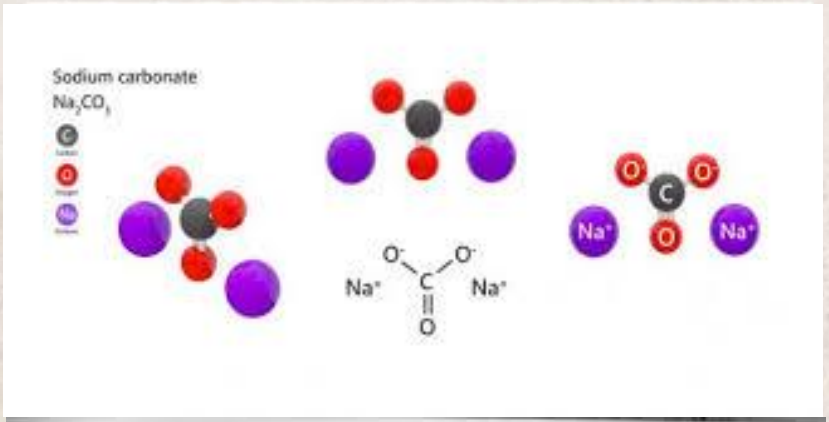
Central Department of Feasibility Studies
and Investment Costs Estimation

General Department of Economic Feasibility Studies

Summary of a Preliminary Feasibility Study on Manufacturing Sodium Carbonate



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INVEST IN EGYPT

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Summary of a Preliminary Feasibility Study on Manufacturing Sodium Carbonate

Chemical Industries Sector*

Project General Description

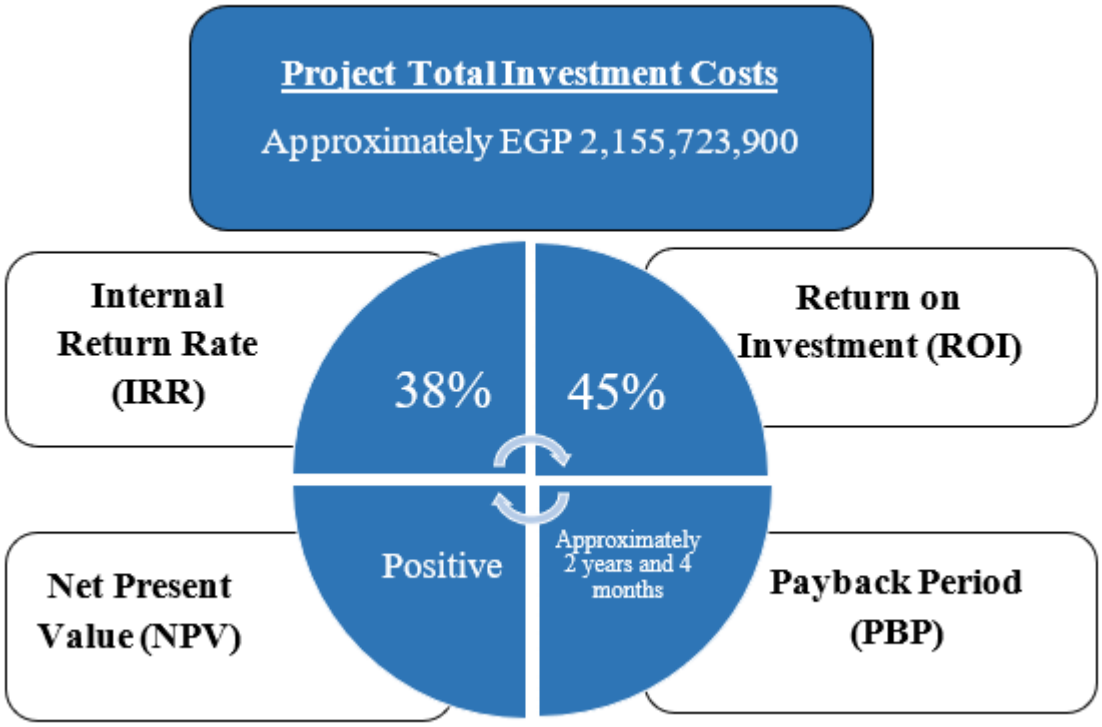
- The study aims to produce sodium carbonate – sodium bicarbonate – calcium chloride (by-product).
- Sodium carbonate is known as a chemical compound with the chemical formula Na_2CO_3. It is sometimes referred to as soda ash or washing soda. It is characterized as a strong alkaline substance with many uses in various industries.
- Sodium carbonate typically exists as a white powder and is an alkaline chemical that can occur naturally as a mineral or be produced industrially through a chemical process called the Solvay process.
- The Solvay process, also known as the ammonia-soda process, is a chemical process used to produce sodium carbonate from readily available raw materials such as salt (sodium chloride) and limestone (calcium carbonate). This process was developed by the chemist Ernest Solvay in the mid-19th century and is primarily based on the reaction between calcium carbonate and sodium chloride in the presence of ammonia as a catalyst to produce sodium carbonate.
- The production of sodium carbonate is considered a fundamental industry in both the global and local markets, with global production ranging from 55 to 60 million tons annually. The United States and China are the largest producers of sodium carbonate globally, accounting for half of the world's production. Other countries, such as Russia, Turkey, India, and several others in Europe and the Middle East, also produce substantial quantities of sodium carbonate.
- The Egyptian market represents a promising and strong consumer market for such industries. Egypt benefits from its strategic location, which allows it to easily and quickly export goods to several countries in Europe, Africa, and Asia. Additionally, Egypt is characterized by advanced infrastructure, including roads, electricity networks, irrigation systems, and ports.

