

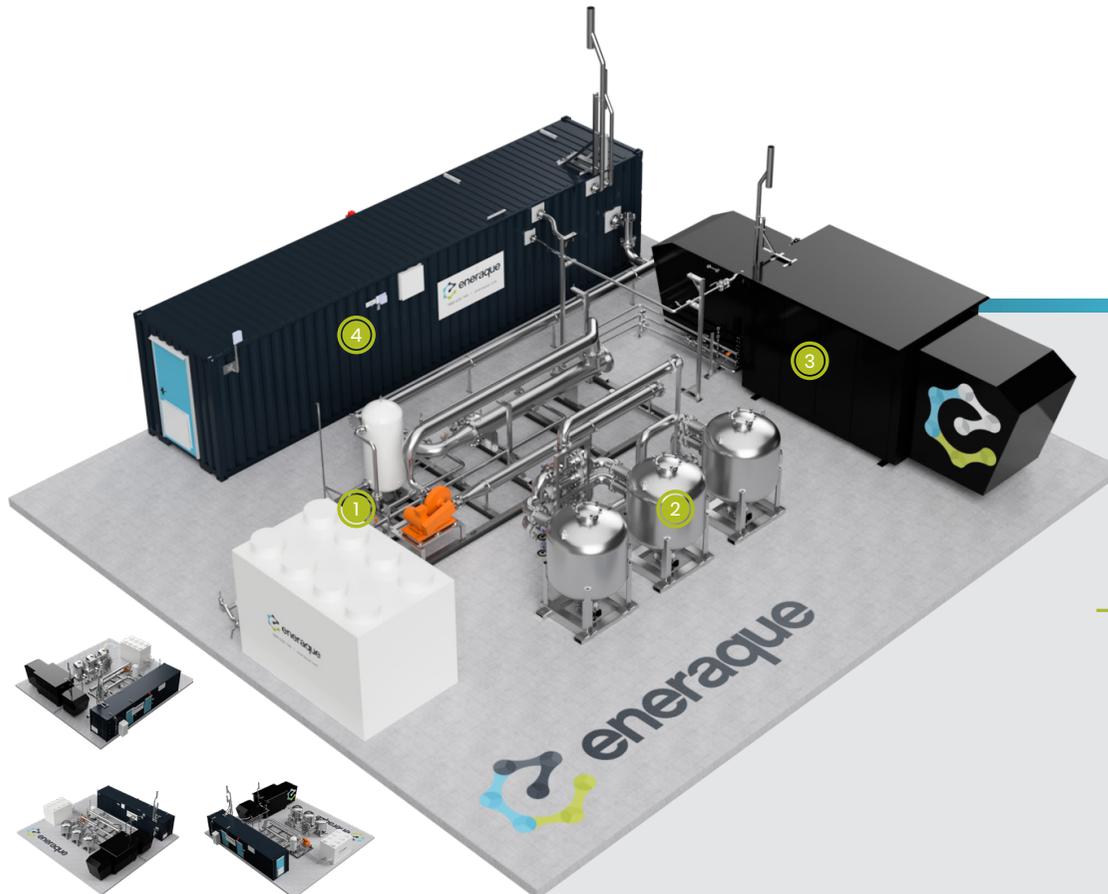
MALABAR BIOGAS UPGRADING PLANT



SUMMARY

The Biogas Upgrader Plant has been developed from many years of successful application across Europe, Asia and the USA. The plant is easily integrated with anaerobic digesters and provides a refined, efficient method of processing raw biogas into useable biomethane. The robust design features an advanced patented control system, continuous process monitoring, remote operation and 24/7 support.

The Malabar plant will upgrade raw biogas from the anaerobic digestion process at Sydney Water's Malabar Waste Water Treatment Plant to high quality biomethane that meets stringent gas specification requirements in prior to blending into the Jemena Gas Network.



- ① Biogas Cooling Skid**
 As the biogas enters the installation it is cooled and dehumidified. The chiller's purpose is solely to cool the gas for dehumidification.
 - ② Pre-Treatment Skid**
 Activated carbon filters remove Volatile Organic Compounds (VOC's) and Hydrogen Sulfide (H₂S) from the biogas.
 - ③ Gas Compression**
 After the pretreatment process, the gas is compressed to the required pressure for the final upgrading process.
 - ④ Upgrading Process & Control**
 The process features a 3-stage membrane system whereby CO₂ and biomethane are separated into concentrated gas streams for final processing. Biomethane is then purified to network gas quality and CO₂ re-processed for maximum biomethane recovery. CO₂ can be recovered for industrial users.
- The upgrader control system consistently monitors the entire process, 24/7, to ensure safe, continuous and uninterrupted plant operation.

AN INTELLIGENT PROCESS.

Moving through the various stages of biogas upgrading, the biogas is ultimately transformed into network quality gas for grid blending. As shown below the plant can also be used for Compressed Natural Gas (bio-CNG) and Liquefied Natural Gas (bio-LNG) as well as Liquid CO₂.

