

Water treatment could be carbon neutral

March 31 2014, by Harriet Jarlett



Carbon dioxide released by some wastewater treatment plants could be recycled at the same time as enhancing the production of renewable energy in the form of natural gas, say scientists.

They say the process could help make the wastewater treatment industry more energy efficient.

In a new study published in *Bioresource Technology*, researchers wanted to understand why mechanisms for recycling carbon dioxide widely used in the energy industry aren't used by the wastewater sector.

To do this, they investigated one of the methods used to treat water – [anaerobic digestion](#).

Anaerobic digestion is used to treat the solid material in wastewater,

farm residues, and organic material going to landfill.

'It's used as a way to stop smell and stabilise the waste. The process produces a steady stream of methane and [carbon dioxide gas](#), which can be used for energy,' explains Professor Elise Cartmell of the University of Cranfield, lead researcher on the project.

Recently it's become much more important to capture these gases, because government incentives have led to rises in methane prices, making it a valuable resource.

'Bacteria in the anaerobic digester degrade the [organic material](#) and produce a gas that is 60 per cent methane and 40 per cent carbon dioxide. You can either use that mixture, called biogas, for energy or you can strip out the carbon dioxide to leave methane – [natural gas](#) – which can be injected back into national stores,' says Cartmell.

She and her colleagues wanted to find a way to use the carbon dioxide coming out of the anaerobic digester, and ideally increase the amount of valuable methane the process produces.

They discovered that if they recycled the carbon dioxide that came out of the process and re-introduced it to the digester, it increased the amount of methane produced by 10 per cent.

'It's not huge and dramatic, but that's not so much the point. The point is that we're doing something constructive with our [carbon dioxide emissions](#),' says Cartmell.

She hopes that by introducing this process they could get close to creating a closed loop in [wastewater treatment](#), making the sector carbon neutral.

'In general there has been a lot of emphasis on carbon capture and storage, and a lot of government investment - which is important because we need to tackle emissions - but it's also important that we don't just focus on the energy sector,' Cartmell says.

'Other sectors are also trying to find solutions to reduce their emissions; we have to remember there are more ways to reduce [carbon dioxide](#) than just those used in the energy sector.'

More information: Y. Bajón Fernández , A. Soares , R. Villa , P. Vale , E. Cartmell (2014) "Carbon capture and biogas enhancement by carbon dioxide enrichment of anaerobic digesters treating sewage sludge or food waste." *Bioresource Technology*, Volume 159

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