



FEASR: Fondo europeo agricolo per lo sviluppo rurale:
l'Europa investe nelle zone rurali



The biogas sector as circular hub: the Powerfood model

Consorzio Monviso Agroenergia (CMA)

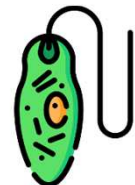
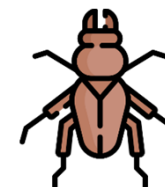
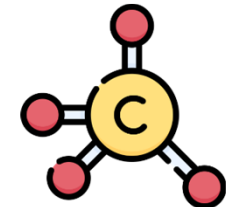
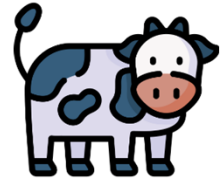
Convegno "AgriBiogas 2023"

Biometano e Biogas risorse rinnovabili per l'Italia di Domani

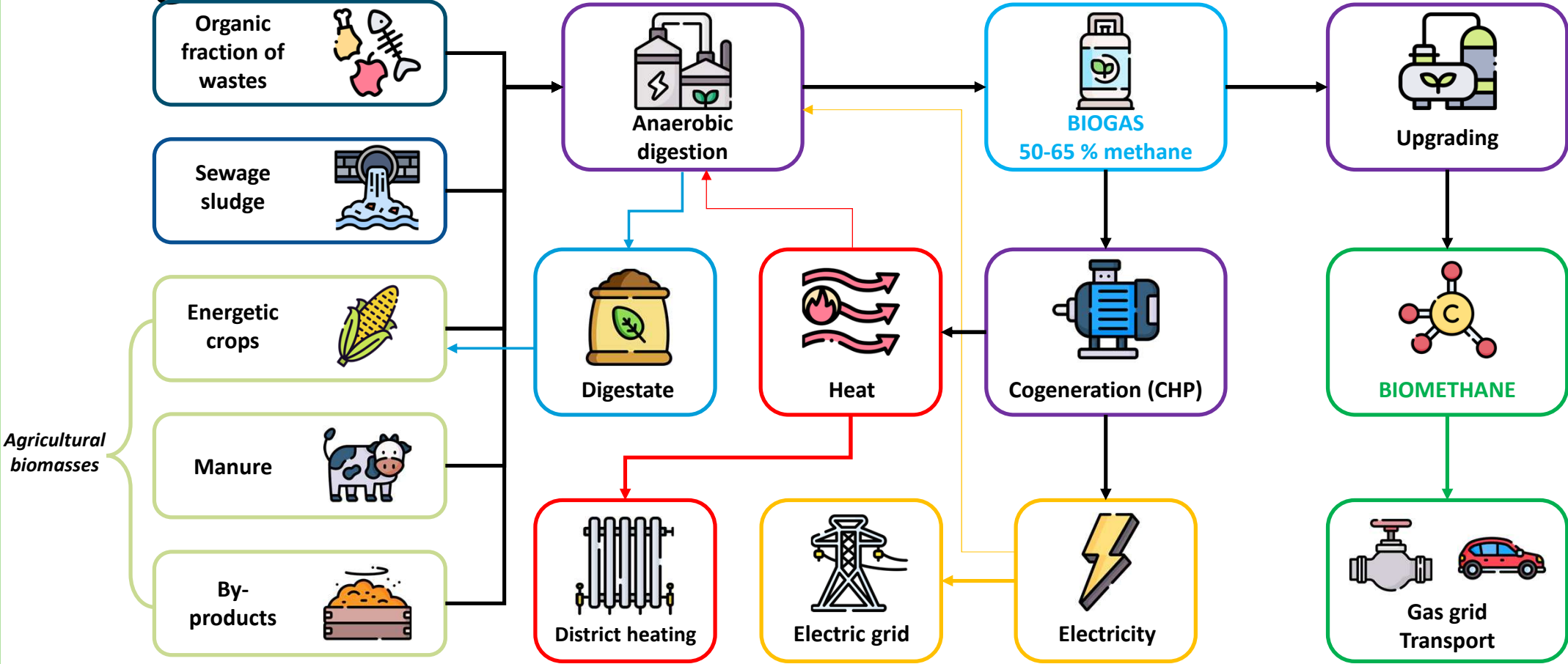
5 May 2023

Outline

- The pivotal role of biogas within the agri-food supply chain
- General overview of the Italian biogas and biomethane sector
- Brief introduction of CMA
- The Powerfood project
 - General overview
 - Partnership
 - Presentation of the technological units
 - Expected outcomes

