ENERGETICS

ENEA - Upscaling e ottimizzazione tecno-economica di tecnologie di upgrading e metanazione del biogas

Funded By	ENEA - Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile [P.iva/CF:00985801000]

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Context of the research activity	Biomethane and biogas are expected to play a key contribution for the development of a renewable-based energy system. The production of decentralized carbon-neutral renewable fuels represents a means to reducing the today's dependency from traditional fossil gas (natural gas) thus reducing the associated GHG emissions. The production of biomethane can be integrated with other renewable energy sources (e.g., solar and wind power generation) to produce a sustainable biofuel starting from biogenic captured CO_2 and green H_2. La borsa è finanziata dall'ENEA (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile) sulla commessa G0N1 relativa al Progetto BIOMETHAVERSE: Demonstrating and Connecting Production Innovations in the BIOMETHAne uniVERSE, finanziato dall'Unione Europea, Programma di ricerca Horizon Europe, call topic: HORIZON-CL5-2021-D3-03-16 - Innovative biomethane production as an energy carrier and a fuel, finanziato con accordo di sovvenzione: 101084200.

Objectives	Biomethane can be produced through several routes. The objective of this research is to investigate innovative biomethane production processes, such as thermochemical or biological biogas upgrading, electricity enhanced production and direct hydrogen integration in anerobic digestors. Detailed process models of the possible different reactors and energy-integrated plant configurations will be developed and validated with the support of experimental and/or literature data. The work will then focus on the identification of the optimal possible process configurations through a detailed process simulation activity integrated with economic analysis. The aim is of minimizing the energy and economical costs and maximizing the reduction in GHG emissions of the most promising plant configurations.

Skills and	The ideal candidate for this position has a scientific background in physics, engineering, mathematics, statistics, and software development. The development of the research activity requires a candidate with: • Solid background in statistical methods and simulation techniques

competencies for the development of the activity	• Solid background in mathematical and physical modelling • Background on energy systems • Background in computational methods • Ability to analyze the scientific literature state of the art • Scientific writing and reporting • Proactive, independent, and parallel thinking • Ability to work in a multi-disciplinary team