

Renewable Energy Outlook — Asia and Middle East — 2024-2025

23 August 2024

As the global economy pulls clear of the supply chain shocks and regulatory uncertainty of the COVID era, this alert looks ahead at key trends that we expect to characterize renewables markets over the next 18 months. Although inflation remains high globally and heightened political tensions in Eastern Europe, Asia, the U.S. and the Middle East continue to impact supply chains and contribute to regulatory uncertainty, we expect that the global energy transition will regain momentum, particularly in Asia and the Middle East where Korea and Japan look set to resume development trajectories that were interrupted by the pandemic, China's emergence in the specialist manufacturing space looks set to eat into the traditional dominance of European players and Saudi Arabia pushes forward with its ambition to become a renewables superpower. Below, we examine five key trends that look set to shape the industry going forward.

1. Offshore Wind To Be Prioritized and China's Impact To Expand

The renewables surge that characterized Asian markets throughout the 2010s looks set to resume momentum, although whilst the previous decade saw high levels of investment in both offshore wind and large scale solar, relative supply chain shocks and the ensuing market dynamics will see most economies and investors prioritizing offshore wind over solar. This is largely driven by the rapidly declining costs of key factors of production for solar developments, primarily PV panels, the average cost of which has fallen by over 40% since 2020, leading to an oversupply in Asian markets and therefore an unattractively low return on investment for developers and investors in this space.

Governments in Asia are also prioritizing offshore wind over solar with Taiwan resuming its delivery program that led the region (excluding China) pre-pandemic, and Japan and Korea continuing their regulatory focus on offshore wind development. China

remains the exception to this rule with large scale wind and solar development set to accelerate further, with its dominance of the global PV panel manufacturing industry facilitating its growth. In contrast, investment potential in the Asia Pacific region for offshore wind farms is estimated at \$621 billion through 2050, and we expect offshore wind to maintain its lead ahead of solar for some time to come.

China's impact in the offshore wind space also looks set to expand. China accounts for 60% of global offshore wind installations and despite its relative inaccessibility to western investors, it is also rapidly emerging as a manufacturer of installation vessels (an industry in which it accounts for approximately 90% of the total number of vessels on order) and large-scale wind turbines, the sale of which to overseas investors and developers may increase the competitiveness of component markets traditionally dominated by European turbine manufacturers such as Siemens and Vestas, and thereby lower some of the barriers to development that had previously characterized the market. Implementing a Chinese supply chain in construction brings its own set of legal and commercial considerations for developers and lenders to consider and whilst it remains to be seen how much of China's turbine production will be exported to supply international projects, it is noteworthy that the outcome of Korea's 2023 grid allocation auction saw two projects opting to use Chinese suppliers, and Jan De Nul recently ordered two of the world's largest seabed cabling vessels from Chinese manufacturers, which indicates that industry players have a strong willingness to take advantage of the opportunities in this area.

2. Korea and Japan's Renewables Potential To Be Realized

In the lead-up to the pandemic, Taiwan stood at the forefront of non-Chinese Asian offshore wind development, with the government's objective being that 5.7 GW of power would be generated in Taiwanese offshore wind farms by 2025, and the early success of projects like the Formosa 1 and 2 Wind Farms being followed at increasing scale by projects such as Changfang Xidao, and more recently, Hai Long. At the time of writing, Taiwan has 2,250 MW commissioned and 2,000 MW in development from offshore wind projects, however, limited port infrastructure, the prohibition on the use of Chinese vessels and continued misalignment between government policies on issues such as local content and grid allocations and the strategic goal for offshore wind development, have made investments in Taiwan more difficult and have led to key market players, such as Vestas, publicly stating that they will struggle to remain operational in that market. At that time, Japan and Korea looked set to follow in Taiwan's footsteps, albeit with clearer regulatory frameworks and greater geographical and meteorological potential for growth. Japanese projects such as Ishikari Bay and

Akita commenced construction and the governments of both countries publicly committed to offshore wind as a growth strategy.

