CONSULTANCY SERVICES WITHIN BIOGAS DISTRIBUTION

The utilisation of biogas as a vehicle fuel or in an existing gas grid is an important contribution to sustainability as the fuel is renewable and represents measurable environmental benefits. When upgrading the biogas to biomethane, the gas receives the same properties as natural gas, and the two are exchangeable. Upgrading biogas using conventional separation technology is energy efficient and allows the biogas to meet local or national quality requirements by removing CO₂ as well as water and other unwanted compounds like H₂S. The upgraded biogas (biomethane) may then be used as a vehicle fuel instead of fossil fuels like gasoline or diesel.

Ramboll offers a wide range of services within the field of gas application from biogas upgrade plants, gas distribution systems like bus fuelling depots, and distribution to existing or new grid systems. We participate in all phases of a project from feasibility studies and planning to procurement, execution and installation. Ramboll even undertakes responsibilities in the commissioning and testing phase and plans and performs inspections.

Project feasibility and planning

The feasibility study is an overall review of the technical and economic requirements. We assess plant area requirements, establish overall system design and layout and estimate total project cost (investments, operation and maintenance), life cycle cost, and potential project income. During this phase we also perform environmental impacts assessments as well as permit applications in accordance with relevant legislation.

Procurement process

The main goal of the procurement process is to ensure value-for-money for the client by establishing a detailed contract with an established vendor. We prepare tender documents covering all aspects of the procurement process and participate in life cycle cost evaluations and contract negotiations.

Execution and installation

During the execution and installation phase we act on behalf of our client to ensure that project goals and technical requirements are met. The role includes project management, on-site responsibilities, vendor follow-up, as well as administrative and strategic assignments.

Commissioning and testing

Once the installation phase is concluded, Ramboll takes full responsibility or participates in planning and executing commissioning activities, all according to our client’s needs. We test installations and ensure that functionality and performance are according to specified requirements.

Inspections

With experienced and certified personnel, Ramboll may take full responsibility for or participate in inspections according to relevant legislations and regulations. Our competent employees may handle the whole process from planning, to execution and reporting.

What is upgraded biogas applied for?

Biogas, produced by anaerobic digestion of biomass, holds approximately 60-65 % CH₄ (by volume) and may be utilised as an energy carrier in a large variety of applications in its untreated form, e.g. in CHP plants. It is, however, becoming more common to upgrade the biogas by removing mainly CO₂ and H₂O, which results in a product gas that typically contains 97-98 % CH₄ by volume. The CH₄-enriched gas (biomethane) may then be used as vehicle fuel by compression and distribution to a fuelling system, or for delivery to a gas grid where it may be used unmixed or mixed with natural gas.

Ramboll’s services

In gas application projects Ramboll provides technical support and advisory services to the client’s project organisation. Our clients are municipalities as well as privately held organisations, and our services include:

- Offer full-range services within biogas distribution – from feasibility studies and permit applications to detailed design and inspections
- Have several senior engineers with over 25 years of experience of biogas
- Have considerable experience in biogas upgrading solutions, gas distribution solutions and systems and grid implementation
- Have been responsible for 10 vehicle fuel systems at green-field bus depot projects with biogas as primary fuel

Selected project references

- Bekkelaget Waste Water Treatment Plant, Oslo Municipality, Norway: Consulting services for complete turnkey upgrade plant for vehicle fuel
- Depå Fyrislund, Upplands Lokaltrafik AB, Uppsala, Sweden: Project management and technical consultancy for turnkey bus depot for LBG and CBG fuelling of 80 buses
- Biogas Brända, Sweden: Biogas consortium project including AD (biogas from manure), upgrade plant, compressor and filling station and pipelines. Performance test and final inspections.
- Avloppsreningsverket Ön, UMEVA AB, Umeå, Sweden: Technical specifications and tender documents for two gas engines, gas boilers and gas- and heating distribution system at new WWTP.
- Sundet Waste Water Treatment Plant, Växjö Municipality, Sweden: Inspection, according to EN2011, of a 4 km biogas pipeline, installed partly subsea, connecting a WWTP and industrial facilities.

CONTACTS
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- Have considerable experience in biogas upgrading solutions, gas distribution solutions and systems and grid implementation
- Have been responsible for 10 vehicle fuel systems at green-field bus depot projects with biogas as primary fuel

Biogas distribution in Ramboll

Number of specialists: 20
Annual turnover: €800,000
Years of experience: 25