Ministry of Foreign Affairs

TA Quick scan in the Egyptian Economy in the sectors of: Renewable Energy, Ports, Development & Waste Management

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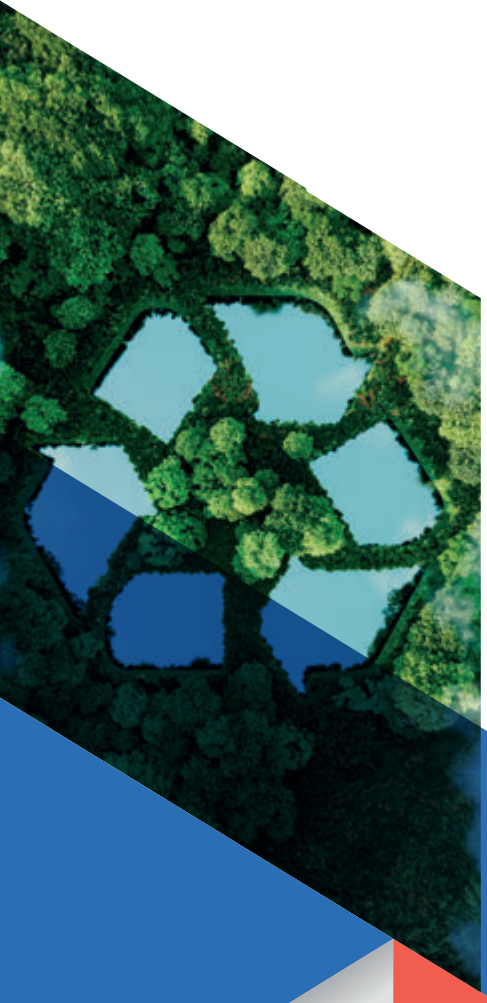

A Quick scan in the Egyptian Economy in the sectors of: **Renewable Energy, Ports' Development, & Waste Management**

Submitted to The Embassy of the Kingdom of the Netherlands in Cairo

About PractiQ Consulting

PractiQ Consulting is a management consultancy firm specialised in managing transformations through technology- friendly enablement. PractiQ Consulting operates across different functional streams including decision support, operations efficiency and capacity building using transformational approaches that best-fit organizational maturity.

info@practiq-consulting.com
Tel +2 010 2655 6661
82 Akhnaton St., 2nd Floor, Fifth Settlement,
Cairo, Egypt 11835
www.practiq.net

> For conducting this market study, various references and reports have been used.
> To access these reports, you can scan this QR Code.

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Glossary

RE	Renewable Energy
PD	Port Development
WM	Waste Management
SCE	The Supreme Council of Energy
MoERE	Ministry of Electricity and Renewable Energy
MoP	Ministry of Petroleum
EgyptERA	Egyptian Electric Utility & Consumer Protection Regulatory Agency
EgyptGRA	Gas Regulator
EEHC	Egyptian Electricity Holding Company
EETC	Egyptian Electricity Transmission Company
HPPEA	Hydro Power Plants Executive Authority
NREA	New and Renewable Energy Authority
RCREEE	Regional Center for Renewable Energy and Energy Efficiency
IRENA	International Renewable Energy Agency
UN	United Nations
EU	European Union
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
JICA	Japan International Cooperation Agency
NGOs	Non-Governmental Organizations
MW	Megawatt
TW	Terawatt
W	Watt
GW	Gigawatt
WH	Watt hour
MWH	Megawatt hour
GWH	Gigawatt hour
TWH	Terawatt hour
PV	Photovoltaic
CSP	Concentrated Solar Power
SWH	Solar Water Heater
EEAA	Egyptian Environmental Affairs Agency
BSRD	Bioenergy for Sustainable Rural Development Project
FIT	Feed-in-Tariff
BOO	Build, Own, Operate
BOT	Build, Own, Transfer
EPC	Engineering, procurement and construction
IPP	Independent Power Producer
PPP	Public–Private Partnership
% y-o-y	Year-Over-Year Percent
MoT	Ministry of Transportation

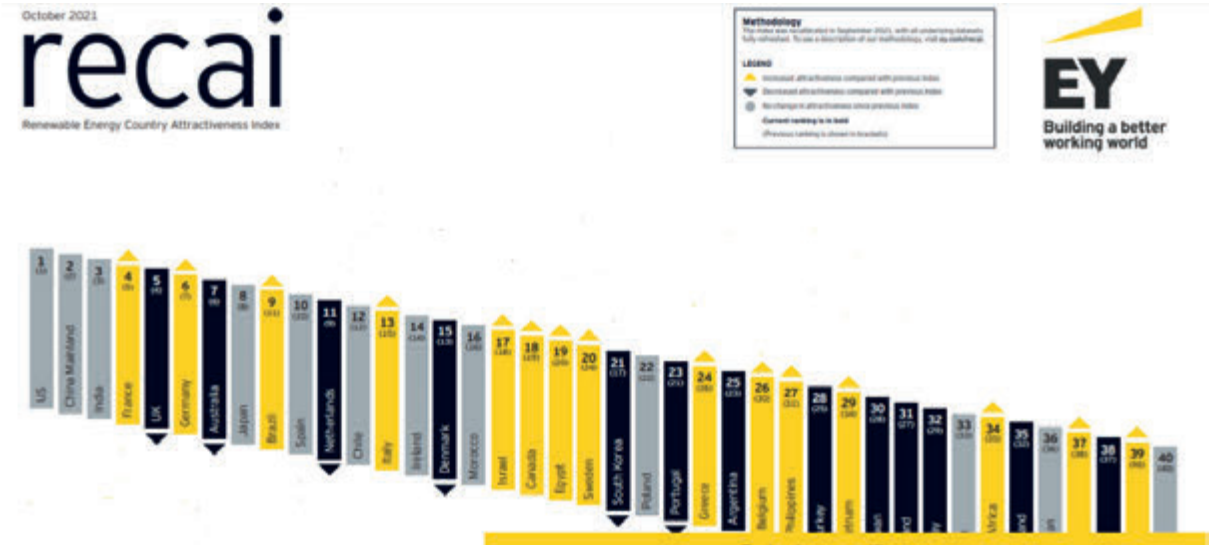
MoIC	Ministry of Investment and International Cooperation
MTI	Ministry of Trade and Industry
MoHESR	Ministry of Higher Education & Scientific Research
MTS	Maritime Transport Sector
EAFMS	Egyptian Authority for Maritime Safety
RTA	River Transport Authority
SCA	Suez Canal Authority
SCZ	Suez Canal Zone
GALDP	General Authority for Land Ports and Dry Ports
MRCC	Maritime Research & Consultaion Center
IT	Information Technology
AASTMT	Arab Academy for Science, Technology, and Maritime Transport
COMESA	Common Market for Eastern and Southern Africa
GAFTA	Grain and Feed Trade Association
EFTA	European Free Trade Association
FTAs	Free Trade Agreements
MERCUSOR	Brazil, Argentina, Uruguay, and Paraguay
GCMA	Greater Cairo Metropolitan Area
GDP	Gross domestic product
TEU	Twenty-foot equivalent unit
AIS	Automated Identification System
HPC	Hamburg Port Consulting Center
EEAA	Egyptian Environmental Agency
MoE	The Ministry of Environment
MOHP	Ministry of Health and Population
MWRI	Ministry of Water Resources and Irrigation
MCIT	Ministry of Communication and Information Technology
ANGD	The National Waste Management Agency
WMRA	Waste Management Regulatory Authority
NSWMP	National Solid Waste Management Program
SWEEPNET	The Regional Solid Waste Exchange of Information and Expertise
NMMC	Network in Mashraq and Magreb countries
BMZ	German Ministry for Economic Cooperation and Development
KFW	German Bank for Reconstruction
SECO	State Secretariat for Economic Affairs
GAFCB	General Authority for Cleanness & Beautification
WB	World Bank
GEF	Global Environment Facility

Executive Summary

According to Ernst & Young (EY) and the Renewable Energy Country Attractiveness Index (RECAI), Egypt is among the world's top 20 attractive markets for in renewable energy investment.

With the growing need for renewable energy resources and many green initiatives undertaken by countries and companies alike, investors are on the lookout for profitable investments in the sector.

Figure 1: The Renewable Energy Country Attractiveness Index (RECAI)_ October 2021



Rank	Previous rank	Movement on previous index	Country/region	RECAI score	Technology-specific scores: Onshore wind	Offshore wind	Solar PV	Solar CSP	Biomass	Geothermal	Hydro
19	20	▲	Egypt	57.8	48.2	15.4	54.5	35.3	20.4	12.0	23.6

With a total installed capacity of 5,500MW, including 2,800MW of hydro-power and around 2,700MW of wind and solar energy, Egypt has Reaffirmed its commitment to the widespread adoption of renewable energy (RE) technology. Today, Egypt boasts several renewable energy promotion programmes, including competitive bidding, feed-in tariffs (FIT), and private power producers (IPP).

The major pillars of Egypt's energy strategy are supply security, competitive markets, sustainability, and establishing Sufficient supply and energy infrastructure capacity for renewable energy.

To specify various technical assistance and business opportunities in each part of the value chain in the RE market, each RE system has to be studied separately. Egypt's leading renewable energy systems include: hydro-power, wind farms, solar PVs, concentrated solar power (CSP), solar water heater (SWH), biomass, waste-to-energy technologies, and geothermal energy.

Egypt is an attractive market for renewables investment due to the government's ambitious renewable energy targets, considerable natural solar and wind potential, developing domestic component manufacturing capabilities, and a competitive and liberal power market.

The Egyptian market is a promising one with many opportunities to be created in various sectors based on the Egypt Vision 2030. Port development is one of these industries. Egypt has the potential to become a commercial hub for the Eastern Mediterranean. This can be done in two ways: through the Suez Canal, which connects Asia and Europe, and by land, which connects Mashreq and Maghreb.

As a result of improved modal choices for people and freight, a more integrated transportation system would allow Egypt to enjoy significant efficiency gains. To improve the global competitiveness and exploit the ports and surrounding areas, particularly around the Suez Canal, four Egyptian ministries have established a comprehensive strategy to expand commercial ports.

These ministries are the Ministry of Transportation, the Ministry of Investment and International Cooperation, the Ministry of Higher Education, and the Ministry of Trade and Industry. The four ministries will collaborate with the Arab Academy for Maritime Transport, the Suez Canal Authority (SCA), and the General Economic Authority for the Canal Zone.

The following map shows Egypt's 15+ ports, each having numerous development prospects.

Figure 2: Egyptian Ports Map

Egypt's renewable energy market isn't the only one that offers investment opportunities. Both the waste management and ports markets offer much promise for investors.

Egypt is the Middle East's most populated country, with about 103 million people. In 2016, 21.7 million tonnes of municipal solid waste were generated. Due to population growth and changing consumer habits, waste generation is expected to increase at 3.4% per year. Moreover, available waste management services and infrastructure are unable to keep up with the rate of increase. Only 60% of waste is collected and less than 20% is effectively disposed of or recycled.

A significant amount of the total waste ends in canals, rivers, streets, and open spaces. With no measures to reduce this environmental damage, the ecosystem is negatively impacted and Egypt is seeing an increase in water, soil, and air pollution, as well as landscape disfigurement. These impacts also threaten human and animal health and are negatively impacting the economy, particularly the tourism industry. As a result, many initiatives are emerging to fully control Egypt's waste management process, presenting several investment opportunities in this sector. The government also has a vision to incorporate the private sector into its waste management plans.

Currently, the government hires the private sector to serve as the backbone of solid waste management. It also assists the industrial sector and other sectors handle non-hazardous/hazardous waste, whether solid or liquid. Types of waste management paths depend on the type of waste, including municipal solid waste, agriculture waste, canals and irrigation network cleansing, and construction waste.

Egypt has launched several fundamental reforms since the Egyptian Pound (EGP) was first floated in November 2016. Egypt was one of the fastest-growing emerging economies before the COVID-19 outbreak, having completed a series of rigorous macroeconomic reforms as part of a three-year, $12 billion International Monetary Fund (IMF) programme. Egypt was the only economy in the Middle East and North Africa (MENA) to see a positive economic growth in 2020, despite the pandemic.
Egypt's principal regulatory and facilitation institution for foreign investment, the General Authority for Investment (GAFI), including the Investor Service Center (ISC), serves international investors interested in Egypt's domestic economy and the country's competitive potential as a "one-stop-shop" export port to Europe, the Middle East, and Africa.

This project has the following objectives:

- ☑ Explore the demand of Egypt for TA and B2B opportunities in the field of: RE, PD, and WM.
- ☑ Mention relevant available market researches and business articles on RE, PD AND WM that give an insight in the sectors and its business opportunities
- ☑ Study the key Egyptian players in all three sectors.
- ☑ Recommendations who to contact and how to enter the market.

Overview of the Egyptian economy

with a short introduction to the renewable energy, ports, and waste management sectors

The Egyptian economy has shown resilience in the pandemic's aftermath

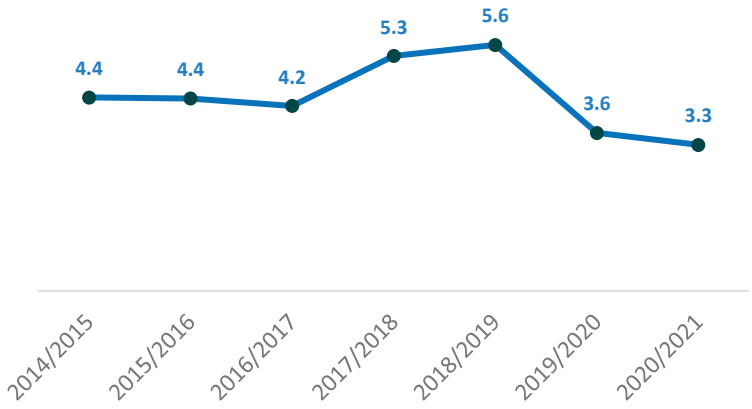
The Egyptian economy's ability to record consistent positive real economic growth rates over the past years and especially amid the pandemic-induced economic downturn indicates how resilient the economy is. The World Bank expects Egypt's economy to record 5.5% growth in FY 2021/22 and FY 2022/23.

INTRINSIC GROWTH DRIVERS

Population Growth & Private Consumption

At 100+ million, Egypt's population is by far the largest in the MENA region with an average annual growth of 2.3%. This provides a solid domestic consumption base.

Real GDP Growth (%)

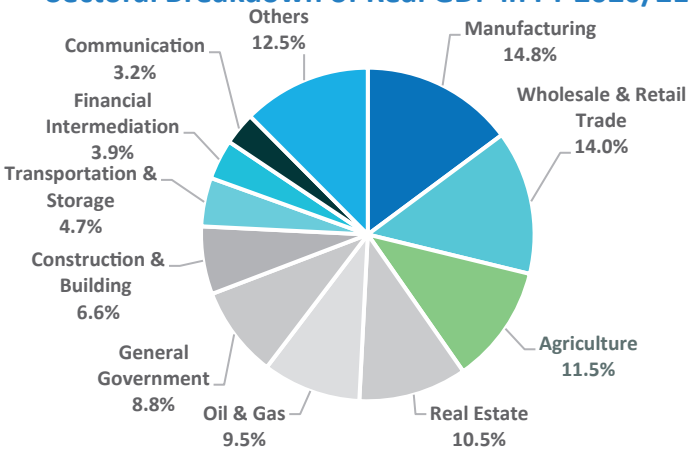


THE DIVERSITY OF EGYPT'S ECONOMY

Sectors' Share in GDP

Diversity is a key strength in the Egyptian economy where growth is driven by many sectors, both conventional and unconventional.

Sectoral Breakdown of Real GDP in FY 2020/21



9%
Real GDP Growth Rate H1 FY 2021/22

86.7%
Share of Private Consumption from Real GDP in FY 2020/21

104+ mn
Total Population March 2022

USD 5.2 bn
Net Foreign Direct Investment FY 2020/21

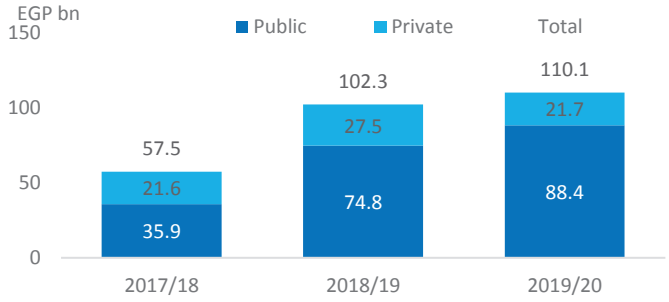
Long strides taken in the transport and logistics infrastructure

The transport infrastructure has improved significantly in the past 5 years backed by the government's increased investments. The transport and warehousing infrastructure have attracted investments from different large players.

PUBLIC INVESTMENTS HAVE MORE THAN DOUBLED

Total Implemented Investments in the transport and logistics sector (EGP bn)

The quick improvements in the sector were a result of the government's commitment, swift allocation of resources, and efficiency in implementation.



TRANSPORT & CONNECTIVITY SCORES, EGYPT VERSUS PEERS

While the economy moved up four places (from 56th to 52nd) in the infrastructure pillar of the Global Competitiveness Index 2019 (WEF, 2019), and made considerable strides in areas such as maritime connectivity, it has much to do to improve connectivity with the rest of the world in other areas that are relevant to today's globalised world.