After the pandemic slowdown, it's these economies, particularly Korea, that are forecast to spearhead offshore development. In 2022, Korea held its first annual wind power auction, providing the opportunity to bid for 20-year Power Purchase Agreements covering both power generation and renewable energy certificates. The 99 MW Jeonnam 1 project was awarded to the consortium of Copenhagen Infrastructure Partners and Korean conglomerate SK E&S, following which in 2023, 1.431 GW was allocated across four major offshore wind projects to developers such as KOEN, Hanwha E&C and Dongchon Wind Power. The Korean coast is characterized by stronger winds than other countries in the region and, whilst this presents a challenge to fixed turbine developments, it elevates the importance of floating technology in Korea's long-term strategy. Korea is expected to have one of the largest floating offshore wind markets globally, and projects are already underway off the southeastern coast of Ulsan.

Interest remains peaked ahead of Korea's next grid allocation auction taking place in December 2024, and we expect to see even greater competition amongst this year's bidders. The Korean market has become the focus of major international players with the most notable example being BlackRock's acquisition of KREDO Holdings in 2020 and establishment of KREDO Offshore in 2021. Korean industry participants are also making their mark at home and abroad, with major industry players such as Samsung C&T, Hyundai Heavy Industries, SeAH, Taihan, CS Wind, SK ecoplant, LS Cable & System and HSG Sungdong landing significant renewables projects, with Samsung and Hyundai in particular planting meaningful early roots in the emerging Saudi Arabian renewables industry.

3. Saudi Arabia To Emerge as a Renewables Superpower

In the Middle East, the Saudi renewables sector is rapidly developing into a powerhouse itself, where the two pillars of Saudi Arabia's nation-building program 'Vision2030' – infrastructure development, and facilitative legal and economic reform – together with its commitment to reduce its economic dependence on oil, have catapulted the Kingdom to the forefront of the emerging renewables superpowers. The renewable energy market in the Kingdom is estimated to increase from 8.33 GW in 2024, to 23.74 GW by 2029, with large-scale solar expected to be the dominant sector due to the country's advantageous sun belt positioning, and a significant portion of this growth to be delivered via the Kingdom's Gigaproject program.

In November 2023, the AMAALA Gigaproject announced that financial close had been reached on the \$3 billion multi-plant integrated utility system PPP project, which included solar PV, battery storage and wastewater desalination plants and network systems, and in June 2024, the Kingdom's Public Investment Fund ("**PIF**") announced the execution of Power Purchase Agreements for three new solar projects to be developed by ACWA Power, Badeel and Saudi Aramco Power Company ("**SAPCO**"). The new facilities will have a combined value of \$3.3 billion and will produce 5,500 MW of renewable energy once operational in 2027. Saudi Arabia is also establishing itself as a leader in green hydrogen and ammonia production, with the NEOM Gigaproject reaching financial close on Helios, the world's largest utility scale, carbon-free hydrogen facility powered entirely by renewable energy, set to be commissioned in 2026. Even Saudi Aramco, the Kingdom's biggest oil and gas production company, has stated objectives of achieving net-zero status by 2050 and generating 12 MW of renewable energy by 2030 and, through its subsidiary SAPCO, in its joint venture with PIF and ACWA Power, acquired a 30% stake in the \$900 million, 1,500 MW Sudair solar PV plant.

The Kingdom's long-term commitment to renewable energy development should establish it as the newest playground for investors and developers alike. Chinese companies have been quick to move in the Kingdom, with three Chinese manufacturers, TCL Zhonghuan Renewable Energy Technology Co., Envision Energy and Jinko Solar entering into tripartite joint venture agreements with PIF and Saudi company, Vision Industries, to localize the production and assembly of key equipment, including wind turbines and solar PV panels. We expect that the ambitious construction goals, combined with collateral regulatory reform aimed at facilitating project development and the influx of foreign investment, will establish Saudi projects in the investment strategies of project sponsors and corporate offtakers alike.

