

An aerial photograph of a bioenergy facility. In the upper portion, there is a cluster of approximately 12 large, cylindrical metal silos arranged in two rows. To the right of the silos is a long, rectangular building with a corrugated metal roof. Further right, a blue and white semi-trailer is parked. The facility is surrounded by green grass and trees. In the foreground, a large field of green crops, likely corn, is visible, with dark lines indicating furrows or rows.

**Bioenergy, Biorefinery, and Green Chemistry:
Projects and activities for the exploitation of
biomass and sustainable carbon sources for
biofuels and biobased products**

ENEA

Integrated biorefinery projects



Rebiochem Project

Biochemicals from 2nd generation biomass (i.g. bio-butandiol; 5-HMF)

Project leader: Mater-Biotech



ALBE Project

Environmental sustainability assessment of polymeric materials from renewable sources

Project leader: ENI Versalis



COMETA Project

Autochthonous Mediterranean crops and their valorisation with advanced green chemistry technologies

Project leader: Novamont



BIT3G Project

Development of a biorefinery integrated into the local area to produce high-added value molecules (i.g. oils to convert into bioplastics, biolubricants, bioherbicides)

Project leader: Novamont



Bioethanol production



PRIT Project

"Pretrattamento italiano"

Large scale project, Industria 2015, Program Efficienza Energetica.

Project Partners: [Mossi&Ghisolfi Industries](#), [ENEA](#), [CNR](#)



BioLyfe Project

2° Generation Bioethanol: The world's largest demo plant ready to be transferred all over the world. 40.000 tons/y of lignocellulosic (EU Project No. FP7-239204)

Project leader: [Biochemtex](#)



Sugars' production from lignocellulosics



Collaborative research

Three-year collaboration agreement concern research and development activities with Canadian company in the field of biorefineries and 2G sugar production

Coordinator: Comet Biorefining Canada



Ambition Project

Advanced biofuel production with energy system integration. Horizon 2020

Project Partners: SINTEF; ENEA; LNEG; KIT; DTU; CENER; ASTON University; TNO



Syngas and Hydrogen production



POR H2

Framework agreement on the research and development of hydrogen as energy carrier for the green **breakthrough** and ecological transition

Next generation EU: National Recovery and Resilience Plan



GICO

Gasification **combined** with CO2 capture and conversion. The proof of concept of an advanced sorption enhanced gasification (SEG) process for high efficiency high purity H2 stream production along with a high concentrated CO2 stream from residual biomass will be demonstrated through material and process development

Project partners: UNIMARCONI, ENEA, TECNALIA, ICICALDAIE, TUE, CSIC, MARRION TECHNOLOGIES SA, UNIVAQ, JULICH, IRIS SpA, CALIDA CLEANTECH



RECOVERY PROJECT

Energy valorization of residual materials coming from the agro-food industry through syngas from gasification for self-production and self-consumption of electricity

Project partners: CMD spa, ENEA-Trisaia, Giaguaro



Syngas and Hydrogen production



WWGF - Wet Waste to Green Fuel Project

Supercritical Water Gasification of organic wastes for biometane production - GNL

Project partners: DiTNE, ENEA, CNR, UniCal, UniBA, PoliTO, Calabria Maceri, Techfem, SOL



BLAZE

Biomass Low cost Advanced Zero Emission small-to-medium scale combined heat and power plant, through integration of gasification and fuel cell technologies

Project partners: UniMarconi, ENEA, UnivaQ, UNITE, SOLID POWER, HIGEAR, EPFL, WALTERTOSTO, ENERECO SPA, EUBIA, ETA



HYTRACTOR Project

Fuel cell farm tractor powered by hydrogen - New Technologies for Made in Italy, Industria 2015

