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# INSIGHTS REPORT

## UNLOCKING OPPORTUNITIES GCC'S RISING FOCUS ON RENEWABLE ENERGY & GREEN HYDROGEN



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# Introduction

The energy industry is undergoing a major transformation driven by three key mega trends: Decentralization, Decarbonization and Digitalization.

Amongst these three mega trends, decarbonization has attracted significant investment and has been a key modality for climate change mitigation efforts undertaken by governments across the world. Decarbonization refers to the process of reducing or eliminating carbon dioxide emissions and other greenhouse gases released into the atmosphere because of human activities, such as the burning of fossil fuels. The goal of decarbonization is to mitigate climate change by reducing the concentration of greenhouse gases in the atmosphere. This can be achieved through different pathways/ modalities, the most prominent ones being energy transition, energy efficiency and negative emissions.

Global clean energy spending has been ramping up and these investments have been increasing from an estimated USD 1.0 trillion in 2017 to an estimated USD 2.0 trillion in 2024<sup>1</sup> driven strongly by investments in renewable energy, energy efficiency and other segments such as grids and energy storage, nuclear energy, electric vehicles, low carbon fuels and CCUS (carbon capture, utilization & storage). Aligning with global trends, GCC countries have also outlined ambitious energy transition plans, with investments predominantly centered around renewable energy and green hydrogen projects.



1 <https://www.iea.org/reports/world-energy-investment-2024/overview-and-key-findings>



## GCC's commitment to Green Energy/ Renewable Energy

The Gulf Cooperation Council (GCC) countries have made various commitments under their Nationally Determined Contributions (NDCs) as part of the Paris Agreement. Countries such as UAE, Oman and Saudi Arabia are currently leading developments in the clean energy space. While UAE and KSA aim to achieve net zero emissions by 2050 and 2060 respectively, Oman seeks to attain carbon neutrality by 2060. Besides these three GCC countries, Qatar, Kuwait and Bahrain have plans to reduce emissions by 25%, 7.4% and 30%, respectively. Investments in renewable energy and green hydrogen production are expected to be the cornerstone of GCC countries' decarbonization efforts. Other modalities such as CCUS, energy efficient power generation, reduced flaring, demand side energy management etc. are expected to play a significant role in GCC countries achieving their NDCs.

**Focus on Renewable Energy** – Moving forward, Saudi Arabia and the UAE will lead the region in renewable energy capacity expansion. While Saudi Arabia plans to have 50% of its installed energy capacity from renewables by 2030, the UAE seeks to achieve 30% clean energy (including nuclear) equivalent to 14.2GW by 2031. Likewise, Oman, Qatar, Kuwait and Bahrain have relatively smaller plans for renewable capacity addition, targeting 30%, 18%, 15% and 20% renewable based electricity, respectively between 2030 and 2035. Proposed developments in renewable energy capacity not only focus on meeting growing demand for sustainable electricity across the respective countries; but also seek to leverage competitive renewable electricity prices (which are currently amongst the lowest globally) for meeting regional electricity requirements through interconnection networks. For example, KSA plans to export renewable electricity to other Middle Eastern economies such as Egypt, Jordan, Iraq etc.



**Focus on Green Hydrogen** – In the Middle East, hydrogen production is expected to increase to an estimated 19 million tons per annum by 2025, further expanding to an estimated 80 million tons by 2050.<sup>2</sup> Of the additional production capabilities, a significant portion of the investment is expected for the production of green and blue hydrogen, where GCC economies like Saudi Arabia, UAE and Oman have taken a lead. The GCC and wider Middle East region demonstrate strong renewable energy potential. Suitable sites across the region (especially along the coast) demonstrate strong complimentary solar and wind power capabilities which can be leveraged for extended renewable electricity availability resulting in an increased scale and efficacy of hydrogen production ultimately enhancing the competitiveness of green hydrogen production in the region.

Oman has set ambitious targets for renewable hydrogen production. The country envisages producing anywhere between 1.0 to 1.25 million tons of green hydrogen by 2030, further increasing up to 3.25 to 3.75 million tons by 2040 and up to 7.5 to 8.5 million tons by 2050.<sup>3</sup> UAE plans to develop at least two hydrogen production hubs called “Oasis” by 2031. The country is targeting to produce 1.4 million tons of hydrogen annually by 2031 and expects to increase production tenfold to 15 million tons by 2050.<sup>4</sup> Of the total 1.4 million tons of hydrogen that the UAE plans to produce by 2031, 1 million tons will be green hydrogen produced by Masdar, a clean energy firm in the UAE. KSA on the other hand is targeting clean hydrogen (blue and green) production of 2.9 million tons per year by 2030 and 4 million tons per year by 2035. The country is currently focused on gaining a significant market share in blue hydrogen and is also targeting a global play in green hydrogen through the 600 tonnes per day NEOM green hydrogen project which is expected to be commissioned 2026.

