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UAE Green Hydrogen Market Assessment, By Technology [Proton Exchange Membrane Electrolyzer, Alkaline Electrolyzer, Solid Oxide Electrolyzer, Polymer Electrolyte Membrane Electrolyzer], By Renewable Source [Solar, Wind, Hydropower, and Others], By Transportation Channel [Roadways, Waterways, Pipelines], By End-user [Power Generation, Transportation, Chemicals & Petrochemicals, Steel, Food & Beverages, Medical, and Others], and By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

UAE is expected to produce 1.4 million tons of green hydrogen by 2030 and 15 million tons by 2050. The energy demand is crucial for fostering economic and social progress, supporting various sectors like industries, transportation, and everyday needs. However, this growing demand poses environmental concerns, resulting in greenhouse gas emissions and impacting climate change. In response to these challenges, green hydrogen is emerging as a promising and viable option for clean energy solutions, as it offers a sustainable alternative that mitigates greenhouse gas emissions and fosters a more environmentally friendly future.

The UAE is diversifying its energy sources and focusing on green hydrogen as a promising solution for growing energy needs. Utilizing renewables, green hydrogen offers a clean option for industries and transportation, combating greenhouse gas emissions and aligning with global sustainability goals.

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In its pursuit of carbon neutrality, UAE is heavily investing in green hydrogen projects, supporting regional clean hydrogen hubs, and strengthening its Green Hydrogen market. As the country moves forward, Green Hydrogen becomes a preferred option for clean energy integration, adopted by businesses and individuals to reduce carbon emissions and attain energy self-sufficiency.

Climate Commitments Accelerate UAE's Green Hydrogen Market

Aligned with the UNFCCC's Paris Agreement, the UAE has set emission targets to constrain global warming to below 2 degrees Celsius, with a preference for the more ambitious 1.5 degrees Celsius goal. Pioneering the region, the UAE's Net Zero by 2050 initiative stands as a national endeavor to achieve carbon neutrality by 2050, marking the first achievement of its kind within the Middle East and North Africa (MENA) region.

The country is making significant strides with around 28 hydrogen projects in progress, including both green and blue hydrogen initiatives. By utilizing hydrogen in various sectors like heavy industry, road transport, aviation, and sea freight, the UAE plans to achieve a 25% reduction in emissions by 2031. UAE formed the Abu Dhabi Hydrogen Alliance in January 2021, comprising Mubadala Investment Company, ADQ, ADNOC, and the Ministry of Energy. At the Mohammed bin Rashid (MBR) solar park, a pilot project aims to generate approximately 20.5 kg/h of hydrogen with a peak power capacity of 1.25MWe. The UAE government has restated its commitment to become one of the world's leading clean hydrogen producers, aiming for a 25% share of the global trade market.

UAE Emerging as a Leading Global Hydrogen Supplier

The UAE strategically positions itself as a significant global hydrogen supplier, capitalizing on its abundant hydrocarbon resources and established industrial capabilities. With a focus on carbon capture and storage, the country aims to diversify its exports away from crude oil and meet the increasing demand for hydrogen from environmentally conscious energy-import-dependent economies across the globe.

For instance, Abu Dhabi, the UAE's capital city, is actively producing hydrogen for ammonia and industrial applications, primarily using grey hydrogen. ADNOC's ambitious plan to increase carbon capture capacity from 0.8 million tons to 5 million tons by 2030, ramping up its production from 300 kt per year of hydrogen for industrial use in its downstream facilities to 500 kt annually of Hydrogen production. Thus, realizing its

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goals to establish the UAE as a major producer of the Green Hydrogen Market. This move enhances the UAE's green hydrogen market and supports its transition to a more sustainable energy landscape.

UAE Government Prioritizes Green Hydrogen in Energy Plans

“The UAE's Vision for Green Hydrogen: A Path to Sustainable Energy and Global Leadership.' The UAE is steadfast in its commitment to a cleaner energy future, significantly emphasizing advancing green hydrogen. The government's proactive support, characterized by policy frameworks, incentives, and funding, propels the adoption and growth of green hydrogen as a sustainable energy solution while reducing reliance on fossil fuels and enhancing energy security.

In 2021, the United Arab Emirates introduced its Hydrogen Leadership Roadmap, a strategic blueprint to nurture low-carbon industries in alignment with the nation's net-zero 2050 aspiration. Expanding on this vision in August 2023, UAE unveiled a comprehensive hydrogen strategy, targeting the annual production of 1.4 million tons of green hydrogen by 2031, further escalating to a remarkable 15 million tons by 2050. This ambitious initiative is poised to significantly elevate the UAE's green hydrogen market presence, solidifying its role as a prominent player in the global hydrogen landscape.

