

Figure S1: Microbial community analysis in the BES reactor at Phylum level. Only phylum comprising at least 0.1% relative abundances is shown, others are included in the “other” category.

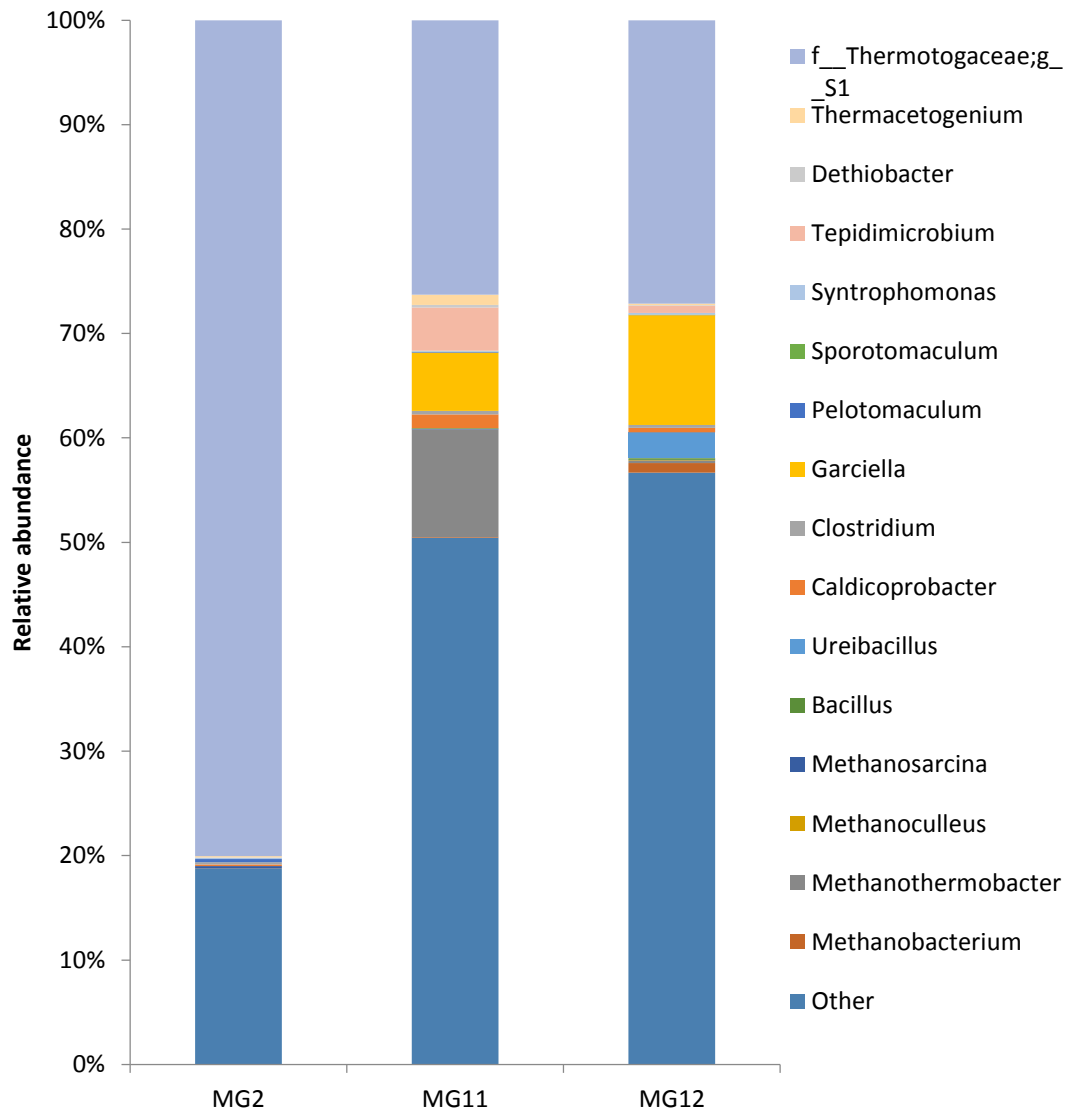


Figure S2: Microbial community analysis in the BES reactor at Genus level. Only genus comprising at least 0.1% relative abundances is shown, others are included in the “other” category.

