ENTRANCE
CENTRE OF EXPERTISE ENERGY

Assignment Name: Techno-Economic Assessment of Farm-Scale Biogas Utilisation Pathways

Client	Zuzi Kurt
Related project	Hydrogen Learn and Train Hub, REMO Lab: Renewable Molecule Lab PHD project: Economic feasibility of bio methanation
Start date	July 2026
Suitable for training course(s)	EMRE, SeSYM
Learning Community	REMO Learning community

Assignment description (max 200 words)

This project assesses the potential of medium-scale farms to support the EU's biomethane production targets and compares farm-scale biogas utilisation pathways using a detailed techno-economic analysis (TEA), particularly given the higher impact of these farms on national resilience.

Medium-scale farms can contribute meaningfully to meeting the EU's 2030 biomethane production target because they can supply substantial manure and organic residues. Their contribution may be further increased through the adoption of new technologies such as bio-methanation that enhance methane yield compared with current farm-scale practices.

This research evaluates bio-methanation and compares its technical and economic performance with established farm-scale biogas utilisation pathways using a techno-economic assessment (TEA). Our ultimate objective is to share insights with the research community focused on farm-scale biogas production and utilisation.

Assignment

Meeting the EU's 2030 target of 35 bcm/year of biomethane production will require the participation of all potential biomethane producers. In this context, medium-scale farms with substantial manure and other organic residues represent an important, often underutilised, feedstock source for biogas (and biomethane) production. However, maximising farms' contribution to the EU's 2030 targets will require not only the installation of additional anaerobic digesters but also the adoption of technologies that increase the methane content and overall yield of the produced gas. In this regard, bio-methanation offers a promising route to enhance biomethane yields by converting biogas CO_2 into CH_4. Given this advantage, bio-methanation is attracting increasing attention not only at the industrial scale but also for on-farm deployment.

However, prior to widespread farm deployment of bio-methanation, it is necessary to compare it with established farm-scale biogas utilisation pathways, particularly combined heat and power (CHP) and biogas upgrading. To ensure a consistent comparison across technical and economic dimensions, a techno-economic assessment (TEA) that compares the cost and performance of farm-

scale bio-methanation with CHP and biogas upgrading is warranted. The TEA will combine process-performance modelling already completed in simulation software (e.g., Aspen Plus or equivalent) with economic modelling (CAPEX, OPEX, etc.)
This study aims to publish its findings in a peer-reviewed journal and to inform the technical and economic comparison of feasible farm-scale biogas utilisation pathways.

Research Question

How does bio-methanation compare, from a techno-economic assessment (TEA) perspective, with established farm-scale biogas utilisation pathways such as CHP and biogas upgrading?

General information

Final Product	Thesis about comparative techno-economic assessment of farm-scale biogas utilisation pathways
Location	Entrance
Parties involved	Entrance, Paques
Contact person	Zuzi Kurt
Guidance	Zuzi Kurt
Details	z.g.kurt@pl.hanze.nl +31505952676

Photo and/or video

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- Location Proeftuin, Zernikelaan 17

- Location Energy Academy Europe, Nijenborgh 6.

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Contact us

Are you interested in the vacancy? Do you have questions or would you like to apply directly?

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