agritower®
biogas at its best

agritower® - big-sized 3D-printed components for an innovative farm-scale biogas plant

R&D cooperation

between

24'7 agrigas gmbh & co. kg

and

Fraunhofer (IAPT)

Institute for Additive Production Technologies

The project is granted by the German Federal Ministry of Economic Affairs and Energy.

Bundesministerium für Wirtschaft und Energie

Biogas is a forward strategy for climate protection and more renewable energies.

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> Methane (CH_4) emissions are very harmful for the environment.

> An important source is liquid and solid manure from animal production in agriculture.

> Uncontrolled methane emissions into the atmosphere?

or

Controlled winning of methane from liquid and solid manure via biogas production?

Climate protection + more renewable energy

Mono-digestion of liquid manure is a challenge.

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> Farm crops as biogas substrates are out. A competition between food and energy production is socially and politically no longer tolerated.

> Liquid and solid manure from animal production are waste materials which do **not** compete with food production.

> In terms of biogas technique the **mono**-digestion of thin liquids is still a difficult process. The main reasons are the

- high share of useless, rather hindering water,
- low level of settlement structures for the bacteria.

> Mastering the mono-digestion of liquid manure is a big step forward in terms of biogas technique and subsequently in terms of climate protection.

Low level of settlement structures, much hindering water.

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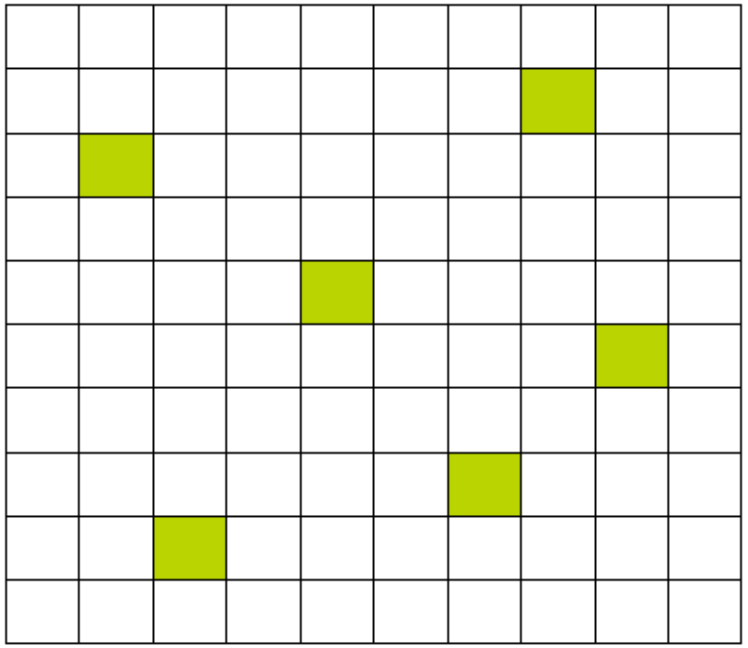

Liquid pig manure with 6% dry matter and 94%(!) water

Dry matter Water

Population density of the fermentation bacteria is very low, intensity of biological decomposition and biogas productivity are subsequently clearly reduced.

The very high share of water is not only useless for the biogas production. Moreover it makes the biogas process rather inefficient (pumping, stirring, holding warm the big water volume).

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>>> Let´s bring out the water quickly!

Farm-scale biogas plant for the mono-digestion of liquid manure:
Effective, cost-efficient, compact