183k KM
Paved road network

9,570 KM
Railway network

21
Airports

98% mobile penetration
57.3% internet penetration

Egypt's youth talent pool is the largest in the region

At about 30 million, Egypt's labour pool is the largest in the region. For decades, Egypt has had a reputation as a net regional exporter of educated, skilled labour. It is worth noting that according to Oxford Business Group, Egypt has 480,000 new university graduates each year.

YOUNG & SKILLED LABOUR FORCE

As a result of the combined investment by the government and multinational companies, Egypt boasts a sizable enough talent pool for most companies looking for outsourcing or technology development capabilities.

29.7 mn
Labor Force
December 2021

481,000
Public and Private Universities Graduates
2020

74
Universities Nationwide
(34 public, 40 private)

53/154
2021 Global Knowledge Index Ranking

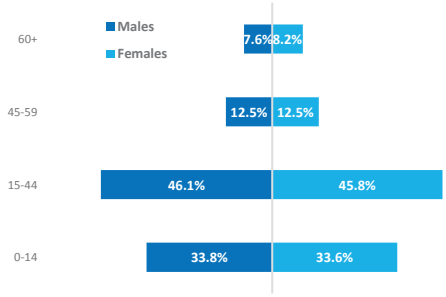
Egypt has a large and promising youthful market with almost 80% of the 103+ million population under the age of 45. **Egypt has emerged as a consumer market of significant importance in the region, as witnessed by the arrival of dozens of global brands and the sharp expansion of retail sales in the past years.** ***This is reflected in Egypt's 23rd global ranking in Market Size by World Economic Forum**.*

104+ mn
Population
March 2022

Source: MPED & CAPMAS

2.1%
Average Annual Population Growth
(2011-2020)

AGE BREAKDOWN



Renewable Energy, Ports, Waste Management Sectors in Egypt

Egypt is committed to increasing renewable energy in the national energy mix

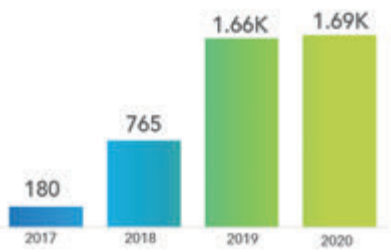
Egypt's government has designed an integrated and sustainable strategy to satisfy the rising energy demand to diversify energy sources and assure energy supply stability. In addition to rehabilitation and maintenance initiatives in the power industry, the plan intends to boost the role of renewable energy and increase energy efficiency.

A 20% Target

Egypt is committed to the widespread deployment of renewable energy technologies. As specified in the ISES to 2035, the Egyptian government has set renewable energy targets of 20% of the electricity mix by 2022 and 42% by 2035.

The 2021 edition of the New and Renewable Energy Authority's harvest report revealed that the renewable energy projects under development amount to 3,570 MW with investments amounting to $3.5bn, 78% of which is for solar energy and 22% for wind energy.

Total Solar Energy Installed Capacity in Egypt (MW), 2021



Egyptian ports, a ripe segment for investment and growth

Egypt's Ports Complex is ranked 18th globally, with upgrades expected to boost exports by $12 billion

During the fiscal year 21/22, Egypt's transportation sector witnessed an investment boom with assets exceeding EGP 240 billion and the ports industry surging by 104%. In addition, Egypt's ministries and concerned bodies are collaborating to support the sector's growth and transform the country into a regional hub.

QUICK FACTS

3000 km Total lengths of the Egyptian coast

53 Total number of Egyptian seaports (15 commercial, 38 specialised)

3 Total ports under construction Jarjoub, Abu Qir in the Mediterranean, and Ras Banas in the Red Sea.

Egypt's waste management sector, a fertile ground for growth

Though it's one of Egypt's most promising sectors, the waste management sector is also one of the most distressed sectors due to the country's massive population and limited resources. In 2016, Egypt produced 90 million tonnes of waste, only 60% of which was collected and only 20% was properly recycled or disposed of.

Why Invest in Egypt

Foreign Direct Investment Policies

Egypt's government has announced plans to improve the country's business climate by encouraging investment, enabling trade, upgrading business services, and implementing investor-friendly legislation. The Investor Service Center (ISC) is a GAFI administrative unit, the General Authority for Investment, that serves as a "one-stop-shop" for international investors interested in the Egyptian domestic economy and the country's competitive potential as an export port for Europe, the Middle East, and Africa.

Availability of raw material

Egypt owns several gas reserves in the Mediterranean region, including the massive Zohr field, the western Nile Delta, and the Atoll gas field, located in the Mediterranean Sea's deep seas north of Damietta. The total amount of petroleum reserves has risen to 1162,000 metric tonnes. Glass sand is a treasure mine of natural resources available in significant quantities in Sinai, compared to other local and global places. Black sand is found in 4.1 million tonnes, and gypsum rocks are one of the medical forms and come in a variety of shapes and sizes.

Skilled Labour

Egypt is one of the region's most significant countries acquiring and exporting skilled labour, including accountants, lawyers, information and communications technology specialists, engineers, technicians, and designers. As a result, a new industrial training programme has been developed to train workers to fill about 500,000 new manufacturing jobs in low-cost economic zones.

Access Possibility

Egypt enjoys a strategic Mediterranean Sea location, with Sudan to the south, Palestine and the Red Sea to the east, and Libya to the west, all of which promote Egyptian-neighboring nation economic cooperation in the petroleum area, among other things; to rehabilitate the energy industry infrastructure. The Suez Canal is one of the world's most critical commercial waterways, allowing traders to carry and ship goods between Asia, Europe, Africa, the Far East, and the Middle East more freely and readily than the rest of the world.

Location

Egypt's strategic location on the Red Sea and the Mediterranean makes it ideal for reaching key global markets in the Middle East, North Africa, Asia, and Europe. Egypt is blessed to have the Suez Canal, which, due to its unique geographic location, is considered the quickest route between east and west.

Consumer Market

Egypt has emerged as a consumer market of significant importance in the region, as evidenced by the arrival of dozens of investing global brands and the sharp expansion of retail sales in recent years. Egypt is also Africa's and the Middle East's most populous country (1,292.745 million international dollars). According CAPMAS, October 2022, Egypt has over 104 million people.

Different Investment Schemes

1. Internal Investment system: All investment projects built on local zones are included in the internal investment system, and foreign investors can own 100% of the investment projects they demonstrate on Egyptian soil. Using Investor Service Centers (ISCs), offer services such as incorporating businesses and their branches, changing a business's activity, and initiating liquidation proceedings, among other things.

2. Free Zones: The Egyptian free zones benefit from the best advantages and assurances globally. It is part of the country, but it is not liable to its customs, import, or tax restrictions. To take advantage of Egypt's geographic location, it exists near seaports and airports. At the End of November 2021, there were 1096 operating projects within the free zone system with a capital investment of up to USD 13.4 billion, creating 183000 job opportunities.

3. Investment Zones: Investment Zones are geographical areas with limits designated for creating specialised investment activities and other auxiliary activities. A Prime Ministerial edict establishes these zones. According to the construction decree's timetable, each investment zone must have a developer to operate, develop, or promote the area. Technological zones are one type of investment zone, although they only focus on the Information and Communication Technology (ICT) business.

In addition to the different investment schemes, it is worth mentioning that Egypt's free zones **enjoy many advantages and global assurances, including:**

a. Investors have the freedom to move their funds and income from their investment enterprise abroad.

b. Investors can choose their investment project's commercial activity and legal framework.

c. Except for investment projects in Sinai, there are no restrictions on the nationality of the shareholders.

d. Foreign investors are given residency privileges, while foreign workers are awarded work permits based on the project's requirements.

e. Imported equipment and machinery are not subject to customs duty.

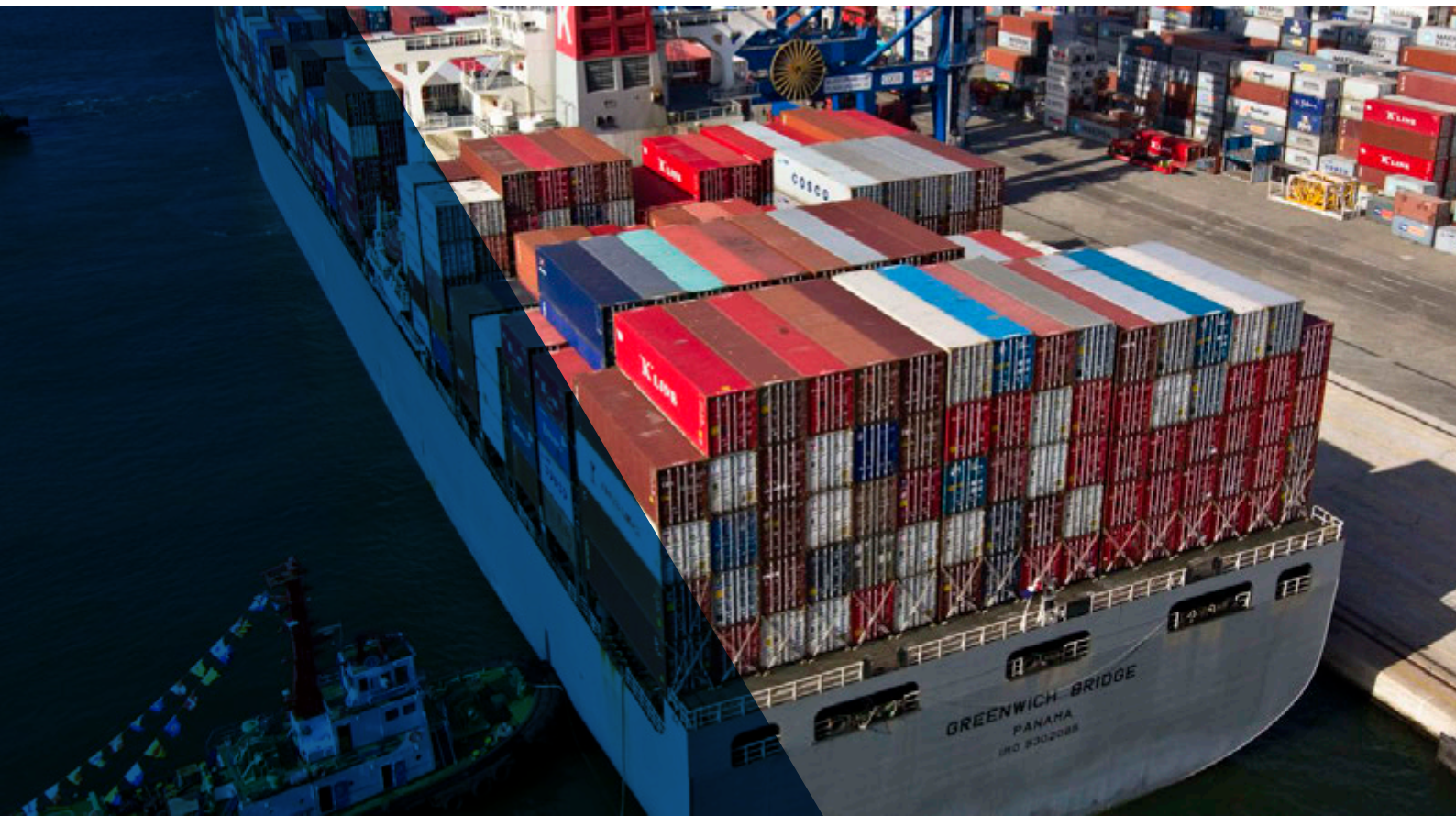
f. To deal with multiple state agencies, a free zone project needs its license to operate.

g. Imports and exports to and from a free zone project are not subject to any standard customs procedures or importation rules within the State.

h. Imports from the local market are exempt from the value-added tax under a free zone project (VAT).

i. If the commodities are sold in the local Egyptian market, all local components of goods produced by a free zone initiative are exempt from customs taxes.

As for the country's investment zones, by December 2021, Egypt had eight investment zones in Cairo, Giza, Sharqia, and Damietta, with 960 projects totalling EGP 30.5 billion in investments. These projects have also generated nearly 82,000 in new jobs.



Egypt's New Investment Law

Guarantees For Investors:

To stimulate new development in Egypt, the new investment law provides a variety of protections for overseas investors:

• Foreign investors will be treated equally to Egyptian citizens under the law.

• With the consent of the Council of Ministers, foreign investors may now be given special treatment.

• Arbitrary procedures or discriminatory choices will not control investments.

• There will be no nationalization of investment projects.

• No administrative authority can cancel or suspend investment project licenses without adequate notice, due procedure, and the opportunity to remedy any concerns.

• Throughout the duration of a project, foreign investors are guaranteed residency in Egypt.

• Investors have the option of transferring their gains to another country.

• Investors' projects can have up to 10% foreign staff, while investment corporations can have 20%.

• Employees of investing firms from other countries have the right to transfer their compensation abroad.

Inducements to Invest:

The law includes policies to encourage major and focused investments to attract global investors:

• **General Incentives:** Companies will be excused from paying 2% of imported equipment and machinery value in customs taxes. On articles of association, mortgages, loan agreements, and land contract notarizations related to their investment, they will also excluded from stamp tax and registration fees.

• **Special Incentives:** The new law allows for deductions from taxable net income based on an upcoming investment map, which will label investment locations as sectors A and B. Investors will receive a 50% discount on investment costs in sector A and a 30% discount on investment costs in sector B for defined priority activities.

• **Additional Incentives:** Egypt's council of ministers may issue additional incentives, which the General Authority for Investment and Free Zones' (GAFI) chairman will distribute. Subsidized utilities, the free distribution of land for important activities, and other incentives are examples.

Characteristics of The Investment Law

• **Unified Approval:** Companies establishing, operating, and managing strategic or national-interest projects, whether as public-private partnerships or related to public utilities, infrastructure, new and renewable energy, roads, and ports, are eligible for a single approval that covers the project's establishment, operation, and management. This will include the project's building permits and real estate allocation.

• **Investor Services:** Investors will be able to receive all permits from GAFI without having to deal with any other government agency. GAFI shall provide incorporation and post-incorporation services, collect all costs, and decide on completed incorporation applications within one working day of receipt. GAFI will also provide electronic ways for conducting incorporation activities. Investors will be assisted and represented before government agencies by private sector Approval Offices licensed and authorised by GAFI.

Mega Projects in Egypt

Definition: What are smart cities?

A smart city is a municipality that employs information and communication technology (ICT) to improve operational efficiency, public information sharing, and the quality of government services and citizen welfare. Smart cities enable three vital pillars for the country and community: smartness, safety, and sustainability. The importance placed on each of the pillars varies in each country, based on the country's requirements and priorities.

Why?

Egypt is seeking to build new smart cities such as the new administrative capital to lower the crowdedness of the major cities and to be able to manage assets, resources, and services efficiently.As part of the president's long-term infrastructuredevelopment goal, the Egyptian government plans to deploy 38 new smart cities across thecountry over the next few years. According to a statement from the Housing Ministry, these smartcities, also known as fourth-generation cities, will be erected on 530k feddans across the country,providing 4 million direct and 3 million indirectjobs. They are projected to attract 30 millionpeople once they are completed. Smart cities development projects include:

- New Al Alamain City
- Al Galala City
- New Mansoura

The primary example is the New Administrative Capital, located east of the Nile. It is envisaged that the new smart city will be the salvation of ancient Cairo, which is overcrowded with over 19 million people. Cairo is a bustling, congested city that is also one of the most polluted. The new capital offers a chance to transform ancient city of Cairo into an internationally appealing metropolis with pharaonic and Islamic architecture forms to represent its unique history.

Areas of improvement in the New Administrative Capital:

- Data Centres: The centres will monitor all innovative systems in cities and receive public complaints so that specialists can electronically resolve them.

Etisalat Misr is one of the companies working on data centres, with a total expenditure of up to $20 million on projects in the NAC alone and bidding for other smart city bids.

- Water and Energy management: By reading real-time data from smart water, electricity, and gas metres in each unit, a control centre adjusts water and energy use to keep it at ideal levels. Water-use tracking can cut costs by up to 15%, while sensors and systems that detect and correct problems quickly can cut costs by 25%. Thanks to new optimization techniques, water consumption can be decreased by up to 50%.

- Waste management: Sensors in the waste management systems assess how filled the garbage containers are and alert waste management services to empty them, allowing trucks to take the most efficient route and schedule possible. It also enables the efficient sale or disposal of waste. These applications can reduce solid waste volume per capita by 10%-12% and substantial unrecycled trash by 30-130 kg per person each year.

- Renewable Energy: Linking solar energy and other renewables to the national grids enhances the percentage of renewable energy of the total energy use in smart cities.

- Transportation systems: new transportation projects such as the monorail, light rail train, and high-speed railway connect the new smart cities to the rest of the country. Cities that adopt smart-mobility technologies have the potential to lower commuting times by 15-20% on average if they have robust transportation infrastructure in place.

Major Events in Egypt

Conference Of the Parties (COP27):

The United Nations Climate Change Conferences are referred to as COPs. These meetings aim to assess how far members of the United Nations Framework Convention on Climate Change (UNFCCC) have progressed in limiting climate change. The UNFCCC's main decision-making body is the Conference of Parties (COP), and it is made up of representatives from all the UNFCCC's signatories (or 'Parties'). The COP evaluates the effects of measures taken by the Parties to limit climate change with the UNFCCC's ultimate purpose.

On behalf of African countries, COP27 is in Sharm El-Sheikh, Egypt. It will take place from 7-18 November 2022. It will allow African countries to convey their fundamental point: poorer countries bear the brunt of climate change repercussions despite their small contribution to global emissions. Furthermore, they require more substantial help to mitigate risks and harms and meet "ambitious" zero-emission targets.

