal winter conditions which included frequent spray off the sea. As expected the combined Windcharger and solar panels continuously delivered the power needed to drive the demands of the lamp.



The Roll Out

Satisfied with the results from the 12 month trial the Council commissioned Marlec to install 20 complete lighting systems for the entire promenade.

The newly updated furling Windcharger, the Rutland FM910-4 was fitted to the columns alongside the latest Ameresco 65W solar panel. Details of the bespoke design lamp poles were refined and this included a hinged base to facilitate and speed up installation and long term servicing. The installation was undertaken over a 3 week period in the winter before the seasonal installation of beach huts on the promenade.



2013 Storm Surge

In December 2013 a combination of extremely high winds and a tidal surge caused a large amount of flooding and damage along England's East Coast. Sheringham and surrounding towns sustained significant infrastructure damage, with the sea wall smashed needing extensive repairs and sections of the promenade required replacement.



Marlec were asked to conduct a post storm inspection in January 2014. Despite the wall of sea water to have struck the bank and the damage to the surrounding street furniture, the Marlec Green Column pole bases had taken on only a little sea water and the Rutland FM910-4 Windchargers and solar panels showed no signs of damage. Owing to the harsh environment an annual planned maintenance of the systems was recommended to support the continued good service and operation for years to come.

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