

## **Harnessing the “cool” in solar power**

Solar is already commercially viable in Australia, but what is still amazing to almost anyone in the sustainable energy space is the relative slowness of its uptake not only for “conventional” solar uses, but for the wide range of cutting-edge technologies and methods that could quickly transform Australia into a world leader.

## **Blockchain**

Even if Bitcoin proves to be a fad at the end of the day, the technology behind it, blockchain, isn't going anywhere. So, what do cryptocurrencies (and virtual ledgers) and the sun have in common? The digital computations involved require vast amounts of energy. Some have claimed that Bitcoin “mining” uses more energy per year than countries like Denmark or Ireland. Using fossil fuels for this much power is clearly neither environmentally friendly nor affordable. The prospect of using cheaper and renewable solar power for this has already been recognized in Western Australia, where planning approval has been obtained for a 20-megawatt solar farm that would be used for powering cryptocurrency mining. This is a path we have to take if we want an affordable and sustainable way to maintain a fully digital financial future on a mass scale.

## **World Health**

Solar Energy is playing a growing role in world humanitarian efforts to save children's lives through vaccines. The World Health Organization and UNICEF estimate more than 12 million babies were not vaccinated in 2016, in part because vaccines simply weren't available. A big issue on that front has to do with refrigeration. That's beginning to change. Solar-powered refrigerators are beginning to be used for vaccine storage in areas where other fuel sources aren't available. One thing these populations do have is the sun, so it's imperative that we use it.

Along with reaching populations in areas with a chronic lack of access to power, solar refrigerators can be deployed in disaster areas. In 2017, the Australian government donated more than half a million U.S. dollars to UNICEF Pacific for the distribution of solar-powered refrigerators and solar-powered power packs to Fiji, where they were used to store vaccines and medicines in the wake of category-five Cyclone Winston. These challenges are real and we can tackle them. In our solar installation work in Vanuatu, we've had direct experience with these issues which has led us to partner with the World Bank to study how to challenge the high costs of utility-sourced energy with solar in the Pacific Islands.

## **Drought Reduction**

The vast majority of our country is desert. Imagine that in the middle of this desert you could use solar energy to extract water from air whenever you are thirsty. Even dry air still retains some moisture, so this simple idea could be an enormous helping hand for people in drought-prone climates, or in areas with an infrastructural lack of access to clean running water. And, what would it mean to live in a world in which drinking water is readily available anywhere and we no longer need to bother making plastic bottles?

It's not just a dream. In Australia, where drought is common, the Renewable Energy Agency (ARENA) is investing in 150 American-manufactured solar powered devices called Source, which use a specialized air filter to extract water molecules from air. Depending on weather conditions, each device can produce up to 10 liters of water on average a day.

Source is just one example of several technologies using solar power to extract water from air that are in development around the world. This is huge, considering that Greenpeace Australia estimates that Australians use between 13 and 14 billion drink containers a year. And it's not just about pollution. Over two billion people worldwide lack access to safe drinking water. Solar technologies may also be crucial one day in solving that international problem.

### **No such thing as too salty**

There is one obstacle to these various applications of solar power. The sun is always shining somewhere, but how much energy we can extract from it depends on both the weather and the time of day. Clearly the sun gives us little energy at night. For solar power to be applied more widely, we'll need to store energy collected from the sun for use when the sun is not around.

The obvious solution in consideration is batteries, but another way to approach this is to store solar energy in salt, which maintains itself well at very high temperatures and efficiently retains energy. When the sun isn't available, we can use the hot salt to heat water for steam, and use the steam to make electricity. In South Australia, renewable energy company SolarReserve is developing the Aurora solar energy project in Port Augusta with an investment from the government. The project will use salt storage technology to operate 24/7. The salt will be re-circulated and will never need to be replaced.

So salt is great because it's so ordinary, and isn't difficult to find. It's also non-toxic and crucially, cheap. Whether or not any of the ideas above have long-term value may be debatable, but what's not debatable is that we need to have a genuine discussion about them and move Australia in this direction. All across Australia, industry-changing technologies are being tested and deployed, but the government and industry needs to take a more active role, not in picking winners, but in supporting and promoting a rapid shift to a future powered by the sun.