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Oman Is Looking To Become a Green Energy Hub

By [Alan Mammoser](#) - Jan 25, 2024, 2:00 PM CST

- ▶ The expected expansion of electrolysis and resulting decline in capital cost could allow Omani hydrogen to be produced at \$1.60/kg by the end of this decade.
- ▶ Oman is moving forward, building a system according to its great coastal geography, with green hydrogen production planned in the sunny, windy south along the Arabian Sea.
- ▶ Several multinational consortia were awarded land blocks by Hydrom last year, in the enormous Special Economic Zone at Duqm



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Like other Gulf countries, Oman is dependent on oil and gas revenues for the major part of its export income, leaving it vulnerable to energy transition. It is therefore looking at large-scale production of carbon-free or 'green' hydrogen.

With its magnificent renewable energy resources, huge areas of open land, and strategic location at the nexus of Arabia, Africa and South Asia, Oman enjoys natural advantages in its ambition to become a major hydrogen producer and exporter.

And its plans are realistic, according to the International Energy Agency. In a report last summer, the IEA wrote that Oman could well become one of the world's most competitive producers of renewable H₂, and the largest exporter in the Middle East.

Planning big



In its report ('Renewable Hydrogen from Oman, A producer economy in transition') the IEA noted that the expected expansion of electrolysis and resulting decline in capital cost could allow Omani hydrogen to be produced at \$1.60/kg by the end of this decade. The agency's assessment of announced projects shows that Oman will be the world's sixth largest producer of hydrogen by 2030.

Oman is moving forward, building a system according to its great coastal geography, with green hydrogen production planned in the sunny, windy south along the Arabian Sea, and decarbonization projects foreseen in northern industrial clusters. Pipelines and power lines will connect the regions with export markets at the ports.

Numerous projects were announced last year, put forth by impressive international consortia. The country has awarded large areas of land and plans to award much more.

Hydrom's high hopes

Hydrogen Oman (Hydrom) was established in 2022 as an independent entity fully owned by the government's Energy Development Oman (EDO) company and regulated by Ministry of Energy and Minerals (MEM).

Hydrom is not a developer but a facilitator of the new energy, planning for infrastructure and working with developers. It has been busy awarding land blocks to developers, each block 320 sq km.

A first round of land block awards occurred last year. The standard project development timeline is seven years, as Hydrom pushes to meet a 2030 production target of 1 MTPA of green hydrogen. Developers will deliver integrated projects including renewable power production, hydrogen production, conversion, and offtake.

Developers completing projects early may receive up to 2-years tax-free status. Hydrom will coordinate common infrastructure for all investments.

"Three years ago, many companies came to Oman to perform a first feasibility study, and they said they want a one-stop shop to make investments easier," says Nasser Al Rizeiqi, Technical Advisor, MEM.

"Oman has made a lot of progress in hydrogen in the past three years, now there are a lot of projects."

First round

Several multinational consortia were awarded land blocks by Hydrom last year, in the enormous Special Economic Zone at Duqm (SEZAD) that covers 2000 sq km in the Al Wusta governorate in the country's mid-south.

The Amnah consortium includes the Danish fund manager Copenhagen Infrastructure Partners (CIP), Danish developer Blue Power Partners (BPP) and Al Khadra Partners, part of Oman's Hind Bahwan Group. According to news reports, it will develop some 200,000 metric tons per annum of green hydrogen from 4.5 GW of installed renewable energy capacity, for planned green steel plants located in Port of Duqm. Total investment is estimated at \$6 billion.

A BP Oman project will produce 150,000 metric tons of green hydrogen a year for ammonia production and export, according to news reports. The site will have 3.5 GW of installed renewable power capacity.

Another consortium called Green Energy Oman includes Oman's integrated energy company OQ, Shell Oman, Kuwait's state-backed energy investor EnerTech, InterContinental Energy, and Omani investment company Golden Wellspring Wealth for Trading (GWWT). It will produce green hydrogen for exporting ammonia. The project is expected to produce up to 150,000 metric tons per annum of green hydrogen and its derivatives from 4 GW of installed renewables capacity, according to news reports.

