## **Capturing CO2 emissions**

## **BY DAMON CRONSHAW**

CARBON capture technology developed at the University of Newcastle aims to help India meet its climate change commitments to the United Nations.

Professor Ajayan Vinu, director of the university's Global Innovative Centre for Advanced Nanomaterials (GICAN), said the technology could significantly reduce carbon emissions.

India is the third highest emitter of carbon dioxide and responsible for 6.9 per cent of global emissions, according to the UN.

India has committed to reduce the emissions intensity of its gross domestic product by 33 to 35 per cent from its 2005 levels by 2030.

Unlike Australia, India has ratified the Paris Agreement - an international treaty on climate change.

Professor Vinu's technology is different to the contentious "carbon capture and storage", in which carbon emissions are planned to be stored underground.

His technology is "carbon capture and conversion".

This involves converting carbon dioxide into "val-"clean fuel and fine chemicals".

"It can be used for any plant that emits carbon dioxide like power plants and cement and steel factories," he said.

"Once we have developed the technology, it could be attached to coal-power plants all over India and other parts of the world including Australia."

partly funded by Defence **Bio-Engineering and Electro** Medical Laboratory (DE- loysite-kaolin clay is availa- had achieved "outstand-BEL), a research wing of the ble in Camel Lake in South ing results". Indian government.

Professor Vinu said carbon capture hadn't been transform this "low-cost, commercial products.



IN THE LAB: Professor Ajayan Vinu displaying equipment in his lab that tests carbon capture technology.

done on a commercial scale naturally available nanosadsorb large amounts of car- bon or other nanohybrids". bon emissions.

which is being developed Australian Stock Exchange ue-added products" like in partnership with Andromeda Metals, Minotaur Exploration and their joint research and development clability for carbon capture company Natural Nanotech.

> These companies recently Vinu's research centre to further their work in this area.

The adsorbent being used is "halloysite-derived carbon nanomaterials". It involves the use of nanotechnology that Professor Vinu discov-The research is being ered called "nanoporous carbon nitride".

A massive amount of hal-Australia.

before because of a lack of tructural clay material into technology to capture and high-value nanotubular car-

Andromeda Metals, which He has this technology, mines this clay, has told the that these nanomaterials were "showing excellent adsorption potential and recyand conversion purposes".

"A number of specific gave \$4 million to Professor research grant applications are in the pipeline to provide additional funding to accelerate activity in key areas," the statement said.

> This included additional funding to "accelerate planned carbon capture and conversion pilot plants".

> The company's statement said Professor Vinu's team

"These results are signif-Professor Vinu's team can icantly superior to current



**COMPETITION:** Elon Musk.

"Optimising the adsorption and recyclability potential are considered critical to commercialisation of this technology."

Professor Vinu said this technology was developed in Australia and would "address the priority goal of developing future supply of reliable, low-cost and low-emission energy".

"This breakthrough technology, derived from Australian resources including halloysite nanotubes and other resources, can provide enormous opportunities for advanced manufacturing, clean gas and energy re-

University of Newcastle.

try partners.

Australia."

eral technologies related to environmental issues, such as clean energy hydrogen production and storage, in addition to cleaning up carbon dioxide from the atmosphere."

## \$100 million Prize

Tech billionaire Elon Musk - the founder of electric vehicle company Tesla - is running a four-year competition with \$100 million in prize money in this field.

The XPrize Carbon Removal competition challenges designers to develop a machine to capture massive amounts of carbon dioxide from the atmosphere or ocean.

It is aimed at "fighting climate change and rebalancing Earth's carbon cycle".

The winner receives \$50 million, second place \$20 million and third place \$10 million.

"Time is of the essence," Mr Musk said in February, when he launched the competition.

The competition aims to help humanity reach the Paris Agreement's goal of limiting the Earth's temperature rise to no more than 1.5 degrees of pre-industrial levels or "even 2 degrees".

"We need bold, radical "The pilot carbon capture tech innovation and scaleplant will be installed at the up that goes beyond limiting CO2 [carbon dioxide] emis-"It will be useful for pro- sions, but actually removes oceans.

"If humanity continues on a business-as-usual path, the global average temperature could increase 6 degrees by the year 2100. The climate math is becoming clear that we will need giga-Professor Vinu started ton-scale carbon removal in the coming decades to avoid the worst effects of climate change."

The competition has been touted as "the largest incen-

sources," he said.

viding training opportunities CO2 already in the air and for research students and early career researchers, and engaging closely with indus-

"This will also create job opportunities for young talents, especially from regional

GICAN with a vision of "solving global environmental problems and contributing to Australia's mission of generating clean energy".

"The centre works on sev- tive prize in history".