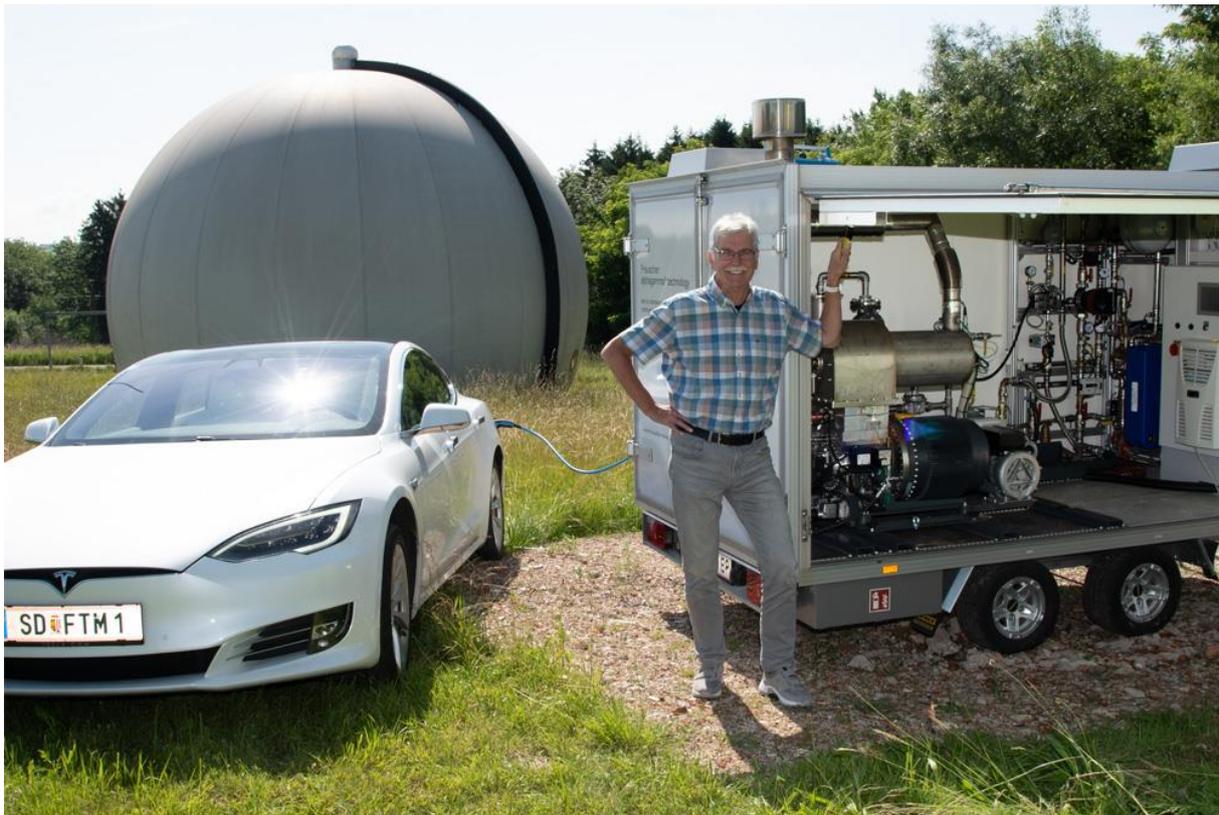


Electricity from biogas instead of dependence on Russia

Frauscher converts landfill gas into valuable energy

St. Marienkirchen bei Schärding. Frauscher Thermal Motors GmbH has successfully commissioned a mobile combined heat and power plant (CHP) with a Stirling engine at the Gradinger landfill site in Ort im Innkreis. The company is thus impressively demonstrating how weak gas and biogas can be converted into valuable energy in times of uncertain natural gas supplies.