Egypt's leading position in Africa in green transformation is strengthened by hosting COP 27 in Sharm El-Sheikh. Hosting COP27 also offers more possibilities for collaboration and partnerships with development partners and international financial institutions (IFIs) to provide development and innovative funding. It is also a chance for Egypt to progress its climate action and accelerate the implementation of its Vision 2030 strategy.

Major projects in preparation for COP27:

Renewable Energy:

In terms of solar energy projects, two parcels of land in Sharm El-Sheikh have been allocated to construct two new solar power stations. With the two additional plants, the city now has four solar power plants with a total capacity of 20 megawatts. The number of stations is planned to grow in the coming period, with a total capacity of 160 megawatts. Workshops for investors and hotel owners titled "Together to deploy small solar power plants in Sharm El-Sheikh" are also being organised.

Central Park in Sharm El-Sheikh:

Ahead of COP27, the Minister of the Environment inked a cooperation protocol with the governor of South Sinai to construct a new central park in Sharm El-Sheikh. According to Egypt's Project Map, the central park would be developed on 30 feddans in front of the Sharm El-Sheikh City Council headquarters, with construction beginning in December 2021. The central park's design and dimensions are compliant with international sustainability requirements. By planting more trees to beautify the environment, improve air quality, and protect the land from environmental damage, the project should help achieve ecological balance and prevent desertification.

Transportation projects:

All petrol stations in Sharm El-Sheikh will be equipped with electric car charging stations. In addition, the city will install charging stations in parking lots and hotel garages. As part of its commitment to conserving the environment, Egypt's government is pushing ahead with plans to convert thousands of petrol-powered vehicles to run on natural gas. All buses and cars, including taxis, and all public transportation in Sharm El-Sheikh and Hurghada will be converted to run on natural gas or electricity.

Egypt's Business Climate

Over the past several years, Egypt has witnessed significant growth at the macroeconomic level. Prior to the COVID-19 pandemic, Egypt was one of the fastest-growing emerging markets. Despite the pandemic, Egypt was the only economy in the MENA region that witnessed positive economic growth in 2020. Before the pandemic, Egypt had floated its currency in November 2016 and carried out a series of macroeconomic reforms as part of a three-year $12-billion International Monetary Fund (IMF) programme.

In addition, Egypt is a signatory to more than a hundred bilateral investment agreements, including the US. It is a member of the World Trade Organization (WTO), the African Continental Free Trade Agreement (AfCFTA), and the Greater Arab Free Trade Area (GAFTA).

Foreign Direct Investment (FDI) Policies:

The first significant step in restoring investor confidence in Egypt was to float the Egyptian Pound in 2016 and continue Egypt's interbank foreign exchange (FX) market, which immediately increased portfolio investment and led to increased FDI in the long-term.

A new investment law and an industrial licencing law were enacted in 2017, followed by a new bankruptcy law in 2018 and a new customs law in 2020. Additional reforms targeted at decreasing regulatory overhang and facilitating doing business were enacted in 2018. Egypt's administration has declared measures to significantly enhance the business climate in the country by promoting investment, facilitating trade, improving business services, and enacting investor-friendly regulations.

The General Authority for Investment (GAFI) is Egypt's leading regulatory and facilitation authority for foreign investment, reporting directly to the Prime Minister. The Investor Service Center (ISC) is a GAFI administrative unit providing "one-stop-shop" services to international investors interested in the Egyptian domestic economy and the country's competitive capabilities as an export port for Europe, the Middle East, and Africa.

The ISC offers a full range of services to investors, including:

1. Aid with company formation, branch establishment, approval of Board of Directors and General Assembly minutes, capital increases, activity modifications, liquidation procedures, and other corporate-related problems.
2. Issue all necessary licences, approvals, and permissions for investment activity within 60 days of receiving a request.
3. Advice and assist in evaluating Egypt as a potential investment destination.
4. Identify relevant areas and site selection choices.
5. Identification of suitable Egyptian partners.
6. Services for follow-up and dispute resolution.

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Part 1

Overview of the Egyptian Economy and the Renewable Energy Market

Introduction

To satisfy the rising demand for energy, Egypt's government has designed an integrated and sustainable strategy to diversify energy sources and ensure energy supply stability. In addition to rehabilitation and maintenance initiatives in the power industry, the strategy intends to boost the role of renewable energy and increase energy efficiency. Egypt has
renewed its commitment to widespread adoption of renewable energy technologies, with a total installed capacity of 5,500MW, including 2,800MW of hydropower and roughly 2,700MW of wind and solar energy.

Renewable energy is emphasised in the 2035 Integrated Sustainable Energy Strategy, which builds on earlier strategies. Egypt aims to boost the percentage of electricity generated from renewable sources to 20% by 2022 and 42% by 2035.

Recently, Egypt began establishing new solar complexes, such as the Benban Solar Park, updating its energy strategy, and comprehensively assessing solar and wind energy capabilities. Egypt has developed a sustainable strategy to diversify energy mix through renewables, in a bid to meet the growing demand for energy.

The current state of renewable energy in Egypt is described in the following sections and includes key players at various levels, such as planning, regulation, and implementation. We also examine the Egyptian energy policy with a focus on renewable energy goals and ambitions. The sections that follow analyze the share of renewable energy compared to other resources, the governing regulatory framework, and current achievements in this field.

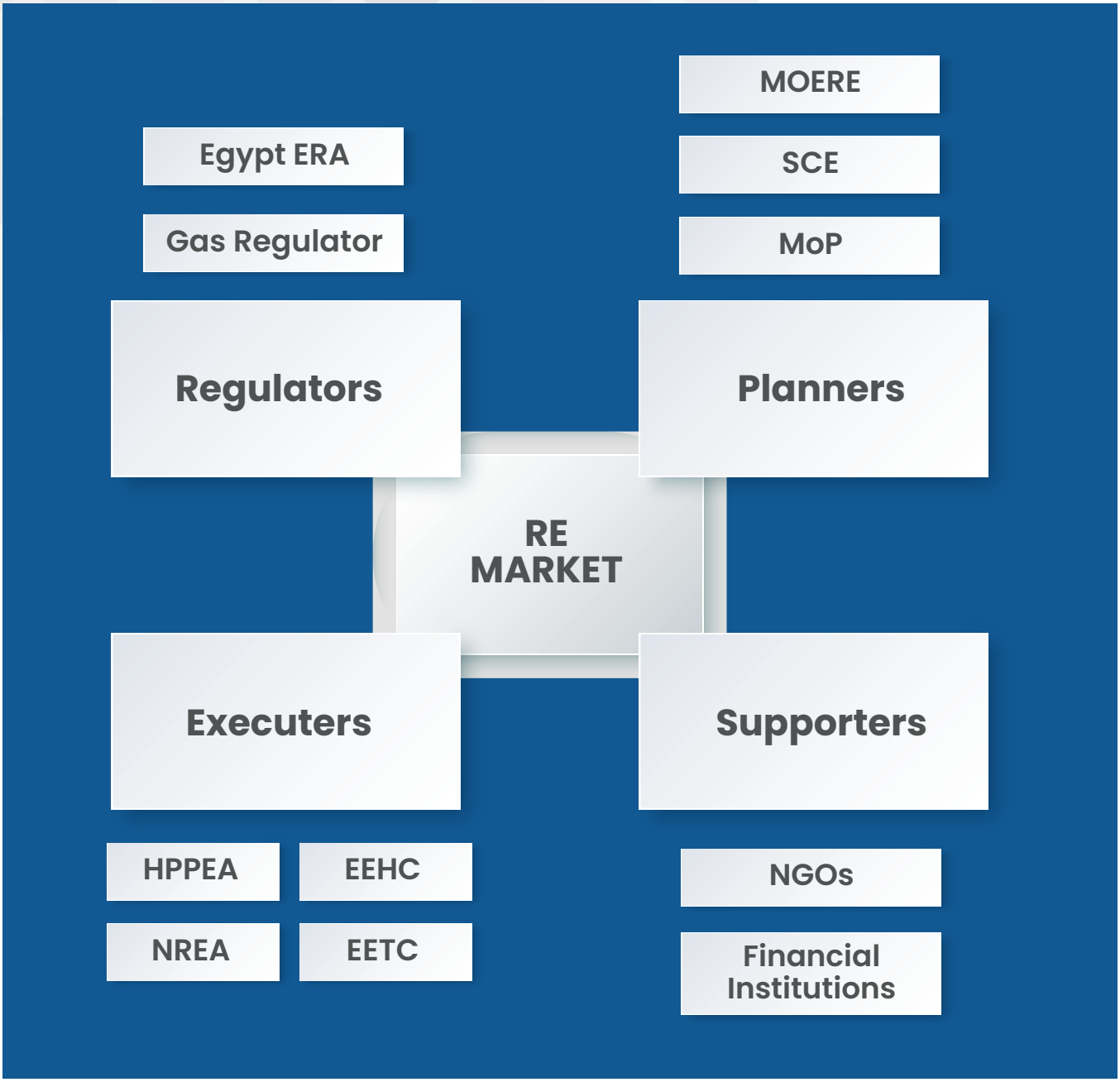
Today, Egypt has different schemes to promote renewable energy applications such as: Competitive Bidding, Feed-in Tariffs, and Independent Power Producers (IPP). Security of supply, building competitive markets, ensuring sustainability, and developing sufficient supply and energy infrastructure capacity for renewable energy are the main pillars of Egypt's energy strategy.

We will also examine the country’s renewable energy market value chain, map stakeholders, and provide a SWOT analysis for the market.

RE Market Stakeholders Mapping

The Ministry of Electricity and Renewable Energy (MoERE), together with the Supreme Council for Energy (SCE), which reports directly to the President and works in close collaboration with the Ministry of Petroleum, is taking the lead in promoting renewable energy in Egypt. Since 1986, the New and Renewable Energy Authority (NREA), which is part of the Ministry of Energy and Renewable Resources, has served as the national focal point for developing efforts to research and commercialise renewable energy technologies.

Figure 3: Egyptian RE Market Stakeholders



The table below lists some of the important public stakeholders involved in the planning, regulation, and implementation of RE projects.

Table 1: RE Market in Egypt

Planners	
The Supreme Council of Energy (SCE)	Founded in 1979 under the Prime Minister's Decree No. 1093, and later revised under Decree No. 1395 of 2006, the SCE is a ministerial committee comprising 12 ministers. The Committee is in charge of designing energy plans to help Egypt's economic and social development policies succeed. It also directs and supervises Egypt's energy sector.
Ministry of Electricity and Renewable Energy (MoERE)	The main goal of the ministry is to provide electricity to all consumers all over the country. Today, the ministry aims to diversify electricity sources.
Ministry of Petroleum (MoP)	The ministry is in charge of securing oil and natural gas supplies to meet national demand.
Regulators	
Egyptian Electric Utility & Consumer Protection Regulatory Agency (EgyptERA)	Since its establishment in 2001, EgyptERA has been responsible for ensuring that all activities in the electricity sector are transparent, fair, and in accordance with existing laws and regulations. It also ensures that relative costs represent the interests of all authorise organizations.
Gas Regulatory Authority (GasReg)	Egypt opted to establish a gas regulator in the backdrop of huge developments in the Egyptian energy market and the necessity to oversee gas industry investments.
Executers	
Egyptian Electricity Holding Company (EEHC)	EEHC's mission is to ensure that electricity consumers have a stable and safe supply. The EEHC works with national energy stakeholders to coordinate their efforts.
Egyptian Electricity Transmission Company	EETC is responsible for establishing renewable energy projects through Build, Own, and Operate schemes and Feed-in Tariff mechanisms, according to Law 203 of 2014. EETC is linked with nine electricity distribution companies and six power generating businesses across Egypt.
Hydro Power Plants Executive Authority (HPPEA)	The Egyptian Hydropower Plants Management and Executive Authority (HPPEA) is in charge of managing and organizing Egypt's hydropower plants. Almost 2800 MW of hydroelectric capacity has been installed in various hydropower projects.
New and Renewable Energy Authority (NREA)	Founded in 1986, NREA's main goal is to encourage the use of renewable energy and enhance energy efficiency in Egypt. The NREA is a key player in Egypt's renewable energy market.

Supporters	
Non-Governmental Organisations (NGOs)	NGOs tend to be successful in supporting and executing energy projects because they are familiar with end-user requirements. Typically neutral to technology, they emphasise training and do not have a large bureaucratic structure. NGOs can easily adapt and are known to collaborate with other NGOs. The NGOs that work in renewable energy are mentioned in Appendix 2.
Financial Institutions	To be able to develop and implement renewable energy projects, Egypt relies on financial support from local, regional, and global institutions.

There are other stakeholders in the renewable energy market like local manufacturers, importers, startups, system installers, etc.
In the next section, we'll fully map these stakeholders along with the RE value chain.

Egyptian Renewable Energy Market

RE Market Stakeholders

Regulators, planners, executors, and supporters are the four primary stakeholders in the RE sector. The Egyptian Electric Utility and Consumer Protection Regulatory Agency (EgyptERA) and the Gas Regulatory Authority are two examples of regulators. The Supreme Council of Energy (SCE), the Ministry of Electricity and Renewable Energy (MoERE), and the Ministry of Petroleum (MOP) among other planners. Executors include the Egyptian Electricity Holding Company (EEHC), the Gas Regulatory Authority, the Hydro Power Plants Executive Authority (HPPEA), and the New and Renewable Energy Authority (NREA). The supporters include non-governmental organizations (NGOs) and financial institutions.

RE Market Value Chain

Egypt's central renewable energy systems are hydro-power, wind farms, solar PVs, CSP, SWH, biomass, waste-to-energy technologies, and geothermal.

• **Wind Energy:** Egypt has significant wind energy resources, particularly in the Gulf of Suez area. It is one of the best locations globally for gathering wind energy because of its high, steady wind speeds, which average between 8 and 10 m/s at the height of 100 metres, and the availability of substantial empty desert expanses. There are many opportunities to support and invest in each milestone of the value chain of the wind energy business. There are ambitious plans to have more projects in the upcoming years in the wind energy sector, including different projects located in the Gulf of Suez, Gabal Elzayt, and West Nile.

• **Solar Energy:** On a global scale, Egypt is one of the most appropriate regions for exploiting solar energy for electricity generation and thermal heating applications. After activating the feed-in-tariff (FIT)plan in 2014, the MOERE began to develop larger-capacity PV installations. With Egypt's electricity crisis rising in 2014 and the cost of PV panels falling, various additional Egyptian agencies have focused their efforts on adopting PV applications, particularly rooftop systems and street lighting. There are various solar energy generation systems, including Centralise grid-connected solar PV, distributed solar PV, concentrated solar power, and solar water heating. The following section will mention the exerted efforts, value chain, and planned projects for developing each solar energy system.

• **Biomass:** Egypt has abundant biomass resources, including agricultural waste, animal manure, and municipal solid waste.The Egyptian Environmental Affairs Agency (EEAA) led the Bioenergy for Sustainable Rural Development Project (BSRD), started in 2009 and sponsored by the UN Development Program and the Global Environmental Facility.

RE Market Forecasting Scenarios and Planned Projects

Egypt's non-hydro renewable energy sector will be more than triple in size between 2019 and 2029. Egypt will be an attractive market for renewables investment due to ambitious government renewables targets, significant natural solar and wind potential, rising domestic component manufacturing capabilities, and a competitive and liberal power market. In addition, plans to build high-voltage transmission links with Europe will allow for sizeable renewable electricity exports in the medium- to long term, boosting prospective returns on investment for renewables investors even more. However, the country's significant electricity oversupplies over the short-to-medium period increase the likelihood of project cancellations and delays in the pipeline. Renewables will account for a good portion of overall electricity generation by the end of 2029. Furthermore, the Egyptian market is dominated by wind and solar projects. As a result, Egypt has various investment opportunities.

RE Market Private Sector:

Egypt has a long history of international cooperation in the energy sector, particularly in wind energy development. International collaboration in local manufacture, on the other hand, has been restricted to the efforts of El Sewedy for Wind Energy Generation (a private company specializing in wind energy equipment and facilities). As for PV systems, NREA has certified several private companies to build PV stations up to 20 megawatts, such as Karm solar, Solarize Egypt, and Solargy. Both the government and the private sector have contributed to implementing the world's largest solar park, which has six million panels erected over a 36-square-kilometre area with the help of international finance institutions.