4. Hyperscalers To Dominate the CPPA and Data Centre Markets

For the reasons highlighted above, Saudi Arabia and Korea are also emerging as target markets for corporate offtakers, particularly in the tech and data centre sectors. According to market analysts, the world's top five hyperscalers (Amazon, Google, Meta, Microsoft and Apple) have a combined renewables portfolio comprising more than 45 GW, which accounts for more than 55% of corporate wind and solar capacity globally. This investment is driven by the increasing demand for data centres that has accompanied unprecedented growth in the volume of data being generated and stored globally, as well as national regulators intervening in the sector to require data to be stored within national borders. As the market expands, investors are increasingly concerned by the risk of major outages, which can have significant financial and

reputational consequences, leaning them towards partnering with experienced operators on such deals. New data centres also exert huge pressure on any existing power supply, and developers are increasingly seeking off-grid locations where reliable power infrastructure can be built as a result.

In Korea, where six new data centres are forecast to be completed in the next 12 months, the Korean government has stated that the existing power supply of greater Seoul is at capacity. Given the current strength of the Korean data centre market, we would therefore expect there to be a push for data centre construction, alongside new power facilities, in more remote parts of the country. Notable upcoming projects include a 1,000 MW data centre network being built in Solasido, expanding the city's data centre count to 25 by 2037, a group of data centres being developed by four operators in partnership with the city of Busan, due for completion in 2027, and a new 120 MW data centre being developed in Pohang by SK ecoplant, DCT Telecom and KB Asset Management, also due for completion in 2027.

5. Momentum for Hydrogen and Ammonia Production To Build

The emergence of Saudi Arabia, Korea and Japan at the forefront of renewables innovation also reflects these nations' early commitments to the emerging hydrogen and ammonia production industries. As the production technology and regulatory regimes for these sectors continue to develop, investor interest is peaked and green hydrogen clearly represents the next wave of the energy transition. Saudi Arabia has taken a leading role in this space with NEOM's \$8.4 billion Helios green hydrogen project securing financing from 23 local and international banks in 2023, and Saudi Aramco signaling a pivot to the sector in July 2024 by taking a 50% stake in the Jubail-based Blue Hydrogen Industrial Gases Company, formerly a wholly owned subsidiary of Air Products.

Japan is aiming for large-scale hydrogen and ammonia economy development and seeks to produce 1% of primary energy from a mix of hydrogen and ammonia by 2030. In May 2024, the Japanese government enacted two new laws (the Hydrogen Society Promotion Act and the CCS Business Act) to demonstrate its commitment to clean energy. This new legislation will come into effect incrementally over the next two years and promises to channel \$20 billion into hydrogen production subsidies. These laws will create significant investment opportunities in Japan's emerging hydrogen and CCS markets for international investors and developers.

Korea has expressed an even deeper commitment to clean energy by announcing a hydrogen and ammonia bidding market for up to 6,500 GWh of electricity to be

produced from clean power generation over the next 15 years. Developers must register as bidders between 7-18 October 2024, following which bids should be submitted by 8 November 2024. Once evaluated by Korea Power Exchange, successful developers will be notified in December 2024. The auction is expected to be highly competitive, with a mixture of international and domestic players, and joint ventures all vying for an allocation. Awards will be limited to developers of clean hydrogen electricity generation plants, ammonia co-fired in coal power plants and hydrogen co-fired at natural gas power plants.

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Suggested Reading

- 18 September 2024 - 19 September 2024 Sponsored Event REFF Wall Street 2024
- 21 August 2024 Press Release Kirkland Advises Piñon Midstream on Being Acquired by Enterprise for \$950 Million
- 20 August 2024 Press Release Kirkland Advises Seller of Package of East Texas Assets Acquired by Diversified Energy and undisclosed Purchaser for \$87 Million

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