

# *EDB pumps \$15m into studies on harnessing solar power*

Eight projects have been granted a total of \$15 million by the Economic Development Board to conduct research on solar technologies for the tropics. The projects include:

## **Using solar technology to generate both electricity and heat**

■ Led by Professor Andrew Tay of the National University of Singapore (NUS) and Dr Jiang Fan from Singapore Polytechnic

■ Most solar technologies focus on producing electricity. But only 16 per cent to 20 per cent of solar energy can be converted by solar cells into

electricity. About 80 per cent of this energy becomes heat.

Companies are now beginning to use this waste heat to warm up water.

The researchers hope to install a 10 kilowatt system at an NUS hostel block in Eusoff Hall in a year's time, serving about 100 student residents.

The same system is enough to power a two- or three-room HDB flat for a year, said Dr Jiang. A smaller 6kw unit is being tested at Singapore Polytechnic.

## **Customising solar modules for Singapore weather**

■ Led by Professor Armin Aberle from NUS

■ Solar cells are sandwiched between two glass panels. The sides are closed off with a sealant to protect them from dirt and the elements. This entire unit is called a solar module.

The efficiency of solar cells, which were developed in temperate climates, drops when the temperature goes above 25 deg C because higher temperatures affect the electrons' ability to convert into electricity.

The researchers want to test if the solar modules on the market will live out their 20-year warranties in tropical climates where temperatures often soar above 30 deg C.

They also want to find out what kind of packaging would be most suitable for the tropics - for example, whether a different coating for the glass would have to be used to protect the solar cells inside from heat.

Packaging makes up about 30 per cent of the cost of a solar module and the researchers are also trying to see if they can bring this cost down.

## **Self-cleaning solar cells**

■ Led by Professor Charanjit Singh Bhatia from NUS

■ Currently, glass panels which protect solar cells inside a solar module are flat and transparent, and get dirtied easily, which makes them less efficient.

The researchers want to put tiny cylinder-shaped nano particles on the glass surface so that it is no longer smooth, and there will not be enough surface tension for dirt to stay on the surface.

Flat-glass surfaces also reflect a lot of sunlight away from the solar module. The tiny cylinders help direct some of these rays back towards it.