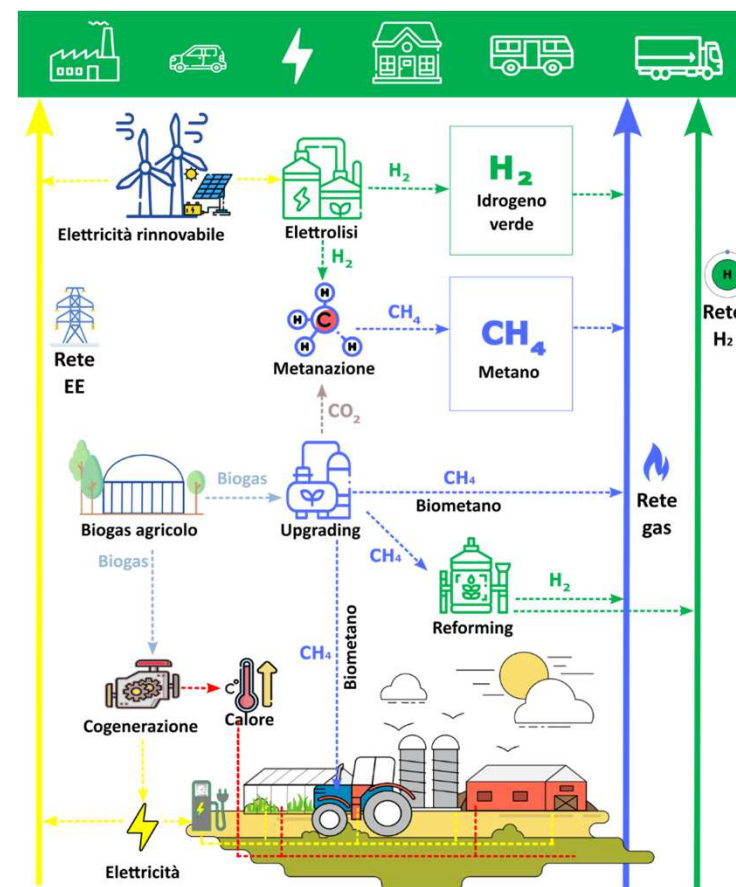


Biogas and biomethane: an introduction



Biogas and agriculture: a valuable nexus

- Key aspects of biogas plants in the agro-energy system
 - Occasion for additional revenues for farms
 - Possibility to exploit heat for farming purposes
 - Treatment of manure
 - Management of odours and emissions
 - Digestate as by-product for agronomic applications
- The potential of development of the supply chain:
 - Biomethane
 - Biohydrogen
 - Fuel cells
 - Fertilizing products (Regulation 2019/1009)



Biogas and biomethane in Europe and in Italy

Biogas in Europe:

- Plants: 18,774
- Production: 15 bln sm³ methane

Biomethane in Europe:

- Plants: 880
- Production: 3 bln sm³ methane

Biogas in Italy:

- Plants: ~1,600
- Production: 2 bln sm³ methane

Biomethane in Italy:

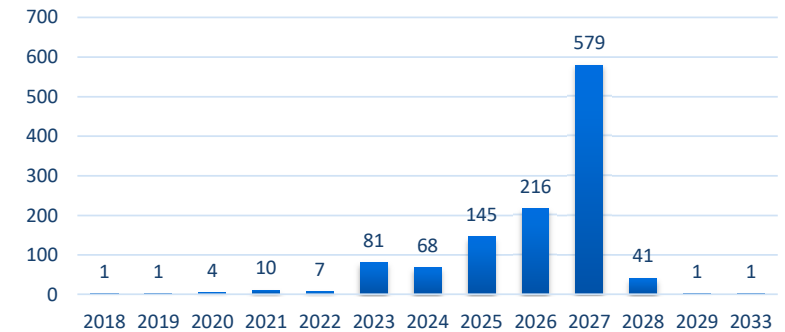
- Plants: 27
- Production: 230 mln sm³ methane