RE Market's Value Chain

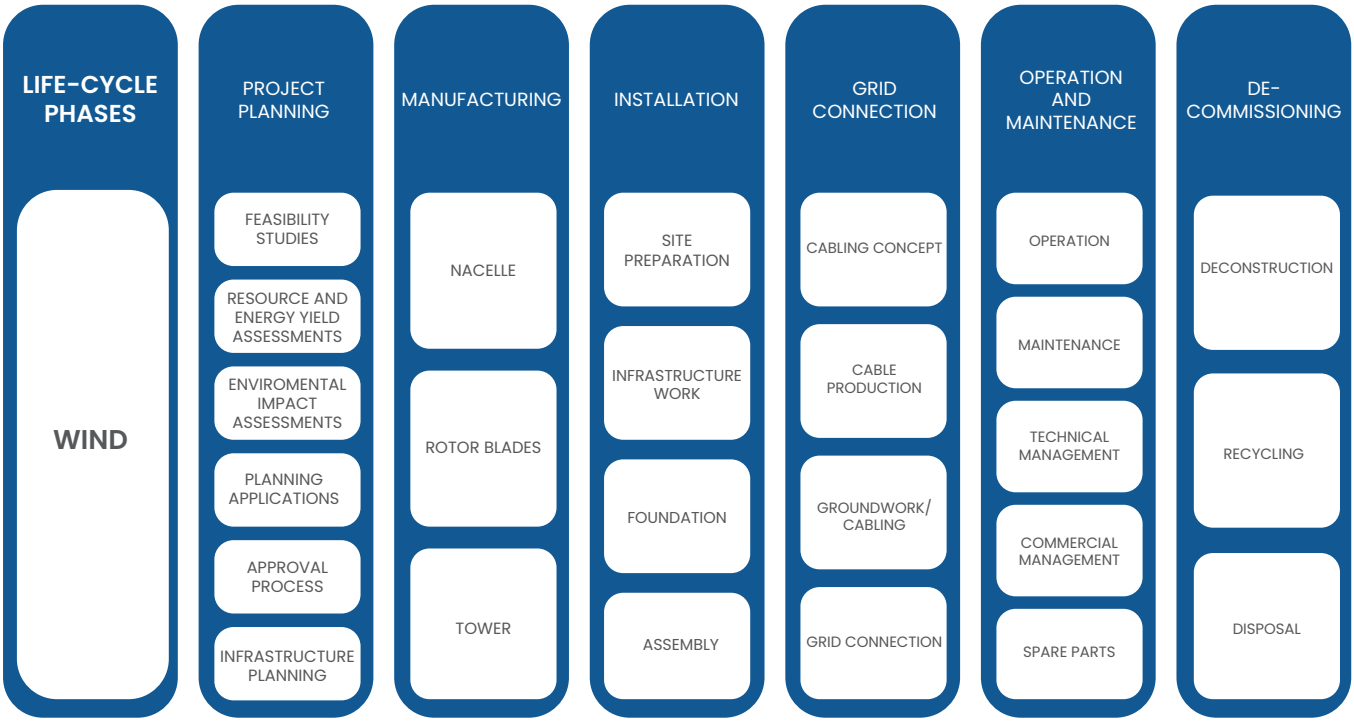
In order to specify various technical assistance and business opportunities in each part of the value chain in the RE market, each RE system has to be studied separately. The main renewable energy systems in Egypt are hydropower, wind farms, solar PVs, CSP, SWH, biomass, waste-to-energy technologies, and geothermal.

Wind Energy:

Egypt's Wind Atlas (Wind Atlas for Egypt Measurement and Modelling 1991-2005) claims that the country has significant wind energy resources, notably in the Gulf of Suez area. Due to its high consistent wind speeds, which average between 8 and 10 m/s at a height of 100 metres, plus the availability of wide deserted desert areas, this is one of the best locations in the world for capturing wind energy.

In Hurghada, Egypt's first wind farm was built in 1993, with 42 units of various technologies and a total capacity of 5.2 MW. Since 2001, the NREA has built a series of large-scale wind farms in Zaafarana (545 MW) and the Gulf of El Zayt, in collaboration with Germany, Spain, Japan, and Denmark, totaling 545 MW in 2010/11 and increasing to 750 MW in November 2015, under an engineering, procurement, and construction (EPC) scheme (200 MW). Before mentioning the planned wind projects in Egypt, the wind projects value chain is mentioned in the next figure.

Figure 4: The Wind Projects Value Chain (The Socio-economic Benefits of Solar and Wind Energy)



It is clear that in each milestone of the wind energy market value chain, there are various opportunities to support and invest in. There are ambitious plans to build more projects in the wind energy sector in the coming years as described in the next table.

Table 2: Planned Wind Projects up to 2023 (IRENA 2018)

Project	Technology	Status	Size	Contract
Gulf of Suez	Wind	Under development	250 MW	NREA-KfW, EIB, AFD EPC Scheme
Gulf of Suez	Wind	Under development	250 MW	GDF Suez, Toyata, Orascom BOO scheme
Gulf of Suez	Wind	Under development	200 MW	NREA-Masdar EPC scheme
Gulf of Suez	Wind	Under development	200 MW	AFD-KfW EPC scheme
Gulf of Suez	Wind	Under development	2000 MW	Siemens EPC scheme
Gabal El Zayt	Wind	Under construction	220 MW	NREA-Japan-JICA EPC scheme
Gulf El Zayt	Wind	Under construction	320 MW	Italgen BOO scheme
Gabal El Zayt	Wind	Under construction	120 MW	Spain-NREA
West Nile-1	Wind	Under development	250 MW	BOO scheme
West Nile	Wind	Under development	200 MW	Japan EPC scheme
West Nile	Wind	Tender-bidding Phase	600 MW	NREA IPP scheme

Solar Energy:

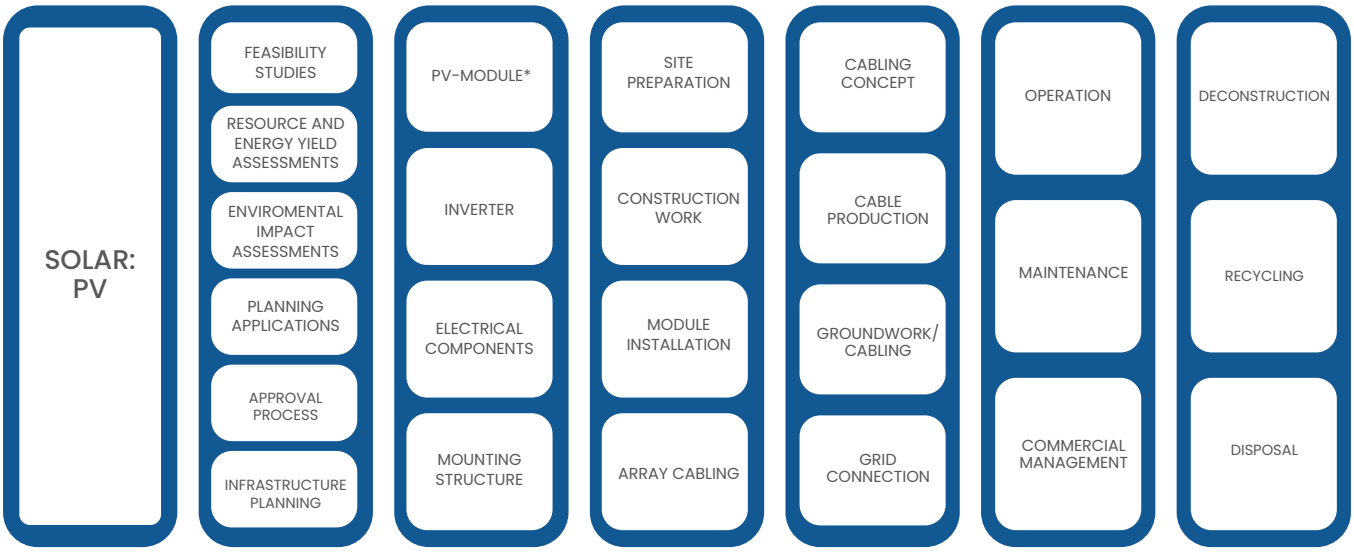
Egypt is one of the most promising regions for solar energy both for electricity generation and thermal heating. Since the early 1980s, Egypt has been home to many solar PV system opportunities including pumping, lighting, advertising, cold storage, and desalination. At the time, solar PV was used in remote areas for commercial purposes such as emergency road and navigation lights.
However, since the implementation of the feed-in-tariff (FIT) plan in 2014, the MOERE has begun developing large-capacity PV installations.
Following Egypt's electricity crisis in 2014, and amid the drop in PV panel prices, many Egyptian companies and agencies began adopting solar PV. This has been the case for rooftop systems and street lighting in particular.
However, when discussing solar energy, it is worth highlighting the many types of solar systems available. These include: centralised grid-connected solar PV, distributed solar PV, concentrated solar power, and solar water heating.

The following sub-sections will highlight the efforts exerted in the field of solar energy in Egypt, along with the value chain and planned projects for developing each type of solar energy system.

Centralise grid-connected solar PV:

It is worth noting that both centralised grid-connected solar PV and distributed solar PV have almost the same value chain as sees in the figure below.

Figure 5: PV Projects Value Chain (The Socio-economic Benefits of Solar and Wind Energy)



It's worth noting that over the past few years, the NREA has developed various solar-powered projects including the Benban solar park. It is also developing more projects which will be mentioned in the following table.

Table 3: Planned PV Projects up to 2023 (IRENA 2018)

Project	Type	Status	Size	Contract
Kom Ombo	PV	Binding	200 MW	BOO scheme
West Nile	PV	Binding	600 MW	Sky Power and EETC BOO
West Nile	PV	Binding	200 MW	EETC BOO
West Nile	PV	Binding	600 MW	BOO scheme
FIT	PV	Operational	50 MW	EETC PPA
FIT	PV	Under development	1415 MW	EETC PPA
Hurghada	PV	Tendering	20 MW	NREA-AFD EPC scheme
Zaafarana	PV	Under development	50 MW	NREA-AFD EPC scheme
Kom Ombo	PV	Under development	26 MW	NREA-AFD EPC scheme
Kom Ombo	PV	Under development	50 MW	NREA-AFD EPC scheme

Distributed Solar PV:

In 2016, the NREA implemented several off-grid PV projects for electrification of remote villages with a total capacity of 32 MW, as well as street lighting systems and hybrid PV-diesel systems, in collaboration with the United Arab Emirates. Distributed solar PV technology is evolving rapidly, with numerous projects in the pipeline. As electricity subsidies are phased out and tariffs rise, the industrial and commercial sectors can use small-scale PV installations to satisfy increased energy demand while lowering utility expenses.

The following table lists some small-scale PV projects.

Table 4: Small-Scale Distributed PV Initiatives (IRENA 2018)

Small-Scale Distributed PV Initiatives	Description
CoM Initiative	☑ Initiated in December 2013. ☑ Mandates all government entities to implement rooftop PV systems with a total installed capacity of 20-30 MW (for 1 000 government buildings). ☑ Under the framework of this initiative, the EEHC and affiliated subsidiaries have implemented 30 solar PV systems with a total capacity of 840 kW at a capital cost of EGP 8.2 million.
FIT Programme	☑ 300 MW of small-scale rooftop installations through the FIT were targeted in 2014, initially with the aim of achieving this level within a two-year period. The programme was then extended in 2016 with revised tariffs.
Egypt-Sun Initiative	☑ Designed and implemented by the Central Energy Efficiency Unit at the CoM. ☑ Promotes the installation of combined efficient lighting and PV systems in government buildings. ☑ Provides technical assistance to staff in different governorates. ☑ 52 projects in 14 governorates were implemented during the period March 2014 to June 2015. ☑ Helped governorates displace more than 2 MW capacity, with PV representing one-third.
UAE Rural Electrification Initiative	☑ Supported PV projects with the objective of electrification through small-scale projects with a total capacity of 32 MW. ☑ Included 6 942 stand-alone systems totalling 2 MW in villages that had no electricity, and 8 centralised systems totalling 30 MW, as well as street lighting and several hybrid PV-diesel systems.

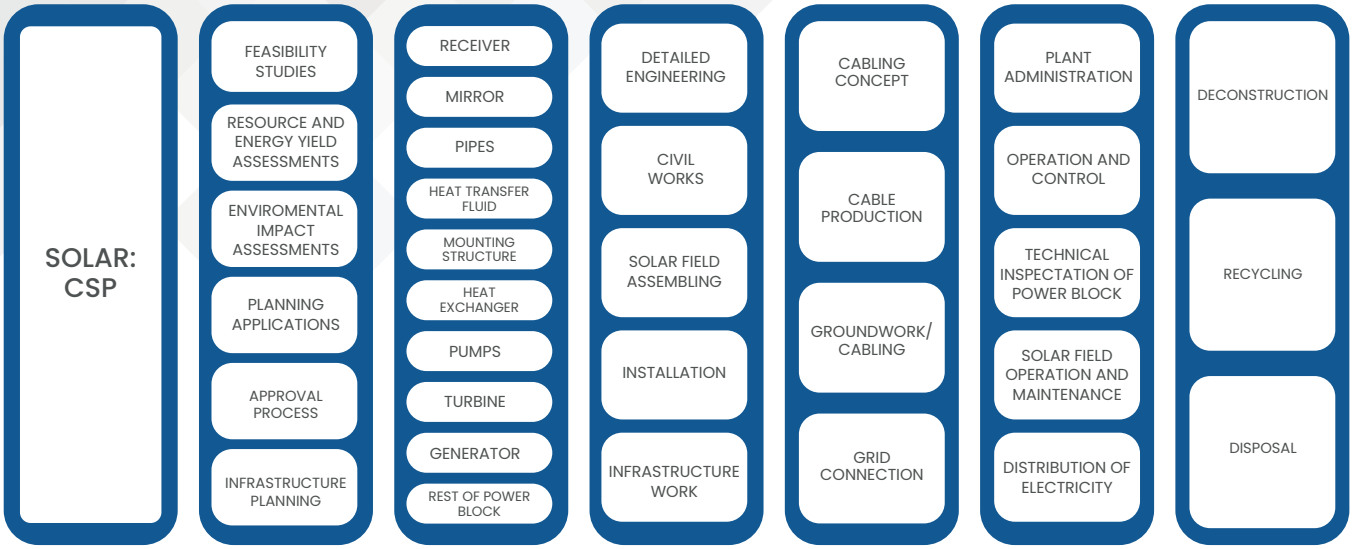
Concentrated Solar Power (CSP):

The first solar thermal integrated combined-cycle power station, with a total capacity of 140 MW distributed as a solar component of 20 MW and a gas-fired combined-cycle plant of 120 MW, was built in the Kuraymat area, primarily supported by the Global Environment Facility. Local manufacturing accounted for about half of the solar component, and the project contributed to the formation of national technical cadres capable.

Through the BOO system, EETC and the NREA launched a tender for a new concentrated solar power (CSP) facility with a capacity of 100 MW in 2015. However, no offers have been made yet. Separately, in November 2013, a study funded by GIZ (the German development agency) proposed increasing energy generation by installing CSP units at existing Egyptian power plants.

The value chain of the CSP technology is illustrated in the next figure:

Figure 5: The CSP Projects Value Chain (The Socio-economic Benefits of Solar and Wind Energy)



Solar Thermal Heating Systems:

Solar energy for water heating is one of the most prevalent uses for reducing electricity and fuel usage around the world.

The Egyptian solar heating systems market has completed many milestones since its inception in the early 1980s till it reached its current form today. Egypt has a total installed area of over 750,000 square metres with about 20 Egyptian firms working in the industry of solar water heater production, importing, and installation.

Figure 6: Here is an overview of Egypt's milestones over the years:

Early 1980s

MOERE imported 1,000 solar water heaters (SWHs) with capacities ranging from 100 to 500 litres per day and tested selected samples in a variety of applications, as well as and rented out others to the general public.

1986

The Ministry of Housing and Urban Communities issued a decree requiring the use of solar water heaters in new cities, resulting in the installation of 800,000 square metres of solar water heaters.

2013

In collaboration with EU countries, the New Urban Communities Authority (NUCA) began implementing SWHs in new cities. Now, 22 companies are registered in Egypt to manufacture and/or import solar thermal technology.

2014

The Ministry of Trade and Industry has announced a USD 5 million programme for small and medium-sized businesses (SMEs) to promote low-carbon technology, primarily solar thermal, for cooling and heating in industrial applications.

Solar Heating Project in Egypt

- In collaboration with the United Nations Environment Program (UNEP) and with funding from the Italian Ministry of Environment IMELS, the EGYSOL project will construct solar water heating systems for Red Sea and South Sinai hotels.

  - The project aims to finance solar water heater installations in hotels and resorts in the Red Sea and Sinai Governorates, at a total cost of USD 500,000. A capital cost subsidy of 25% to SWH installations (up to 250 square metres (sqm) will be granted to each hotel.

  - A four-year maintenance cost subsidy (USD 4/sqm/yr) for the maintenance cost component for the first two years of operation (after the year of warranty) and (USD 3/sqm/yr) for the remaining two years, will be granted to each hotel to ensure the long-term high-quality functionality of the installed systems.

Biomass:

Egypt has abundant biomass resources, including agricultural waste, animal manure, and municipal solid waste. Agricultural waste amounts to roughly 35 million tonnes per year, with 40% of that going to feed animals and the balance (equal to 5 Mtoe/year) going to energy. The average daily amount of urban solid trash is 0.5 kg per person, equating to about 10,000 tonnes in Greater Cairo alone.

The Egyptian Environmental Affairs Agency (EEAA) led the Bioenergy for Sustainable Rural Development Project (BSRD), which began in 2009 and was sponsored by the UN Development Programme (UNDP) and the Global Environmental Facility. The project sought to encourage young graduates to start their own businesses. It focused specifically on women and rural areas.

A comprehensive study about Egypt's waste management market is provided in Part 3.

RE Market's Forecasting Scenario and planned project

Egypt's non-hydropower renewables sector will grow quickly from 2019 to 2029, more than tripling in capacity. Egypt will be an attractive market for renewables investment due to ambitious government renewables targets, significant natural solar and wind potential, rising domestic component manufacturing capabilities, and a competitive and liberal power market. In addition, plans to build high-voltage transmission links with Europe will allow for large renewable electricity exports in the medium- to long-term, boosting prospective returns on investment for renewables investors even more. However, the country's significant electricity oversupplies over the short-to-medium term increases the likelihood of project cancellations and delays in the pipeline.

