

UCSB Engineering Partners with Technology Company to Turn Water and Sunlight into Power Fuels

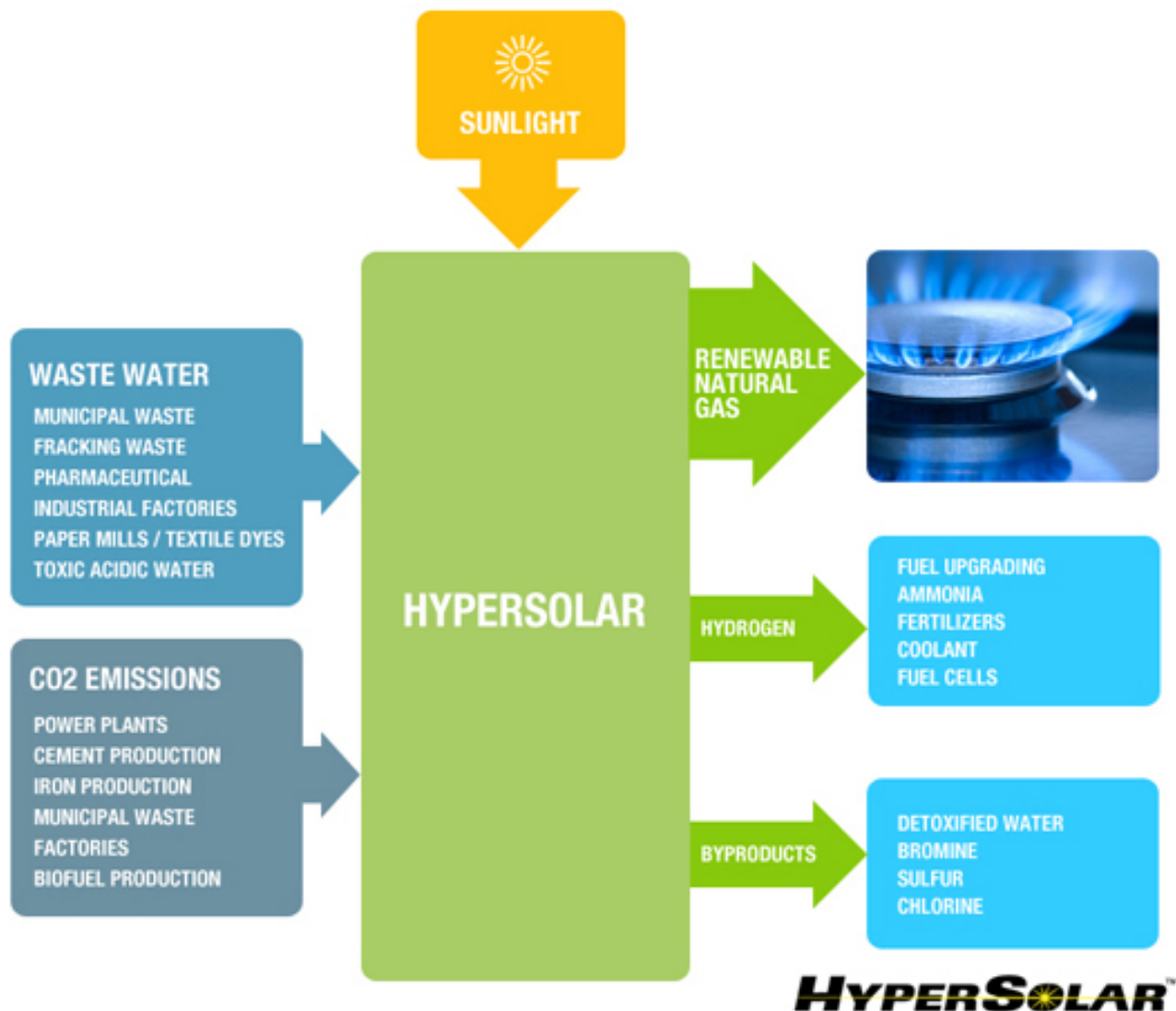
Chemical Engineering researchers teamed with HyperSolar, Inc. to refine solar-powered nanoparticle technology for generating clean fuels

Researchers with the UC Santa Barbara College of Engineering have partnered with [HyperSolar, Inc.](#) for further development of clean energy technology that mimics photosynthesis to produce renewable natural gas.

[Eric McFarland](#), professor of [Chemical Engineering](#), will lead the UCSB research and development efforts for HyperSolar's technology, which uses sunlight, water, and carbon dioxide to make renewable methane gas. Their proprietary process uses nanoparticles to produce hydrogen (H₂) from water molecules (H₂O) in wastewater components. The hydrogen gas is then reacted with carbon dioxide (CO₂) to produce methane (CH₄), the primary component in natural gas used commonly as a fuel source for heating, cooking, and some transportation.

"We look forward to assisting HyperSolar with this research project. For almost a century, scientists have tried to 'split water' to produce hydrogen and oxygen in a cost effective manner," commended McFarland. "Over decades, researchers around the world have built an enormous knowledge base about the problems and opportunities in renewable hydrogen production which we will draw on."

Unlike water splitting using conventional electrolysis, where hydrogen and oxygen molecules are completely produced using a large voltage, this new technology designed by HyperSolar uses a significantly smaller voltage to produce hydrogen. The science of their technology involves engineering the reaction kinetics toward hydrogen generation in conjunction with oxidization of organic molecules in wastewater. Nanoparticles function as one-way machines that detoxify wastewater, and produce clean water and pure hydrogen in the presence of sunlight.



"We are very excited about this opportunity to gain access to the talents and state-of-the-art facilities of one of the world's top universities for scientific impact," said Tim Young, CEO of HyperSolar. In UCSB's year-long research agreement with HyperSolar, the team plans to complete several major milestones, including development of a prototype and analyzing the viability of using wastewater in the process.

Researchers will look at wastewater as a feedstock, and how they can optimize their technology to use municipal and industrial wastewater as a water source. Young commented that, in addition to producing clean energy, their technology could help mitigate the costs of wastewater treatment at a potential cost savings of billions of dollars annually across many sectors.

HyperSolar's process could change the way natural gas is created and produced on an industrial scale, eliminating many of the harmful aspects of methane extraction via drilling or fracking. No other energy source is required, making this an economical and commercially viable approach to producing hydrogen and ultimately natural gas.

Source: [HyperSolar, Inc](#) . news release

Images