* The data mentioned in this study are preliminary, estimated, and indicative material retrieved from the competent authorities for the purposes of promoting the investment opportunities available at GAFI. Accordingly, they may not be used before banks, the judiciary, or any other government entity or any third party.

The Investment Opportunity and the Location of the Project

- Project Location: According to the technical study, the project can be established in any Industrial Zone where chemical industries are permitted.
- Project Surface Area: According to the data provided by the relevant entities and available on the Investment Map, the project can be established on a surface area ranging from 50,000 m² to 116,000 m².
- Allocation Method: Usufruct rights at a rate of EGP 220 per square meter (indicative price), with a total cost of EGP 26,100,000.

Project Key Financial Indicators



The Outcomes of the Legal Feasibility Study

- According to the provisions of Investment Law, the chemical industries sector is one of the sectors governed by the law, and the State gives it attention and provides incentives to encourage it.
- According to the size of the project and the investments required to establish it, it is preferred that the incorporated business activity take any of the corporation forms, including joint stock company, which help manage the project independently of the ownership rights of the shareholders and this provides flexibility and ease in dealing with government and executive entities.
- The project may be established in a form of sole proprietorship, partnerships, limited liability company, or joint stock company. It is recommended to establish the company

in accordance with the provisions of Investment Law No. 72 of 2017 in order to benefit from the investment incentives designated for such activities.

- When obtaining an operational license from the relevant authorities, there are legal requirements that must be met as follows:
  - The applicant must satisfy the requirements of the relevant authority as well as the local administrative unit/city hall in whose jurisdiction the project site is located.
  - The applicant must also satisfy civil defense and fire department requirements.
- All chemical industries are subject to the supervision of the Chamber of Chemical Industries, which is one of the chambers of the Federation of Egyptian Industries (FEI). It is responsible for representing the interests of its members and providing services and support to various chemical industry sectors, including the sodium carbonate industry, and thus increasing its competitive capability.
- In the case the project relies on some types of raw materials imported from abroad, it must obtain an import card for this purpose. In case of exporting, it must obtain an export card specifying the nature and description of the products being dealt with. The project may also export directly by relying on intermediary companies that handle the export procedures and customs clearance on behalf of the project.

The Outcomes of the Environmental Feasibility Study

- The environmental feasibility study is defined as the study that explains the degree of protection and maintenance achieved for the environment, by taking into account its absorptive capacity or its maximum capacity to withstand human activities aimed at exploiting environmental resources without the occurrence of environmental degradation or depletion on the short and long term, whether directly or indirectly.
- Environmental feasibility studies are considered one of the pillars of environmental protection and preservation. Environmental feasibility studies for various development projects are an essential necessity to achieve sustainable development, alongside economic feasibility studies, which aim to ensure that the project achieves the maximum possible material benefits without considering the environmental conditions, capabilities, and the potential negative impacts of the project on the environment.
- The project is classified as a Category (C) project listed as number (3) in the environmental classification projects list in accordance with Item (7) of Article (14 bis) of Law No. (105) of 2015 issued on October 19, 2015 on the amendment of Environment Law No. (4) of 1994 and its Executive Regulations as amended, and as per Minister of Environment Decree No. (16) of 2016. The project shall prepare environmental impact assessment studies, and previews and standards shall be done in accordance with the environmental classification sample (C) and Environment Law requirements, taking into account satisfying the governmental fees prescribed for such classification. The project must also comply with the environmental requirements specific to this activity due to the nature of the industry.
- The project is subject to strict occupational health and safety requirements to ensure the safety of workers and guarantee the safety of the product handled by the project at all stages of its production. This includes the management of solid and liquid waste, such as calcium chloride, and the recycling of by-products and waste, such as the use of calcium chloride in other applications.