Table 5: Estimates and Forecasts for the Egyptian Renewables Market (Fitch Solutions)

RENEWABLES HEADLINE FORECASTS (EGYPT 2019-2024)						
Indicator	**2019e**	**2020f**	**2021f**	**2022f**	**2023f**	**2024f**
Generation, Non-Hydropower Renewables, TWh	5.999	8.434	10.351	12.898	15.399	17.880
Generation, Non-Hydropower Renewables, % y-o-y	88.0	40.6	22.7	24.6	19.4	16.1
Capacity, Non-Hydroelectric Renewables, MW	3,121.5	3,708.4	4,452.5	5,518.4	6,412.6	7,339.8
Capacity, Non-Hydroelectric Renewables, % y-o-y	59.0	18.8	20.1	23.9	16.2	14.5

e/f = Fitch Solutions estimate/forecast. Source: EIA, IRENA, EEHC, Fitch Solutions

Based on Fitch Solutions' estimates, the Egyptian renewables market is forecast to grow as follows:

Table 6: Estimates and Forecasts for the Egyptian Renewables Market from 2018 to 2029 (Fitch Solutions)

Generation Indicator/ Year	2018	2019e	2020f	2021f	2022f	2023f	2024f	2025f	2026f	2027f	2028f	2029f
Total, TWh	188.56	205.40	212.17	221.08	236.01	249.67	262.86	275.36	286.91	298.29	309.09	320.03
Total, % y-o-y	3.397	8.931	3.295	4.199	6.753	5.789	5.281	4.756	4.196	3.967	3.622	3.537
Non-Hydropower Renewables, TWh	3.192	5.999	8.434	10.351	12.898	15.399	17.880	20.285	22.846	25.619	28.724	32.150
Non-Hydropower Renewables, % y-o-y	2.7	88.0	40.6	22.7	24.6	19.4	16.1	13.4	12.6	12.1	12.1	11.9
Non-Hydropower Renewables, % of total electricity generation	1.693	2.921	3.975	4.682	5.465	6.168	6.802	7.367	7.963	8.588	9.293	10.046
Geothermal, TWh	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal as % of total non-hydropower renewables generation	0	0	0	0	0	0	0	0	0	0	0	0
Wind, TWh	2.334	3.325	4.255	5.136	6.443	7.832	9.209	10.530	11.919	13.311	14.807	16.377
Wind, % y-o-y	6.091	42.457	27.984	20.684	25.464	21.549	17.579	14.346	13.196	11.675	11.240	10.605
Wind, % of total non-hydropower renewables generation	73.123	55.420	50.456	49.616	49.955	50.859	51.501	51.910	52.172	51.957	51.548	50.940
Wind, TWh	0.553	2.36	3.857	4.900	6.146	7.269	8.380	9.469	10.640	12.018	13.623	15.475
Wind, % y-o-y	-8.220	327.422	63.197	27.020	25.436	18.273	15.280	12.992	12.370	12.950	13.360	13.590
Solar, % of total non-hydropower renewables generation	17.326	39.398	45.738	47.337	47.651	47.205	46.866	46.679	46.572	46.910	47.428	48.133
Tide/Wave, TWh	0	0	0	0	0	0	0	0	0	0	0	0
Tide/Wave, % of non-hydropower renewables generation	0	0	0	0	0	0	0	0	0	0	0	0
Biomass and Waste, TWh	0.305	0.311	0.321	0.315	0.309	0.298	0.292	0.286	0.287	0.290	0.294	0.298
Biomass and Waste, % of non-hydropower renewables generation	9.551	5.181	3.806	3.047	2.394	1.935	1.633	1.412	1.256	1.134	1.024	0.928

The previous table clearly shows that by the end of 2029, the renewables market would contribute a reasonable amount to Egypt's total electricity generation with wind and solar projects being the main renewable energy sources. This presents many investment opportunities in this sector.

Here's an overview of the most updated renewables projects:

Table 7: Updated Egyptian renewables projects

Project Name	Sub-Sector	Size (MW)	Companies	Time Frame End	Status
Elsewedy Gabal Elzeit Wind Project, Gulf of Suez	Wind - onshore	500	ACWA Power [Operator] {Saudi Arabia}, Government of Egypt [Sponsor]{Egypt}, Marubeni Corporation [Sponsor]{Japan}, Elsewedy Electric [Sponsor]{Egypt}	2020	Contract awarded
AMEA Jabal Al-Zayt Wind Project, Gulf of Suez	Wind - onshore	500	AMEA Power [Operator]{UAE}, Al Nowais Investments [Sponsor]{UAE}	2023	Contract awarded
Hurghada Wind Farm, Gabal El Zeit, Red Sea	Wind - onshore	350	Italgen [Operator]{Italy}		Project finance closure
Gulf of Suez 1 Wind Power Project, Gulf of Suez	Wind - offshore	252	Egypt's New & Renewable Energy Authority [Sponsor] {Egypt}, Vestas [Construction]{Denmark},KfW [Financier] {Germany}, European Investment Bank[Financier] {Luxembourg},Agence Française de Développement [Financier]{France}, European Commission [Financier]{Belgium}	2022	Contract awarded
SES Concentrated Solar Complex	Solar - CSP	250	Smart Engineering Solutions [Sponsor]{Egypt}, Egyptian Ministry of Military Production [Sponsor]{Egypt}		In tender /tender launched
Red Sea Wind Energy Project 2, Ras Ghareb	Wind - onshore	250	Red Sea Wind Energy [Operator]{Egypt},Engie (35%) [Sponsor]{France}, Toyota Tsusho Corporation (40%) [Sponsor]{Japan}, Orascom Construction (25%) [Sponsor]{Egypt}, European Bank for Reconstruction and Development [Financier]{UK}		Project finance closure
Lekela Gabal El Zeit Wind Power Plant, Gabal El Zeit (Jabal al-Zeit)	Wind - onshore	250	Lakela Egypt [Operator]{Egypt}, Mainstream Renewable Power[Sponsor]{Ireland}, Actis Capital [Sponsor]{UK}, Egyptian Electricity Transmission Company [Sponsor] {Egypt}	2021	Under construction
West Bakr Wind Farm Project, Ras Ghareb	Wind - offshore	250	Gamesa Renewable Energy [Equipment]{Spain},European Bank for Reconstruction and Development [Financier]{UK}, Actis Capital [Sponsor](60) {UK}, International Finance Corporation [Sponsor]{US}, Mainstream Renewable Power [Sponsor] {Ireland}, Egyptian Electricity Transmission Company [Sponsor]{Egypt}	2021	Under construction
Gabal El Zeit Wind Farm 4, Gulf of Suez	Wind - offshore	250	Societe Generale [Financier]{France}, Sumitomo Mitsui Banking Corporation [Financier]{Japan}, Japan Bank for International Cooperation [Financier]{Japan}, Nippon Export and Investment Insurance of Japan[Financier]{Japan}, Toyota Tsusho Corporation[-Operator]{Japan}, Engie[Operator]{France},Orascom [Operator]{Egypt}, Egypt's New & Renewable Energy Authority[Sponsor]{Egypt}		Under construction
Eni Kom Ombo Photovoltaic Plant, Kom Ombo	Solar - PV	200	Eni [Operator]{Italy}, Egypt Ministry of Electricity [Sponsor]{Egypt}		Announced

Project Name	Sub-Sector	Size (MW)	Companies	Time Frame End	Status
West Nile Area Wind Farm Project	Wind - onshore	200	Eversheds Sutherland [Consultant/Project Management] {UK}, Egypt New & Renewable Energy Authority [Sponsor]{Egypt}, Egyptian Electricity Transmission Company [Sponsor]{Egypt}		At planning stage
West Nile Area Photovoltaic Solar Project, West Nile	Solar - PV	200	Egypt New & Renewable Energy Authority [Sponsor] {Egypt},Synergy [Consultant/Project Management] {Australia}, Egyptian Electricity Transmission Company [Sponsor]{Egypt}		At planning stage
Kom Ombo Solar Power Plant, Aswan	Solar - PV	200	European Bank for Reconstruction and Development [Financier]{UK}, Agence Francaise de Developpement [Financier]{France}, Japan International Cooperation Agency [Financier]{Japan}, ACWA Holding [Operator] {Saudi Arabia}, Egyptian Electricity Transmission Company [Sponsor]{Egypt}, African Development Bank [Financier] {Côte d'Ivoire}, Synergy Consulting [Consultant/Project Management] {US},Sargent & Lundy [Consultant/Project Management] {US},Baker McKenzie [Consultant/Project Management] {US}	2021	Project finance closure
AMEA Kom Ombo Solar Power Plant, Aswan	Solar - PV	200	AMEA Power [Operator]{UAE}, Al Nowais Investments [Sponsor]{UAE}	2021	Contract awarded

In addition to the previously-mentioned projects, there are various opportunities in the renewable energy market in Egypt such as:

- ☑ A new factory for the production of solar cells from silicon wafers.
- ☑ Some current PV cell factories offer investment potential such as Sun Prism for Energy Technology.
- ☑ Potential investment in education by developing curricula for new renewable energy majors in public and private universities as well as in sponsoring students' scholarships.
- ☑ Developing the energy efficiency units' roles in various ministries, government entities, and buildings. This includes working with them on their planned projects and targets.
- ☑ Laying the foundation stone for green hydrogen in Egypt.
- ☑ Spreading electric transportation manufacturing and adoption.

RE Market SWOT Analysis

Having defined the renewable energy market's stakeholders, value chain, and possible investment opportunities, it is time to review the sector's its strengths, weaknesses, opportunities and threats (SWOT). Reviewing the following SWOT analysis will clarify how affordable it is to invest in the above-mentioned RE opportunities. With this information, Dutch entrepreneurs can feel more confident investing in the Egyptian renewable energy market.

Moreover, identifying the RE market's threats offers the opportunity to create solutions to overcome these threats in the coming years.

Figure 7: Egyptian Renewable Energy Market's SWOT Analysis

Strengths

- Policy changes that enabled international arbitrage and the introduction of competitive capacity bidding at auctions have increased market competition.
- Rapid economic and population growth, as well as the building of cross-border linkages to expand electricity export capacity, are expected to drive up power consumption dramatically during the next decade.
- Egypt has a very high solar and wind potential in various areas.

  Distinction of the energy sector in terms of having ministerial units on climate change, energy efficiency and mitigation activities, and policy reform.

Weaknesses

- The transmission and distribution infrastructure in Egypt is ageing, creating a bottleneck for the integration of intermittent wind and solar energy.
- Foreign currency shortages and a growing budget deficit plague the country.
- Investors wishing to increase long-term exposure to the market may be cautious of the lack of policy stability.

Opportunities

- A succession of high-profile memorandums of understanding and contracts demonstrate the government's interest in establishing large-scale renewable energy projects.
- Increased electricity prices and reduced fuel subsidies could help renewable energy become more competitive and profitable for private power companies.
- Plans to increase the country's electricity export capacity will improve total demand, propelling the industry forward.
- Egypt's leading role in international negotiations on climate change, along with hosting the 2022 Climate Change Conference (COP27).

Threats

- The Egyptian pound's volatility puts foreign currency-denominated renewable projects at risk of dramatically higher costs.
- Historically unstable political and security environment.
- Egypt's ability to maneuver its finances will be limited by the requirements of the new IMF loan.
- Weaker economic development as a result of Covid-19 and low oil prices could reduce power consumption growth and extend the country's electricity excess, limiting the incentive to build additional capacity.

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Part 2

Overview of the Egyptian Economy and the Port Development Market

Introduction

Like the renewable energy sector, Egypt aims to make the most of its pivotal location and hence, has an ambitious strategy to strengthen its ports' infrastructure and improve the efficiency of all types of transportation.

Accordingly, during the current fiscal year 21/22, Egypt's transportation sector experienced an investment boom, with total investments amounting to EGP 244.7 billion. The sector has grown at a rapid rate of 104%, more than doubling its investments from the previous year fiscal 20/21.

As per Egypt's Vision 2030, the ports market has ambitious targets be achieved. These targets fall under the six goals of the Egypt Vision 2030, which are: Quality education, gender equality, clean water and sanitation, affordable and clean energy, peace, justice, and strong institutions, and establishing partnerships to achieve these goals.

To achieve these goals, one must not forget the country's ports, which are the focus of this section.

In the past few years, many laws and presidential decrees were issued and approved to facilitate the investment process and public-private partnerships (PPP) in the ports segment. This was clear in the government's development of current ports and the establishment of new ones in collaboration with international bodies, whether directly in the ports or indirectly via capacity building, information technology, transportation network, etc.

To study the Egyptian ports market and identify potential investment and cooperation opportunities, we'll explore the different types of ports, review the various stakeholders and their role in the ports sector, the segment's legislations, and the supply chain. We'll also provide a SWOT analysis and relevant data.

The following table shows maritime transport figures until the end of 2020.

Table 8: Egyptian maritime transport in numbers until the end of 2020

Statement	Value
Total number of Egyptian seaports	53 ports (15 commercial, 38 specialised)
Total ports under construction (3) commercial ports	Jarjoub, Abu Qir in the Mediterranean, and Ras Banas in the Red Sea.
Maximum depth of navigational channels is: El-Dekheila, East Port Said, Sokhna 2	20, 19, and 17 m, respectively.
Total lengths of the Egyptian coast	about 3000 km (Mediterranean Sea 1000 km, Red Sea 2000 km)
Total number of workers in the sector and marine organisations affiliated to the Ministry of Transport	About 8,200 workers.
Total number of internally trained workers during 2020	62 trainees (32 trainees in Port Training Institute- 30 trainees in Sector Training Centre)
Total number of external scholarships during 2020	4 trainees (1 Sweden, 3 Arab Academy for Science and Technology and Maritime Transport in cooperation with Belgium and France)
Total ships of the national merchant fleet until the end of 2020	126 ships with a DWC 1,531,930
Total TEUs handled annually in 2020	7.6 million TEUs
Total cargo turnover for 2020	Approximately 164, million tonnes (156 by commercial ports-8 by specialised ports.
Total vessels calling at Egyptian seaports in 2020	11890 vessels

As mentioned in the previous table, Egypt has the opportunity to be the trade hub of the Eastern Mediterranean region and it can be done in two ways: between Asia and Europe via the Suez Canal, or between Mashreq and Maghreb, and between Europe and the Arabian Peninsula via land. Therefore, a more integrated transport system would allow Egypt to reap large efficiency benefits from improved modal choices for both passengers and freight.

The previously adopted master plan sought to turn Egypt into a regional hub for transshipments and containerised trade. However, that plan did not materialise due to conflicts of interest and multiple functions of the port authorities and maritime transport sector and their related logistics services.

Egypt's Port Market

Ports Market Stakeholder Mapping

The key stakeholders in the Egyptian ports sector include regulators, planners, executors, and supporters. The General Authority for Land Ports and Dry Ports (GALDP), the Suez Canal Authority, and the Regional Ports Authority are regulators. The primary pillars in the planners' category are the Ministry of Transportation (MoT), the Ministry of Investment and International Cooperation (MoIC), the Ministry of Trade and Industry (MTI), and the Ministry of Higher Education and Scientific Research (MoHESR). Construction corporations, capacity-building firms, and IT development organisations fall into the Executors category. Supporters include the Arab Academy for Science, Technology, and Maritime Transport (AASTMT) and national and international organisations.

External Trade

Egypt has signed several important Free Trade Agreements (FTAs), including COMESA, GAFTA, the EU-Egypt Partnership Agreement, the Agadir Free Trade Agreement, and the Egypt-EFTA Free Trade Agreement. Since March 2007, preferential trade agreements with specific countries including Syria and free trade agreements with Turkey, EFTA countries, and the four MERCUSOR countries - Brazil, Argentina, Uruguay, and Paraguay — have been in effect. Furthermore, quantitative analyses suggest that the EU is Egypt's most important trading partner, a scenario that is unlikely to change in the near or medium future. On a commodity group basis, the total annual consumption volume fluctuates. Low-value commodities, such as bulk freight, accounted for over 67% of total activity in 2010. The median value commodity, often break-bulk cargoes, is expected to account for 23% of total entities, while higher-value commodities, typically containerised cargoes, account for 10%.

Maritime Transport Sector Achievements in 2020

Several factors can indicate Egypt's port market readiness for development, including legislation, licensing restrictions and encouragement, information technology, capacity building, and national and international cooperation. The growth achieved in each factor will be presented in the following section.

Outline for Egyptian Ports

Egypt's Ports Complex is ranked 18th globally, with upgrades expected to boost exports by $12 billion. The Ports Complex's success hinges on gaining access to Egypt's major industrial and consumption areas. The Greater Cairo Metropolitan Area (GCMA), which accounts for about two-thirds of Egypt's GDP and half of the country's jobs, and underdeveloped regions such as Upper Egypt, account for a significant share of the country's population and agricultural production volumes, are examples. Egypt's five main commercial ports are Greater Alexandria Port (Alexandria and Dekheila ports), Damietta Port, Port Said Port, Suez Port (including Adabiya Port), and Safaga Port. The General Authority for Land and Dry Ports (GALDP) intends to build nine dry ports/logistics centres utilising a public-private partnership model based on Egypt's Transport Master Plan 2012-2027.

