



GREEN AND
EFFECTIVE



H₂S and odor removal at biogas plants

IT'S TIME TO REPLACE TRADITION WITH INNOVATION

 **ozonetech.**
a MELLIFIQ brand

GREEN BUSINESSES SHOULD USE GREEN TECHNOLOGIES

One of the challenges of biogas plants is the strict requirement of H₂S removal after the anaerobic digestion stage, before upgrading.

Another constant source of concern is the odors emitted from the biogas plant. Today, both can be solved effectively, and green.

We have developed a catalyst specifically for H₂S removal: the Rubicat™. Even without oxygen, H₂S is removed, leaving no traces before the upgrading stage. As the working mechanism is catalytic, the Rubicat has a much longer lifespan compared to traditional

technologies, such as activated carbons. The Nodora CAT can yield a 40-95% reduction in operating costs.

In addition, one can handle the odor problems inside the plant by producing ozone very cost-effectively on-site. The ozone is lead into the existing ventilation to reduce odorants to then pass through a Nodora ADS as final polishing stage, before discharge.

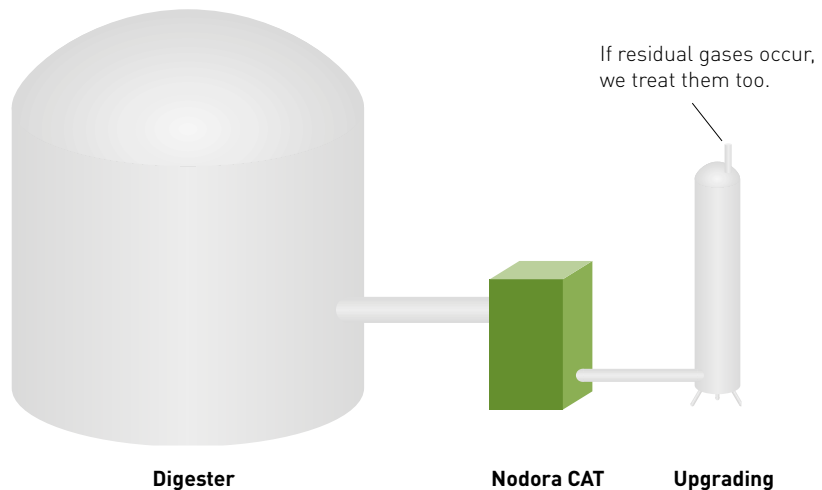
Ambitious biogas producers have an additional option: to treat the biomass with ozone, which in some applications can double the amount of biogas yield.

Regardless of application, the treatment will be efficient, green and easy to manage.

OUR ODOR TREATMENT SOLUTIONS AT BIOGAS PLANTS

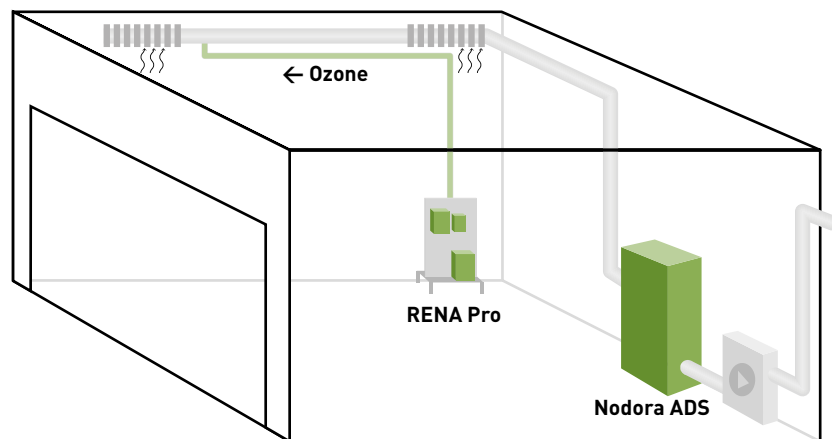
H₂S removal before upgrading

With our solution you don't need several technologies to handle the H₂S. No activated carbon, no ozone or other treatment methods. Our in-house developed Nodora CAT equipped with the Rubicat is sufficient. The Nodora system is designed to constantly make use of all active material, highly increasing H₂S removal efficiency and the filter material lifetime.



Inhouse odor removal

The odors from inhouse sources are removed through the ventilation and the collected odors can then be treated using RENA Pro and Nodora ADS before the air is discharged into the environment.



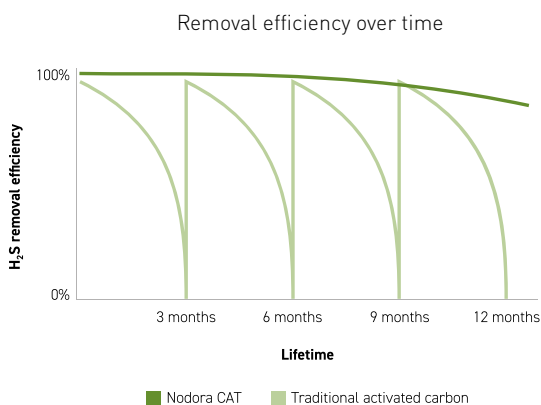
The existing ventilation is the treatment chamber.