The Outcomes of the Social Feasibility Study

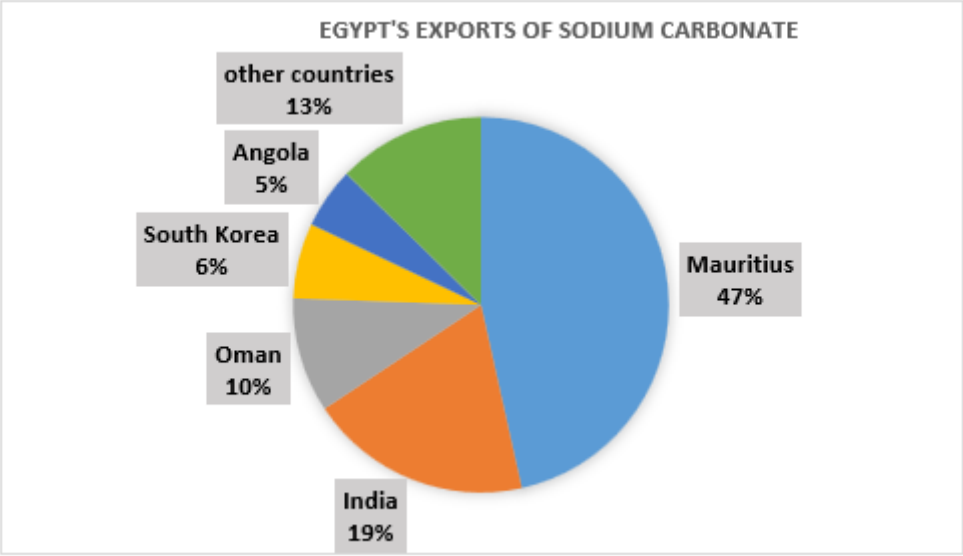
- The social feasibility study is designed to analyze the social benefits and costs associated with various projects, ultimately aiming to select those that maximize social welfare. Unlike other types of feasibility studies, the social feasibility study focuses on the project's social impact and its contribution to achieving broader economic and social goals within the community.
- Investment projects are considered one of the fundamental pillars in the economic development process of the State and a means to achieve the desired economic, social, and developmental goals, which ultimately reflects in achieving good levels of welfare for society.
- The project helps create new job opportunities and reduce the unemployment rate in the community. It directly employs different types of labor through work in the project itself, and indirectly through the supply and distribution chains the project interacts with. The project provides approximately 50 direct job opportunities, as well as indirect job opportunities.
- The project contributes to the national program for import substitution, benefiting society by relying on local manufacturing, saving foreign currency, and promoting industrial localization.
- In light of the above, the feasibility of the project from a social perspective becomes clear.

The Outcomes of the Marketing Feasibility Study, Growth Drivers, and Competitiveness

1. The project aims to produce Sodium carbonate – Sodium bicarbonate – Calcium chloride (by-product).
2. The project contributes to increasing local production of the product and reducing the import ratio to fill the gap of trade balance deficit.
3. Egypt's strategic location contributes to the ease of exporting to Asia, Africa, Europe and North America.
4. The availability of raw materials contributes to the production process and reaching the largest number of customers.
5. One of the drivers of growth and competitive strength for the activity under study is Egypt's signing of several international trade agreements, including:
   - The Greater Arab Free Trade Area (GAFTA);
   - The Common Market for Eastern and Southern Africa (COMESA);
   - The Agadir Agreement;
   - The Partnership Agreement between Egypt and the European Union;
   - The EU-Egypt Association Agreement (EFTA);
   - Qualified Industrial Zones (QIZs) Agreement; and
   - The Free Trade Agreement between Egypt and the Southern Common Market (MERCOSUR).

Supply Volume

- In accordance with World Bank data of 2022, Egypt ranked 44th out of a total of 117 countries worldwide in sodium carbonate exports, with an export value of approximately $1.8 million out of the global total of approximately $5.58 billion. Egypt's share of global sodium carbonate exports is approximately 0.0003%.
- In accordance with World Bank data, the number of countries to which Egypt exports is approximately 19. The largest countries to which Egypt exports sodium carbonate can be illustrated in the following chart:
  - Mauritius ($853 thousand, representing 47% of Egypt's total exports)
  - India ($351 thousand, representing 19% of Egypt's total exports)
  - Oman ($181 thousand, representing 10% of Egypt's total exports)
  - South Korea ($119 thousand, representing 6% of Egypt's total exports)
  - Angola ($96 thousand, representing 5% of Egypt's total exports)
  - Other countries ($232 thousand, representing 13% of Egypt's total exports)

