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Research areas: Sorption-Enhanced Processes (SEG / SE-SMR); CO_2 capture, utilisation and storage (CCUS); catalysis for CO_2 valorisation and dry reforming; CO_2 mineralisation on industrial waste; plasma-assisted e-fuels.
Research keywords: sorption-enhanced gasification; calcium looping; CO_2 capture; hydrogen; CCUS; heterogeneous catalysis.

Umberto Pasqual Laverdura, PhD, is a Junior Researcher at the Energy Technologies and Renewable Sources Department of ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development. His main research fields are the R&D of Sorption-Enhanced Processes (SEP), with a focus on Sorption-Enhanced Gasification, catalysis for CO_2 valorisation and dry reforming, accelerated CO_2 mineralisation on industrial waste, the integration of CCUS systems in hard-to-abate industries, and the exploitation of chemical plasma for e-fuels production.
He works in several European and national projects, such as “Gasification Integrated with CO_2 capture and storage – GICO” (WP2–5), the Marie-Curie RISE project “Chemistry of Platinum Group Metals – CHemPGM”, and the PNRR project “ECCSELLENT – Development of ECCSEL-R.I. Italian facilities: user access, services and long-term sustainability”. Within the National Project PTR 2025–2027 “Energy efficiency of industrial products and processes” he leads activities in WP3 “Development of CCS technologies for the efficiency of the hard-to-abate industry and the achievement of Net-Zero objectives”.
He is the ENEA representative in the Joint Programme on CCS of the European Energy Research Alliance (EERA) and the Italian representative in IEA-IETS Subtasks 24 and 25. He co-supervises PhD students and is the author of more than 20 papers in international journals and conference proceedings.