CARBON DIOXIDE WASTE TURNED INTO ESSENTIAL MANUFACTURING CHEMICAL

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Spotted: University of New South Wales researchers have created a chemical building block from carbon dioxide pollution. The new process mixes waste emissions with zinc oxide nanoparticles to create a much greener version of synthesis gas, or syngas. Syngas is used in myriad manufacturing processes, so a faster method of production, combined with the use of captured carbon dioxide, has great potential for the creation of a more sustainable fuel.

The new way of creating syngas is incredibly quick and more affordable than current methods. Zinc oxide is inexpensive, abundant and mined locally in Australia. When heated to temperatures of 2000 degrees Celsius via flame spray pyrolysis (FSP) and mixed with carbon dioxide, the combination transforms into a simple hydrogen and carbon monoxide mix. The process takes approximately 10 minutes, and that simple two-item chemical is what makes up syngas. Used as the basic chemical component for a huge range of products, diesel fuel, plastic and alcohol may all be produced depending on the ratios of the two ingredients.

Syngas is currently created using natural gas, so by using harmful waste emissions instead, the power industry can begin moving towards circular production processes. The University team’s goal is to sufficiently scale up the system’s capture capability in order to enable the retrofitting of full-scale power plants.

Springwise has spotted a range of innovations working to reduce carbon emissions while also making use of abundant waste materials. Scavenger robots that eat metal to produce energy could replace lithium-ion batteries, and a new process that turns brewery waste into biofuel could be used to heat homes.
Takeaway:

More and more innovative uses for captured carbon dioxide are being thought up in industries including jewellery, food, drink and construction. The challenge lies in making the innovations scalable and affordable as quickly as possible. Once the world reaches a point where carbon dioxide waste is at a minimum, it is interesting to consider ways in which new technologies could begin being applied earlier in supply chains to help eliminate the creation of waste.