The POSCO-ENGIE consortium includes the Korean conglomerate POSCO Holdings, Engie Middle East, Samsung Engineering Co. Ltd., Korea East-West Power Co. Ltd., Korea Southern Power Co. Ltd, and FutureTech Energy Ventures Company Ltd. (subsidiary of Thai company PTTEP).

It will build 5 GW wind and solar power, battery energy storage, and a hydrogen plant that will produce 200,000 metric tons per annum of green hydrogen to be transported by pipeline to Port of Duqm where it will be converted into approximately 1.2 million tons per annum of green ammonia for export, according to an Engie press announcement.

The Hyport Duqm consortium includes OQ Alternative Energy and the Belgian infrastructure company DEME Concessions NV. It will build a combined renewable power capacity of around 1.3 GW in a first phase and potentially have over 2.7 GW in a later phase, according to a DEME press announcement. The project is planned to produce approximately 330,000 metric tons of green ammonia in the first phase and more than 650,000 metric tons during the second phase.

For a second round, Hydrom will award three land blocks in the southern Dhofar region. Announcements are anticipated in April.

Connecting infrastructure

According to company statements last year, Hydrom is forming an advisory board to oversee the development of common infrastructure, to be built in coordination with developers and national utility operators. Last year, an MOU for pipeline study was signed between Hydrom and OQ Gas Networks (OQGN), the exclusive operator and owner of Oman's natural gas transport system.

Other industry sources report that Hydrom is planning 2,000 km of pipelines to supply green hydrogen to industrial zones in Duqm and Al-Jazir, where a small port is under development, and to Salalah in the Dhofar region in the south.

Decarbonization

Other projects are taking shape in industrial zones in northern port cities on the Gulf of Oman, including Sohar, Muscat, and Sur.

The Sohar Port and Freezone entered an agreement, with German company Hydrogen Rise and Jindal Shadeed Iron & Steel, to evaluate the development of a green hydrogen plant to decarbonize steel production. It would initially have 35 MW electrolyser capacity powered by solar energy, according to news reports.

The Sur Industrial City is the site of a proposed Hydrogen and Energy Transition Cluster to contribute to industry decarbonization and to free up natural gas for liquefaction into LNG. It has the potential to produce approximately 480 metric tons per day of hydrogen, according to state-owned Oman LNG, which is supporting a feasibility study currently underway.

More projects



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Other projects in the news during the past two years may be future recipients of Hydrom's land blocks.

The Omani economic development agency Madayn and US-based H2 Industries signed an MOU last year to build a \$1.4 billion waste-to-hydrogen plant at a coastal location, able to convert up to 1 million metric tons of municipal solid waste each year to green hydrogen and CO₂, according to a statement from H2 Industries.

India's ACME Group is planning to produce green hydrogen in the SEZAD, with 3.5 GW of electrolyser capacity powered by 5.5 GW of solar PV, according to the company.

Saudi Arabia's ACWA Power entered a joint development agreement with OQ and Air Products in 2022 to develop a green hydrogen-based ammonia production facility in the Salalah Free Zone.

OQ has also entered an agreement with the Japanese industrial conglomerate Marubeni, Dubai-based Dutco, Samsung, and Hydrom for detailed studies on the development of a green ammonia plant for local use and export. According to earlier news reports, the companies entered a joint development agreement for a green hydrogen and ammonia project at Salalah Free Zone.

Oman's ambitions

Oman wants to produce one million metric tons of renewable hydrogen per year by 2030, 3.75 million metric tons by 2040, and 8.5 million metric tons by 2050. This would indeed give Oman a significant new source of export revenue, according to the IEA.

However, the agency, in its report last year, outlines enormous work to be done this decade. There must be enormous expansion of ammonia export infrastructure, and massive buildout of

renewable power capacity. The agency estimates that cumulative investment needs by 2030 would be approximately \$33 billion.

The IEA suggests that domestic demand could play an important role in getting the hydrogen sector started, particularly in refining, where fossil hydrogen could be replaced with renewable hydrogen at a production cost of \$1.60/kg by 2030.

The large number of announced projects now shows Oman to be a serious player in the emerging sector. All are in planning but none have reached financing. Their success will be key to attaining the country's hydrogen ambitions.

By Alan Mammoser for Oilprice.com



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