

# **E2DT - 1<sup>st</sup> International Conference on Energy, Environment & Digital Transition**

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### **Topic III - HYDROGEN ENERGY: PRODUCTION & STORAGE**

#### **Process Technologies for Energy Transition: Production, Storage and Transport of Hydrogen**

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The “European Green Deal” introduced extraordinary objectives for the decarbonization of the European Union, with a target of net-zero emissions by 2050 and a midway 55% reduction in 2030, compared to 1990 level. To this end the European energy transition and decarbonization strategy needs to mobilize a wide range of solutions in a technology-neutral approach to affordably secure the energy supply.

The use of hydrogen, particularly coming from renewable source, will play a key role in the EU Green Deal: Hydrogen can be used as a fuel, an energy carrier, or a feedstock, and could reduce emissions in hard-to-abate sectors, particularly in industry and transport.

The renewable and low-carbon hydrogen is the useful and clean energy vector mainly considered for the energy supply chain as feedstock for synthetic fuels, and industrial processes (high temperature heating). Renewable hydrogen (green hydrogen) is produced from biomass or via electrolysis, powered by electricity from renewable sources, while low-carbon hydrogen (blue hydrogen) is based on fossil fuels with low-emissions technologies like in the natural gas reformers integrated with carbon capture and sequestration facilities, CCS.

Blue hydrogen is a flexible process already available for large-scale production, that can provide a base load supply to the nascent hydrogen market. At the same time, EU Member States should also start developing green hydrogen production, in accordance with the relevant EU regulation on additionality, in order to increase the available volumes of decarbonized hydrogen and trigger those cost reductions that are crucial to make green hydrogen competitive with other energy products.

In Eni we believe that decarbonized hydrogen production technologies are complementary and not competing, and there is room for innovative approaches and advanced development in hydrogen production, storage, and transport. The evolution of conversion technologies, such as electrolysis and fuel cells, as well as the emerging materials application to production and storage show great potentials in reducing the costs of hydrogen-based clean energy solutions.

Eni, with more than 300 kton/a of hydrogen production capacity, is one of the largest producers and consumers in Italy. To date, hydrogen has been used mainly as a feedstock in traditional refining processes, as well as for producing hydrotreated vegetable oil biofuels in our biorefineries.

As part of Eni strategy, the hydrogen sector has been identified as a great transformation opportunity, and it is under evaluation the feasibility and potential of projects involving green and blue hydrogen production, as well as the use of blue and green vectors (e.g. ammonia) for the transport of hydrogen with the aim of having a tangible possibility to decarbonize hard-to-abate production processes.

As far as blue hydrogen is concerned, the mandatory enabler for large capacity production is CCS which is a feasible and safe solution for decarbonization as it is based on consolidated technologies. As an energy company with an excellent upstream legacy, Eni has the know-how, the capabilities, and the assets (in terms of depleted reservoirs and relevant infrastructures to be reused) to become an important player in this new-born business which will offer CO<sub>2</sub> transport and storage services to third parties as a cost-effective way to decarbonize their activities.