Source: EBA statistical report – 2021



The Italian biogas case: scenario and perspectives

- More than 1,600 biogas plants
 - Around 1,150 will reach the end of the subsidy period within 5 years
- Which possibilities?
 - Translation of EU Directive 2001/2018 on Renewable Energy (RED II) into national law (December 2021, D.Lgs. 199/2021)
 - Executive decrees
 - Biomethane: 15 september 2022
 - GOOD OPPORTUNITY FOR FARMS
 - CAPITAL CONTRIBUTION (40% on new buildings and conversions)
 - FIXED RATES FOR 15 YEARS
 - Electricity: Art. 5 & 6 of D.Lgs. 199/2021
First drafts released



The CMA – Consorzio Monviso Agroenergia



150
Ordinary members
350
Provider members



1.500
ancillary farms



1.100.000 t/y
livestock waste
16.700 t/y
by-products



840.000 t/y
vegetable biomass



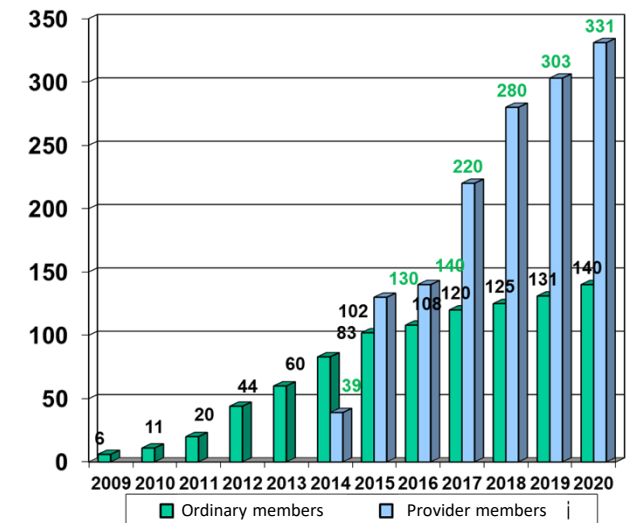
150 M€
income



72 MW_e installed
600_e kW average power
610.000 MWh_e produced

The CMA – Consorzio Monviso Agroenergia

- A constantly growing organization over the last 13 years
- Ordinary members: biogas plants
- Which services for the members?
 - Technical support
 - Periodical inspection of plants
 - Support the biogas plants owner in decision-making process
 - Administrative support
 - Follow-up of documentation, billing
 - Fulfillment of the requirements by different organisations
 - Regulatory support
 - Constant update about the evolution of the regulatory scenario of the sector and active participation in the debate at different level (dialogue with other biogas associations in Italy as well as in Europe)



The «vision» of CMA

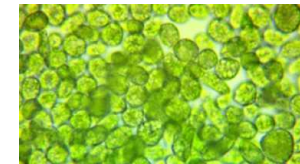
- Highlight the positive features of biogas plants and emphasize their strategic role:
 - Increase the competitiveness and virtuosity of farms
 - Treatment of manure and livestock waste (reduction of odours, emissions)
 - Production of digestate with appreciable fertilizing properties, allowing the reduction of mineral inputs
 - Guarantee incomes from the production of energy, allowing further investment for farm development (Agriculture 4.0)
 - Ensure the production of sustainable energy
 - Production from renewable sources, with important savings of CO₂ and other emissions
 - Versatility of the production: from biogas to biomethane & other
 - Possibility to operate in a variable set-up, following the requirements of the grid
 - Promotion of environmental and economic sustainability
 - Boost the carbon sequestration into the soil
 - Support «circular practices» all over the whole supply chain



Not only biogas plants: the Powerfood project



- Context: Rural Development Programme (2014-2020) – Regione Piemonte
- Target: Valorisation of thermal energy from biogas for the integrated production of food and feed proteins
- Strategy: Direct **integration at farm level** (within the site of biogas plant) of pilot tech units for the production of:
 - Insects
 - Microalgae



Partnership



Consorzio Monviso Agroenergia
(project leader)



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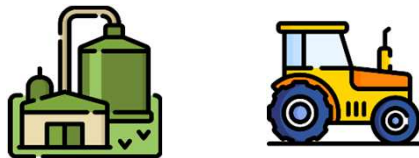
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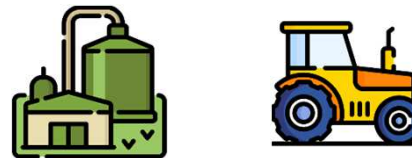
Department of Agricultural,
Forest and Food Sciences
University of Turin



Azienda Agricola La Gaia S.S.



