PROJECT DESCRIPTION

ELWA on Skeleton Coast of Namibia

System: ELWA
Planner: Calpak Solar Energy
Location: Namibia, Skeleton Coast

Object data

- Six photovoltaic panels Yingli 265 Wp
- 200 l hot water boiler Kwikot

Project description

The Skeleton Coast of Namibia is one of the loneliest places in the world. Only a few creatures can survive in the Namibian desert next to the cold Atlantic. In a remote Desert Lion Conservation Research Centre, an ELWA photovoltaic hot water heater improves the working- and living conditions for the research team.

Pioneering Character

This project opens the field of power-to-heat from photovoltaics in Africa. In Europe's residential segment, this technology has almost replaced classic solar thermal technology in many regions over the past few years, although this has not been the case for remote regions in Africa to date. However, due to the progressive decline in module prices, such projects can now also be implemented with PV.

The technical advantages are manifold. "Cables instead of pipes" make installation and operation far easier and even high target temperatures can be achieved without drastically increasing losses.

Why is this so unique?

In the past the use of solar thermal products (solar geyser) was common in this remote area. Under these harsh weather conditions, the exposed water storage tanks were unable to keep the generated heat due to the cold Atlantic sea breeze. The effects of salt and sand also placed a high burden on the used materials.
In comparison, the use of direct DC driven photovoltaic hot water preparation is a great improvement and has already proven to be very advantageous. To date, it is the only hot water generation system in the entire region that exclusively uses solar energy without the use of fossil fuels.

Figure: Due to the harsh weather conditions (the cold Atlantic sea breeze) the hot water storage tank was assembled inside a storage container to avoid heat-losses and to protect the ELWA electronics from environmental impacts.

Advantages for nature and people

In a research center for desert-adapted carnivores such as lions, brown hyenas, jackals, sea lions and other animals, the use of veterinary medical products is necessary on a daily basis. Thereby the production of hot water becomes an essential basis for maintaining hygiene and cleanliness. The project thus creates the basis for further research into these animals and for ensuring their survival. Only in this way future generations will be able to enjoy this untouched wild life.

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Economic Benefits

Remote areas like the skeleton coast are far away from any commercial town or centres, making it very costly to bring in any fossil fuel based materials for energy generation. As it is situated in a desert environment also the use of wood requires costly transportation. Therefore, the use of renewable energy technology with great savings is a necessity for the clients.
Using photovoltaics instead of a solar-thermal system also means far lower costs for maintenance and an increased lifespan of the system.

Technological innovation

The use of PV power for water heating is a young topic, but it has been developing at an increasing rate over the last years. With my-PV technology, the power of electric heaters can be controlled linearly. A feature that is essential for photovoltaic-heat applications. The technical advantages are manifold. "Cables instead of pipes" simplify the installation, the systems are maintenance-free. Compared to solar thermal systems 90% less copper is required. All pipes, pumps, valves, expansion vessels, anti-freezing liquids etc. are obsolete and PV works even more efficiently at low ambient temperatures!

Solar power is becoming the cheapest form of energy worldwide. Photovoltaic water heating with ELWA is more beneficial than solar thermal energy.

ELWA data processing

An integrated data logger makes it possible to visualise the solar yields achieved and the hot water temperature curve.

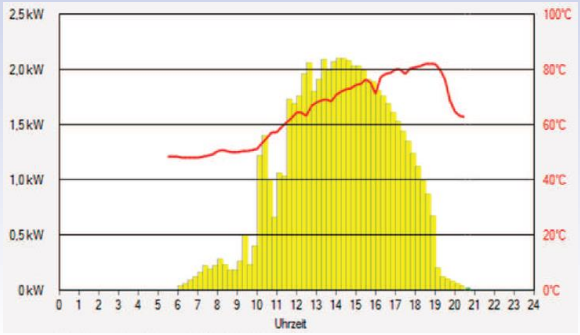

Figure: Solar yields (yellow) and temperature curve in the hot water tank (red).

ELWA Product details

- 0 – 2,000 W linear power control
- Target temperature adjustable with rotary knob
- Even works during grid blackouts
- For water tanks with capacities of 100 – 1,000 litre
- Internal consumption 2 W
- Efficiency ratio >99 % at nominal capacity
- Optional boost backup 750 W

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