



# **AERIS**

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BIOGAS POWER



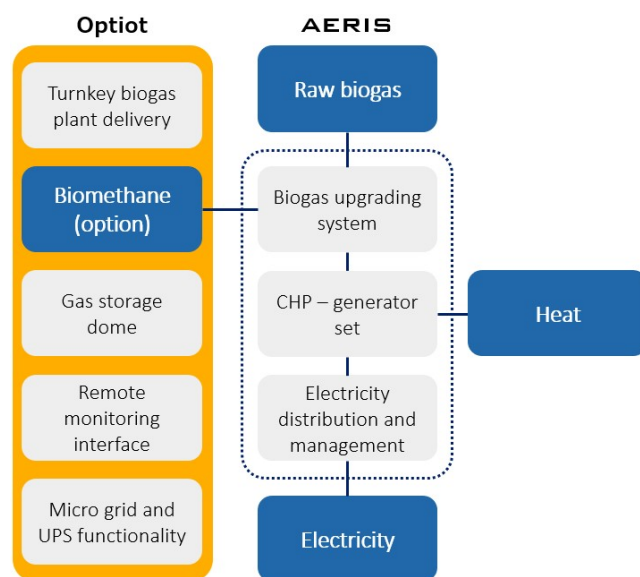
## From biogas to electricity and heat. Effortlessly.

OPhi Aeris –biogas upgrading system creates new earning and saving opportunities for farmers and agricultural enterprises. Aeris utilizes a high level of automation, practical design and high-quality components, forming a robust and efficient system.

The system is fuelled by raw untreated biogas, formed in a biogas reactor. The Aeris' sophisticated upgrading system purifies and pressurizes the raw biogas, removing excess moisture and other unwanted components from the gas, improving its quality to a level comparable to natural gas.

The energy contained in the upgraded biogas is turned into electricity and heat in a CHP –generator set. Excess gas can be used as vehicle fuel, used for extra heating in a separate boiler, or stored for later use in an external gas storage dome. The generated electricity is managed and distributed by the Octagon MPC-unit, located in the control and electronics compartment.

The OPhi Aeris –concept harnesses unutilized resources that you already possess. The Aeris includes the technology required for upgrading biogas and turning it into electricity and heat. Manure pools, buildings, storage silos and machines you already own will be utilized in the design of the biogas reactor and other parts of the plant.

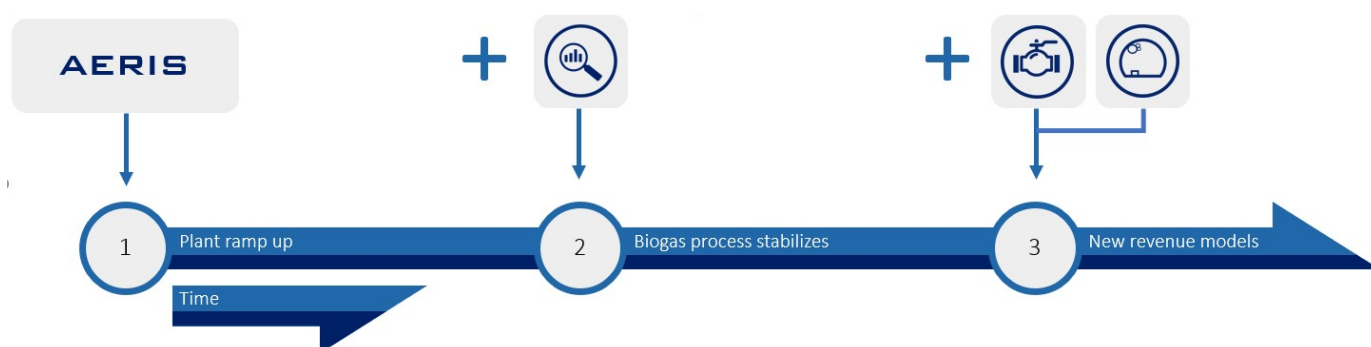


Biogas quality	> 90% CH <sub>4</sub>
Nominal power, electricity	45 kW <sub>e</sub>
Nominal power, heat	90 kW <sub>th</sub>
Max. annual capacity, electricity	300 000 kWh
Max. annual capacity, heat	600 000 kWh

## Our aim is to increase value in steps

We begin looking for the right solution for you by thoroughly studying your specific needs. The quality and volume of available feedstock, and your daily requirement for electricity and heat among other parameters will be investigated. According to the preliminary survey, we'll choose the best product configuration to suit your needs. OPhi's modular design principles have been utilized in the development of the system. Multiple Aeris units can be installed in parallel to meet requirements for higher capacity.

