

NEW CONCEPT BLOWS IN

Could a wind energy harvester help to meet the power needs of developing countries?

Power needs in developing countries are huge. Over a billion people have no access to modern energy provision and a further billion only have intermittent access. Getting reliable power to these people is complex and challenging. Hurdles to be tackled span a long list, including remote or difficult to access locations; lack of infrastructure investment; and less experience of renewable energies and their associated technologies. However, some novel energy harvesting technology from a UK-headquartered firm could assist in overcoming some of these challenges.

WHAT IS A WITT?

A WITT energy harvesting system

uses natural occurring motional energy (NOME) that is all around us – in water, wind, humans and animals – taking all the chaotic motion clockwise, anti-clockwise, back and forth and up and down (six degrees) and turns a flywheel in one direction, harvesting the energy and turning it into electrical power using clever electronics. The power can be stored in a battery and called upon when needed.

The aim is to take natural energy and turn it into useable power, providing a clean, green solution that has clear merits for developing countries.

Although the WITT energy concept has many

ways of harvesting power to provide an affordable solution (subsea being a prime example of an area that is currently being commercialised), particularly of interest to developing countries is the WITT approach to harvesting wind energy.

In this solution, a WITT 'dragonfly' can be easily assembled to harvest all wind energy and the energy can be stored and used in remote locations or in townships to provide power for cooking, lighting, etc.

The dragonflies are ideal for emerging economies as they are light and easily deployed, making them useful for remote locations. The generator and assembly are close to the ground, which means that no special equipment is required for maintenance.

Unlike some other wind energy solutions, the dragonflies work with low wind speeds. Their energy harvesting potential can be modelled using computational fluid dynamics.

Their 'wings' can be made of fabric and easily 'trimmed' for different conditions. Also, the rudder can be disengaged so that the dragonfly turns to the wind at higher wind speeds.

In current iterations the wings can be up to 3.5m in length wings – larger sizes are being researched. The wings can be multi coloured or camouflaged, depending on their application.

The dragon fly's main body can be secured to the ground or base structure to prevent theft. And the fabric superstructure is inexpensive (and worthless without the generating system), further deterring would-be thieves.

REAL-WORLD CASE STUDY

South Africa is one region that the WITT's inventors believe could benefit from their solution. Power needs in South Africa are many. Power cuts occur frequently, which greatly affect hotels and leisure facilities (and mean that power is often needed to charge generators).

WITT Energy won a much-coveted place at Innovate UK's Energy Catalyst 8 event to visit Cape Town and Johannesburg in March 2020. The company's founders visited energy companies and townships to understand the needs and experience first-hand the power problems in the townships. A huge problem they noted was that electrical power is often stolen – with rows of 'live' cables going into the shacks and sheds.

WITT's aim is to help bring power solutions harvesting the natural

occurring energy in a clean way, using the resources that are already there.

The Energy Catalyst 8 funding opportunity opens in June 2020 and the company will be applying, with the aim of building and testing its dragonflies.

OVERALL POTENTIAL

It is too early to say how much impact the WITT technology could have in areas such as South Africa. However, the firm currently has two systems for testing a small six-degree of motion simulator, as well as a large Fanuc robotic arm for its bigger concepts – such as tidal WITTs. The company can take the motion data and input it into its system, which will inform interested parties how much power they will be able to achieve by deploying the dragonflies or other WITT solutions, such as its various water energy concepts. ●

Could wind energy be the answer to South Africa's power needs?



The dragon fly is an easy to assemble wind energy harvester