

# Clean thermal energy for clean fresh water

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Thermal Water Pump. Credit: RMIT University

RMIT's Dr Abhijit Date was awarded the \$AUD132,000 grant for his research into a sustainable and economical fresh water management system that could be used in coastal areas of India and salt-affected farming land in Australia.

The system uses a special thermal [water](#) pump developed at RMIT and the University of Pune, India, which is driven by low-temperature thermal energy rather than grid electricity.

"There are many poor [coastal communities](#) in India where access to [fresh water](#) is an issue but they cannot afford to use standard power-hungry desalination and irrigation systems," Dr Date said.

"The desal and [irrigation system](#) we are developing is both cheap to run and sustainable, producing no greenhouse emissions.

"Not only could this system help many coastal communities, it could also enable saline groundwater to be turned into fresh water and used for agricultural irrigation – helping farmers in Australia and across the world."

The sustainable [water management](#) system runs on clean power sources – such as solar thermal, geothermal or waste heat – and generates both fresh water and water pumping power using thermal energy at temperatures below 100C.

Researchers have built a lab-scale prototype of the thermal water pump system, with early tests showing the system can produce 1000L of fresh water from 2000L of saline feed water with a salt concentration between 5000-15,000 grams per cubic metres.

The system works by boiling a refrigerant at constant temperature and using the pressurised refrigerant vapour to power a piston and pump water out. To suck water in, the vapour is cooled down, reducing the volume, pushing the piston in the opposite direction.

"The success of this project will provide a much needed alternative system that can be manufactured in Australia and provide opportunity for industry development, employment creation and export," Dr Date said.

Provided by RMIT University

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