Azienda Carrera S.S.



Società Agricola Maracujà



What we have already done

- Extensive literary review on insect farming and microalgae cultivation
 - Model species
 - Commercial technologies for production
 - Success stories from other producers
- Assess the perception from the audience about the «Powerfood» topics
 - Surveys to generic consumers, biogas plants owners, farms
- Evaluation of the best solutions for the purposes of Powerfood project
 - Individuation of model species and technological units
 - Farm inspections and individuation of the most appropriate sites
 - Research of tech providers, request of quotations and cost analysis



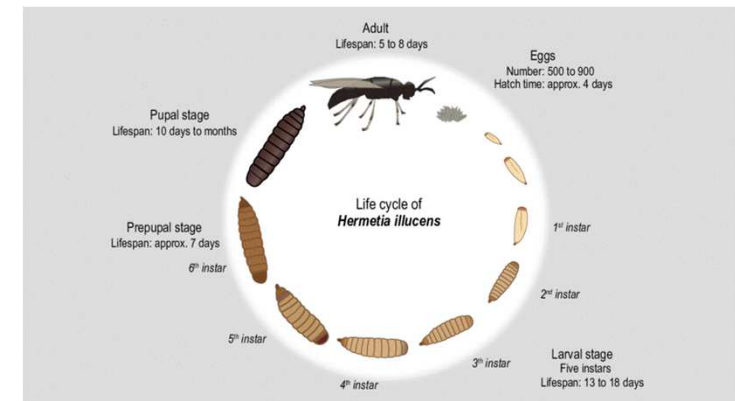
Microalgae cultivation facility

- Site:
 - Azienda Carrera S.S. – Granozzo con Monticello (NO, Italy)
- Model species:
 - *Arthrospira platensis* (Spirulina spp.)
- Technology chosen:
 - Raceway pond reactor installed in greenhouse
- Operativity:
 - Management of full life cycle over 9 months (Mar – Nov)
 - Exploitation of heat from biogas
 - Nutrition based on purified digestate from the biogas plant
- Status:
 - Permitting phase

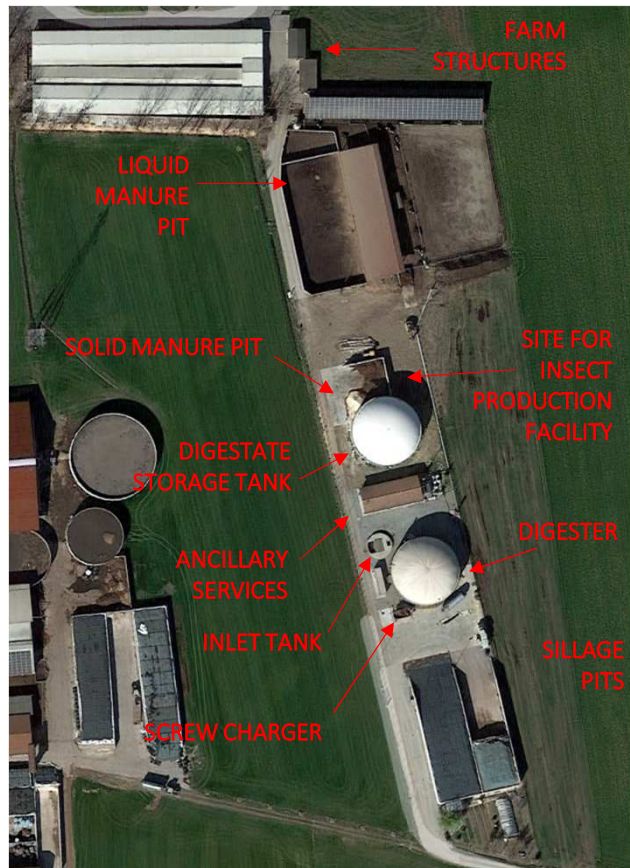


Insect production facility

- Site:
 - Società agricola Maracujà – Saluzzo (CN, Italy)
- Model species:
 - *Hermetia illucens* (black soldier fly)
- Technology chosen:
 - Bioclimatic chamber
- Operativity:
 - Management of larval stage over the whole year
 - Exploitation of heat from biogas
 - Nutrition based on feedstocks directly reliable at farm level
- Status:
 - Permitting phase



