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TITLE: PUB embarks on solar projects to diversify energy sources

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POSTED: 02 May 2014 18:40

URL: <http://www.channelnewsasia.com/news/singapore/pub-embarks-on-solar/1092750.html>

Singapore's national water agency PUB has started two pilot projects to harness solar power, building rooftop solar panels at Choa Chu Kang Waterworks and installing floating solar systems on Tengeh Reservoir.

SINGAPORE: Singapore's national water agency PUB has started two pilot projects to harness solar power, building rooftop solar panels at Choa Chu Kang Waterworks and installing floating solar systems on Tengeh Reservoir.

It said these projects are part of a national effort to explore alternative and sustainable energy sources to develop Singapore into a smart energy economy.

Through both projects, PUB will conduct a test-bedding study on the cost-effectiveness, potential benefits and scale limitations of investing in solar power infrastructure.

PUB said the 1 Megawatt peak (MWp) rooftop solar panel at Choa Chu Kang Waterworks will harness solar energy for the plant's water treatment operations, while Tengeh Reservoir will house floating solar systems which double up as an energy catchment to channel generated solar power into the national grid.

Chosen for its large roof space and treatment capacity, Choa Chu Kang Waterworks will see up to 50 per cent of its peak daytime electricity supply for water treatment equipment, lighting and air-conditioning coming from solar power.

The rooftop solar panels will generate an estimated 1.1 Gigawatt hours (GWh) of electricity per annum, equivalent to the average annual energy consumption of about 250 HDB households.

The \$2.3-million rooftop solar project is slated to commence operations by the first quarter of 2015 and the energy tapped will enable PUB to reduce the power it draws from the national grid.

In addition, the project will allow PUB to build sufficient technical capabilities in the use of solar modules in its waterworks.

The tender for the solar panel project at Choa Chu Kang WaterWorks has been awarded to RCS Engineering, which bid together with another company SolarGy.

RCS Engineering said the project is expected to generate about 1.2 million kilowatt hours of energy every year, which translates to about S\$300,000 in savings annually.

At Tengeh Reservoir, the floating solar systems will cover three hectares, or less than 0.5 per cent, of the reservoir area and generate up to 3.3 GWh of electricity per annum.

This is equivalent to the average annual energy consumption of about 750 HDB households.

Experts said having solar panels float on water will also cool them down, which may increase their yield by about 10 per cent compared to those installed on land.

But there are challenges.

Mr Albert Lim, managing director of SolarGy and co-awarded Choa Chu Kang Waterworks tender, said: "You will need to have a system of floats to place them on the reservoir and on top of which we put the solar panels. We have to think of how to bring the water, the cable through the water and back to land. During the installation, not many general workers would be able to install because some of them may have to go underwater to secure the whole system.

"Maintenance is also another consideration. Unlike land-based installation, there will be algae formation on the floats, maybe on the underside of the panels. So we have to develop ways of how to get access to the panels to clean them. Maybe we have to apply some type of coating to reduce the growth of the algae. All this would add to the maintenance cost."

The \$11-million floating solar project is led by the Economic Development Board, in partnership with PUB, and managed by the Solar Energy Research Institute of Singapore.

As part of the pilot project, PUB will conduct an environmental study to measure its impact on reservoir evaporation, biodiversity and water quality.

A preliminary assessment conducted prior to the project commencement has identified potential benefits such as reduction in reservoir evaporative rate and reduction in algal growth.

In addition, PUB's study of a similar project in South Korea showed an increase in biodiversity around the floating solar system with negligible impact on the reservoir.

Mr Harry Seah, Chief Technology Officer from PUB, said: "Today, solar power is the most promising sustainable resource for equatorial Singapore located in the heart of the Asian Sunbelt.

"As such, PUB is exploring the use of solar energy to diversify our energy options away from conventional, non-renewable fossil fuels, contribute to a smaller carbon footprint and promote more sustainable use of energy resources.

"Through both projects, we aim to analyse the capabilities of solar energy for high voltage operational efficiency, and utilise the large expanse of our reservoir's area which provides a good opportunity for testbedding."

- CNA/de