

NUS team makes cheap power from rainwater

■ **BY FENG ZENGKUN**

SCIENTISTS at the National University of Singapore (NUS) have found a cheap way to convert rainwater into electricity – and they are expanding their research to include sea water and wastewater, such as urine, as well.

They said such electricity is as cheap as power from the national grid and could become even cheaper in the future.

It can also be used to power cars if fuel tanks are replaced by water tanks.

Project member Chua Kian Jon, 41, an assistant professor at the NUS Faculty of Engineering, noted that the system makes use of Singapore's abundant rain. "We're surrounded by all this water which could supply all of our electricity needs," he said.

The rainwater system consists of tanks that can be placed on HDB block rooftops. The water is converted into electricity in two ways:

- Electricity generated by solar panels is used to split water into hydrogen fuel and oxygen.
- Sunlight directly converts rainwater into electricity through photocatalysis, a process that the scientists have improved with the invention of a new chemical compound that makes water more sensitive to sunlight.

They said each rooftop system can produce enough electricity to power the lifts, water pumps and corridor lights of an HDB block. Batteries can also be used to store the excess energy to power communal spaces. Oxygen created by the splitting process can also be sold.

Project member Ho Ghim Wei, 36, an assistant professor at the NUS Faculty of Engineering, said the hybrid system combines the best of alternative energy sources.

"Most commercial systems use only electricity to convert the water. This system also uses the sun's power and reduces the electricity needed by up to seven times," she said.

"It's also cheaper than pure solar energy because its main components are water and chemicals, not solar panels."

The Singapore Energy Market Authority (EMA) estimated that solar power now costs twice as much as power from the national grid.

The team is also working with ST Kinetics to explore using the technology to power hydrogen cars.

And they believe there is much potential in developing similar sea water and wastewater systems. Project member Zhang Chun from the Faculty of Engineering said of converting sea water: "Imagine the massive amount of power that can be produced. Power plants can be built on floating platforms out at sea, saving a vast amount of land space."

The project has received about \$1 million in funding from NUS since 2008.