

UAE Clean Energy Market Assessment, By Type [Hydropower and Tidal Power, Wind Power, Solar Power, Biomass and Waste, Nuclear Power, Green Hydrogen], By End-use [Residential, Commercial, Industrial, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

The increasing demand for energy has raised concerns about its environmental impact, particularly in terms of greenhouse gas emissions and climate change. Clean energy refers to energy derived from renewable and low-carbon sources that have minimal environmental impact. Clean energy sources include solar, wind, hydro, geothermal, and biomass, Nuclear and Hydrogen and energy generated using fuel cell technology with each offering unique advantages.

The UAE Clean Energy Market volume size was estimated to be 8.5 GW 2022, and it is projected to reach 16.96 GW by 2030, with a Compound Annual Growth Rate (CAGR) of 9.02% during the forecast period from 2023 to 2030. The increasing adoption of clean energy has been fueled by various factors, including cost reductions, technological advancements, supportive policies, and a growing awareness among the public. Governments, businesses, and individuals are all embracing clean energy solutions to lower carbon emissions, enhance air quality, and achieve energy independence.

Despite possessing the world's seventh-largest proven oil and natural gas reserves, the UAE is taking proactive measures to diversify its energy mix and economy. In 2021, the country consumed 66 Mtoe of energy, and for the year 2022, clean energy accounted for 19.63% of the energy mix. Within this, renewable energy contributed 12%, while nuclear energy made up 7.55% of the overall energy consumption. These efforts reflect



the UAE's commitment to incorporating cleaner energy sources into its energy landscape.

Clean Energy Sources Offer Ways to Mitigate Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement share the common objective of limiting global warming to below 2 degrees Celsius above pre-industrial levels, with efforts to further restrict the temperature increase to 1.5 degrees Celsius. In accordance with the Paris Agreement, the UAE government has established its own emissions reduction targets and became the first Middle Eastern country to announce a net-zero goal. In 2021, the Ministry of Energy and Infrastructure renewed their national target, aiming for a 70% reduction in CO2 emissions by 2050.

The UAE's Energy Strategy 2050 outlines specific targets for the energy mix, including 44% from Clean Energy, 38% from Gas, 12% from Clean Coal, and 6% from Nuclear sources. Dubai, in particular, has set its own objectives, striving to generate 25% of its power output from clean energy by 2030 and aiming for 75% by 2050. These efforts demonstrate the UAE's commitment to align with international climate goals and foster the adoption of cleaner energy sources.

Moreover, as part of the UAE's Net Zero by 2050 initiative, Abu Dhabi is planning several renewable energy projects. These include the 5.6 GW Barakah nuclear energy plant and the 2 GW Al Dhafra Solar PV project. Together, these projects will contribute to a clean power generation capacity of 8.8 GW by 2025. This initiative aims to increase the share of clean energy in Abu Dhabi's electricity mix to 55% by 2025, resulting in a significant reduction in power generation emissions. Specifically, it is expected to reduce CO2 emissions from 40 million tons in 2020 to approximately 20 million tons in 2025.

Expansion of Clean Energy Sectors Like Solar Energy and Wind Energy

The promising developments of increased investment in large-scale renewables and rooftop solar provide a solid foundation for UAE in efforts to achieve its renewable generation and emission reduction targets. In alignment with UAE's National Energy Strategy 2050, UAE has been rapidly increasing their renewable energy capacity and reached 2.3 GW by the end of 2020, around 91% of which comprises of solar PV projects. Projects like the Mohammed bin Rashid Al Maktoum Solar Park, implemented by Dubai Electricity and Water Authority (DEWA) is the largest single-site solar park in



the world built using the Independent Power Producer (IPP) model which bolster actions towards carbon neutrality and achieving its renewable goals.

Moreover, in order to broaden its energy sources, the UAE implemented the region's inaugural wind turbine on Sir Bani Yas Island, capable of generating 850 kilowatts per hour. As a result, the exploration and expansion of alternative methods for clean energy production are anticipated to drive the adoption and competitiveness of clean energy, fostering market growth.

UAE Government Push from Fossil fuel to Clean Energy

Government spending has played a significant role in driving the rapid growth of clean energy investment. Acknowledging this fact, the recently elected UAE government initiated 11 environmentally friendly energy projects, amounting to a total value of USD 43.2 billion in 2022. The UAE has also implemented several national policies aimed at shaping energy transition and consumption targets. These policies include the UAE Net Zero by 2050 strategic initiative, the UAE Green Agenda (2015-2030), and the UAE's National Climate Change Plan (2017-2050). Moreover, the UAE is well-prepared to take on the presidency for COP 28 in 2023, leading the global transition to clean energy sources.