Comprehensive development plans for Egyptian ports

One of Egypt's most important projects is the development of Alexandria's port. This project has already begun with upgrades made to the ports of Dekheila and El Max. The project, which is expected to be completed by the end of 2024, will make Alexandria one of the major ports in the Mediterranean. The Ministry of Transport was interested in developing transport and logistics hubs connecting seaports, dry ports, and logistic areas on the tenth of Ramadan, the sixth of October, and Sadat. The most important is the Sokhna/Alexandria axis, which passes through industrial zones, dry docks, and logistic centres. For the sake of sustainability and coherence of the transportation system, Egypt developed some targets of construction of new berths, river ports, dry ports, and logistic areas. The development status of the planned projects will be presented in the following section.

Ports Market Stakeholder Mapping

In the last decade, Four Egyptian ministries have developed a comprehensive plan for the development of commercial ports in order to achieve global competitiveness and to exploit the ports and neighboring areas, especially in the Suez Canal area. And that is through cooperation between the Ministries of Transport, Investment and International Cooperation, Higher Education, Trade and Industry, as well as cooperation with the Arab Academy for Maritime Transport and, of course, Suez Canal Authority, and the General Economic Authority for the Canal Zone.

This comprehensive plan for the new seaports will contribute to developing the maritime transport industry, activating the role of seaports, developing investment opportunities, and expanding logistical activities related to the ports and the surrounding industrial areas. The general plan is divided into two parts: infrastructure and transportation. Infrastructure includes building dry ports and logistics centres along development axes, converting Egyptian ports into logistic ports, establishing distribution centres along highways, and distributing transportation among various modes of transportation.

To achieve these ambitious plans, various stakeholders have to be involved and taken into consideration while planning and executing. The following figure and table examine the various stakeholders and their role in the Egyptian ports market.

Figure 8: Egyptian Ports Stakeholder Mapping

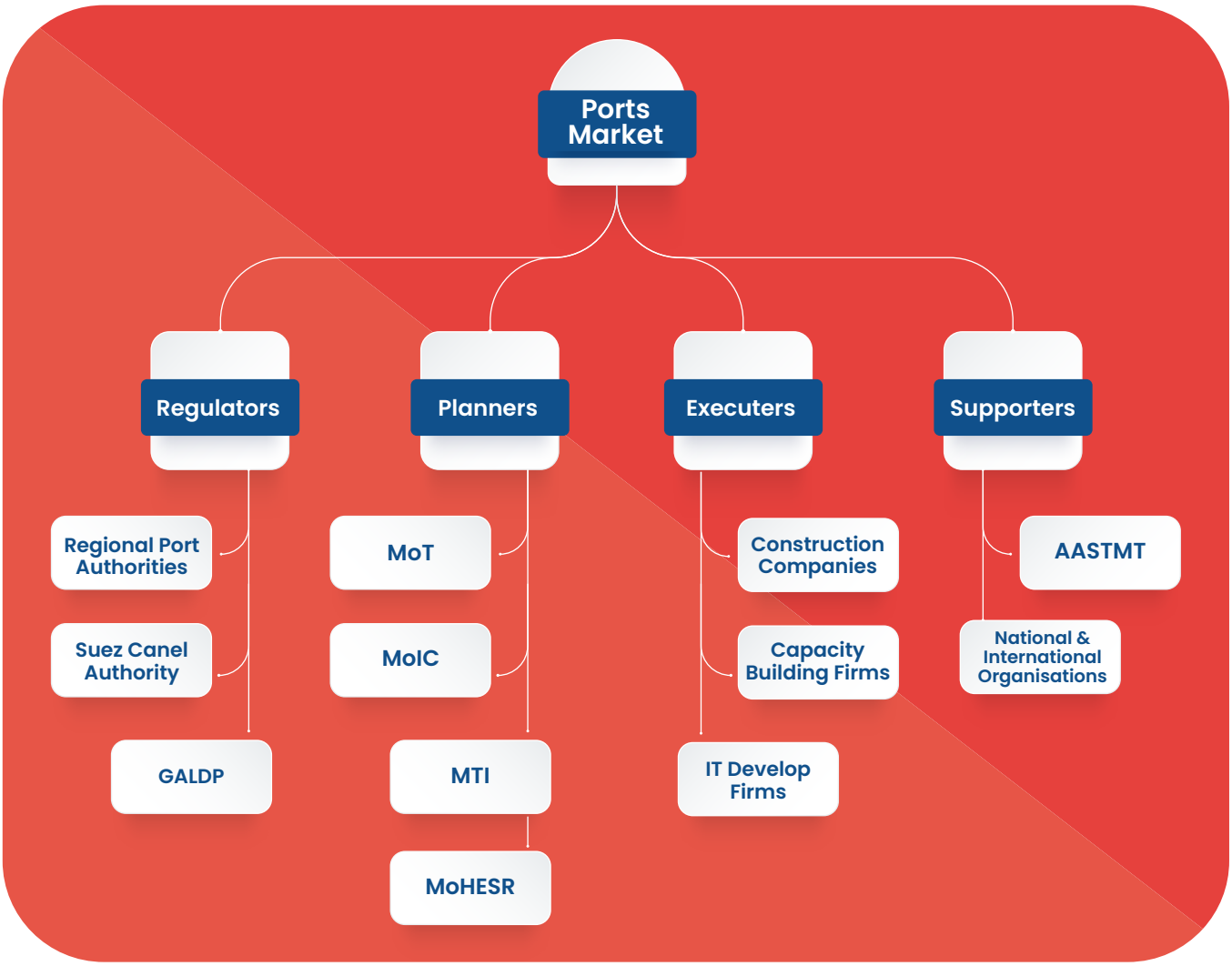

Table 9: Egyptian Ports' Stakeholders

Planners		
Ministry of Transportation (MoT)		The Ministry of Transportation encompasses several entities and bodies that shape the Egyptian transportation system. These bodies include: the Transport Planning Authority, Egypt National Railway, the National Authority for Tunnels, Holding Companies for Roads, Bridges, and Land Transport, Egypt National Institute for Transport…etc. The entities with the most direct responsibilities in the development of ports are: ☑ Maritime Transport Sector (MTS), which supervises and coordinates maritime transport-related bodies and entities. ☑ The Egyptian Authority for Maritime Safety (EAFMS), which regulates and manages maritime navigation as per international conventions and regulations. ☑ The River Transport Authority (RTA), which plans, constructs, and manages all rive transport facilities. It also sets the regulations for river transport operators.
Ministry of Investment and International Cooperation (MoIC)		The Holding Company of Maritime & Land Transport ☑ 14 maritime transport companies are affiliated to the Holding Company of Maritime & Land Transport. ☑ Its establishes subsidiaries solely or jointly in the fields of maritime transport, land transport, and related activities.
Ministry of Trade and Industry (MTI)		Ports are designed to serve and enhance Egypt's trade and industry. Accordingly, the ministry provides the plans for the construction of new maritime, dry, or land ports. It also provides annual data about imports and exports.
Ministry of Higher Education & Scientific Research (MoHESR)		The Ministry reviews all plans and uses its scientific expertise to spot opportunities.
Regulators		
Suez Canal Authority		☑ Sets the general regulations for Egyptian ports. ☑ construction works related to the Suez Canal. ☑ Operation and Maintenance of the Suez Canal. ☑ Ownership and overall management of the affiliated companies and facilities.
General Authority for Land Ports and Dry Ports (GALDP)		Plans, contracts, sets the regulations, and supervises land and dry ports.
Regional Port Authorities	Alexandria Port Authority	☑ Alexandria Maritime Port is the number 1 port in Egypt in terms of volume of trade movement, as about 60% of Egypt's foreign trade passes through it. ☑ It regulates the work and legislations for all companies and people who use the port. ☑ It is responsible for 2 ports: Alexandria and Dekheila ports.

Regional Port Authorities	Damietta Port Authority	☑ Strategically located, the Damietta port has an impressive infrastructure that connects the port to the hinterland via an integrated network of multimodal transport including land, rail and river, making it accessible from all sides. ☑ It regulates the work and legislations for all who work in and use the port.
	Red Sea Ports Authority	☑ The Authority's ports and marinas are located along the coasts of the Red Sea and the Gulfs of Suez and Aqaba. What distinguishes these ports is their location, making the Arab Republic of Egypt act as a window that connects between the East, many countries in the Arab Mashreq, and countries of the Near and Far East and East Africa. ☑ The Authority's ports vary between commercial ports, tourist ports, mining ports, petroleum ports, and fishing ports. ☑ The authority is responsible for 6 ports. ☑ It regulates the work and legislations for all who work in and use the port.
	Suez Canal Zone	☑ The 461km zone is governed by the General Authority for the Suez Canal Economic Zone: an autonomous body with executive/regulative powers. ☑ The authority is entitled to approve decrees, propose additional incentives, and has the full authority to oversee all areas of operation, staffing, control over budget, funding, developing partnerships and providing business facilitation services. ☑ It is responsible of 6 ports: Port Said port, East Port Said Port, Arish Port, Adabiya port, Sokhna Port, and Al-Tour port.

Executers

Construction Companies	In order to complete all construction and development works in various ports such as excavation, dredging, etc., various national and international companies are called to execute these projects based on the tenders that can be offered.
Capacity Building Firms	The Port development sector lacks the qualified and professional workforce and therefore has to cooperate with various capacity-building firms to qualify its existing workforce and create opportunities for others to join this sector.
IT Development Organisations	The Egyptian transportation sector lacks systems that connect the country's infrastructure with shared data resulting in bad experiences for international customers using Egypt's ports. Accordingly, Egypt has to cooperate with various IT development organisations to develop a system that connect all the whole ports and makes data sharing easier.

Supporters	
Arab Academy for Science, Technology, and Maritime Transport (AASTMT)	☑ The Academy is considered one of the top centres for scientific excellence in the Arab world. It labels itself a non-governmental, not-for-profit university. ☑ The Academy supports the maritime sector with expertise to create and develop strategies for ports development. ☑ The Academy supports the maritime sector with graduates, annually, who can be additions to the market on various levels.
National and International Organisations	Various national and international organisations can support the Egyptian ports market by supplying the market by finances, reports, studies, recommendations, etc. like national and international banks, United Nations, GIZ, JICA, etc.

External Trades

COMESA, GAFTA, the EU-Egypt Partnership Agreement, the Agadir Free Trade Agreement, and the Egypt-EFTA Free Trade Agreement are only a few of the key Free Trade Agreements (FTAs) Egypt has signed. Preferential agreements with particular nations, such as Syria, and free trade agreements with Turkey, EFTA countries, and the four MERCUSOR countries — Brazil, Argentina, Uruguay, and Paraguay — have been in place since March 2007. Moreover, Quantitative reviews show that the EU remains Egypt's most important commercial partner, a situation that is unlikely to change in the near or medium term.

The following table summarises the changes of total annual consumption volume on a commodity group basis. The share of low value commodities, being typically bulk cargoes, was estimated at approximately 67% for 2010. The middle value commodity, being typically break-bulk cargoes, is estimated at 23% of the total, while higher value commodities, being containerised cargoes, represent roughly 10%.

Table 10: Projection of Consumption Volume by Commodity Group (JICA- MINTS 2012)

Units: Million Tonnes

Item	Product	2010	2017	2027
1	Petroleum	132.7	197.8	286.6
2	Building Materials	185.6	240.5	337.5
3	Minerals Products	11.6	17.0	27.6
4	Agriculture Products	105.3	131.3	173.8
5	Livestock Products	13.1	15.3	20.5
6	Fishery Products	1.2	1.8	3.0
7	Processed Foods	4.6	6.5	9.4
8	Metal Products	17.9	30.7	50.1
9	Textile Products	1.0	2.6	6.8
10	Chemical Products	21.2	32.9	60.5
11	Beverage	1.8	2.5	4.5
12	Manufactured Goods	6.9	17.7	47.8
	Total	503.0	696.7	1028.0

Ports will surely improve foreign trade competitiveness and provide access to global markets by connecting the national transportation network with international transport networks via ports and some land crossings. The Egyptian transportation system is currently being developed, with a focus on improving port efficiency in order to increase the transit of import and export goods, as well as transit cargo, through Egypt's important ports.

Outline for Egyptian Ports

The development of dry ports and logistical facilities at GCMA and Upper Egypt, as well as trains and inland waterways to connect them to the Ports Complex, is part of the strategy to improve freight transportation connectivity. Almost all freight is transported by road, which has the highest operational expenses, due to a lack of coordination. Due to conflicts of interest and many functions of the port authority and maritime transport industry, as well as their linked logistics services, the previously adopted Master Plan aimed at making Egypt a regional hub for transshipments and containerised trade did not materialise.

Egypt's Ports Complex is ranked number 18 in the world, and renovations may increase exports by $12 billion. Establishing access to Egypt's major industrial and consumption hubs is critical to the Ports Complex's success. These include the Greater Cairo Metropolitan Area (GCMA), which accounts for almost two-thirds of Egypt's GDP and half of the country's jobs, as well as underdeveloped regions like Upper Egypt, which nonetheless account for a considerable portion of the population and agricultural production volumes.

Greater Alexandria Port (Alexandria and Dekheila ports), Damietta Port, Port Said Port, Suez Port (including Adabiya Port), and Safaga Port are Egypt's five largest commercial ports. The General Authority for Land and Dry Ports (GALDP) is planning the establishment of nine dry ports/logistics centres using a PPP framework, based on the 2012 National Transport Master Plan. Three of the nine proposed dry ports appear to have a better chance of receiving private funding than the others. GALDP intends to build two of these dry ports in GCMA on the 6th and 10th of Ramadan, respectively, while SCZ plans to build the Ismailia Dry Port.

The following table shows the situation at Egypt's ports between 2019 and 2020. A decrease in import and export operations due to the 2020 pandemic. However, these ports are expected to see significant interest in the coming years.

Table 11: Total Container Handling in the Egyptian Seaports during (2019, 2020) (MTS Achievements 2020)

Port	2019				2020				Rate
	Imp.	Exp.	Transit	Total	Imp.	Exp.	Transit	Total	
Alexandria	449,803	394,650	6,833	**851,286**	465,044	387,994	433	**853,471**	0.3%
El Dekheila	471,523	485,560	6,581	**963,664**	414,923	423,482	1,376	**839,781**	-12.9%
Damietta	181,958	303,230	582,814	**1,068,002**	164,137	276,180	611,552	**1,051,869**	-1.5%
West Port Said	169,895	216,363	268,061	**654,319**	154,560	158,947	186,025	**499,532**	-23.7%
East Port Said	78,120	85,543	2,840,177	**3,003,840**	97,980	130,791	3,281,369	**3,510,140**	16.9%
Adabiyah	34,968	34,812	0	**69,780**	40,002	38,579	0	**78,581**	12.6%
Sokhna	297,395	320,692	16,569	**634,656**	343,100	380,367	7,544	**731,011**	15.2%
Total	1,683,662	1,840,850	3,721,035	**7,245,547**	1,679,746	1,796,340	4,086,924	**7,564,385**	4.4%

Table 12: Components of The Egyptian seaports until the end of 2020 (MTS Achievements 2020)

Statement of Port	berth data			Capacity		
	Number of berths	Length (m)	Draft (m)	Cargo (million ton)	container (million TEU)	Yards and warehouses million (M)
Alexandria	66	9697	14	38	1.5	0.54
El Dekheila	21	4661	20	28	1.5	1.64
Alexandria Port Authority	87	14358	0	66	3	2.20
Damietta	28	6600	15	33	1.4	1.10
Suez	14	2100	8	7	0	0.02
Petroleum Basin	7	828	10	8	0	0.00
Hurghada	1	330	10	0	0	0.02
Safaga	6	1327	14	7	0	0.21
Nuweiba	3	385	9	3	0	0.23
Sharm El-Shaikh	2	741	10	0	0	0.11
Red Sea Ports Authority	33	5711	0	25	0	0.60
Total affiliated Ports	148	26669	0	124	4.4	4.00
West Port Said	32	4427	13	12	1.1	0.24
East Port Said	4	2400	19	12	5.4	1.80
Adabiyah	9	1840	13	11	0	0.28
Sokhna	9	2400	17	24	1.1	0.01
El Tor	1	75	5	0	0	0.39
Arish	2	364	8	1.2	0	0.03
The Econimic Zone Ports	57	11506	0	60.2	7.6	2.80
Total	205	38175	.	184.2	12	6.7

Table 10: Projection of Consumption Volume by Commodity Group (JICA- MINTS 2012)

Item	2019	2020	Rate%
Total vessel voyages (vessel)	14000	11890	-15%
Total handled cargo- Commercial Ports (1000,000 tonnes)	**160**	**156**	**-3%**
Total handled imported cargo (1000,000 tonnes)	82	76	-7%
Total handled exported cargo (1000,000 tonnes)	40	39	-3%
Total handled transit cargo (1000,000 tonnes)	38	41	8%
Total handled Cargo-Specialised ports (1000,000 tonnes)	12	8	-33%
Total handled Cargo-Commercial, Specialised ports (1000,000 tonnes)	**171**	**164**	**-5%**
Total container handling (1000,000 TEUs)	**7.2**	**7.6**	**6%**
Total handled imported container (1000,000 TEUs)	1.68	1.7	1%
Total handled exported container (1000,000 TEUs)	1.84	1.8	-2%
Total handled transit container (1000,000 TEUs)	3.7	4.1	11%

Maritime Transport Sector Achievements in 2020

Some market indicators can help investors and businesses understand the readiness of a market. These indicators include: legislation, licencing constraints, information technology, capacity building, and international cooperation.

Let's explore these indicators further in the table below.

