

AH₂PD: Autogenerative High Pressure Digestion

Upgrading biogas with hydrogen



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AH₂PD : Autogenerative High Pressure Digestion

The Biochemistry

1 Hydrolysis

Complex organic molecules to soluble

2 Acidogenesis

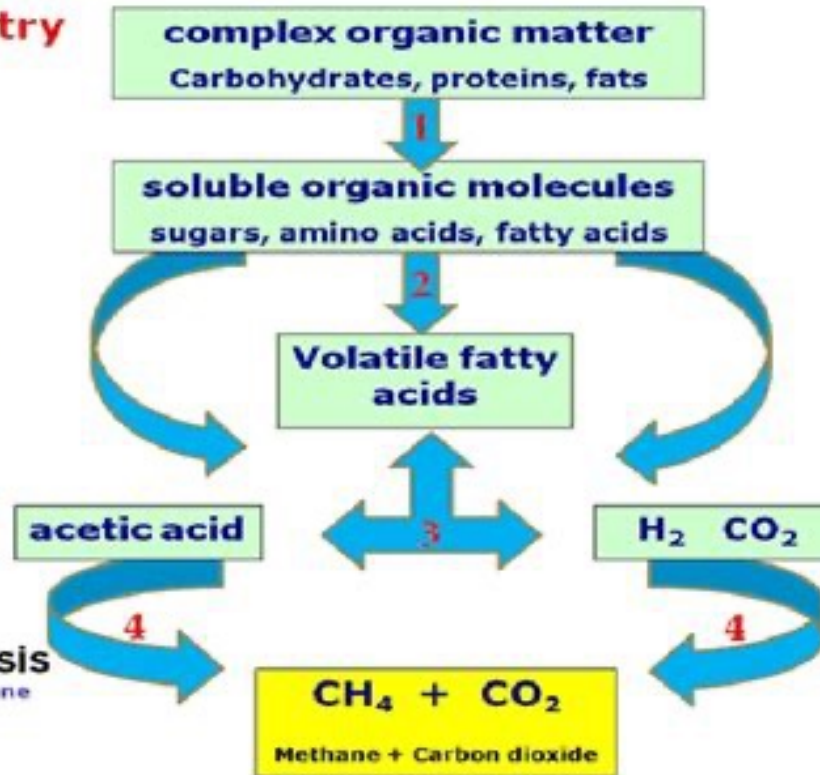
Small organic molecules to fatty acids

3 Acetogenesis

Conversion to acetic acid & CO₂

4 Methanogenesis

Final conversion to methane [CH₄]



AH₂PD = Bio-Sabatier

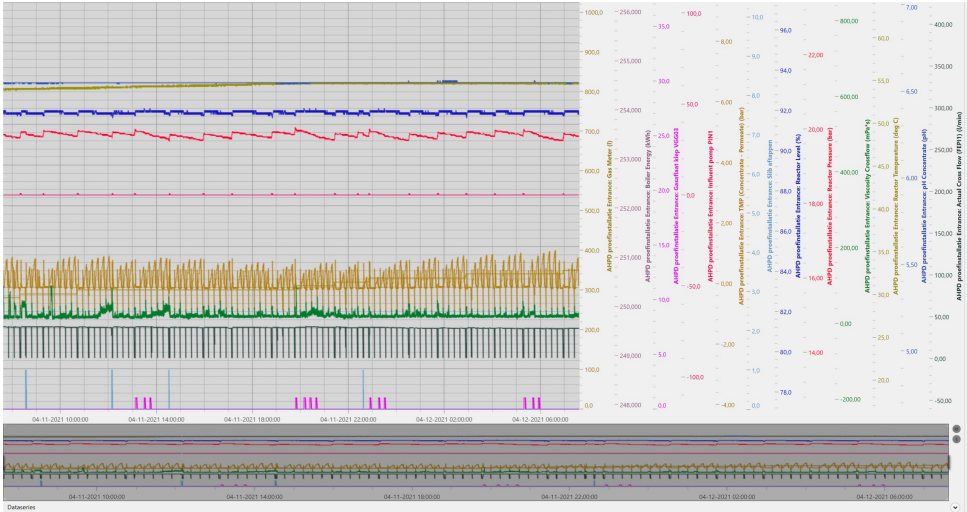
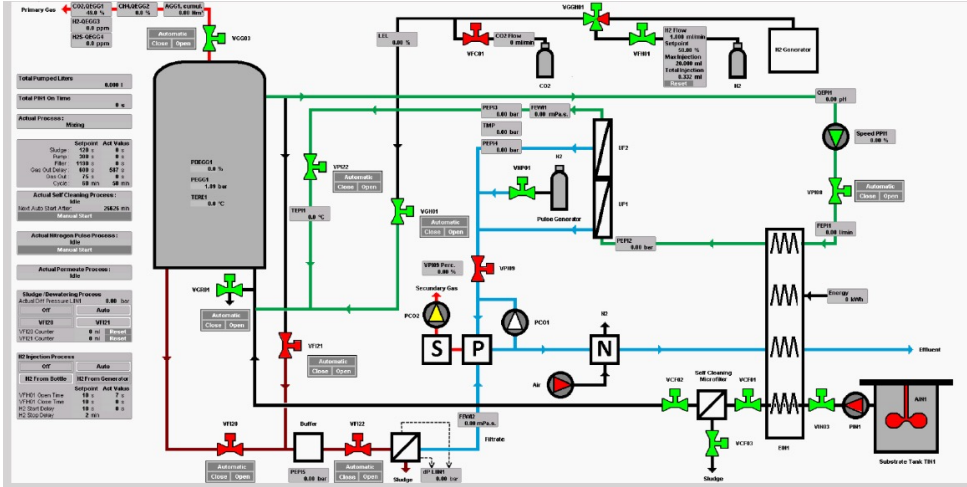
Extra H₂ addition at 20 bar:

