



The Minhe biogas upgrading plant (China)

Planning

Implementation

Commissioning

Operation

Service



- ← The crude gas pretreatment with activated carbon filters and gas cooling scrubbers is selected according to the specific project-specific requirements.
- From the membranes directly to the CNG petrol station



The Minhe biogas upgrading plant in China

- Location:** Penglai City (Shandong province, China)
- Output:** 2x 1,000 Nm³/h of biomethane
- In-service date:** Both systems have been in operation since March 2017
- Input materials:** Poultry litter from the owner's approx. 1 million head of poultry
- Features:** This plant is the first biogas upgrading plant from EnviTec Biogas in China. Both of the structurally identical EnviThan upgrading systems, each with a capacity of 1.000 Nm³/h biomethane, deliver bio-CNG (compressed natural gas from biogas) as the end product of biomethane treatment. The bio-CNG is used as a green fuel in the company's own filling station and in the nearby city of Yantai.

A quick look at the Minhe biogas upgrading plant

Minhe, Shandong province, is the location of the first EnviTec gas upgrading plant in China. The plant uses two identical EnviThan systems that each produce 1,000 Nm³/h of biomethane, with the raw gas fed from the existing biogas plant. The customer is Shandong Minhe Biological SCI-Tech Co., one of the world's largest poultry farmers.

The EnviThan membrane technology used here is an especially cost-effective and environmentally friendly innovation, as it operates without chemicals, water or the use of other external resources. The container-based design means each plant can be customised to suit the performance requirements of the individual owner. Here, the customer has specified that elevated levels of ammonia and hydrogen sulphide are to be expected in the raw biogas. Since ammonia is readily soluble in water, a combined gas cooler/scrubber has been installed at the

plant. In the scrubber, a chiller unit cools the condensate produced to 10 °C, which is then used in a trickle-bed reactor to scrub the gas flow. In this way, the biogas is cooled to the desired temperature and dewatered in just a single process. The process also scrubs out the ammonia. Usefully, this also avoids the need for a fresh water supply, since condensate is produced continuously from the biogas.

For the removal of hydrogen sulphide, the MAKА activated charcoal filters already successfully deployed in Germany are also used here. These filters are housed at the plant in replaceable containers that can either be refilled at our factory or onsite, as required. Filters can also be hot-swapped, since each system has three activated charcoal filters connected in parallel.