Furthermore, the promotion of clean energy use is evident through the establishment of eco-friendly districts such as Dubai Sustainable City, Dubai South, Al Barari, and Dubai Silicon Oasis, which solely rely on renewable energy sources. In addition to these efforts, the UAE is planning to invest a substantial amount of USD 163 billion in clean and renewable energy sources over the next three decades.

The Private Sector Discovers New Sources

With the push from the UAE government and upcoming renewable energy projects have attracted the attention of many private players. Government climate change-related policies such as Dubai Net Zero Carbon Emissions Strategy 2050 which aims to provide 100% of Dubai's total power production capacity from clean energy sources by 2050, have encouraged investment in large-scale renewable electricity generation.

In December 2022, state-owned Abu Dhabi National Oil Company (ADNOC), Taqa, and Abu Dhabi sovereign wealth fund Mubadala Investment Company entered a partnership to become shareholders of renewable energy company Masdar, to advance efforts to create a world-leading portfolio in clean energy with over 23GW of current committed,



and exclusive renewable energy capacity. This makes Masdar one of the largest clean energy companies globally, with plans to expand well over 50 GW by 2030.

Clean Energy Sources Offer Competitive Pricing to Fossil Fuel Sources

The declining costs of renewable technologies, particularly solar, have made clean energy increasingly competitive with traditional fossil fuel-based energy sources. Prices of solar PV systems in the country have dropped by more than 76% since past 5 years. This cost-effectiveness has attracted investments and stimulated the deployment of renewable energy projects across the country.

Furthermore, UAE has launched Geospatial Platform for Future Energy to track the progress of projects under UAE Energy Strategy 2050 by constantly updating and analyzing data on clean energy projects across the country. Owing to this, projects like the AI Dhafra project had made headlines by offering a remarkably low tariff of USD 13.50 per MW, positioning it as one of the most competitively priced solar power purchase agreements (PPA) worldwide.

Impact of COVID-19

Similar to other economies, the Clean Energy sector in the UAE faced significant challenges during the COVID-19 pandemic. It experienced severe short-term impacts, resulting in delays in projects reaching commercial operation due to various factors, including physical issues, delivery limitations, and financial obstacles. Despite these setbacks, the UAE promptly employed strategies such as corporate renewable power purchase agreements. These agreements provided a long-term hedge in the energy market and offered benefits in reducing emissions. As a result of these efforts, the UAE successfully increased its clean energy capacity from 5.84% in 2019 to 19.63% of the total energy mix by 2021.

Moreover, in virtual Abu Dhabi Sustainability Week held in January 2021, highlight the OPEC member's commitment to diversify their fossil fuel-based economy by investing in low-carbon technologies like hydrogen, a promising zero-carbon fuel for road, shipping and aviation transport. Programs like Abu Dhabi Sustainable Finance Forum hosted by Abu Dhabi Global Market provided capital for sustainability projects worldwide.

Impact of Russia-Ukraine War



The ongoing conflict between Russia and Ukraine has presented a fresh set of energy security challenges for the UAE, both domestically and internationally. In the first half of 2022, Dubai witnessed a significant 6.3% increase in energy demand, driven by a sustained economic recovery in the country. Despite being a major oil producer, the UAE faced a sharp rise in the price of Brent crude oil from OPEC+ countries, reaching over USD 130 per barrel when the war began. However, by March 2023, the price had dropped to just above USD 70 per barrel, marking its lowest point in 15 months.

In response to the surge in crude oil prices and its commitment to clean energy, the UAE set an ambitious target of having clean energy contribute approximately 30% of its energy mix by 2030 and 50% by 2050. As part of this endeavor, the country invested USD 43 billion in 2022 to launch more than 10 clean energy projects.

Key Players Landscape and Outlook

Key players are heavily investing in production of Green Hydrogen with dual objectives, firstly to meet the domestic consumer demand for energy and secondly, surging demand for green hydrogen from overseas countries, which provides lucrative opportunity for export purpose. This could be attributed to drastic shift towards clean energy preference over the energy produced from conventional fossil fuels across the world. Hence leading companies are collaborating with each other to enhance production landscape of green hydrogen in UAE.

For instance, Abu Dhabi Future Energy Company PJSC (Masdar), a company jointly owned by ADNOC, Mubadala, and TAQA, has set its sights on achieving a renewable energy portfolio capacity of at least 100 GW by 2030. Additionally, they aim to reach an annual production capacity of up to 1 million tonnes of green hydrogen by the same year.



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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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