

## Study of a molten carbonate fuel cell combined heat, hydrogen and power system: Energy analysis

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Countries around the world are trying to use alternative fuels and renewable energy to reduce the energy consumption and greenhouse gas emissions. Biogas contains Methane is considered a potential source of clean renewable energy. This paper discusses the design of a combined heat, hydrogen and power system, which generated by Methane with use of Fuelcell, for the campus of Missouri University of Science and Technology located in Rolla, Missouri, USA. An energy flow and resource availability study was performed to identify sustainable type and source of feedstock needed to run the Fuelcell at its maximum capacity. FuelCell Energy's DFC1500 unit (*a molten carbonate Fuelcell*) was selected as the Fuelcell for the tri-generation (heat, hydrogen and electric power) system. This tri-generation system provides electric power to the campus, thermal energy for heating the anaerobic digester, and hydrogen for transportation, back-up power and other applications on the campus. In conclusion, the combined heat, hydrogen and power system reduce fossil fuel usage, and greenhouse gas emissions at the university campus.

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