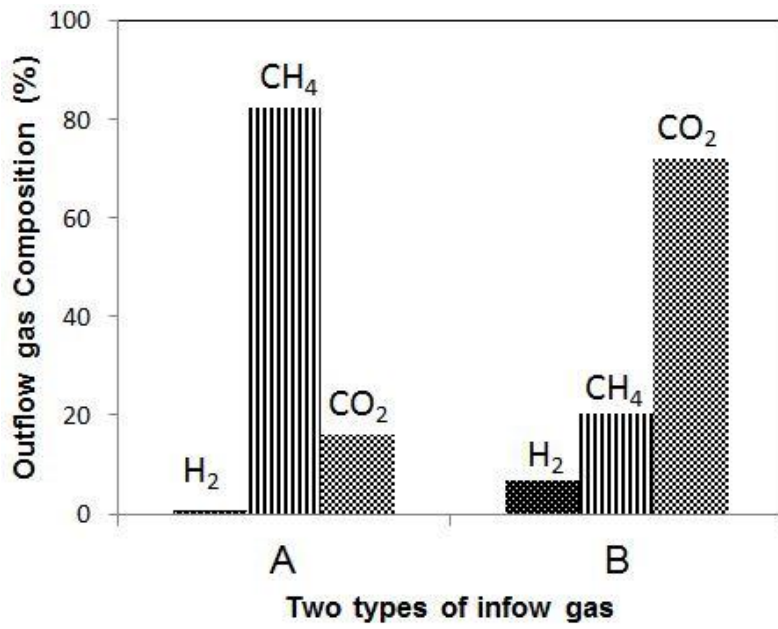


Figure S3. Comparison of outflow gas composition for the *ex-situ* BES reactor loaded with two different synthetic biogas compositions: (A) 50%/50% CO₂/CH₄; and (B) 100% CO₂.

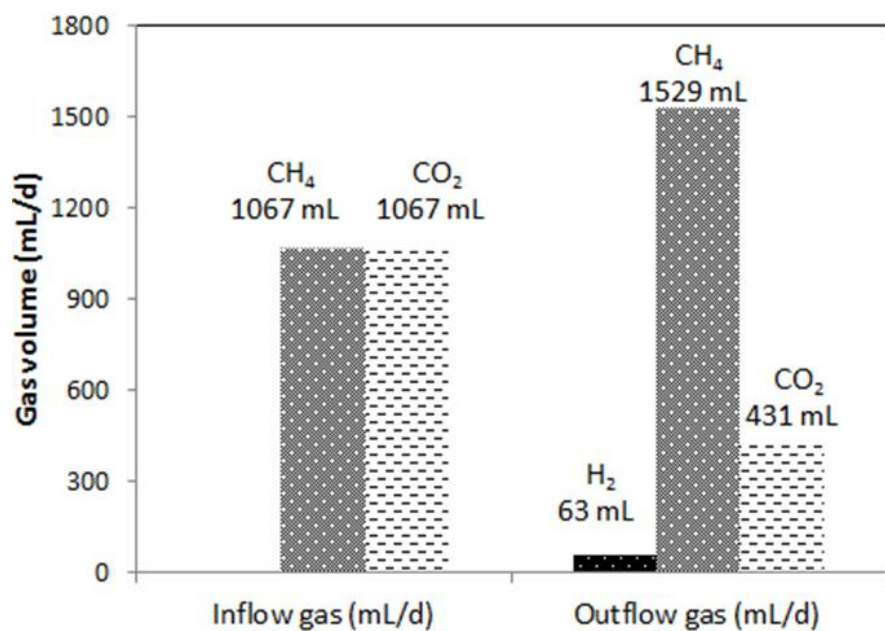


Figure S4. Difference in the gas composition between the inflow and outflow of the BES reactor. (The values were determined from a 24-h period of continuous operation of the BES reactor).

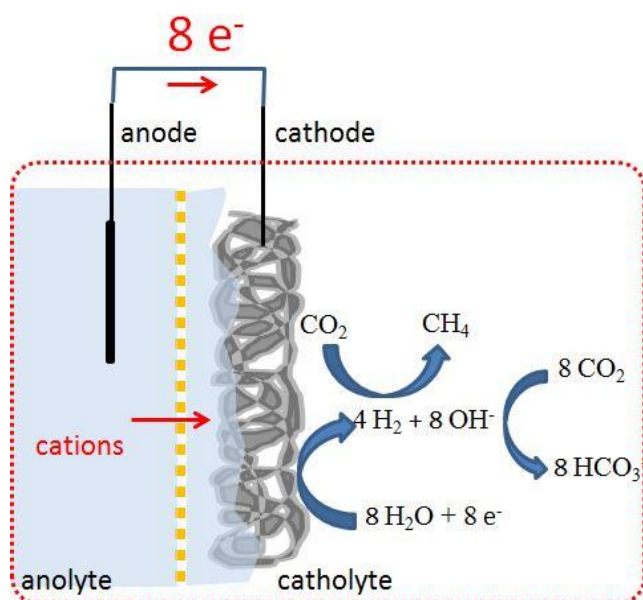


Figure S5. Speculative mechanisms of CO₂ removal at the cathodic compartment of the *ex-situ* biogas conversion BES reactor.