

# Have sun will sail – NUS team develops solar-powered boat

It has taken the boat on trips in the region and is now exploring how to make idea commercially viable

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An undergraduate project to convert a motorised sailing boat to one that uses only solar power may pave the way for cleaner cruises.

A team of 10 students and two academics from the National University of Singapore (NUS) is exploring how to make the idea commercially viable, after taking a solar-powered boat on several trips in the region.

Their project is part of Frog-Works, a joint initiative of NUS' University Scholars Programme (USP) and the Design-Centric Programme at the engineering faculty.

The programme is an avenue for students to test greener transport methods, in a shift towards renewable energy from fossil fuels.

The boat is the team's second project after it converted a 10-year-old Honda motorbike into an electric vehicle, which finished third in a rally in Switzerland last year.

This time, the group of USP and engineering students, led by Associate Professor Martin Henz and Dr Joerg Weigl, installed 5 sq m of solar panels on the fibreglass boat. The panels were supported by a stainless steel mount. They also fitted a German-made electric motor, two lithium-ion battery packs, and a charge controller to prevent the batteries from overcharging.

Mr Anand Sundaram, 20, a third-year computer science student, then spent about four months building and fixing a data acquisition system on the boat.



(From left) Dr Joerg Weigl, Mr Anand Sundaram and Associate Professor Martin Henz on board the Bo Bo Cha Cha at Changi Sailing Club. Without using its sail, the zero-carbon boat can travel for five hours non-stop, with a full speed of 5 knots, or about 9kmh. ST PHOTO: NEO XIAOBIN

The device can remotely track the voltage level of the batteries on the boat, which are powered by the solar panels.

Without using its sail, the zero-carbon boat can travel for five hours non-stop, with a full speed of 5 knots, or about 9kmh.

The project started in October last year and the boat has since gone on four major trips as far as Batam and Pedra Branca. The farthest it has travelled was 52km to Bintan last month. The trip took 6½ hours.

Prof Henz, the project manager, said most boats used for leisure run on combustion engines. "What we're doing is trying to provide a sustainable propulsion system for cruising sailing boats," he said, adding that he is exploring plans for commercialisation.

Based on project estimates, it will cost \$12,000 to convert existing motorised boats to ones that rely on solar energy.

Prof Henz, who is from the NUS school of computing and a USP residential fellow, said the aim of the

project is to let students try their hand at solving real-world issues.

"You learn most when you construct things and see projects in the real world – for instance, to build a mount for the solar panels is a significant design challenge," he said.

Mr Sundaram said: "I had never done anything like this before but my background knowledge about coding, programming and operating systems came in handy."

Another group of students is working on building a multicopter – an aerial vehicle powered by

propellers and batteries.

Prof Henz and Dr Weigl said that their next step is to prepare the boat for longer voyages. They are working on installing emergency communication devices and adjusting the weight distribution of equipment on board.

They are also renovating the boat's interior cabin. They hope to take it to Christmas Island, about 2,000km away, next year, said Prof Henz.

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