

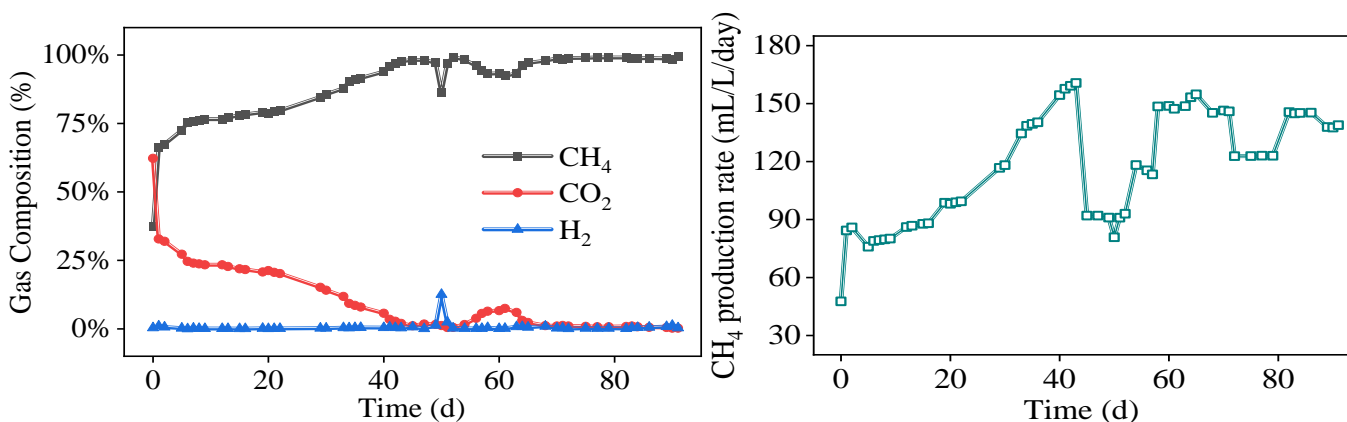
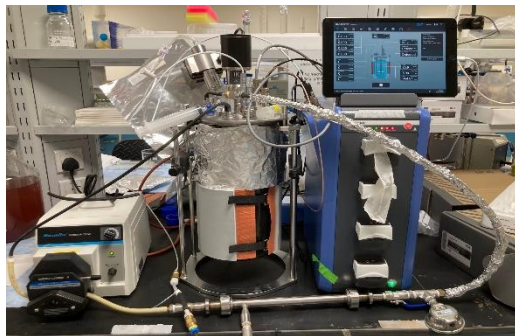
NEWRI INNOVATION

IN-SITU H₂ ASSISTED BIOGAS UPGRADING TOWARDS BIO-LNG

Biogas produced from anaerobic digestion of biomass. has low energy content (20 MJ/m³ - 65% CH₄) greatly limits its use as an efficient energy resource. **Upgrading of biogas to biomethane greatly improves the energy content (36 MJ/m³, >95% CH₄),** serving as direct energy substitute for natural gas and further conversion to LNG.

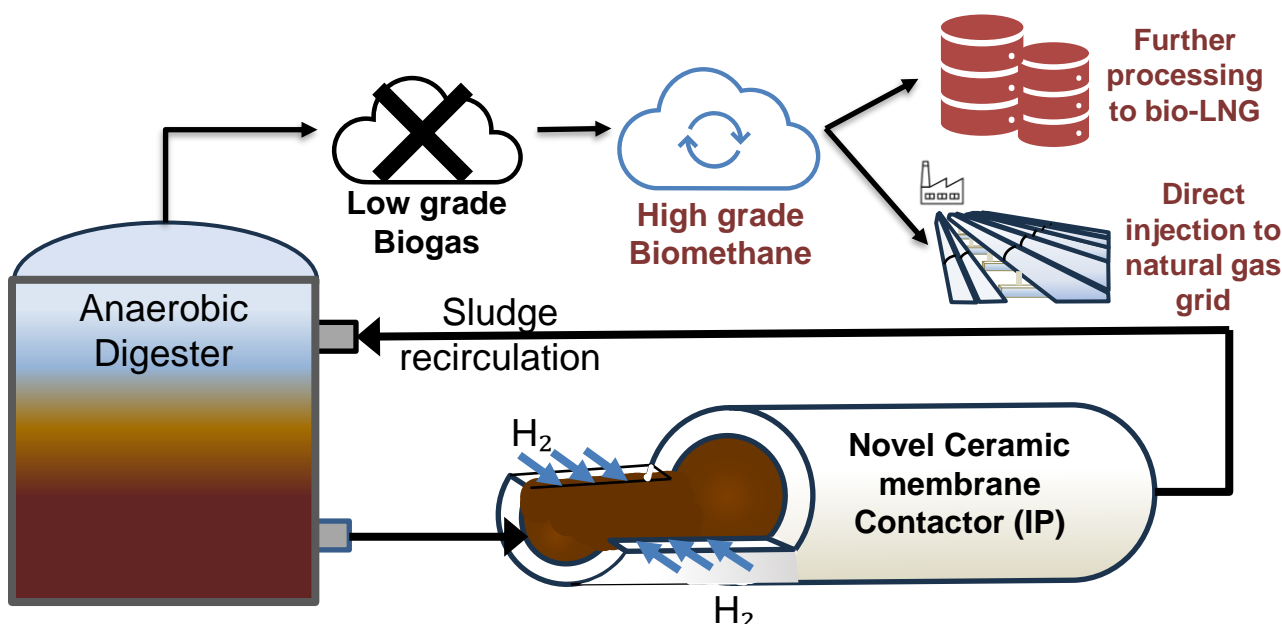
Method:

- External ceramic membrane contactor module coupled to typical ADs for efficient H₂ injection
- H₂ gas transfer and dissolution occurring at membrane inner surface
- Use of sludge recirculation



Key results

Max CH ₄ content (%)	99.1
CH ₄ production increase (%)	108
H ₂ utilization rate (%)	99.6



Benefits:

- **Excellent biomethane quality** compared to conventional methods
- Low fouling & long lifespan
- Ease of maintenance and retrofitting
- High grade biomethane production for direct gas grid injection or bio-LNG production

Development of external ceramic membrane contactor (Conny – NTU IP) for in-situ H₂ assisted biogas upgrading

Presented by

Biotechnology and Bioprocesses
Nanyang Environment and Water Research Institute

Details:
Project funded by Conny Tech Pte Ltd
Contact information: Zhouyan@ntu.edu.sg;
chanhl@conny.sg

