The technology uses solar heat as an energy source, increasing the efficiency of the hybrid unit as the weather gets hotter.

Spotted: Students from the National University of Singapore (NUS), in a joint effort with the Ecoline Solar, have released a hybrid air-conditioner that reduces electricity consumption. The technology has provided cooling solutions to Singapore’s “vertical farms”, hotels and other companies such as NCS, Starhub and Singtel.

The system leverages solar thermal technology and a condensing unit consisting of vacuum tubes, specially engineered by the NUS team. These compression machines enable the recycling of the low pressure, low-temperature gas that is collected in high pressure, high-temperature gas.

Doing so assists the superheating of the refrigerant in the system, and reduces reliance on the compressor that pumps the refrigerant through the system by up to 55 per cent. The result is a reduction in both the electricity consumed, and greenhouse emissions released.

The team believes that the solar thermal air-conditioning technology may help to improve the energy efficiency of buildings, and is a potentially effective way for businesses and households to reduce their operating cost and carbon footprint, while “becoming an integral part of the global warming solution”, says Associate Professor Ernest Chua Kian Jon, who led the NUS team.

Explore more: Science Innovations | Sustainability Innovations

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Takeaway:

With the global temperature rising, there is a parallel demand for fuel to run energy-hungry air-conditioning. Although an inverter air-con costs 20 per cent less than NUS’s solar hybrid, the actual usage data showed the hybrid system has consistently reduced energy usage. NUS says the cost difference would be offset by electrical cost savings in under two years, cutting down utility bills by 30 to 55 per cent.