Josef Frauscher with the mobile Stirling CHP at the Gradinger landfill in Ort im Innkreis: The harmful methane gas is converted into electricity, which charges the Tesla from Frauscher Thermal Motors here. (Usage free of charge, Copyright: Frauscher Thermal Motors)

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About a kilometer north of the center of Ort im Innkreis, Gradinger operates an older landfill. According to official requirements, the methane emissions from the landfill must be rendered harmless to the atmosphere through oxidation. Because methane is considered a climate killer: Measured over a period of 20 years, the climate-damaging potential (GWP, Global Warming Potential) is 81.2 times higher than that of CO₂.¹

But climate protection is not the only focus of innovation. Josef Frauscher, managing director of Frauscher Thermal Motors GmbH in St. Marienkirchen, is convinced that weak and biogas make a decisive contribution to the energy transition and thus to reducing dependence on Russian natural gas: "Unfortunately, in Austria, the great potential of biogas is used far too little",

¹ https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf, S. 1842

says Frauscher, "Electricity from this source can represent an ideal balance for the volatile solar and wind energy."

Biogas is cheaper than natural gas

Austrian gas consumption is currently around 89 terawatt hours (TWh) per year. 79 TWh have to be imported, 80 percent of which come from Russia².

A new study³ by the Economica Institute and Econmove comes to the conclusion that in the medium term one third to almost half of current gas consumption can be covered by biogas.

The current price development also speaks for the stronger expansion of biogas: While natural gas in Austria currently costs around 100 euros per megawatt hour, the price of biogas is between 32 and 56 euros, depending on the size of the plant, according to the study.

Patented technology replaces methane flare

Josef Frauscher considers it an urgent necessity in terms of energy and environmental policy to promote the use of weak- and biogas. His company, Frauscher Thermal Motors, has invested 20 years of research and more than 180,000 working hours in the development of a new type of Stirling engine, which forms the heart of the CHP at the Gradinger landfill.

The technology known as Alphagamma is considered a decisive step in the further development of Stirling engines - the process patented by Frauscher enables long-lasting and lubricating oil-free operation with high efficiency at the same time⁴.

"So instead of burning off the methane uselessly, our CHP converts it into valuable electrical energy that can be used in landfill operations," explains Josef Frauscher.

Valuable insights expected

In continuous operation at the Gradinger landfill, the Alphagamma Stirling engine is now to demonstrate its high practical suitability. "So far we have tested our technology for more than 50,000 hours on our test benches - now we are moving the test bench outside," says Frauscher.

The managing director of Frauscher Thermal Motors GmbH assumes that practical use can also provide valuable insights into dealing with landfill gas as a fuel. "Landfill gas is contaminated with residues of sulfur and chlorine," says Frauscher, "but despite these loads, we expect long and low-maintenance operation as the basis for economic implementation."

Successful entrepreneur and award-winning innovator

Since 2001, Josef Frauscher has been researching Stirling engines. The breakthrough was achieved in 2017 with the invention of Alphagamma technology. The engine technician and successful entrepreneur, who sold the rail technology company Frauscher Sensortechnik GmbH as part of a management buy-out in 2016, runs his own research center in St. Marienkirchen.

The development was also awarded several innovation prizes, including the VERENA powered by VERBUND special prize as part of the Austrian State Prize for Innovation 2020, the German Innovation Award 2021 and the Upper Austrian State Prize for Innovation 2019.

² <https://infothek.bmk.gv.at/oesterreich-kann-abhaengigkeit-von-russischem-erdgas-bis-2027-beenden/>

³ <https://www.gaswaerme.at/presse/gruenes-gas-schafft-jobs-wertschoepfung-und-macht-unabhaengig/>

⁴ <https://de.wikipedia.org/wiki/Stirlingmotor>

In addition to the operation of combined heat and power plants, the Alphagamma technology is suitable for use as a power generator (auxiliary power unit, APU) in trucks, yachts and mobile homes. Here, the unit quietly and persistently supplies both the parking air conditioner and the parking heater and takes over charging the on-board battery.

All information on Alphagamma technology is available on the website <https://frauscher-motors.com/>.

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