Egypt: Green Hydrogen Production in the Suez Canal Economic Zone

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Green Hydrogen Production in the Suez Canal Economic Zone – AMEA Power

Deal opportunity overview

1 GW green hydrogen project powered by 2.5GW of renewables (wind and solar), to be used for producing 800,000 tons of green ammonia a year. This project will support Egypt on its efforts of developing a green hydrogen industrial ecosystem in Ain Sokhna and to position the country as one of the first large-scale exporters of green ammonia to Europe and Asia

- AMEA Power
- Investor Category: Corporate investors
- Funding Required: USD 4bn USD (USD 1bn equity / USD 3bn debt)
- Use of Proceeds: Renewables: USD 2.3bn / Hydrogen & ammonia process plant: USD 1.3bn / Financing, development and other fees: USD 0.4bn

Project/enterprise details

Background

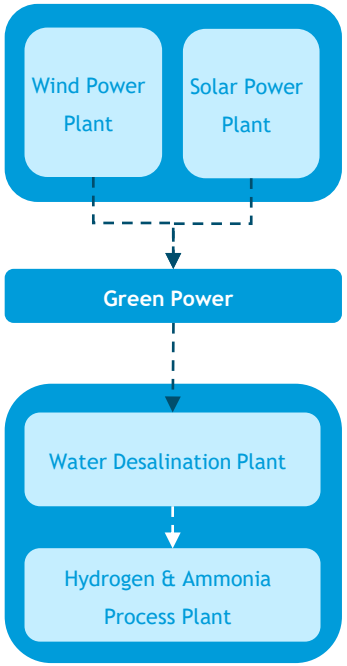
- **Team:** Mr. Hussain AlNowais (Chairman) and Mr. Hussein Matar (Senior Director)
- **Track record:** Founded in 2016, AMEA Power has assembled a leading team of global industry experts to deliver projects across Africa, the Middle East and Asia. It has a clean energy pipeline of over 6 GW across 20 countries. Presently constructing 1 GW renewable power plant in Egypt and developing 1.5 GW renewable power projects for supplying power to the Egyptian Electricity Transmission (EETC)

Business Model

To develop, construct, own and operate the full value chain of a 1 GW green hydrogen project, from renewable power generation until the ammonia storage. AMEA Power will leverage its track-record in developing large scale renewable power plants in Egypt, to optimize the green hydrogen project economics.

Milestones

- **Operational:** AMEA Power signed an MoU with the Egyptian authorities in April 2022 which was translated into a Framework Agreement in November 2022. The detailed feasibility study was concluded in Q2, 2023
- **Financial:** Once fully developed, this project will have USD 650m-800m revenues a year
- **Partnerships:** AMEA Power is developing this project in cooperation with several Egyptian agencies (EETC, NREA, SC Zone and TSFE). Currently in discussions with offtakers and technological companies to strengthen the consortium



Risk and Mitigation Strategies

Egypt

Risks and mitigation

	Risks	Mitigation Strategies
1 Market Risk	As green hydrogen/ammonia market is currently very small, the visibility on future prices over the long term are very uncertain. Furthermore, the prices of the closest commodity, grey hydrogen/ammonia, strongly depends on fossil fuels which historically has had a high volatility	Enter into long-term off-take agreements with solid and reputable companies that have access to end-users or act as market aggregators, since they will be able to have better visibility on market conditions and back their off-take commitments through their balance-sheet
2 Financing Risk	Green hydrogen projects require a large investment, (USD 4.5bn for a 1GW project), in an industry that is very new, with very few large-scale projects being implemented	Diversification of the sources of financing (DFIs, ECAs and commercial banks) and development of a strong consortium with right partners (off takers and technology companies) that allows to reduce the risk profile of the project
3 Technology Risk	Despite the elements of a green hydrogen project have been tested individually (wind, solar, electrolyzers and ammonia synthesis plants), the integration in a single system is very new. There is no track-record of hydrogen or ammonia plants operating using intermittent renewable power	This project will be connected to the EETC grid, which will be available to provide the necessary support as a backup to ensure that the equipment operates within its safety limits. Additionally, optimized storage of power and intermediates is foreseen to avoid sudden disruptions in operation
4 Regulatory Risk	Green hydrogen and ammonia will need a price premium over the grey products. There are different schemes currently being proposed in the US, EU, Japan and Korea based on carbon-tax to the correspondent grey products, or government incentives to complement the price. However, in all cases, it depends on the final regulation of each region	A key element of defining the green premium is the carbon tax regulation. E.g., in Europe or CBAM (Carbon Border Adjustment Mechanism), which has already been approved by the EU parliament. Hence Europe looks to be attractive and is engaging with European off-takers. AMEA Power is also approaching companies/countries who are keen to reduce their carbon footprints
5 Development Risk	The inherent development risk is also impacted by the challenges of a new and evolving industry, in regard with the technical, commercial and regulatory aspects. Development also involves many private and public stakeholders, whose interests might not always be fully aligned	Egypt has developed an excellent regulatory framework for the development of green hydrogen projects, based on a Framework Agreement. This agreement defines the rights and obligations of each party, including an incentive package of the Egyptian government, which improves the project feasibility

Impact Metrics

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Impact

Social Impact Targets

- **Project Beneficiaries**
  Around 800,000 tons of green ammonia will be produced every year, which will allow to avoid 1.3 million tons of CO_2. Furthermore, this project will support the development of a green industrial ecosystem in Ain-Sokhna and the de-carbonization of other industries

- **Employment Creation**
  Over 1,500 temporary jobs during the construction period and 750 permanent jobs

- **Sustainability**
  - Energy Security: New and sustainable energy sources, to diversify energy mix
  - Climate Change: De-carbonize new industries (fertilizers, shipping, etc.)

- **Social Inclusion & Local Development Considerations**
  - Development of local skilled opportunities, through direct jobs and indirect jobs
  - Support the growth of local know-how in a new key industry
  - Promote CSR activities as part of the engagement of the local communities

Return expectations

- **Growth projections**
  - The project will be developed in two phases, of 500MW H2 electrolyzer each.
  - Once fully developed, the project will generate around USD 650m-800m revenues a year
- **Return**
  - The project is expected to provide higher returns than renewable energy projects, also the risk profile of the project is different

Signature of MoU in April 2022

Signature of Framework Agreement in November 2022