

POST

Putting Profits in Farmers' Hands & Maximizing GHG Emission Reduction with Farm-Scale Digesters



image credit: Bioelectric



KLAAS VANHEE ✨516

Commercial director, BIOELECTRIC

📅 Member since 2023 ✎ 1 items added with 215 views

 **Contact**

 **Follow**

 **Profile**

      **Like (2)**  **Comment**

📅 Aug 17, 2023 👁 216 views

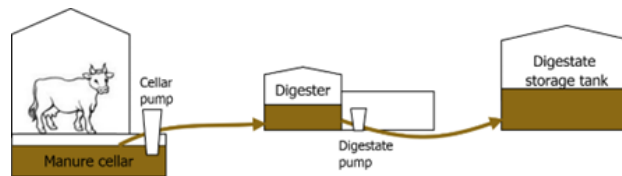
Digestion on the farm?

Farm-scale digesters employ an automated process that pumps slurry directly from the manure pit to the digester, significantly simplify to monetize the power of their slurry. By focusing on simpler biological processes, there is also no need to introduce additional energy-rich substrates, thus eliminating the requirement for land dedicated to energy crops and minimizing waste and digestate transportation.



In the foreground, a slurry pump connected to the digester

Moreover, the utilization of fresh manure allows farmers to prevent over 80% of biomethane losses, maximizing both energy output and earning potential. All this possible as of 60 dairy cows (or equivalent). The main two criteria is that manure is collected daily and is pumpable to allow this automation.



Regenerative Agriculture at its finest

Farm-scale digestion exemplifies regenerative principles, converting fresh cow manure directly into electricity, heat, and valuable agricultural inputs. When applying the digestate as fertilizer, the nitrogen is released more gradually into the soil rather than being emitted into the atmosphere. This is much better for the local biodiversity and the nearby bodies of water's.

Furthermore, applying digestate to soils also enhances biogeochemical cycles which promote carbon retention and by taking the manure out of the stable on a daily basis, it significantly enhances the well-being of the animals.

Proven to be sustainable

Studies conducted by Wageningen University & Research have shown that farm-scale digesters can lead to an impressive 82% reduction in greenhouse gas emissions compared to traditional manure management practices. Additionally, when combined with a Nitrogen stripper, these digesters can achieve up to 65% reduction in nitrogen emissions.

Farmers who embrace this solution can have their CO₂ emission reductions certified in the form of carbon credits which can be sold to third parties, further incentivizing sustainable practices and shortening the payback period.



Why choose farm-scale instead of much larger collective digesters?

Choosing to install a digester directly on the farm instead of relying on a larger central biogas plant, offers various benefits which are outlined in below table :

Aspect	Farm-Scale Digester	Large Collective Digester
Size	Smaller than a barn, with a silo below 12 meters high and a volume of 100 – 1500 m ³	Multiple silos commonly starting as of a combined 10.000m ³ of storage space
Investment	As of 100.000 EUR	As of 1.500.000 EUR
Permit Process	Smoother permit process due to an installation being smaller than stables and no burden for the environment	Complex permitting and regulatory requirements due to larger scale

Workload for farmer	Fully automated, max. 15 minutes of monitoring per day	Intensive : buying waste streams, monitoring biology, managing complex administrative flows, arranging the offtake of digestate
Biology	Simple, harnessing the bacteria already present in rumen animals	Often requires additional energy-rich substrates for optimal performance given manure is never fresh
Land use	No need for land to be used for energy crops	Often requires land for energy crop cultivation
Transport	None, as integrated into the farm	Extensive manure and other waste & digestate transportation
Pathogen risk	No pathogen exchange between different farms	Risk of pathogen exchange among farms because of manure exchange
Greenhouse gas reduction	Prevents up 82% of biomethane losses, through usage of daily fresh manure	As typically it takes at least two weeks before manure is collected, over 50% of biogas into the atmosphere, already escaped prior digestion process
Animal well-fare	Better climate in barn, as this stimulates taking the manure out of the barn on daily basis	Manure often digests couple weeks under animals, resulting in poor barn climate through ammonia gases for feedstock and farmer
Financial benefits	For farmer	Often in the hands of big(ger) industrial players

Offers on the Market

The European micromethanisation market leader is Bioelectric, with over 300 manure-only biogas plants and an rapid growth rate. Several other providers offer farm-scale digesters below 100kW, including Ener-G from the UK, Rota Guido from Italy, Biogas Plus from the Netherlands, and Green Service Group from Belgium.

Correlation with European Objectives

Farm-scale anaerobic digestion aligns perfectly with the European Union's commitment to reducing greenhouse gas emissions and achieving carbon neutrality. As the EU progresses with the Renewable Energy Directive (RED III), a 100% manure digesting model is gradually becoming the standard in the next years.

In summary, farm-scale digesters offer a promising and sustainable solution for modern farming. By converting fresh cow manure into renewable energy and quality fertilizer, all while reducing greenhouse gas emissions and nitrogen pollution, these digesters align perfectly with regenerative agricultural principles. As the European Union strives for reduced emissions and greater sustainability, farm-scale anaerobic digestion is primed to play a significant role in the ecological and energy transition.

🔗 bioenergy 🔗 carbon markets 🔗 emissions 🔗 environment 🔗 public power
🔗 renewables