Legislations

- Presidential Decree No. 54 /2020 on the requirement for the Presidential approval before granting the license to establish an international marina, without prejudice to the provisions of the Irrigation and Drainage Act issued by Law no.12/1984.
- Prime Minister Decree No.1847/2020 on establishing Abu Suma Marina.
- Prime Minister Decree No.578/2020 on the inclusion of Ministry of Transport to be a member of the High Committee on Licenses of Shore Protection Authority.
- Prime Minister Decree No.907/2020 on the inclusion of Ministry of Transport to be a member of the ministerial committee of Tourism and Antiquities.
- Minister of Transport Decree No. 317 /2020 on issuance of licenses of establishing docks and piers on the Egyptian coastlines.
- Minister of Transport Decree No. 121 /2020 on the treatment of Foreign Ro-Ro vessels, engaged in regular voyages between Egyptian ports the same way of National Vessels.
- Minister of Transport Decree No. 273 /2020 on forming the board of Directors of Damietta Chamber of Shipping.
- Minister of Transport Decree No. 274 /2020 on forming the board of Directors of Port Said Chamber of Shipping

- Minister of Transport Decree No. 275 /2020 on forming the board of Directors of Alexandria Chamber of Shipping.
- General Authority of Alexandria Port Decree No. 2196 /2020 on defining parking fees for vehicles in both Alexandria and Dekhila Ports.

Licensing

- Shipping agency licenses were granted to (19) companies for virious tonnages.
- Shipping agency licenses were renewed for (28) companies for virious tonnages.
- (16) licenses were canceled for nonperformance of activities for a period of 3 years.
- The adoption of (147) approvals on operation of ships and marine units (flying the Egyptian flag) in coastal transport between Egyptian ports (cabotage)

Capacity Building

- Scholarships and internal Trainings in which various courses are given to the trainees like: Economic feasibility studies and evaluation of projects in the maritime transport sector, Human resources management in maritime transport, etc.
- External trainings and scholarships such as:
  1. The scholarship provided by the International Maritime University of Sweden.
  2. The grant provided by the Arab Academy for Science, Technology and Maritime
  3. Transport under the supervision of the Belgian government.
  4. The grant provided by the Arab Academy for Science, Technology and
  5. Maritime Transport in cooperation with the Port Corporation of Marseille,
  6. France, to obtain a training diploma (online).

Information Technology

- Updating the Automated Identification System (AIS), which is responsible for tracking ships, across the country's port authorities, civil and military agencies.
- launching the electronic archive of the Maritime Transport Sector.
- Registries in the Maritime Transport Sector database reached nearly 45 million records.

Cooperation

- Following up on the measures of transferring stranded people in Dhiba Port (Kingdom of Saudi Arabia) in coordination with the concerned authorities and Alkahera Company for Ferries and Maritime Transport (14,624 Egyptians, and 62 foreigners were transferred).
- Disseminating the Terms and Conditions regarding the entry of vehicles into Kingdom of Saudi Arabia during the pilgrimage season (Hadj and Umra) using transport companies that operate on the Egyptian-Saudi borders of: Nweiba/Aqaba- Hurghada /Dhiba –Safaga/Dihba).
- Finalizing negotiations and reaching to a final version of the bilateral agreement in the field of maritime transport between the Arab Republic of Egypt and the Council of Ministers of the Republic of Albania (the agreement is ready for signature at the presidential level).
- The comprehensive plan for the Egyptian seaports in accordance with Egypt's vision 2030, which is implemented by the Research and Consultation Centre MRCC in cooperation with the Hamburg Port Consulting Centre HPC.

Comprehensive development plans for Egyptian ports

The development work in the port of Alexandria, as well as what has been implemented in the ports of Dekheila and El Max, are among the most important projects undertaken by Egypt's Ministry of Transport, as they are expected to be completed by the end of 2024, making Alexandria one of the largest ports in the Mediterranean.

In the areas of the 10th of Ramadan, the 6th of October, and Sadat, the Ministry of Transport was interested in developing transport and logistics hubs connecting seaports, dry ports, and logistic areas, the most important of which is the Sokhna/Alexandria axis, which passes through industrial zones, dry ports, and logistic centres. It all begins with the multimodal transportation system's expansion of Egyptian ports.

To ensure sustainability and coherence of the transportation system, Egypt has developed several targets for the construction of new berths, new river ports, dry ports, and logistic areas as shown in the next figure

Figure 9: Maritime Transport Sector Development Plan

The establishment and development of berths and multi-purpose stations specialised in specific types of goods serves the various activities of export, import, and transit. It also takes into account these berths are implemented at depths in accordance with the increase in the draught of large ships, allowing the port to be transformed into a regional hub for the service of transit trade with its direct connection to the port of Sokhna via The Electric Rail Highway as shown in the following table.

Table 14: Egyptian Ports Planned Projects

Project Name	Description	Time Frame End	Status
Alexandria Port			
With the completion of the next projects, the Great Port of Alexandria will have 87 berths with a total length of 24.9 km and depths ranging from 8.5-20 m.			
Multi-storey garage	The project consists of 5 floors on a floor area of 15,000 square metres (sqm) with a total of 75,000 (sqm) and a capacity of 4,000 cars	2021	Implemented
Tahya Misr station	Establishing and operating a multi-purpose Tahya Misr plant on berths 55-62 at a financial cost of EGP 7 billion and a capacity of 12-15 million tonnes annually with total berth lengths of 2.5 km and depths ranging from 14.5-17.5 metres with a storage area of 560,000 (sqm).	2023	Implementation rate 75%
Berth 85 / 3	Establishment of berth 85/3 (timber handling /unloading station) with a length of 433 metres and a depth of 15.5 metres at a cost of EGP 400 million and allowing the accumulation of ships up to 70,000 tonnes	2022	Implementation rate 90%
New storage yards	The establishment of new storage yards on an area of about 50 acres of the lands of the back of the port north of El Max Road (commercial timber land - refrigerator land - school - architecture - Al-Anmati Street - safety authority land) allowing the circulation of 3 million tonnes at a cost of EGP 305 million.	2022	Implementation rate 98%
Multipurpose terminal on berth 100	Establishment and operation of a multi-purpose terminal on (berth 100) in Dekheila port, the berth length is 1800 m, depth of 17 m, and the backyard has an area of 660,000 (sqm) at an estimated cost of EGP 3 billion	2023	Starting
Clean dry bulk plant	Establishment of a dry bulk handling station between berths 91 and 92 in Dekheila Port, with a length of 1150 m, a depth of 15 m, and a storage yard of 300,000 (sqm) at an estimated cost of EGP 1.8 billion.		Planned
Unclean casting station	Establishment of a station for handling unclean casting in the area behind berth 90 at Dekheila Port, with a length of 540 m, a depth of 16 m, and a storage yard of 188,000 (sqm) at an estimated cost of EGP 1.6 billion		Planned
The middle port (El Max port)	Establishment of the middle port between Alexandria and Dekheila ports in El-Max area with 3.5 km berths and 3.5 km2 storage yards at an estimated cost of EGP 12 billion		Planned

Development of the road transport system	It includes the establishment and development of 3 free traffic axes to connect with the reconstruction axis linked to entrance and exit yards and equipped with inspection and insurance devices to increase circulation rates in the port and eliminate traffic congestion. They are the Dekheila axis with a length of 4.5 km at a cost of EGP 816 million, and axis 27 with a length of 2.4 km at a cost of EGP 450 million, axis 54 with a length of 2.3 km at a cost of EGP 905 million.	2021	Implemented
Rail transport system development	The railway network is being rehabilitated and linked to all berths and stations within the port in order to connect with the fast electric train line, as well as the courtyards and rails being renovated in accordance with worldwide engineering standards. Passengers on trains, including all types of tractors and wagon, as well as sophisticated electrical transit systems including monorails, light rails, metros, and railway construction, repair, and maintenance equipment.		Ongoing
Development of the river transport system	It includes the development of the salt lock (Hawais El-Malih) for the passage of all types of floats and the development of the navigation course for the Nubaria Canal to connect it with the river port and the logistic area of the Metras Basin and the Nile River, and it includes the development of the bridges of the lock (2 car bridges - mobile railway bridge) at a cost of EGP 300 million.	2023	Implementation rate 45%
Logistics areas	It includes the establishment of logistic areas and distribution centres for goods with a direct link to the port with an integrated multi-modal network via land, rail or river transport, to increase the circulation in the port, increase the spaces available for storage services, link them to the port and provide opportunities for value-added activities.		
The first logistic zone	With an area of 273 acres, at an estimated cost of EGP 1 billion, in the Al-Matras Basin		Planning
The second and logistic zone	With an area of 11.7 acres in Naga Aso and Naga aluminum.		Planning
Damietta Port			
Multi-purpose station	Supplying, managing and operating a multi-purpose station behind the western barrier.		Planning
Station for handling and storing grains	Developing and operating a station for handling and storing grains and value-added industries with an area of about 108,000 sqm and an estimated cost: $100 million		Planning
300m berth development	Development and operation of a 300 m berth		Planning
270,000 (sqm) Area development	Development and operation of an area of 270,000 sqm next to the eastern breakwater		Planning

Red Sea Ports			
Multi-purpose terminal at Safaga Port	Supplying, managing and operating a multi-purpose terminal (containers - general cargo) at Safaga Port (Estimated cost: $300 million)		Planned
Safaga 2 Station	The berth length is: 1100 m, the berth depth: 17 m, the area of the station: 810,000 sqm, and the capacity: 2 million containers and 7 million tonnes of general cargo annually (total cost: EGP 2.64 billion)	2023	Under Implementation
Abu Tartour Industrial Port	A mining and industrial port, 5km south of Safaga port in Red Sea. The consulting agreement has been signed in 2016, and the IFC are currently advising the PPP unit on the matter		
Ain Sokhna Port Development	The total area of the port is 23 square kilometres, berths of 18 km length and 18 m depth, trading yards with a surface area of 9.6 million sqm, logistic areas with an area of 5.3 square kilometres , a network of internal roads with a length of 17 km, as well as a network of railways with a length of 33 km connected to the electric express train line (total cost EGP 45 billion)		Planned
A Berth behind the northern berth in Port Tawfik Port	Supplying, managing and operating a berth behind the northern berth in Port Tawfik Port (estimated cost: $250 million)		Planned
Multi-purpose terminal at Nuweiba port	Supplying, managing and operating a multi-purpose terminal at Nuweiba port (estimated cost: $200 million)		Planned
The river port of Dandara in Qena Governorate	Construction, management, operation, exploitation and re-delivery of the river port of Dandara in Qena Governorate (estimated cost: $20 million)		Planned
The river port of Al-Mansha' in Sohag Governorate	The project of establishing, managing, operating, exploiting, and handing over the river port of Al-Mansha' in Sohag Governorate (estimated cost: $20 million)		Planned
General Authority for Land and Dry Ports			
The logistic centre adjacent to the dry port in 6th of October	Establishment of the logistics centre on an area of 300 acres adjacent to the dry port in 6th of October (estimated cost: $300 million)		Planned
Construction of a dry port in the 10th of Ramadan City	The project aims to reduce congestion in seaports, apply effective procedures for customs inspections and clearance, and work to reduce the total cost of goods and production components.		Planning
Ismailia Dry Port	Envisaged to have specialised facilities for the handling, transit, and storage of agricultural commodities		A prefeasibility study was completed in 1979 but no recent studies have been conducted.

A logistic centre as a backyard for Salloum Port	Establishing a logistic centre on an area of 700 acres as a backyard for Salloum Port (estimated cost: $300 million)		Planned
A logistics centre in Qastal	Establishment of the logistics centre in Qastal on an area of 300 acres (estimated cost: $100 million)		Planned
A logistics centre in Arqin	Establishment of the logistics centre in Arqin on an area of 300 acres (estimated cost: $100 million)		Planned
Dry port in the new city of Sohag	Dry port in the new city of Sohag on an area of 45 acres (estimated cost: $85 million)		Planned
Dry port in the new city of Beni Suef	Dry port in the new city of Beni Suef on an area of 100 acres (estimated cost: $200 million)		Planned
Dry port in Sadat City	Dry port in Sadat City on an area of 75 acres (estimated cost: $161 million)		Planned
Dry port in Borg Al-Arab	Dry port in Bord Al-Arab on an area of 90 acres (estimated cost: $100 million)		Planned
Dry port in Damietta	Dry port in Damietta on an area of 15 acres (estimated cost: $20 million)		Planned
Dry port in Al-Tor city	Dry port in Damietta on an area of 15 acres (estimated cost: $20 million)		Planned
Capacity Building& IT			
Training youth and women to work in seaports	Various port authorities seek funds and grants to train women and youth to work in seaports.		
The single window system	Governance procedures within the framework of the single window system and coordination with the agencies and departments affiliated with the port to speed up the movement of circulation and the exit of goods from the port		

Egyptian Ports Market's SWOT Analysis

After defining the Egyptian port market including stakeholders, projects, and possible investment opportunities, it is time to analyse the ports sector's strengths, weaknesses, opportunities, and threats. Despite the fragmentation in the Egyptian port market, the previously mentioned plans and the following SWOT analysis can show Egypt's desire to develop and sustain its ports market, thereby paving the way for Dutch entrepreneurs to invest and start their work in Egypt.

Figure 10: Egyptian Ports' Market SWOT Analysis

Strengths

- There are strong indicators for updating policies and legislations for the ports market, which would enable the private sector and international organisations to invest and contribute.
- In the short term, the National Ports Development Strategy would be finalised which would facilitate the more transparent concessioning of port terminals, and revision of the governance structure.
- There is a real potential to develop the whole transportation system in Egypt and integrate the ports into these plans.
- The Egyptian political system has stabilised over the last few years and hence, the government controls most of the ports market.
- Egypt's workforce is eager and ready to develop their skills in various aspects and fields.

Opportunities

- The General Authority for Land and Dry Ports (GALDP) is using the 2012 National Transport Master Plan as the framework within which it is planning the development of nine dry ports/logistics centres using a PPP framework.
- El Dekheila / Alexandria Dry Port / SEZ. El Dekheila/Alexandria Port has limited space for container storage and is seeking to develop an inland container terminal and/or SEZ in Borg El Arab, which is about 20kms from the Port.
- Damietta Grain Logistics Centre.Damietta has ambitious plans to be a grain centre for the Eastern Mediterranean.
- The government has already startedmaking use of the financial and technical support from European Bank for Reconstruction and Development (EBRD) for the preparation of the aforementioned 10th of Ramadan Dry Port project as a PPP.
- The World Bank and IFC are working with MoT on developing a freight railway line to establish this connectivity through a PPP.
- The ambitions to have a Free Trade Zone at Ismailia. It is now envisaged to have specialised facilities for the handling, transit, and storage of agricultural commodities.

Weaknesses

- The port subsector governance is fragmented, which has led to a lack of coordination in investment planning and an inconsistent overall scope of investment ambitions.
- Ports are not integrated into broader transport system planning.
- The lack of an independent regulator has also resulted in unresolved disputes between the Government and private concessionaires.
- Inefficient clearance and handling services, part of which is attributed to a cumbersome customs clearance process, outdated IT systems and insufficient qualified staffing.

Threats

- No clarification for the need and timing for the proposed new ports, dry ports, logistics centres, etc. has been made.
- High Market risks: The main successful private sector port investments took place over 10 years ago. Given the current environment it is unlikely that commercial banks and International Financial Institutions will accept the market risks involved in the port sector, and therefore new projects may not be bankable.
- The risk of over-capacity: Being Grain Logistics Centre via Damietta, El Dekheila Grain Silo Connectivity Project and PSE Grain Silo Project, there is the risk of over-capacity even for the domestic and re-export markets. The National Ports Development Strategy should provide a context in which the risk of over-capacity can be resolved, to facilitate the financialviability of the potential grain logistics projects, and enable potential PPPs.
- Although the Free Zone was established in 1985, it hasn't seen much progress due to the absence of a connecting railway.

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Part 3

Overview of the Egyptian Economy and the Waste Management Market

Introduction

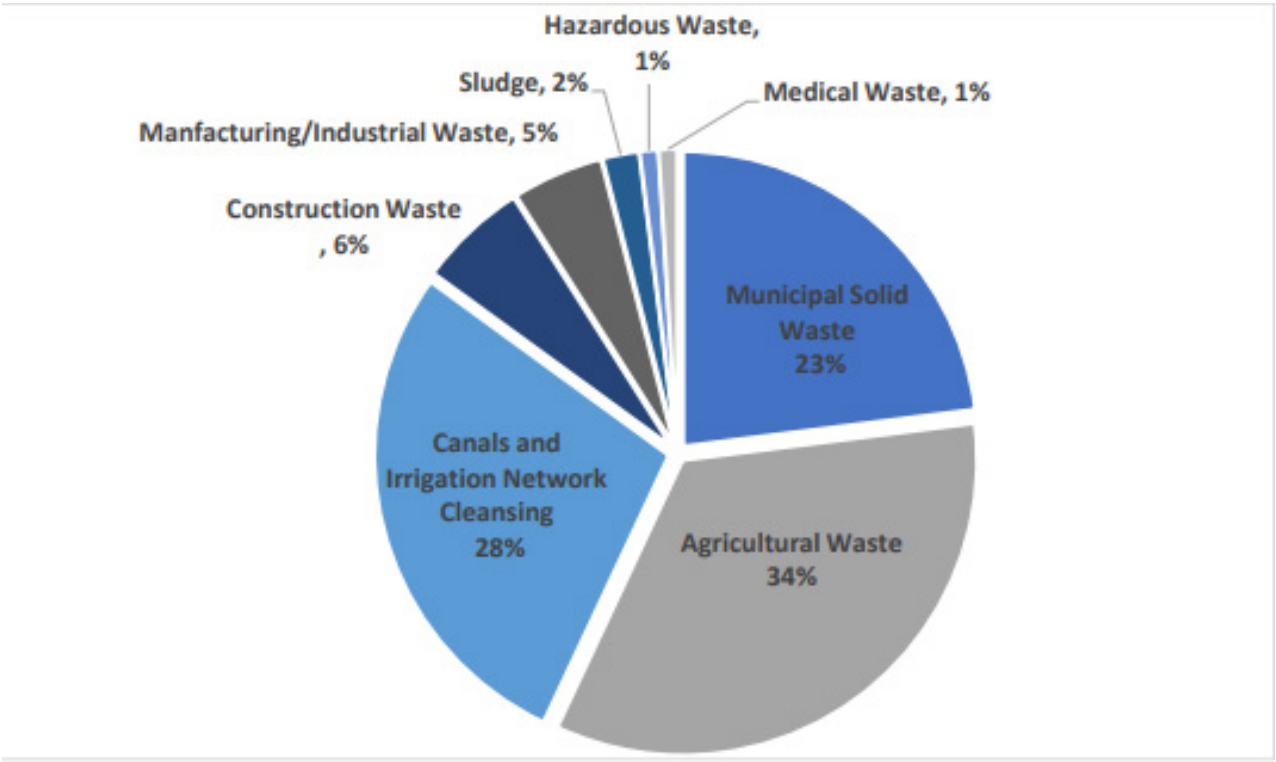
Egypt's waste management sector is both one of the most promising sectors and one that is in desperate need of development. In 2016, Egypt generated about 90 million tonnes of waste and this figure increases every year. Statistics show that only 60% of waste is collected with less than 20% of that 60% is properly disposed of or recycled.

