

Collecting carbon in a concrete jungle

November 30 2011

Land unsuitable for tree planting could still be used to reduce levels of carbon dioxide in the atmosphere thanks to new research.

Microscopic tubes that suck in carbon dioxide from the air are being developed by chemists, engineers and [medical researchers](#) at the University of Edinburgh, with funding from the RCUK Energy Programme, led by the Engineering and Physical Sciences Research Council (EPSRC).

Just one 1m² unit containing the tiny tubes could adsorb (suck in) the same amount of carbon as 10 average trees.

In the future larger versions of the units could be placed alongside places like motorways or on rooftops to make better use of land and spaces in reducing our [carbon footprint](#).

If the technical hurdles are successfully overcome, a patentable unit could be developed and available for purchase within five years.

Each individual tube will be around 1 micrometre long and just 1 nanometre in diameter (1 micrometre is 1 millionth of a metre, 1 nanometre is 1 billionth of a metre). They will be made of pure carbon with some additional chemical groups that will attract and trap the carbon dioxide.

Once saturated with carbon 'used' tubes will be regenerated by a rapid heat pulse generated from a [renewable energy source](#), such as a solar

cell, and the carbon dioxide will be concentrated and stored in small canisters. These canisters may be exchanged periodically for fresh ones as part of a regular collection round.

"The tube material will be specially designed at the nanoscale to be highly porous, in order to adsorb as much carbon dioxide as possible," says Professor Eleanor Campbell, who is leading the project. "A key task is to engineer the chemistry of the tubes so that they only adsorb carbon dioxide without taking [water vapour](#), for instance, out of the air as well."

The filled carbon dioxide canisters could be transported to a special facility where the carbon can be collected prior to secure disposal deep underground using carbon capture and [storage technology](#), the development of which the University is also prominently involved with through the Scottish Carbon Capture and Storage (SCCS) consortium. Alternatively, the [carbon dioxide](#) could be converted into added-value chemicals using novel catalytic reactions that are currently being developed at the university and elsewhere.

The project team will look at a whole range of issues, such as a unit's potential purchase price, its appearance and its optimum dimensions.

The views of the public were canvassed at an event which took place on 5 November 2011 in Edinburgh.

"In some ways, the unit would work like an artificial tree," says Professor Campbell. "A key advantage of course is that the units could be used in built-up urban areas where tree planting is not possible."

Provided by Engineering and Physical Sciences Research Council

Citation: Collecting carbon in a concrete jungle (2011, November 30) retrieved 19 April 2024

from <https://phys.org/news/2011-11-carbon-concrete-jungle.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.