

RENEWABLES AS ALTERNATIVE TO DIESEL GENERATORS AT BTS

LEAD ORGANISATION

PowerOasis Ltd
Carpenter House
Broad Quay
Bath
BA1 1UD
Contact: Nick Smailes
Tel: 07767 685775
E-mail:
nick.smailes@power-oasis.co.uk
www.power-oasis.com

PARTNERS

Motorola Ltd
University of Bristol

COST AND DURATION

The Carbon Trust contribution towards this project is £125,000. The project started in March 2008 and is due for completion in March 2010.

PROJECT REFERENCE NUMBER

076-135

OBJECTIVES

PowerOasis Ltd plans to develop and trial a combination of renewable power sources to act as a high-availability power supply for off-grid telecommunications base transceiver stations (BTS). The main objectives are to:

- Develop a method of incorporating site-specific weather data with available forecast information to predict the renewable generation capacity of a site
- Establish a software model that combines predicted generating capacity with anticipated BTS load data to estimate site renewable power generation and battery requirements
- Develop predictive control software that would enable active management of supply, storage and demand on site
- Integrate novel and highly robust flow battery technology into the concept to significantly increase the operational life of storage batteries.

SUMMARY

To fulfil their contracts, telecommunication operators require an uninterrupted power supply at a BTS. In most situations, this is achieved by connecting to the local electricity grid with limited battery back up for short-duration interruptions. However, where a grid connection is considered to be too expensive, unreliable or too remote, then diesel generators are often used.

As an alternative to a diesel generator, a BTS test site in the UK has been operating with a power system that comprises renewables technology (i.e. a solar array and wind turbine) with lead-acid battery storage. A similar system has been operating in Namibia since May 2007.

Analysis of the data from these two sites by the PowerOasis team shows that when the capital and operational costs of these 'renewables' arrangements are compared with those of a diesel generator there can be a significant payback period before the



Solar array and wind turbine powering a BTS at Swindon test site

renewables option becomes cost-effective. The length of the payback period differs from site to site due to key factors such as the costs of refuelling, insurance and the power needs of the site.

However, by incorporating weather data, intelligent electronic control and integration, and novel flow battery technology, the team is confident of being able to deliver improvements. These improvements should enable a renewables solution to compete favourably with a diesel generator on price, reliability and environmental grounds, and reduce carbon dioxide emissions from each BTS by up to 110 tonnes/year.

It is estimated that there are over 7,000 off-grid BTS sites in Europe and over 35,000 sites worldwide where such a solution could be appropriate.