- Henry's law (solubility gases)
- Selection of Archaea
- > 90% degradation of organics

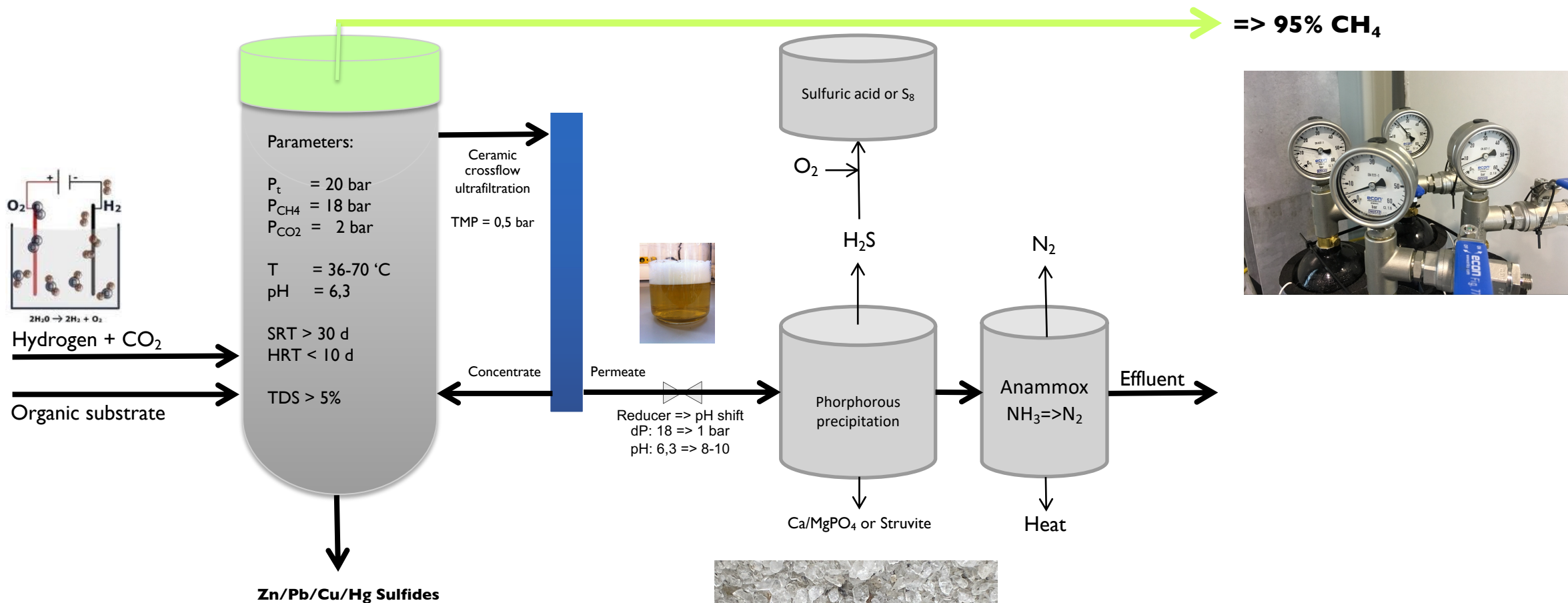


> 95% CH₄

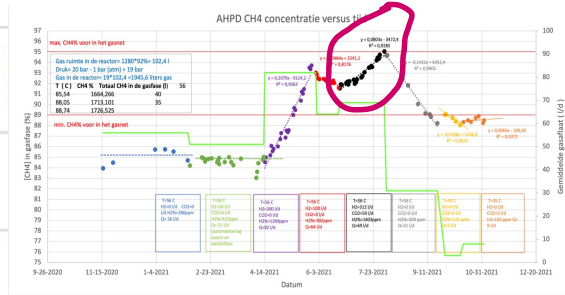
AH₂PD: Pilot plant in continuous operation (> 30.000 hrs)