Project leader: CNH



BRISK1 and BRISK2 Projects

Biofuels Research Infrastructure for Sharing Knowledge 7FP and Horizon 2020

Project leader: KTH



Bio-oils production



JCA ENI-ENEA

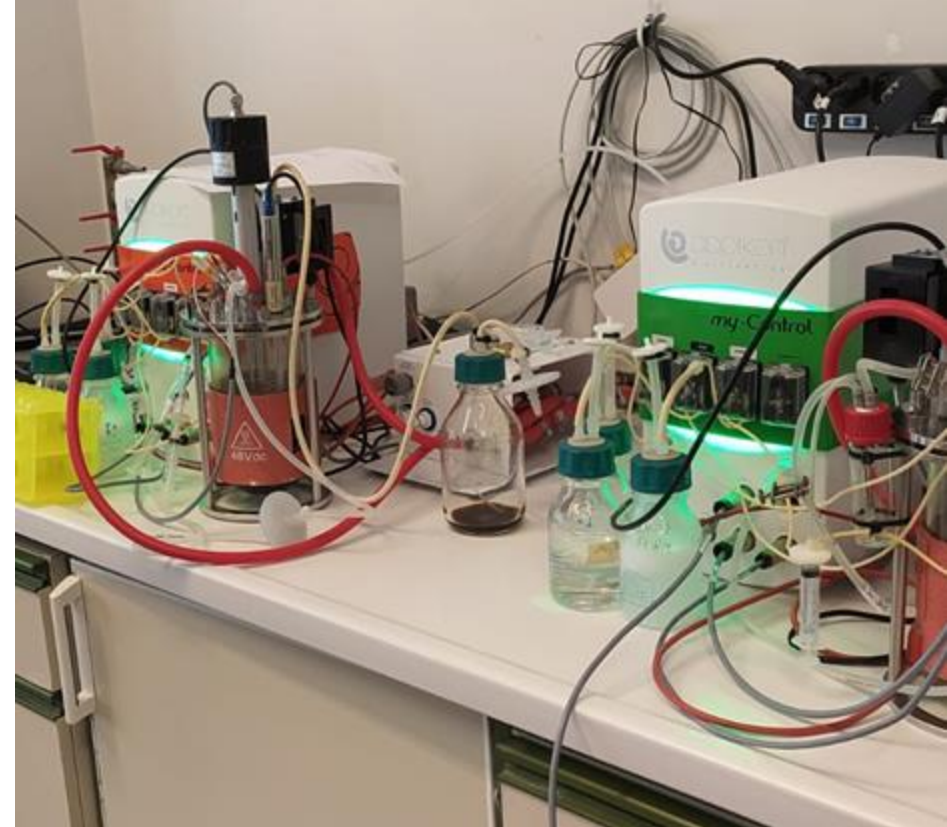
Development of processes for the production of microbial oils, biogas/biomethane, intermediates for advanced biofuels and biochar by exploiting waste and lignocellulosic biomass



PIBE

Research infrastructures for the production of energy and bioproducts from renewable sources contributing to the transition towards a decarbonized economy

Project partners: [ENEA-Basilicata Region](#)



Bio-char valorisation



PNRR - AGRITECH

Study of the effect of pyrolysis parameters on the biochar efficacy as soil amendment (study of the effects on plants and rhizosphere microbial communities)



NEST

Network for Energy Sustainable Technologies
(Green Energies for the Future)

Evaluation of the effects of biochar amendments on dark fermentation process performances and microbial community; Biochar boosts *in-situ* bio-methanation process for biological biogas upgrading.



Bio-char valorisation



REVINE

Regenerative agricultural approaches to improve ecosystem services in Mediterranean vineyards

Converting pruning waste biomass into biochar to improve carbon storage, vineyard performance and sustainability, in a circular economy perspective.

Studying the effect of biochar treatments on vine-associated microbial communities.

Partners: [Mediterranean institutions and private companies](#)



JCA ENI-ENEA

Development of processes for the production of microbial oils, biogas/biomethane, intermediates for advanced biofuels and biochar by exploiting waste and lignocellulosic biomass



Separation of rare-earth elements with synergistic mixtures of extractants



TREIBACHER

Novel rare earths extraction process by supercritical CO₂ and TBP-HNO₃ complex





ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES,
ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT

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