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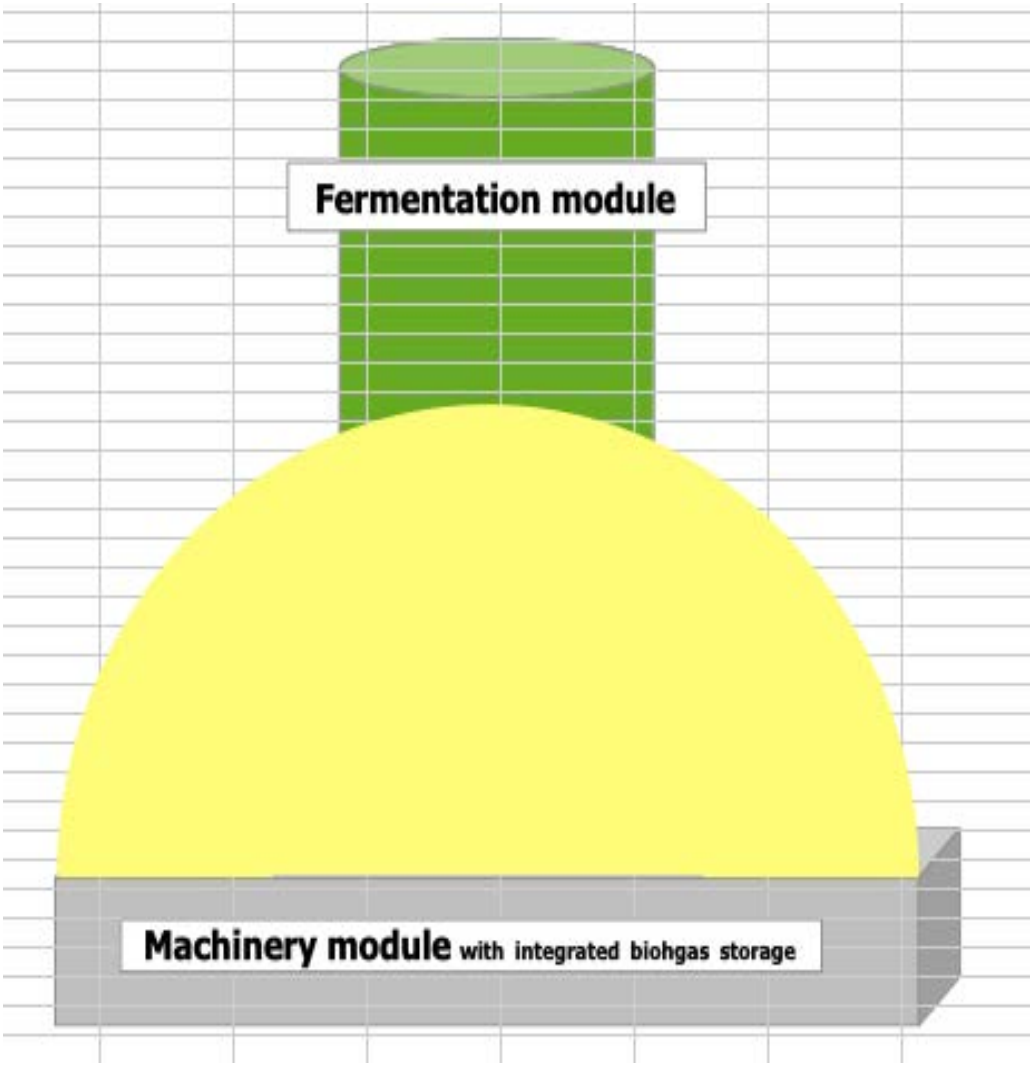

What is currently going on with our joint R&D - project?

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> **Aim of the cooperation**

building up a prototype biogas reactor in 1:1 size,
its testing under real conditions on an animal holding farm

> **Responsibilities**

24´7 agrigas gmbh & co. kg:
biogas process, devices and equipments
Fraunhofer IAPT:
big-sized 3D-printed components for the fermentation module and especially for the machinery module.

> The fermentation module is more or less ready.

> The machinery module is under planning and development.

The running cooperation is a win-win situation for both partners.

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> **24´7 agrigas gmbh & co. kg is winning:**
better integrated and more functional components

> **Fraunhofer IAPT is winning:**
detailed experience in scaling up from small-sized to big-sized 3D-printing technology

Looking into the future we expect that our today´s efforts and inputs may medium-term run into completely 3D-printed industrial plant modules.

Thank you for your attention!

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