Insect production facility: the biogas plant site



Liquid manure pit



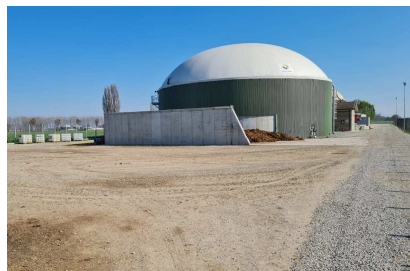
Screw charger and digester



Inlet tank and digester



Solid manure pit and digestate storage tank



Sillage pits



Ancillary services and digestates storage tank

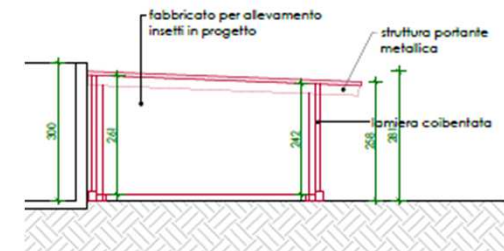
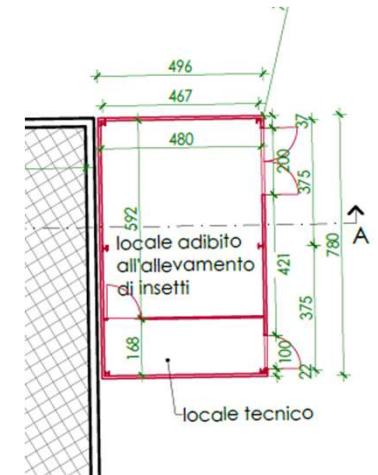
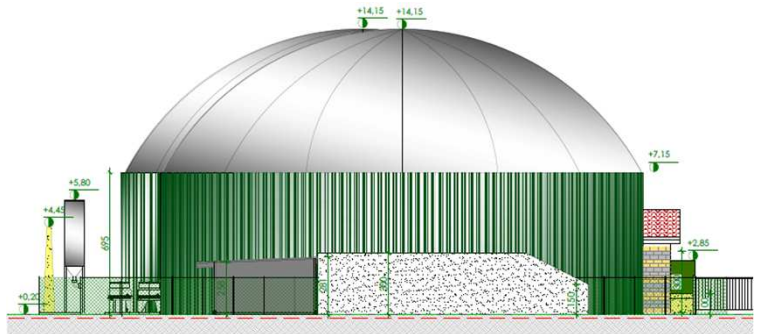
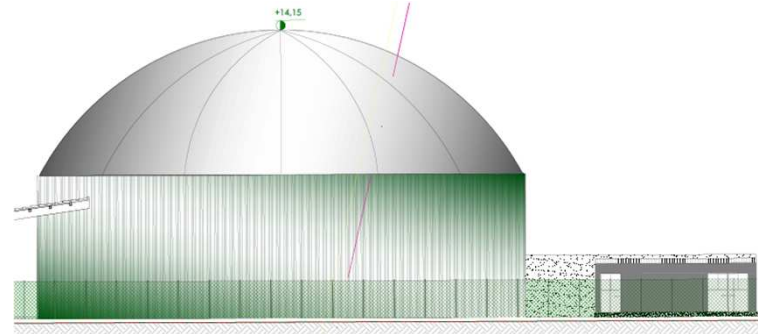


Insect production facility: the project

View of the site



Proposed layout



Next steps and outcomes

- Realization of the pilot plants by next summer
- Adoption of a multi-level approach:
 - Technical and scientific
 - Follow-up of the start-up phase
 - Assessment of the growth parameters to optimize the production and data elaboration
 - Provision of technical support to farm operators
 - Logistic
 - Training of the operators
 - Definition of the common procedures and practices adopted
 - Educational and communication
 - Preparation of informative material for biogas plants interested in acquisition of technology
 - Divuligation of the results through different media





Thank you for your attention!

www.monvisoenergia.it

www.power-food.eu

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