

# UPGRADE

# Biogas to Biomethane



Circular Research  
FOUNDATION

Biogas produced from anaerobic digestion (digester or landfill) is mainly comprised of methane and carbon dioxide. Upgrading of biogas allows renewable energy recovery and greenhouse gas reduction. Upgraded biogas (97-99% methane) has two attractive applications: grid injection and vehicle fuel.

## TECHNOLOGIES

Upgrading biogas to biomethane requires removal of carbon dioxide and trace compounds up to 97-99% of methane. Available processes are:

- *Water wash:* carbon dioxide in biogas is absorbed into water at high pressure and then stripped at lower pressure. This is the most commonly used upgrading technology.
- *Chemisorption and physisorption:* it uses organic solvent for chemisorption of carbon dioxide and other trace compound.
- *Pressure swing adsorption:* based on pressure swing cycles to trap selected compound on adsorbent medium. this system uses four phases to trap selected molecules in an adsorbent medium that are released at lower pressure.
- *Membrane separation:* permeable membranes are used to retain selectively methane on one side, while carbon dioxide permeate on the other side of the membrane due to a pressure differential.

## BiometUp Process

The BiometUp process is based on the most environmentally friendly solution which uses water in a absorption/stripper configuration, to achieve a degree of biogas purification without the need for chemicals or heat. The first stage is desulfurization to remove hydrogen sulfide, VOCs, siloxans, and other trace compounds responsible for equipment corrosion. The main stage is water wash through absorption/stripping. To reach grid specification can be used a final step of adsorption.

# BiometUp<sup>®</sup> Process

DESOLFORAZIONE    GASOMETRO    COLONNA LAVAGGIO CO<sub>2</sub>    COLONNA STRIPPING    COLONNA CONCENTRAZIONE    STOCCAGGIO M.P.    STOCCAGGIO A.P.    COLONNINE EROGAZIONE



