

# Conclusion

*“Green hydrogen is key to decarbonizing the economy”*  
United Nations Industrial Development Organization (UNIDO)<sup>69</sup>



The continued growth of the world's population and the ongoing industrialization to raise the living standards of citizens in the global economy will continue to put upward pressure on energy demand in the coming years. To mitigate this effect and make progress in both efficiency and decarbonization, it will be necessary to increase production and consumption, innovation and implementation of new forms of energy, with the associated climate and environmental impacts.

The use of renewable energies can contribute to the decarbonization of the economy. However, it also entails environmental impacts and challenges in terms of accumulation and storage of the electricity produced.

In this context, green hydrogen is emerging as a key player in the transition towards a sustainable and emission-free economy. It is positioning itself as a structural solution to the variability of renewable energy production and the decarbonization of some sectors with difficult electrification, as well as an essential component of other applications to reduce greenhouse gas emissions.

In order to meet the NZE scenario, 850 GW of electrolyser capacity would need to be installed by 2030, which is double the projected capacity based on currently announced projects (420 GW). This shows that there is still a long way to go to make this energy vector a key player in the energy transition.

Furthermore, the recent discovery of natural deposits of white hydrogen around the world<sup>70</sup> has raised the possibility that white hydrogen may also be an important energy source. The coexistence of green and white hydrogen represents a promising approach to meeting the challenges of the energy transition. These two types of hydrogen can provide a more diversified and efficient route to a sustainable energy future.

Today's vision of an economy based on renewable hydrogen is faced with major challenges, requiring strategic and collaborative responses to technical and economic difficulties in production, transport, consumption and regulation.

In view of the need to reduce production costs, investment in research and development is crucial, as it would make it possible to overcome the economic and technological barriers that currently prevent large-scale production of renewable hydrogen.

At the same time, it is necessary to create a sustainable and diversified demand for renewable hydrogen by promoting its use in sectors such as industry, transport and power generation.

Infrastructure is proving to be a critical element on the road to the hydrogen economy. Adapting and modernizing existing facilities, as well as planning new infrastructure, plays a key role. Strategic location and interconnection efficiency are decisive.

On the other hand, establishing a legal and regulatory framework is essential to facilitate hydrogen production and distribution. Certification and quality standards, publication of national hydrogen strategies with specific installed capacity targets, support for investment and innovation in sustainable technologies, regulation of hydrogen use in the gas grid, and adaptation of hydrogen as a transportation fuel are key measures to ensure sustainability and transparency throughout the supply chain.

Finally, practical tools and applications that can support decision making, such as the selection of optimal locations, facilitate the adoption of new business processes, as companies adapt to this new economy.

In summary, green or renewable hydrogen is emerging as an essential pillar in the transition to a sustainable economy, but only through collaborative efforts, investment in technology and regulatory support will it be possible to overcome current challenges and unlock its full potential as a transformational energy carrier.

<sup>69</sup>2022. UNIDO is a specialised United Nations agency whose mandate is the promotion, stimulation and acceleration of industrial development.

<sup>70</sup>World's largest white hydrogen deposit found in France" – World Economic Forum (sep. 2023).