

Finding a renewable storage solution

Currently, energy produced by solar or wind costs around 60c per kilowatt hour produced, and roughly R1 per kilowatt hour for coal-fired power stations. However, the cost of storage raises the cost of renewable energy above that of coal-fired power stations.



Prof Bernard Bladergroen

But a team, led by Professor Bernard Bladergroen, at the University of the Western Cape's (UWC) Energy Storage Innovation Laboratory (Esil) is working to find a solution to the energy storage problem, and to make the cost of solar and wind energy comparable, if not lower than that produced by coal-fired power stations.

"If you can beat coal-fired power stations, you can also beat nuclear," says Bladergroen.

Litium ion batteries

The team has already carried out successful field tests on lithium ion batteries, but larger storage batteries are still several years away from the market. The biggest challenge to their development is funding to keep the research going.

The lithium ion batteries made famous by Elon Musk and the Tesla Gigafactory are similar to those being produced at UWC. The big difference, however, is that Musk and some large Asian manufacturers are commercially producing lithium ion batteries in massive quantities.

“Musk has been able to invest R75bn on the plant. So if you want to compete with Elon Musk then you have to think about building a similar-sized factory,” he says.

While lithium ion batteries have a much longer productive life than the lead acid batteries in everyday use in most cars, they are not suitable for large-scale storage of energy.

Looking at vanadium

“What we are looking for is a battery that is not very capital intensive, that is able to store large amounts of energy and that will last 10 to 20 years. That’s where all our research is heading.”

A better prospect for large-scale energy storage, Bladergroen believes, is the vanadium redox flow battery that has great potential in South Africa, especially as this country is a large producer of vanadium and has the third-highest estimated reserves of the metal.

“Energy storage has enormous potential to change the world. I think many people do not comprehend the implications of this research. With the correct type of energy storage you can have the whole world running on clean, cost-effective solar and wind power.”

Leapfrogging technology

Bladergroen says that undeveloped rural areas will benefit most from this technology.

“Just like we saw with the introduction of mobile phones where landlines became redundant, effective energy storage solutions will enable us to leapfrog many of the traditional aspects of the energy grid. With the implementation of wind, solar and storage you can penetrate the areas that are not currently on the grid.

“We are right on that pivot point where the combination of renewable plus storage becomes the cheapest way of doing things. It is a very exciting time, and it is up to the researchers to break through that cost target,” he says.

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