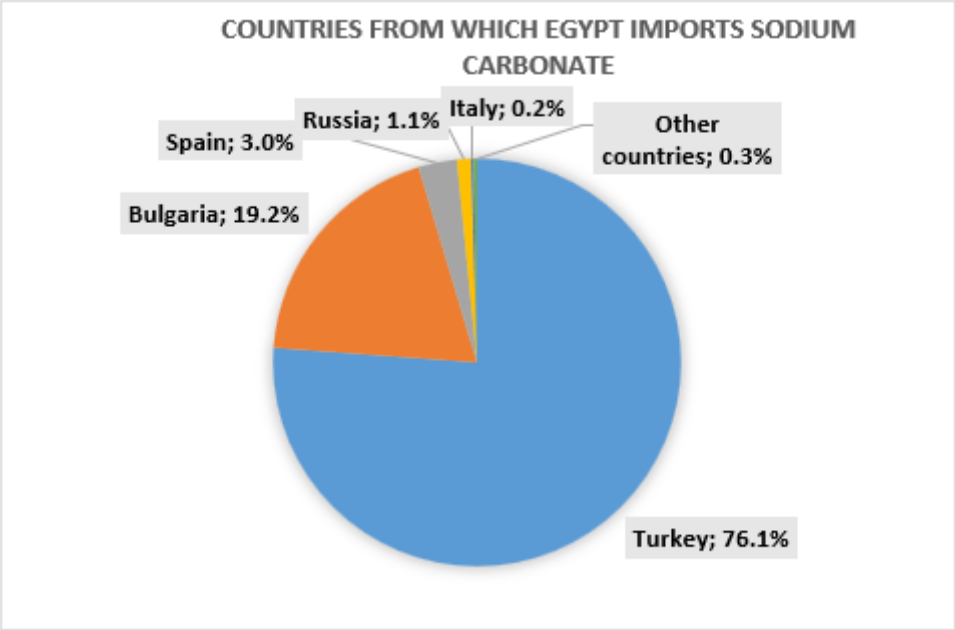


The graph is developed as per WB data of 2022

Demand Volume

- According to World Bank data for 2022, Egypt ranked 10th out of a total of 194 countries worldwide in sodium carbonate imports, with Egypt's total imports amounting to approximately $161.5 million out of the global total of approximately $5.58 billion. Egypt's share of global sodium carbonate imports is approximately 0.03%.
- According to World Bank data, the number of countries from which Egypt imports sodium carbonate is approximately 13. The largest countries from which Egypt imports can be illustrated in the following chart:
  - Turkey ($122.9 million, representing 76.1% of Egypt's total imports)
  - Bulgaria ($31 million, representing 19.2% of Egypt's total imports)
  - Spain ($4.9 million, representing 3% of Egypt's total imports)
  - Russia ($1.8 million, representing 1.1% of Egypt's total imports)

- Italy ($303 thousand, representing 0.2% of Egypt's total imports)
- Other countries ($426 thousand, representing 0.3% of Egypt's total imports)



The graph is developed as per WB data of 2022

Market Gap

- Based on the above, it is clear that Egypt is experiencing a trade deficit in sodium carbonate products.
- In 2022, Egypt exported approximately $1,835,519 and imported approximately $161,533,233. This can be illustrated in the following chart:

The graph is developed as per WB data of 2022

- It is clear from the previous chart that there is a domestic deficit in sodium carbonate production amounting to approximately $159,697,714, which presents an opportunity for the project under study to substitute imports and export abroad.

Global Market

- The global sodium carbonate market is witnessing significant growth due to the increasing demand from several industries, such as the glass, chemicals, detergents, and pharmaceutical sectors.
- The market size is expected to reach over $25 billion by 2029, with a compound annual growth rate (CAGR) of approximately 6.6% from 2024 to 2029.
- Glass is the largest consumer of sodium carbonate, especially in regions such as North America and the Asia-Pacific, where sodium carbonate is primarily used in the production of flat glass and glass containers that meet the needs of the construction and packaging sectors.
- Sodium carbonate also has emerging uses, including the production of lithium batteries used in electric vehicles, as well as its role in environmentally friendly technologies such as flue gas desulfurization systems, which help reduce air pollution.
- One of the main challenges facing the sodium carbonate production market is the fluctuation in raw material prices, such as coal and natural gas, which affects production costs. Despite these challenges, the growth in industries consuming sodium carbonate and the shift toward more sustainable production processes will drive the market's growth positively in the coming years.
- The Asia-Pacific region is one of the dominant areas in the market, where the demand for glass is accelerating due to the growth of the construction and manufacturing sectors. This is followed by North America, which benefits from its natural sodium carbonate (soda ash) resources.
- These regions are expected to continue leading the market with the growing focus on sustainable development and the increasing number of industrial applications for sodium carbonate.