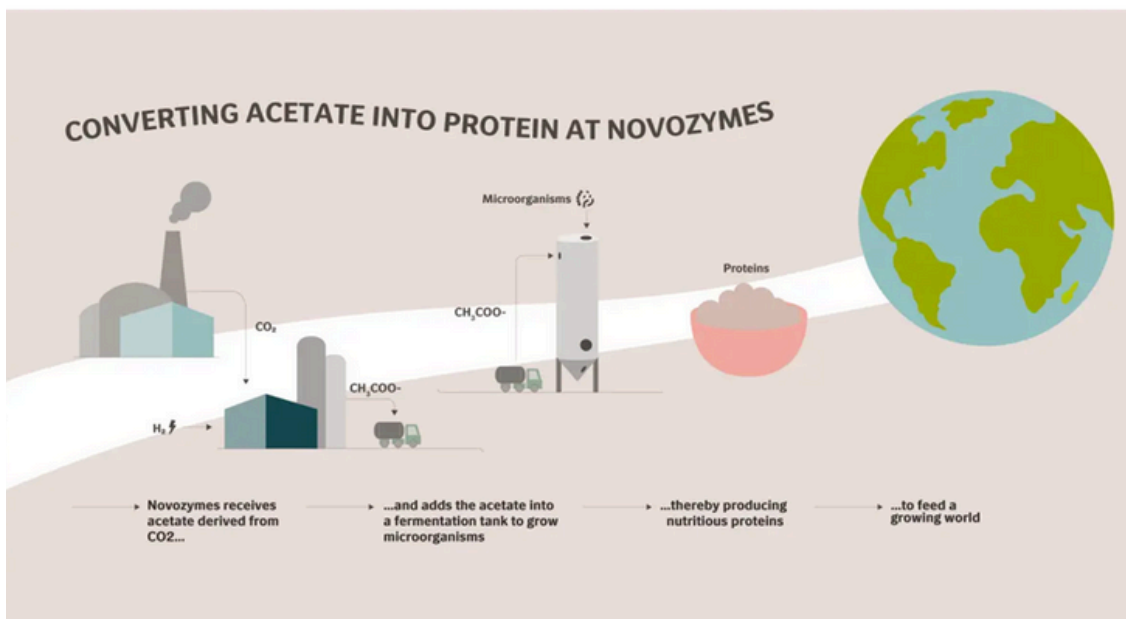


## Transforming CO<sub>2</sub> into proteins

*Submission from Novonesis*



### The innovation.

Novonesis has become part of a new consortium aimed at creating a sustainable protein source for human consumption derived from CO<sub>2</sub>. This innovative partnership combines the expertise of Novonesis, Topsoe, Washington University in St. Louis, Missouri, and the Novo Nordisk Foundation CO<sub>2</sub> Research Center (CORC) at Aarhus University in Denmark. The aim of the project is to turn CO<sub>2</sub> into acetate and use the acetate to produce proteins for human consumption. The conversion of CO<sub>2</sub> to acetate is going to happen through electrochemical catalysis on water to produce hydrogen and then reacting hydrogen with CO<sub>2</sub>. The production of protein will be fermented using acetate as the energy source of carbon. Novonesis' most important contribution lies in the engineering of microorganisms that can grow on acetate rather than on traditional sugars.

### The benefits.

The development of a climate-neutral way to convert CO<sub>2</sub> into protein will help address global issues of food insecurity, land use change and global greenhouse gas emissions. The current demand for dairy and meat production and the need for sugars and starches in fermentation processes are putting a burden on natural resources. Converting CO<sub>2</sub> into acetate and using it to produce proteins for human consumption will enable the decoupling of food production from land use, leaving more room for biodiversity, and bypassing the use of fertilizer and water. Based on calculations by the Novo Nordisk Foundation, harnessing the annual CO<sub>2</sub> emissions from Egypt's cement industry alone could potentially support protein production to feed up to 1 billion people annually and result in land use reduction equivalent to an area larger than Argentina.