

# A train that can capture CO2 from the air

Taking the train can be a great way to cut your emissions compared to travelling in a car or boarding a flight.

But as it stands, train travel isn't carbon neutral, with journeys accounting for 0.4 ounces (14 grams) of carbon dioxide (CO2) per passenger mile.

However, that could be set to change with a new train that actively removes CO2 from the air as it moves.

A US-based startup called CO2Rail Company has been working with engineers at the University of Sheffield and University of Toronto to develop huge vents that take in air while the train moves.

The CO2 can then be separated from the air, converted to a liquid and stored within the carriage until it can be emptied.

The researchers believe this is a more cost efficient than other direct air capture (DAC) solutions, as the carriages can be retrofitted to trains already in service.

They claim that each car could remove up to 3,000 tonnes of carbon dioxide per year in the near term.

The technology also requires less land than stationary DAC facilities, and will help countries reach their net zero emission goals.

Prof. Peter Styring, Director of the UK Centre for Carbon Dioxide Utilisation at the University of Sheffield and co-author of the research, said: 'The direct capture of carbon dioxide from the environment is increasingly becoming an urgent necessity to mitigate the worst effects of climate change.'

'The technology will harvest meaningful quantities of CO2 at far lower costs and has the potential to reach annual productivity of 0.45 gigatons by 2030, 2.9 gigatons by 2050, and 7.8 gigatons by 2075 with each car having an annual capacity of 3,000 tonnes of CO2 in the near term.'

In a paper published today in Joule, the researchers outline the design for the CO2Rail carriages.

They are an example of a DAC technology, that removes carbon dioxide from the air and compresses it for storage or utilisation purposes.

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the air that extends up into the slipstream pushes ambient air into a cylindrical CO2 collection chamber.

The air is then moved through a chemical process that separates its CO2, before the

CO2-free air travels out the back or underside of the car and into the atmosphere.

After a sufficient amount of CO2 has been captured in the collection chamber, it is concentrated and stored in a liquid

reservoir. The liquid can be emptied from the train at a crew change or fuelling stop to be transported into the circular carbon economy or to nearby geological landfill sites.  
- Daily Mail



## How does the train carriage work?

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