NO RECONSTRUCTION NEEDED. MINIMAL OPERATING COST.

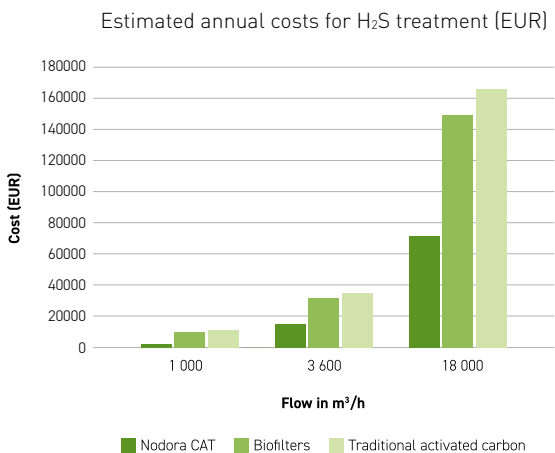
Our most important advice is to carefully analyze the air. The analyses and pilot tests we perform at our facilities focus on flows and concentrations, preparing the design of the optimal treating method.

Nodora is installed in industries with strong regulatory requirements for odor reduction.

All Nodora systems are tailored to the current load to achieve maximum possible H₂S and odor reduction. One of many benefits when combining ozone treatment and Nodora is that the active material is active at least five times longer than a solution without prior ozone treatment.



A standard solution using activated carbon treatment is both costly and ineffective compared to our Nodora CAT. The high performance of Nodora CAT is due to the advanced active material used, the material mix and the overall design making use of all filter material equally. The experiments were conducted in Stockholm, with the collaboration of KTH Royal Institute of Technology. Real biogas conditions were tested with a H₂S concentration of 1000 ppm.



Using Nodora CAT will cut costs in half compared to traditional activated carbon. When replacing a traditional activated carbon system, the return of investment will be less than two years.

RENA PRO OZONE SYSTEM

Treatment method: ozonation

Odor reduction: up to 98%

Removal ability: hydrogen sulfide, mercaptans and volatile organic compounds

Operating cost: minimal: inexpensive consumables and electricity consumption of the ozone system

Handling: minimal, on/off or automatic

Monitoring: remote 24/7 with service agreement RENA premium

Raw material: ambient air to produce oxygen

Ozone distribution: 8 mm tubes

Footprint: 80x60 cm

NODORA CAT

Treatment method: catalysis

H₂S reduction: up to 100%

Removal ability: hydrogen sulfide

Operating cost: minimal compared to activated carbons due to much longer lifetime

Handling: none, no electricity or heat required

Monitoring: N/A

Active material: Rubicat

Footprint: 1160x760 mm

NODORA ADS

Treatment method: selective adsorption

Odor reduction: up to 100%

Removal ability: mercaptans, volatile organic compounds and amines

Operating cost: minimal compared to activated carbons due to much longer lifetime

Handling: none, no electricity or heat required

Monitoring: N/A

Active material: tailored for each application

Footprint: 1160x760 mm

ADDITIONAL SERVICES

Service agreement: adapted to the customer's need and requirements and can include full annual maintenance service

Air analysis: performed at Ozonotech premises

Tailored process design: performed at Ozonotech premises

Manufacturing: at our facilities in Sweden

About Mellifiq

Mellifiq is a multi-awarded environmental service company group, that has since the early nineties evolved into a world leading system and solution provider with multiple groundbreaking applications for industrial, municipal, and real estate clients. We supply cutting-edge technologies to manage the most sophisticated air, water, and energy challenges.

Mellifiq offers a complete range of air and water treatment technologies and solutions across multiple industries such as processing industry, energy sector, food and beverage, pharmaceutical, wastewater treatment and commercial real estate.

Mellifiq offers strong and renowned brands, such as Ozonetech, Nodora and Water Maid, and world-class engineering services combined an excellent track record of more than 40 years of innovation. We help our clients achieve the most efficient and sustainable solutions while creating the maximum value for their businesses.

With several business units across Europe, Mellifiq is headquartered in Stockholm where research and development, production, QA and certification all take place. Our unique technology and our extensive expertise have made us the Center of Excellence for the world's most complex projects, and a global player with installations on all six continents.

Everyday millions of people rely on our solutions for ventilation, disinfection, sanitation, and odor control. We are committed to raising the bar for the concept of clean and the industry standard for engineering, technical services and general contracting.

For additional information, visit our website at www.mellifiq.com

Elektravägen 53
SE-126 30 Hägersten, Sweden
+46 10 252 30 00
www.mellifiq.com



MELLIFIQ