Press Release

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Cogeneration and On-site Power Production

Solar power shines its light on site

Solar power is fast becoming the renewable resource of choice for on-site power production. Benoit Rolland, managing director of Tenesol, a global player in the field of solar energy, highlights some of the key industries where sunlight is powering business.

The use of renewable energy in remote off-grid locations has increased rapidly over the past few years. Where diesel generators or expensive grid connection were the two options considered most, renewable resources are proving to be a far more efficient and sustainable solution.

Renewable energy is, and has been for many years, the future. As we develop new technologies and innovations to harness renewable resources, we discover new applications that make off-grid power generation more available and more efficient.

Among renewable resources, solar power is regarded as the leading choice for off-grid power generation. There are a number of reasons for this. Firstly, its versatility; solar technology can be installed in almost any location – including mountains, deserts, jungles and off-shore locations – and can suit any power requirement, so long as enough photovoltaic (PV) panels are installed. Secondly, its reliability; solar systems utilize the latest technology but perform a relatively simple operation where little can go wrong. It is not uncommon for a solar installation to run for more than 25 years. Finally, its ease of maintenance; with a solar system, basic maintenance ensures reliability and prolongs efficiency. A local representative can be trained to carry out system maintenance and repairs, minimising the requirement for technician call outs.

How it works

A major benefit of using an on-site solar system is its simplicity. A typical system works by capturing solar radiation in silicium cells within the PV panel, which enable the panel to supply a direct current. This current is delivered and stored in a battery. The battery is then linked to the required equipment and supplies power as and when it's needed. That's it.

A typical off-grid system is made up of a standard set of components: PV modules, junction boxes, storage batteries and a controller. The components are arranged in a way that best suits the specific

site. The PV modules are first and foremost, they are installed as a solar array and supported by a metallic structure. Junction boxes are used to link a group of modules together before being connected to the controller. The controller manages the charging and discharging of the storage batteries, monitors the production and consumption levels of the system and provides remote monitoring information for the system. The storage batteries are used to ensure power is supplied even during the hours of darkness or low levels of sunlight. The entire system is often remotely monitored to ensure production matches consumption, and to remove the need for regular on-site inspections.

Applications

Solar power's ability to provide efficient on-site power production means it is suitable to a wide range of applications and industries. From the oil and gas sector to telecommunications industry and from rural electrification to solar water pumping – there are literally dozens of potential applications. Below is an outline of how solar power performs in some of these arenas.

Oil and gas

Remote locations and the oil and gas industry go hand-in-hand. Pipelines carrying these diminishing resources travel across some of the most isolated environments on the globe. In the past, power was supplied to such locations using diesel generators. But for over 25 years, Tenesol has supplied customised turnkey solar solutions to the oil and gas industry at remote on- and off-shore locations. Such installations are designed to suit specific project needs and can cater for any situation regardless of location, power requirement or activity. Systems typically provide power for exploration, tracking, boring, transporting, cathodic protection (such as well heads and pipelines), lighting, security and emergency shut-down equipment.

Tenesol has a long-term involvement in large scale oil and gas projects in North Africa, the Middle East and South America. In the Middle East alone, the company has delivered more than 700 solar systems to some of the region's largest oil and gas operators.

Providing sustainable energy solutions for off-grid equipment is now a major part of the oil and gas industry. As oil prices rise and climate change continues, the need for alternative energy solutions increases. The suitability of solar energy's capabilities in the oil and gas industry, combined with the ideal climate of most oil and gas regions, means this is a fast expanding market.

Telecoms

The importance and wide-spread use of telecoms in modern society has increased the need for telecommunication infrastructure in both remote off-grid locations and in urban areas. This has heightened the need for suitable on-site power sources. Tenesol has met that need with its award winning solar energy solutions. These solutions are comprised of the usual array of PV modules,

junction boxes, storage batteries and a controller. Tenesol supplies such installations for multiple telecommunication applications including fixed, mobile and radio operated networks; all forms of transmitting base stations including small-sized, microwave repeater and base transceiver stations that operate wirelessly; and peripheral infrastructures such as lighting, security and air conditioners.