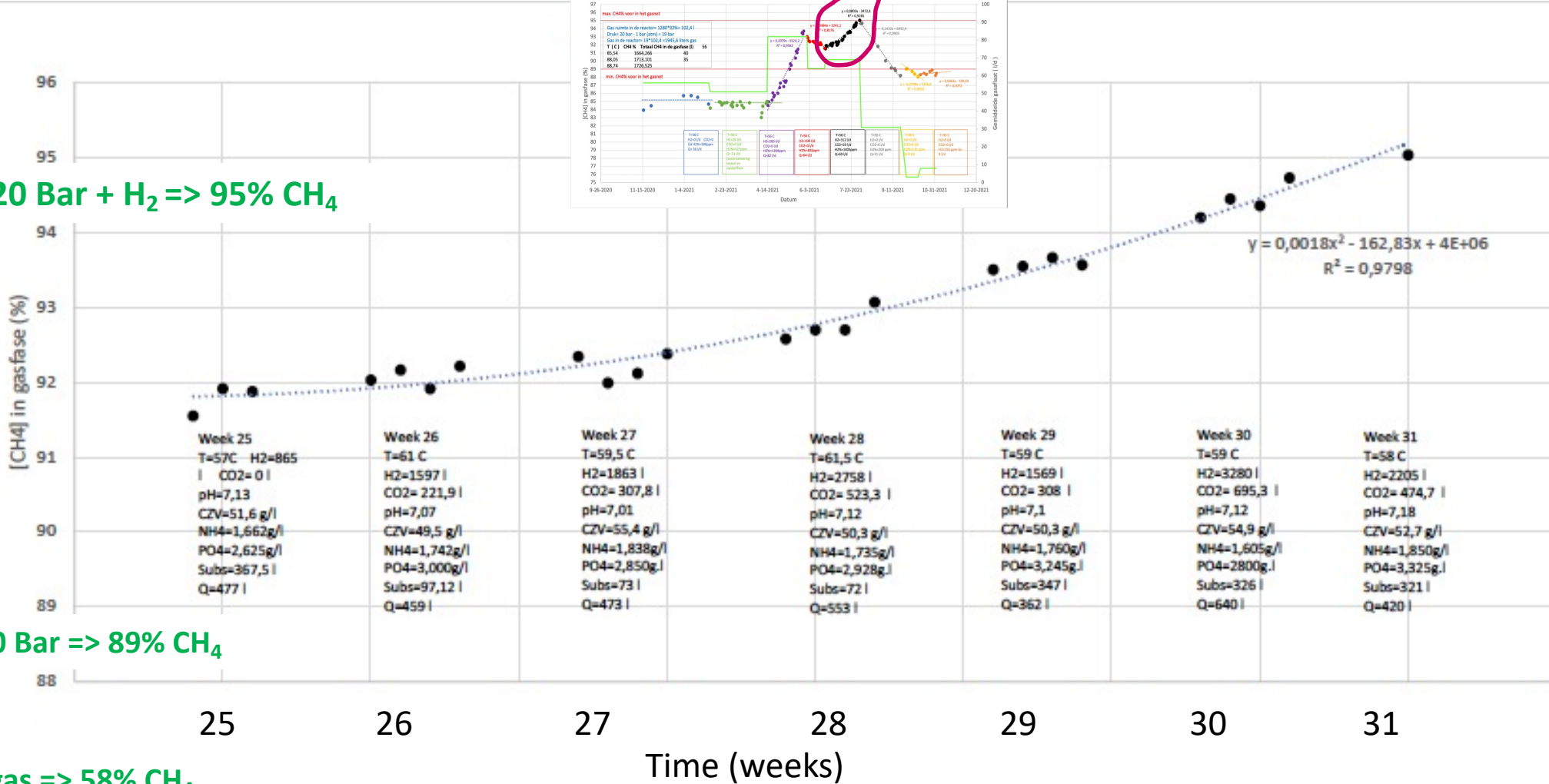
AH₂PD : An-MBR@20Bar / optimized for enhanced nutrients removal