The standard configuration unit can be installed with a reasonable initial investment. New functionalities and more capacity can be installed later. Thanks to the modular design architecture, the same software and hardware subsystems can be used as they are in all uses and conditions. The Aeris can be complemented or even retrofitted with e.g. solar panels or a small hydro power turbine to form a hybrid renewable energy system.



## Operating and maintenance expenses - example calculation

The reliability of Aeris is ensured by using high-grade components. A comprehensive set of operating and maintenance documentation and technical data is provided with the system, to further ensure reliable, safe and efficient operation of the system.

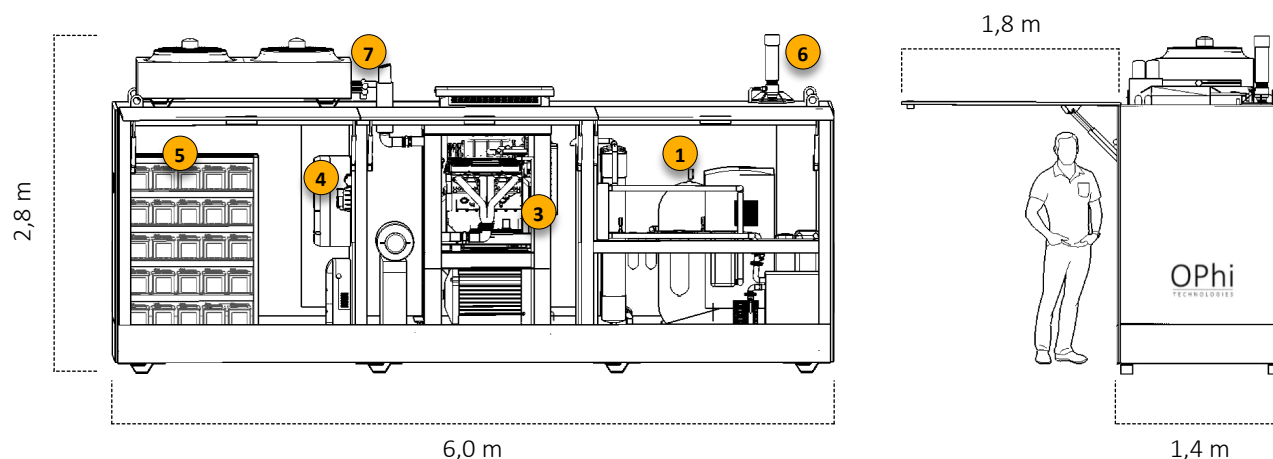
In this estimated expenses calculation, the Aeris has been modified to control the pre-existing feed pump and mixer in a biogas reactor, and to monitor the pressure and temperature inside the reactor. The data can be viewed in the Aeris' touch panel interface or via a remote user interface, through either WLAN or cable ethernet.



Replacement parts & maintenance	Estimated cost (€ Per annum)
Biogas upgrading system	500 - 1 000
CHP -generator set	5 500 - 6 500
Power electronics	800 - 1 000
Measuring and safety equipment	200 - 500
<b>Total estimated annual cost</b>	<b>7 000 - 9 000</b>

## Layout and dimensions

- 1) **Biogas upgrading system**, consisting of e.g. membrane separators, nanofilters and a chiller
- 2) Optional **Gas storage dome**, to balance gas production and consumption
- 3) **CHP -generator set**
- 4) **Octagon MPC**, to manage electricity and control the Aeris
- 5) Optional **Energy storage** with micro-grid & UPS capability
- 6) **Measuring and safety equipment**, consisting of e.g. pressure sensors and the safety flare
- 7) **Radiator unit**, to dissipate excess heat





## Warranty policy

The OPhi Technologies standard limited warranty covers parts on failures caused by defects in OPhi Technologies materials or workmanship for the OPhi Aeris and all its standard and optional features. The OPhi Technologies standard limited warranty coverage is good for 12 months or 2000 running hours, whichever comes first.

Ask your OPhi representative for optional extended warranty coverage.

## Instructions

Installation and commissioning, operation and maintenance instructions, along with all the documented information you need to successfully own and operate the Aeris are provided with the system.

As part of the delivery, your chosen personnel will also receive a thorough training for the safe and efficient operating of the system. The training will also cover best practices and most common troubleshooting tasks of the system and its components.

## OPhi Technical Support

We at OPhi are determined to provide our customers with smoothly operated systems. OPhi Technical Support acts as a quick response to any problems that may arise during the product's lifetime.

Combining extensive knowledge in renewable energy and industrial engineering, OPhi Technical Support provides comprehensive assistance for the owners of OPhi products and systems.

## Contact OPhi for more information

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