Although the renewable energy and green hydrogen ambitions of GCC countries create opportunities for regional and global project developers and EPC contractors, the advantages of these projects extend beyond just these stakeholders. Ongoing and proposed developments in these fields will provide opportunities for stakeholders across the value chain, who provide relevant products, solutions and services

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2 <https://hydrogencouncil.com/wp-content/uploads/2022/10/Global-Hydrogen-Flows.pdf>

3 <https://iea.blob.core.windows.net/assets/338820b9-702a-48bd-b732-b0a43cda641b/RenewableHydrogenfromOman.pdf>

4 [reuters.com/world/middle-east/uaes-revised-energy-strategy-includes-big-hydrogen-plans-2023-07-11/](https://reuters.com/world/middle-east/uaes-revised-energy-strategy-includes-big-hydrogen-plans-2023-07-11/)

# Opportunities Emerging from Renewable Energy and Green Hydrogen Development

**Localization and Local Content Development** – Countries across the GCC, particularly KSA and the UAE have put in place mandates for local procurement of products and services (where available) across renewable energy projects. As leading GCC economies continue their economic diversification efforts, local manufacturing of products and components for renewable energy and green hydrogen projects is expected to accelerate. Key components in focus include polysilicon, ingots, modules and cells, PV panels, and electrolyzers, amongst others. Local manufacturing of products and solutions is expected to have a significant socio-economic impact on the regional economies, with countries that demonstrate a robust localization framework also standing a chance to complement global supply chains.

The development of a local market for renewable energy projects and a local value chain for technology, products and services are closely interlinked. As demand gathers pace and a sizeable market for technology is created regionally, benefits would be realized for manufacturers and value chain participants. The strategic location of the GCC countries relative to demand centers in Asia, Africa and Europe, along with well-established seaports and airports, as well as low energy prices that reduce production costs, are key factors that will encourage technology and component manufacturers to set up manufacturing facilities in the region.

**Energy Storage** – Renewable energy and its inherent intermittent nature pose a challenge while integrating large quantities of renewables with the utility grid/ energy streams. Storage technologies are critical for the integration of large-scale renewable electricity in the grid. Battery energy storage systems (BESS) are particularly expected to witness significant investments owing to their applicability across different segments of the electricity value chain also strongly supported by an uptick in electric mobility solutions.



**Grid Modernization/ Digitalization** – Grid digitalization will be a key enabler in addressing the challenges faced by utilities in the current stage of industry transformation. Successful implementation of digital solutions will be imperative for integration of renewables, energy storage, and distributed energy resources (DERs). Digital/ smart grids will be critical for grid stability & flexibility while enabling improved electricity access, transport electrification and optimized performance. Electricity grid digitalization is based on three fundamental aspects:



**Industry Convergence** – The region has been garnering interest towards the integration of renewable energy in water desalination. This convergence is characterized by the collaboration between the renewable energy sector and the water desalination industry, driven by the pressing need for sustainable solutions in the face of water scarcity. For instance, KSA already has several renewable energy powered desalination plants including the Al-Khafji desalination plant and plants at Yanbu and Jubail that are under development.

**Skills Development** – Local talent development/ capacity building has become a critical aspect of ongoing economic diversification efforts in the region. Addressing the skill gaps in the renewable energy sector is crucial for the region's clean energy transition. This would involve investing in education and training programs, attracting international talent, and fostering partnerships between industry and academia. Developing education programs focused on renewable energy can cultivate expertise and support industry growth through skilled workforce development.



## CONCLUSION

The rise of renewable energy and green hydrogen in the GCC signifies a strategic transformation towards a more sustainable, diversified, and competitive energy landscape. This shift is not only about reducing carbon emissions but also about positioning the region as a global leader in the energy sector. As the GCC countries continue to invest heavily in renewable energy and green hydrogen projects, they are set to become pivotal players in the global energy market.

The ongoing investments in clean energy projects will have far-reaching impacts on the region. Economically, these projects will contribute significantly to the GDP by increasing the manufacturing value add. This, in turn, will stimulate local industries and create numerous job opportunities, fostering economic growth and stability.

Moreover, the focus on renewable energy and green hydrogen will drive digitalization across various sectors. The integration of advanced technologies in energy projects will enhance efficiency, reduce costs, and foster innovation. This digital transformation will also necessitate the development of new skills, leading to extensive skills development programs and educational initiative. In summary, the GCC's commitment to renewable energy and green hydrogen is a multifaceted strategy that promises to deliver economic, technological, and social benefits, positioning the region as a key player in the global transition to sustainable energy.

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