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GREENING EGYPT'S PETROCHEMICALS INDUSTRY

EXPLORING DEVELOPMENT OPPORTUNITIES

GREENING EGYPT'S PETROCHEMICALS INDUSTRY:

EXPLORING DEVELOPMENT OPPORTUNITIES

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Key Takeaways

Investment Cost of Green Petrochemical Projects

$2.63 billion

Co2 Emissions Reduction from Major Green Petrochemical Projects

Polylactic Acid Production Project

Co2 Reduction
1.2 mmt/y

Bioethanol Project

Location
Damietta

Co2 Reduction
0.3 mmt/y

MDF Project

Location
Beheira

Co2 Reduction
0.36 mmt/y

SAF Project

Location
Alexandria

Co2 Reduction
400,000 mmt/y

The Egyptian Petroleum sector has a clear vision to maximize the added value of the petroleum resources through developing the petrochemicals industry. The industry is witnessing a huge influx of investments to implement plans to increase production capacity and creating a surplus for export in light of the growing global demand.

Despite the importance of petrochemicals, the industry has a substantial contribution to global environmental pollution. It involves energy-intensive procedures, leading to notable carbon emissions, land degradation, and water pollution. Therefore, the growing global interest in achieving net-zero emissions and transitioning to green energy has extended to the petrochemical sector, encouraging the development of sustainable petrochemicals such as chemical recycling. This will effectively reduce the environmental impact of petrochemicals by reducing greenhouse gas emissions (GHG).

In the same context, the Egyptian Ministry of Petroleum and Mineral Resources (MoPMR) declared its intention to expand the green petrochemical industry announcing a package of green petrochemical projects. This came within the framework of Egypt's updated national petrochemicals plan 2020-2040.

The report throws light on the Egyptian petrochemicals production and the key producers in the market. Moreover, it shows the state's tendency toward greening the petrochemical sector to limit its environmental impacts by establishing several projects and adopting more sustainable solutions.

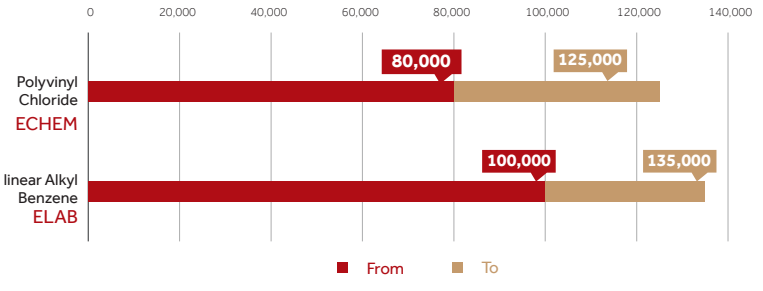
PETROCHEMICALS PRODUCTION

Egypt put a framework to update the national plan for the petrochemical industry until 2040, to widely expand petrochemical projects, contributing to increasing total production, meeting the local needs, and exporting the surplus.

This is in addition to initiating several new petrochemical projects which were accompanied by the development of the existing factories. The most significant is the development operations and increasing the production capacities of the Egyptian Petrochemicals Company (ECHEM) and the Egyptian Linear Alkyl Benzene Company (ELAB), according to the MoPMR.

>4.3 mmt
Petrochemicals Production in FY 2022/23

Increase in Petrochemicals Product Capacity (t/y)



SCALING UP GREEN PETROCHEMICALS

Egypt is working to accelerate the pace of decarbonization and diversifying energy sources in commitment to the "Sustainable Development Strategy (SDS): Egypt's Updated Vision 2030" and the "Integrated Sustainable Energy Strategy 2035", which was launched in 2015, by the Egyptian oil and gas sector.

In this regard, the sector works to enhance decarbonization activities and energy transition by introducing new green and environmentally friendly petrochemical products that would increase total production.

Green Petrochemicals Adoption

Bioethanol

Egypt pioneered bioethanol production through local sugar companies and used it in producing bioethylene with a capacity of 60,000 tons per year (t/y). It aims to produce polyvinyl chloride by the Indian company TCI Sanmar Chemicals S.A.E in Port Said, according to the Organization of Arab Petroleum Exporting Countries (OAPEC).

Low Carbon Petrochemicals

Egypt made a strategic decision over 20 years ago to use carbon-free natural gas as a cleaner, less carbon-intensive, and more environmentally-friendly fuel. In this regard, it works to expand the production of new petrochemical projects using natural gas to preserve the environment, according to the MoPMR.

Natural Gas Utilization in the Petrochemical Sector in FY 2022/23

16%
of the total natural gas consumption

Egypt's Investments in Green Petrochemicals

Egypt is actively seeking to reduce methane gas emissions and use it in green petrochemicals production to produce methanol. In alignment with the emissions reduction roadmap, Egypt joined the Global Methane Pledge (GMP) within the Oil and Gas Track of the Major Economies Forum on Energy and Climate Change (MEF). Egypt executed a comprehensive methane gas measurement campaign across six gas facilities and one tank farm. Building upon this progress, a second methane gas measurement campaign was successfully implemented at more than 25 facilities, according to the Information and Decision Support Center (IDSC).

Egypt has actively participated in boosting investment in green petrochemicals projects such as metallic silicon and sodium carbonate (soda ash) production complexes in New Alamein, and green ammonia and green methanol projects in Damietta, in addition to projects to produce Medium-density fibreboard panels (MDF), methanol derivatives, and bioethanol from molasses, according to the Cabinet.