AH₂PD test results: $\text{CO}_2 + 4\text{H}_2 \Rightarrow \text{CH}_4 + 2\text{H}_2\text{O}$



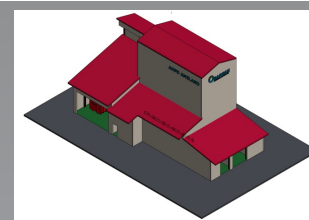
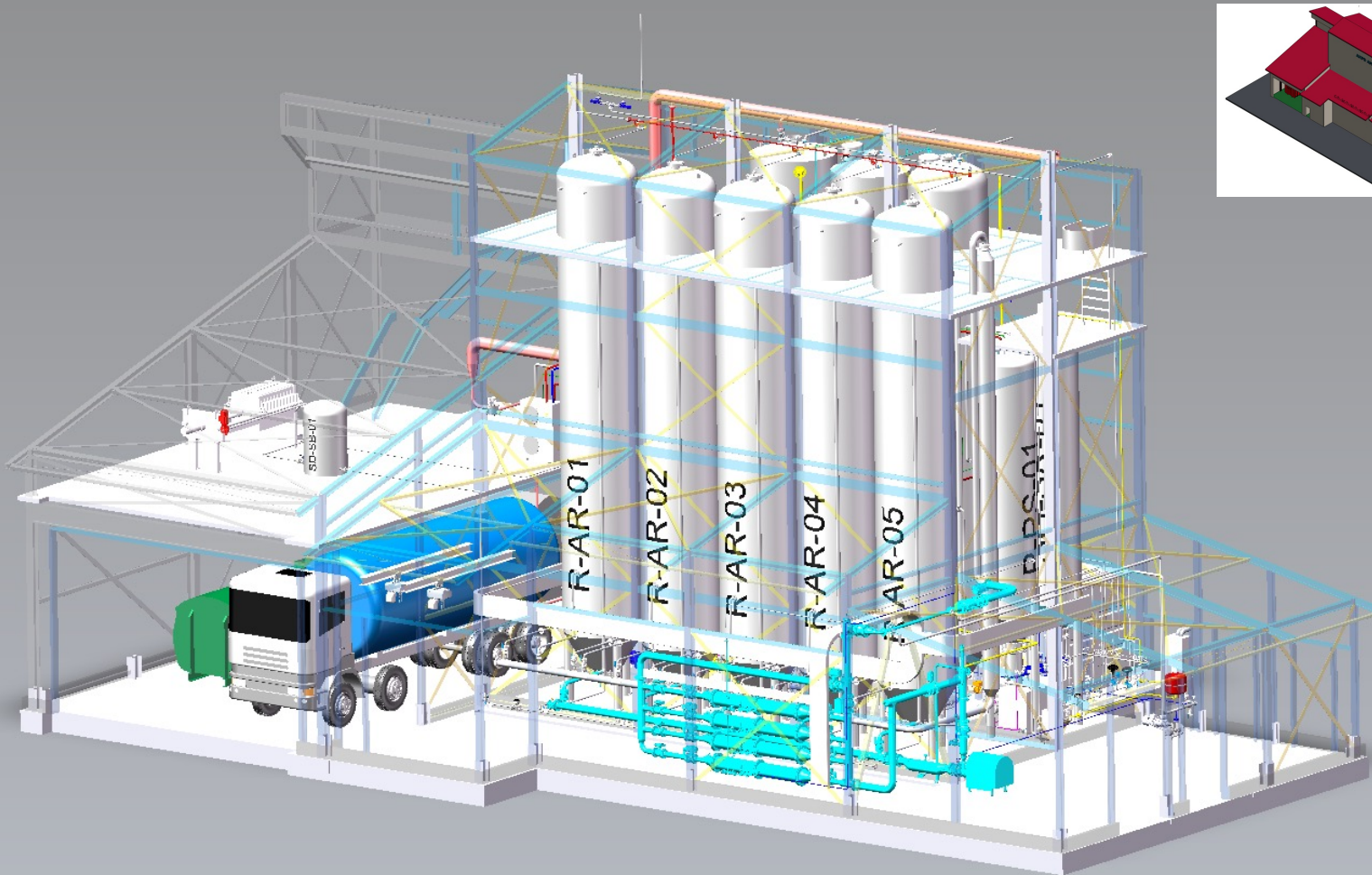
Step 3: @20 Bar + H₂ => 95% CH₄



Step 2: @20 Bar => 89% CH₄

Step 1: Biogas => 58% CH₄

AH₂PD: Production plant 3D design



Questions:

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