UAE Spearheads Green Hydrogen Potential, Forges Global Collaborations

The United Arab Emirates (UAE) is taking a pioneering stance in harnessing the vast potential of Green Hydrogen, strategically capitalizing on the diminishing costs of renewable energy sources to drive a robust, cost-effective, and efficient energy solution. Furthermore, leveraging its established capabilities in oil exports, the UAE is orchestrating a deliberate shift towards green hydrogen initiatives, fostering strong partnerships with renowned international entities such as BP, ADNOC, and Masdar. Together, they are actively driving forward hydrogen-centric projects, including endeavors in Teesside, UK.

ADNOC's substantial 25% stake in BP's H2Teesside blue hydrogen project is a significant testament to the UAE's commitment. Equipped with two formidable 500MW hydrogen production units, this initiative will initiate operations in 2027, marking a pivotal advancement in sustainable energy pursuits.

ADNOC and Fertiglobe announced plans for a 1 million tons per annum 'blue' ammonia

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production facility in Abu Dhabi's TA'ZIZ industrial hub. The facility will be in TA'ZIZ Industrial Chemicals Zone in the industrial hub of Ruwais and is slated for a startup in 2025. This ambitious venture demonstrates the UAE's commitment to a diverse green hydrogen ecosystem. ADNOC sold its inaugural blue ammonia cargoes to three Japanese clients, showcasing the rapid growth of the UAE's green hydrogen enterprise.

Infrastructural Expansion Propels UAE's Green Hydrogen Market

The UAE, a wealthy nation, is investing heavily in green hydrogen production and infrastructure. Prioritizing storage, transportation, and refueling facilities, the UAE is expanding its green hydrogen market. Utilizing petrochemical expertise, the country integrates hydrogen into power and transportation sectors, aiming to accelerate the widespread adoption of green hydrogen technologies. This includes hydrogen-powered urban transportation systems and efficient clean energy storage solutions.

The UAE's ambitious hydrogen-focused agenda encompasses the establishment of two dedicated production hubs aptly named 'Oasis,' which will serve as focal points for hydrogen generation. Additionally, a pioneering green H2 research and development center is being set up to spearhead innovation in this domain. These strategic endeavors collectively position the UAE as a significant hydrogen producer within the Middle East, effectively catering to the escalating global energy demands. Moreover, this concerted effort is pivotal in transitioning the nation into a sustainable, hydrogen-powered economy.

Impact of COVID-19

The COVID-19 pandemic profoundly impacted the energy sector of the United Arab Emirates (UAE), leading to disruptions and decreased demand for transportation fuels and industrial activities. This situation underscored the need for increased resilience and the reduction of carbon emissions. As a response, both the UAE government and private sector made significant investments in the development of green hydrogen projects, associated infrastructure, and research initiatives. During this crisis, the UAE implemented economic stimulus packages to support businesses facing challenges. Despite temporary setbacks, the country remained steadfast in its commitment to diversifying energy sources. This commitment was demonstrated through a strong focus on renewable energy projects, aimed at ensuring long-term energy security and sustainability.

Impact of Russia-Ukraine War

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The ongoing conflict between Russia and Ukraine has heightened the UAE's focus on energy security and the need for diversifying its energy sources. The UAE is actively exploring hydrogen as a promising alternative in response to these challenges. With its abundant renewable energy resources, such as solar and wind, the country is positioning itself to become a significant exporter of green hydrogen. This strategic move enhances the UAE's energy security and aligns with its commitment to sustainable and low-carbon energy solutions.

UAE pioneers MENA's green hydrogen market with its Mohammed bin Rashid al-Maktoum solar-powered project and intends to invest 163 billion USD in renewable energy over three decades, to be a major green fuel exporter, demonstrating its commitment to sustainability.

Key Players Landscape and Outlook

Prominent players in the UAE's green hydrogen sector are actively immersed in research and development (R&D) endeavors to advance technologies, trim production costs, and augment overall efficiency. These influential entities allocate substantial investments toward expansive projects and forge strategic alliances, propelling the growth of the green hydrogen market and fostering the establishment of green hydrogen infrastructure domestically and globally.

For instance, in April 2023, Al Fattan Energy of the UAE, and South Korea's LTechUVC joined forces to establish ALFATTAN LtechUVC Green Energy. This collaborative venture is geared towards creating a 200 MW green hydrogen and ammonia facility, backed by a substantial investment of USD 400 million. Located in KEZAD, a prominent industrial zone in Abu Dhabi, this partnership bolsters the UAE's green hydrogen market presence and solidifies its standing within the sustainable energy sector.

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