One of Tenesol's largest telecommunication projects was carried out in partnership with telecoms giant Orange. The project proved so successful that Tenesol and Orange were awarded the *Best Wireless Infrastructure Innovation* award at the Global Telecoms Business Innovation Awards 2010.

Developing new applications and new system structures to suit specific requirements has made solar power the leading choice for efficient power generation. In the world of telecoms, equipment does not require vast amounts of power so the system does not need to be very large. A solar system can be easily installed without much preparation to surrounding land and begins generating power immediately. It is the ideal choice.

Power to the people

As well as its industrial uses, solar power is ideally suited to humanitarian applications. The most common of these is rural electrification, the process of bringing power to remote off-grid areas. According to the International Energy Association, 1.456 billion people do not have access to electricity, of which 83% live in rural areas. Tenesol set out to help this situation over 26 years ago and has since provided more than 2,500 cost effective and reliable power solutions to more than 50 countries. The solar systems are installed on rooftops or small structures and linked to people's homes. They are provided either on a turnkey basis or as self-contained PV kits, which provide all necessary components to create a small solar installation without external support.

Tenesol is currently working on a major rural electrification project in Madagascar. The ACORDS project, which is part of an EU-funded global development program, aims to improve Madagascar's rural provinces through the use of sustainable technology.

Bringing sustainable electricity to communities for the first time is a highly rewarding and challenging task. As a company, Tenesol established itself in rural electrification and we have gained the expertise and capabilities to deliver on truly life-changing projects.

Rural locations are often remote. Accessing such areas carrying PV panels, storage batteries and general installation equipment can often prove difficult. The climate can also be a challenge. Tenesol draws on all its available resources and experience to reach end-user homes. On a recent project in Morocco, the company outlined a detailed transport plan using a variety of methods including journeying part of the way by donkey.

Rural electrification systems often become an indispensable element of a community. Training a local representative can be the difference between a quick fix and a lengthy technician call out. It also empowers the local community and provides them with the necessary skills to maintain and manage what is often a life-changing power source. Tenesol provides on-site training that covers system operation, maintenance and basic repairs.

Water from the sun

In addition to rural electrification, solar water pumping is another on-site humanitarian application. More than a billion people worldwide do not have access to safe drinking water, according to the UN's World Water Development Report. And for many isolated communities, pumping underground water to the surface is the only way to access potable water. A simple solar installation is the ideal solution; the PV panels and storage batteries are connected to a pump that has been submerged in a borehole or well. The pump extracts the water and transports it to a water tank at surface level, ready for the local community to drink.

Tenesol began to explore the use of solar energy for water pumping in West Africa during the 1980s. Since then, it has installed more than 4,000 solar water pumping systems worldwide – pumping around 80,000m^3 of water per day. The company has worked with many different organisations and charities to bring fresh, safe drinking water to rural locations and isolated communities across the globe.

Most recently, Tenesol completed its 200th solar water pumping system in Senegal. Two of the largest projects in the country involved the Ministry of Social Development and the CILSS (Interstate Committee for the fight against drought in Sahel). Tenesol delivered 80 solar pumping systems for the CILSS's Regional Solar Programme, which uses solar energy as a tool for regional development. It also provided 72 solar pumping systems for the Ministry of Social Development's PLCP project, which aims to combat poverty throughout Senegal.

These are just a few examples of applications and projects where solar power has emerged as a leading form of on-site power production. Solar power's ability to adapt to almost any environment and suit almost any requirement means its use in remote locations – whether for industrial or humanitarian purposes – will continue to grow.

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About Tenesol

A rapidly expanding global player in the field of solar energy *(with a turnover of €249 million in 2009, +29%)*, Tenesol works on behalf of businesses, local authorities and private individuals. For more than 26 years, Tenesol has been engineering, designing, manufacturing, installing and managing solar energy systems including production and consumption of supplied systems *(Off-grid sites, general grid supply via direct connection, solar water heating)* for its customers around the globe. A benchmark player in its sector, Tenesol currently has a staff of over 1,100 across 20 subsidiaries including two production facilities.
For more information, please visit: http://www.tenesol.com/?lang=en

For all media enquiries, please contact:

International contact:
Ronan Cloud,
Account Manager, SE10
Tel: +44 (0)20 7107 2008
Email: **cloud@se10.com**