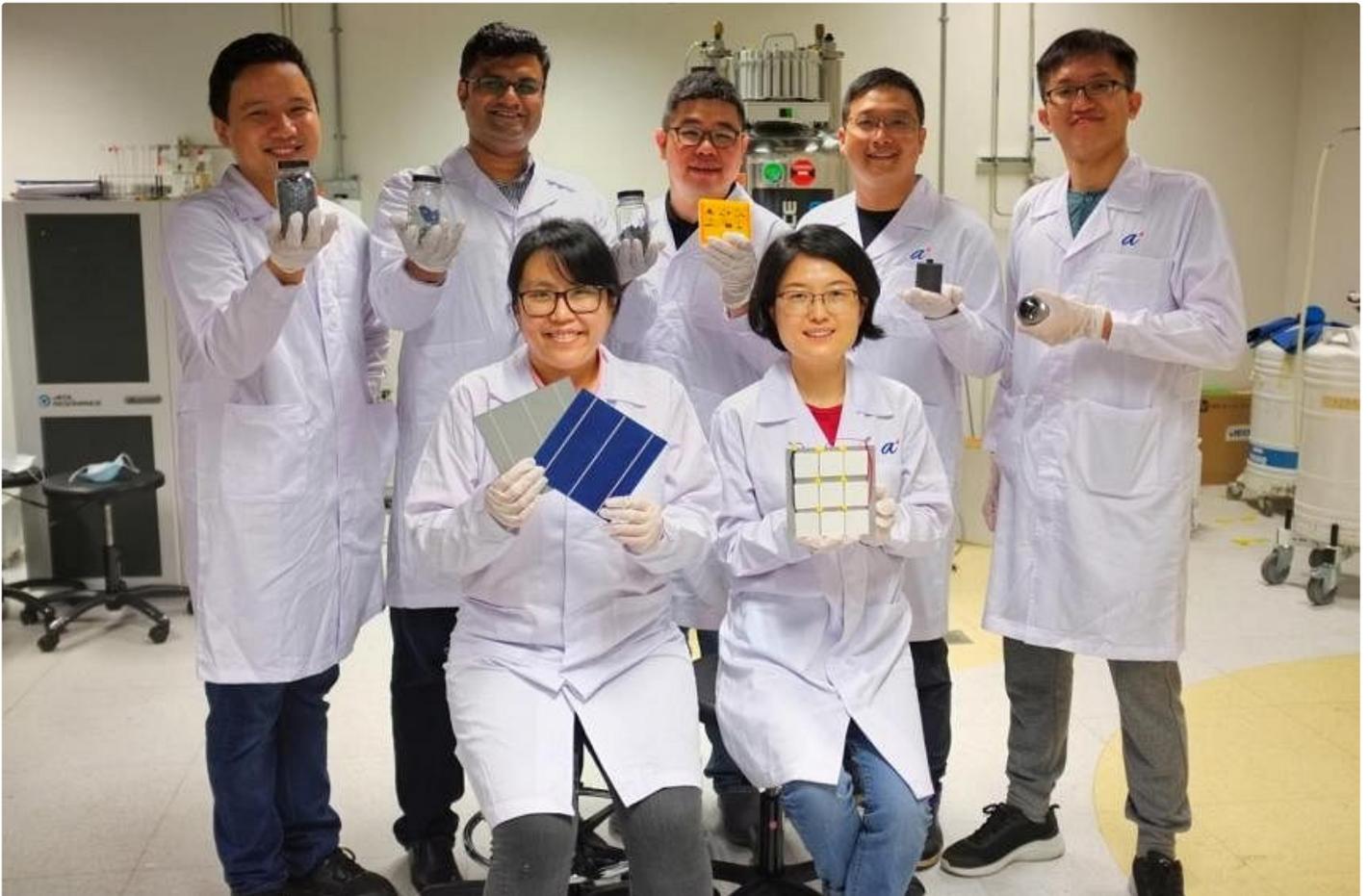


SCIENTISTS FROM A*STAR, NTU FIND WAY TO UPCYCLE OLD SOLAR PANELS

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SINGAPORE – Recycling old solar panels is challenging, but scientists from Singapore have found a way to upcycle the silicon inside and turn them into materials that can convert heat into electricity.

The team comprising researchers from the Agency for Science, Technology and Research (A*Star) and Nanyang Technological University (NTU) turned old solar panels into thermoelectric materials.

Such materials convert heat into electricity, and work in a similar way to how hydropower generation plants use water movement to drive turbines to generate electricity.

The joint study was published in the scientific journal *Advanced Materials* in March.

Dr Ady Suwardi, the deputy head of the soft materials research department at A*Star's Institute of Materials Research and Engineering said that by moving heat from one side to another, thermoelectric materials generate electricity.

This can then be used for applications like cooling, added Dr Ady, who co-led the study.

The team found that impurities and defects in the silicon used to make solar cells actually enhance the performance of thermoelectric materials.

A solar panel is made up of many solar cells, also known as photovoltaic cells.

Separating the materials used to make solar panels and recycling each of them is a complex and costly process, said Associate Professor Nripan Mathews.

Prof Mathews, who is the cluster director of renewables and low-carbon generation (solar) at the Energy Research Institute @NTU (ERI@N), added that current recycling methods are able to recover only the glass and metallic support structures from solar panels.

Solar cells contain a complex mix of materials such as aluminium, copper, silver, lead, plastic and silicon.

Silicon, which is extremely pure, makes up 90 per cent of solar cells. However, this normally ends up in landfills.

This is because silicon has to be chemically treated and remelted to be recycled into pure silicon, said Prof Mathews.

He added that it is challenging, energy-intensive and expensive to recover the silicon to create new, functional solar cells.

“While silicon holds very little weight in the entire solar panel, it is the most valuable part of it, which explains why it is important for us to try and upcycle it,” said Prof Mathews.