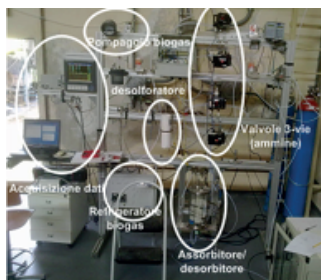


BIOGAS FROM ANAEROBIC DIGESTION TREATMENT: PURIFICATION AND UP-GRADING TO BIOMETHANE

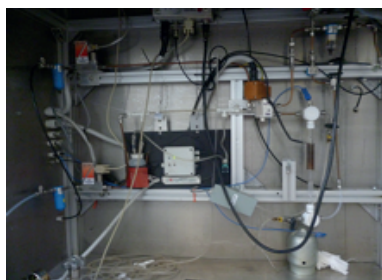
Innovations and Benefits - The energetic content of biogas produced by anaerobic digestion facilities lies in its methane component. The biogas treatment technologies towards biomethane utilization foresee three steps: biogas dehumidification, sulphurate compounds removal, in particular hydrogen sulfide, and carbon dioxide separation, in order to get a gas, the biomethane, suitable to be injected into the natural gas network. The developed methods optimize the costs and the energetic expense of those processes.

Uses - The processes of purification and upgrading of the biogas produced by anaerobic digestion can be utilized downstream the digesters utilizing as feedstock both zootechnical and agricultural residuals, and the organic part of municipal wastes. The biomethane obtained by the purification and removal of the CO₂ content in biogas can be utilized for heat production by combustion (with higher efficiency with respect to direct biogas utilization) or as fuel, or can be injected into the natural gas network.

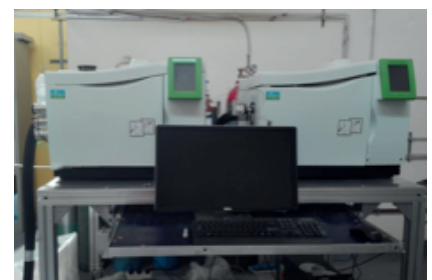
Past and Present Activities - At the ENEA Lab experimental tests have been carried out in order to optimize the operating conditions of biogas purification from sulphurate compounds by activated carbons. The biogas was cyclically up-graded by CO₂ absorption in an amine solution in a mixing of ethylene glycol and n-propanol. Both synthetic and real biogas was used for the up-grading tests.



Prototype system for biogas purification and upgrading. The de-sulphurizing reactor with activated carbons and the CO₂ absorption/desorption reactor are evidenced



Experimental facility for tests of H₂S adsorption by activated carbon



GC/FID/TCD e GC/FPD systems for biogas analysis and contaminants detection