Investment Cost of Green Petrochemical Projects
$2.63 billion

Major Green Petrochemicals Projects

The oil and gas sector has continued its pivotal role in advancing and implementing a comprehensive suite of new green petrochemical projects.

The MoPMR has developed an investment plan to initiate ventures aimed at enhancing the production of high-value products and fostering domestic manufacturing of diverse raw materials and finished goods. These products are poised to be utilized across various sectors, contributing to the reduction of imports and generating surplus quantities for export, thereby boosting foreign currency reserves.

Polylactic Acid Production Project (Biodegradable Plastic)

The project is designed to produce polylactic acid and lactic acid by utilizing agricultural waste and raw sugar as feedstock. The project is anticipated to reduce CO2 emissions by 1.2 million metric tons per year (mmt/y). The estimated investment cost for this project amounts to $600 million. The project is in the preliminary study phase and is anticipated to commence operations in 2026, the IDSC stated.

Polylactic Acid
75,000 t/y

Lactic Acid
40,000 t/y

Bioethanol Project in Damietta Port

The project seeks to produce bio-ethanol and vinasse by utilizing molasses sourced from local sugar companies. The primary objective is to satisfy a portion of the local market demand while exporting surplus.

This initiative is anticipated to reduce CO2 emissions by an estimated 300,000 t/y. The Egyptian Bio-Ethanol Company (EBIOL) is spearheading the project, with the petroleum sector contributing 85% and sugar companies contributing 15% with a total investment of $120 million and it is planned to start operating in 2024, according to MoPMR.

Bio-Ethanol
100,000 t/y

Vinasse
130,000 t/y

Project for the Production of MDF

The project was established in Idku, to produce MDF panels based on 250,000 t/y of rice straw. This initiative is intended to partially fulfill local market demand and replace imports. By reducing the practice of rice straw burning, the project is anticipated to decrease Co2 emissions by 360,000 t/y.

The ECHEM, in collaboration with the Egyptian General Petroleum Corporation (EGPC), Petrojet, and Sidi Kerir Petrochemicals Company (SIDPEC), is undertaking the project with a total investment of €351 million, according to the MoPMR.

MDF Capacity **205,000** m^3/y

Silicon Production Complex Project in El Alamein

The project aims to produce metallic silicon utilizing Egypt's abundant ultra-pure quartz ore reserves with an investment cost estimated at $172 million. This strategic initiative will shift the country's focus from raw material exports to value-added manufacturing, thereby addressing local demand for metallic silicon and generating a surplus for exports.

The project's energy requirements will be met through renewable solar power sources. The project includes four different phases. A detailed feasibility study for the first phase has been completed, according to MoPMR.

Metallic Silicon

Capacity (t/y)

45,000

Microsilica

Capacity (t/y)

19,000

Red Sea Petrochemical Complex Project

The project seeks to transition from the production of conventional petrochemicals to specialized value-added petrochemicals, catering to both domestic demand and generating surplus for export. Strategically located within the Suez Canal Economic Zone (SCZONE).

The project is being undertaken by a collaborative alliance between ENPPI and Petrojet with a total investment of $11.7 billion per phase. A preliminary agreement has been secured with Aramco to ensure a reliable supply of crude oil to support the project's operations, according to the MoPMR.

Petrochemical Production Capacity

3.5 mmt/y

The Soda Ash Production Project

The projects were established in El Alamein with an estimated total investment of approximately $684 million. It aims to produce soda ash and its derivatives, which contributes to maximizing added value and reducing imports of soda ash, according to the MoPMR.

Soda Ash Production Capacity

600,000 t/y

SAF Production Project

This project focused on the hydroprocessing of used cooking oil, to convert it into Sustainable Aviation Fuel (SAF). This initiative contributed to a significant reduction in CO2 emissions of approximately 400,000 t/y. The project is slated for development in Alexandria and carries an estimated investment cost of $380 million, according to NERA.

120,000 t/y
Production Capacity

Green Naphtha Production Project from Algae

ECHEM has entered into a Memorandum of Understanding (MoU) with Riga Green Energy of the United Arab Emirates (UAE) to collaborate on the production of algal oil within the New Alamein City development. This biofuel feedstock will be utilized in manufacturing bio-jet fuel and green naphtha, offering a sustainable and environmentally friendly alternative to traditional petrochemical raw materials, according to MoPMR .

Projects Serving the Green Petrochemical Industry

Projects	Green Methanol	Methanol Derivatives Production	Ammonium Nitrate Fertilizer Production
Capacity	40,000 t/y potential to increase to 200,000 t/y	140,000 t/y	1,200 t/d of ammonia 1,830 t/d of nitric acid 2,400 t/d of ammonium nitrate
Investments	$450 million	$120 million	EGP 10 billion
Partners	ANRPC & EBIOL	ECHEM, local banks & companies	AFC, EGPC & ECHEM



The petrochemicals industry has experienced a significant expansion, contributing approximately 3% of the gross domestic product (GDP) and 12% of the industrial sector. In alignment with the MoPMR's objective to increase CO2 reduction endeavors, the ministry has endeavored to produce green petrochemicals to elevate added value and fulfill the demands of the domestic market for green petrochemical products, thereby reducing the import bill and bolstering foreign exchange reserves.

Green production initiatives in petrochemicals have been realized through a series of green projects concentrated in the El Alamein and Damietta regions. Furthermore, a group of projects have been implemented to support this industry in achieving a blend of clean and renewable energy.

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