Waste has many categories depending on the source and composition. By source, waste includes: municipal solid waste, industrial waste, medical waste, agricultural waste, canals and irrigation network cleansing, and construction waste.

Based on population growth and factoring in GDP, solid waste generated is forecasted to reach 95 million tonnes by?. Agriculture Waste accounted for the highest amount of waste with 34% of the total, followed by canals and irrigation networking cleansing with 28%, municipal solid waste with 23%, construction, manufacturing, sludge, hazardous waste, and medical waste.

Greater Cairo was the highest governorate in terms of waste generation, followed by Alexandria, Giza, and Qalyubia.

Figure 11: Waste Compositions in Egypt 2016



Amounts and compositions of waste generated in rural areas differ from those in urban areas due to the lifestyle and consumption pattern. It is estimated that solid waste generation is 0.5 to 0.6 kg/day per capita in rural areas and around 1 kg/day per capita in urban areas. The rural area generates 70-80% organic waste divided roughly into 2/3 food scraps and 1/3 animal manure. Rural areas generate approximately 6% plastic waste, 6% diapers, 4% paper and cardboard, 2% glass, and 1% metals.

Egypt's Vision 2030 supports market improvement in the field of waste management. The country's waste management sector is rich in business opportunities due to poor collection, recycling, treatment, and presence of few landfills.. Egypt's Vision 2030 has three pillars of sustainability, one of which is the environmental dimension, which includes two broad goals.

The first goals are "Environment is integrated into all economic sectors to preserve natural resources and support their efficient use and investment, while ensuring next generations' rights. A clean, safe and healthy environment that leads to diversified production resources and economic activities, supporting competitiveness, providing new jobs, eliminating poverty, and achieving social justice." Having a safe clean environment requires proper collection, classification, efficient management system, and treatment and recycling facilities which represent opportunities.

Egyptian waste is a rich source for various industries as it offers raw materials and energy resources.

The second environmental goal is "A balanced spatial development management of land and resources to accommodate population and improve the quality of their lives." Sustainable development in the waste management sector can be translated into an improvement in collection in all governorates and efficient use of waste as a source for improving the quality of people's lives.

WM Market's Stakeholders Mapping

According to Presidential Decree No.275/1997, the responsibility of Egypt's first full-time Minister for Environmental Affairs was allocated in June 1997. From there, the new Ministry has concentrated on creating environmental policies, setting priorities, and implementing projects in the context of sustainable development, working closely with national and international development partners.

The Ministry of Environment (MoE) and the Egyptian Environmental Agency (EEAA) are Egypt's main authorities in charge of promoting and protecting the environment, as well as coordinating appropriate responses to these challenges. The Waste Management Regulatory Authority (WMRA) is a regulatory governmental authority that was established by the MoE and works under its supervision. The WMRA is in charge of implementing the aim of a green, waste-free Egypt.

The WMRA oversees Egypt's solid waste management ecosystem, encompassing collection, transportation, treatment, storage, and disposal of solid waste in all governorates and municipalities, the Law No. 202 of 2020 promulgating the new Waste Management Law. The WMRA is allowed to establish and implement laws for various solid waste management activities in Egypt to promote sustainable development in accordance with Egypt's Agenda. Meanwhile the National Solid Waste Management Program (NSWMP) was established in 2012 also under the MoE. It assists the WMRA in the establishment of a sustainable and integrated solid waste management system in four governorates, namely Kafr El Sheikh, Gharbia, Assiut, Qena). The NSWMP is funded by the Egyptian Government represented in the MoE, alongside the EU, German Ministry for Economic Cooperation and Development (BMZ) through the German Bank for Reconstruction (KfW) and GIZ, and the State Secretariat for Economic Affairs (SECO).

The project aims to restructure the waste sector at the national, regional, and local levels, as well as establish an autonomous central institution to regulate municipal solid waste management and waste management units in four governorates (Kafr El Sheikh- Gharbia- Quena- Assiut).

The General Authority for Cleanness & Beautification (GAFCB) is a governmental authority responsible for the implementation of solid waste management plans which include collection, sorting, and dumping of solid waste in Cairo and Giza. Local Municipalities are the local implementors of the solid waste management plans.

Waste Management in the Egyptian Economy

WM Market Stakeholder Mapping

Egypt's waste management stakeholders are divided into four major categories: planners, regulators, executors, and supporters. Planners are the Ministry of Environment (MoE) and the Egyptian Environmental Agency (EEAA), while regulators include The Waste Management Regulatory Authority (WMRA) and the Egyptian Environmental Agency (EEAA). The executors category includes the National Solid Waste Management Program (NSWMP), the General Authority for Cleanness & Beautification (GAFCB), and governorate officials.

The Ministry of Environment (MoE) and the Egyptian Environmental Agency (EEAA) are Egypt's leading authorities to promote and protect the environment and coordinate appropriate responses to these challenges.

Meanwhile, the Waste Management Regulatory Authority (WMRA) is a governmental regulatory authority that works under the supervision of the Ministry of Environment. The MoE established the WMRA to implement activities to achieve the target of a green, waste-free Egypt. The WMRA oversees Egypt's solid waste management ecosystem, encompassing collection, transportation, treatment, storage, and disposal of solid waste in all governorates and municipalities, the Law No. 202 of 2020 promulgating the new Waste Management Law. WMRA can create and implement regulations for various substantial waste management activities in Egypt to promote sustainable development under Egypt's Agenda.

The General Authority for Cleanness & Beautification (GAFCB) is the government authority responsible for implementing solid waste management plans, including collection, sorting, and dumping of solid waste in Cairo and Giza.

Municipal Solid Waste

Egypt is developing its solid waste management system. The existing system has numerous flaws and is not uniform across the country's governorates. Currently, several projects are Being executed to enhance the solid waste management process, increase its efficiency, and support its sustainability.

Agriculture Waste

Agricultural waste is waste produced because of various farm operations. It includes manure and other wastes from farms, poultry houses, and slaughterhouses; harvest waste; fertiliser run-off from fields; pesticides that enter the water, air, or soils; and salt and silt drained from fields. Due to the economic nature of Egypt as an agricultural land mainly. Egypt has a significant portion of its waste from an Agriculture source estimated by 34 % of total annual waste production.

Construction Waste

The construction industry contributes a significant amount of construction and demolish (C&D) trash to landfills. According to the Egyptian Ministry of State for Environmental Affairs' annual report on solid waste management, 41.7 million tonnes of C&D garbage were generated in 2013. And this figure rises by around 3.2 percent per year. Since 2013, the government has faced a challenge from rising garbage creation, which coincided with Egypt's building sector. C&D waste recycling and reuse (R&R) can help to mitigate adverse environmental effects.

WM Market's Private Sector

There are two types of stakeholders in the waste management market: formal and informal stakeholders. The central government, formal private firms, "national and international" donors, commercial garbage generators and residents, and non-governmental organisations (NGOs) are part of the formal private sector.

Meanwhile, traditional rubbish collectors (Zabbaleen), Roamers (Sarriiha), Robabekia and Saxonia peddlers, middlemen and intermediary buyers and/or dealers, and wholesale merchants of commodities from roamers are all part of the informal sector. More than 40,000 people are projected to work in the informal sector nationally, collecting, transporting, recovering, and recycling garbage and waste. In Cairo, they were responsible for a third of all sustainable waste management (SWM) activities, which means that the informal sector is a significant stakeholder in the SWM process.

Waste Management in the Egyptian Economy

Sector	Challenges	Opportunities	Strengths
Waste Management	Collection efficiency is very low between %20 to %30 of total waste generated.	Highly growing population results in significant amounts of waste and rich resources for many elements.	Policy changes that enabled international arbitrage and the introduction of competitive capacity bidding at auctions have increased market competition.
	Lack of unified, applied, and efficient system to manage all waste types.	Different waste compositions between governorates.	The high focus of the government in developing a sustainable waste management system.
	Waste taxation is established in some governorates only.	Fertile economic environment and governmental support.	Installation of composting systems and biogas units.
	Weak infrastructure to handle this amount of waste generated.		

Some ministries collaborate with local governorates to handle some types of waste like agriculture waste, sludge, medical waste, and hazardous waste.

Table 15: Participating Ministries with MoE in Waste Management

Participating Ministry	Type of Waste
Ministry of Local Development (governorate)	Municipal Solid Waste
Ministry of Agriculture and Land Reclamation	Agricultural Waste
Ministry of Health and Population	Hospital Waste (Hazardous Waste)
Ministry of Water Resources and Irrigation	Waste from Cleaning Waterways
Ministry of Housing Utilities and Urban Committees	Municipal Sludge

The private sector contributes greatly to the waste management industry. The Egyptian government employs the private sector to act as the country's backbone in solid waste management. The private sector also handles hazardous and non-hazardous solid and liquid waste generated by the industrial and other sectors. It can handle collection, transportation, recycling, sorting, treatment, and disposal.

Mega transformations and institutional setup require massive funds, which are not available in developing countries like Egypt. That's why financial institutions, such as the GIZ, UN, and World Bank, are the support system for megaprojects implemented by both the government and private sector.

The following diagram shows how the waste management sector operates across its four pillars: Regulators, planners, executers, and supporters.

Figure 12: Waste Management Stakeholders Map in Egypt

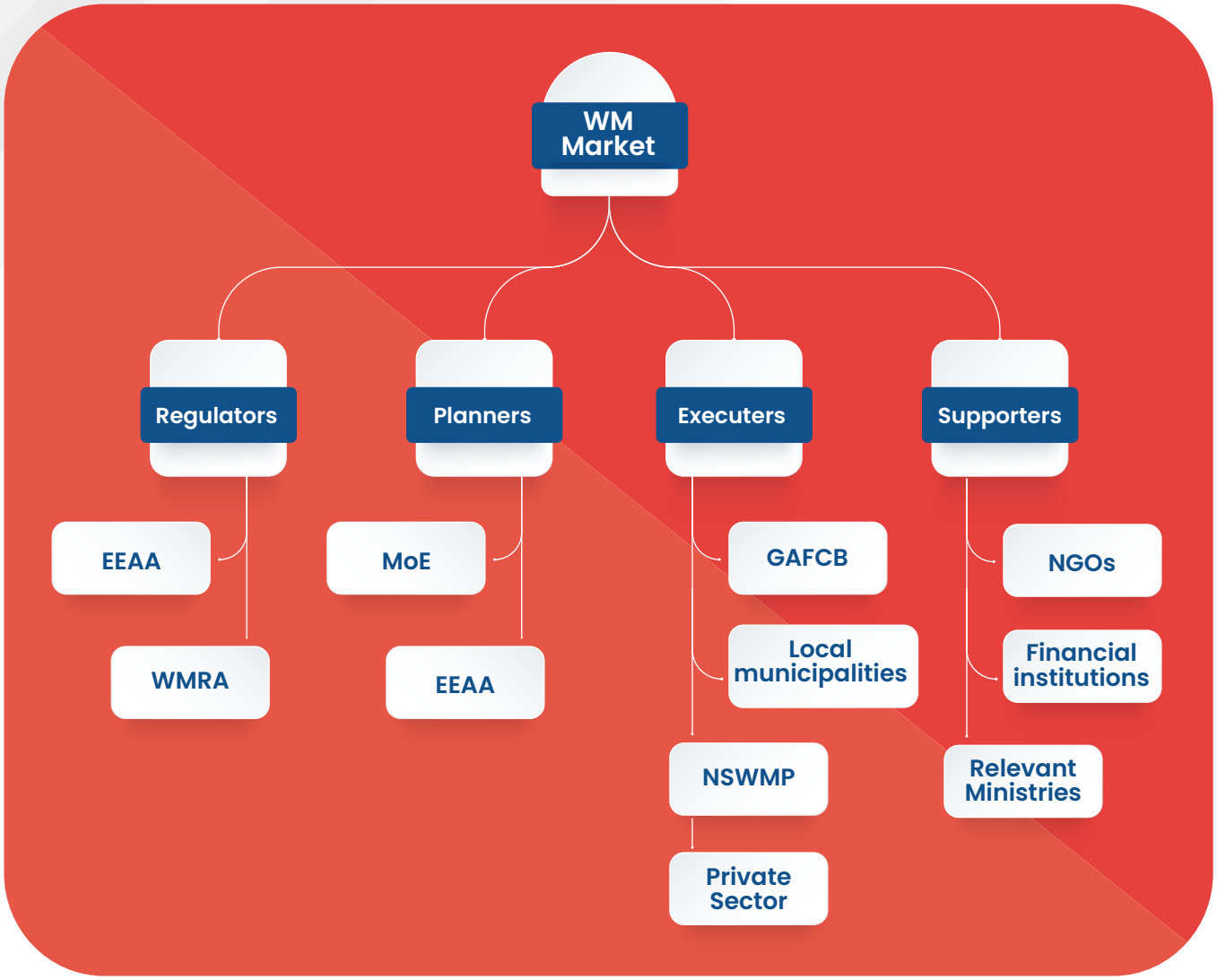


Table 16: Waste Management Stakeholders and their role In Egypt

Planners	
Ministry of Environment	The main goals of the ministry are ☑ Formulate Environmental Policies. ☑ Prepare the necessary plans for Environmental protection and environmental developmental projects, follow up on their implementation, and undertake pilot projects.
Egyptian Environmental Agency (EEAA)	☑ Prepare draft laws and decrees related to the fulfillment of its objectives and express its opinion on proposed legislation related to the protection of the environment. ☑ Prepare studies on the state of the environment, formulate the national plan with the projects included for the protection of the environment, prepare the estimated budgets for each as well as environmental maps of urban areas and areas to be developed, and lay down the criteria to be observed when planning and developing new areas as well as the criteria targeted for old areas. ☑ Gather national and international information on the environmental situation and the changes affecting it on a periodical basis in cooperation with the information centres of other agencies, publish such information and evaluate and utilise it in environmental management and planning. ☑ Lay down the principles and procedures for assessing the environmental effects of projects. ☑ Prepare an environmental contingency plan in the manner stated in article 25 of the Law and coordinate with the competent bodies in the preparation of programs to face environmental disasters. ☑ Prepare programs for the environmental education of the public and assist in their implementation. ☑ Coordinate with other competent authorities in connection with regulating and setting safety standards for the conveyance of hazardous materials. ☑ Drafting a strategy for integrated environmental management for coastal zones.
Regulators	
Egyptian Environmental Agency (EEAA)	☑ Conduct field follow-up of compliance with the criteria and conditions that are binding to agencies and establishments and take the procedures prescribed by law against those who violate such criteria and conditions. ☑ Determining and ensuring abidance by standards, percentages, and pollutants loads. ☑ Participate in the preparation and implementation of the national programme for environmental monitoring and make use of the data provided. ☑ Implement pilot projects for the preservation of natural resources and the protection of the environment from pollution. ☑ Coordinate with the Ministry for International Cooperation to ensure that projects funded by donor organisations and countries are in line with environmental safety considerations.

Waste Management RegulatoryAuthority (WMRA)	☑ Regulate, follow, and observe all waste management processes at both central and local levels. ☑ Strengthen relationships between Egypt and other countries and international organisations in the area of waste management. Recommend legal actions necessary to be taken in the international and regional conventions on waste. ☑ Attract and promote investment in the collection, transport, treatment, and safe disposal of waste.
Executers	
National Solid Waste Management Program (NSWMP)	☑ Consulting services connected to the Program's development and implementation (Preparation of waste management master plans, design and tender documents, construction, supervision, commissioning, training, and auditing measures, etc). ☑ Constructing waste treatment, recycling, composting, RDF (Refuse Derived Fuel) manufacturing, disposal facilities, and transfer stations infrastructure. ☑ Transferring groups of foreign and national consultants to use their expertise to provide technical help across all solid waste management aspects. ☑ Providing trash management and environmental advice to the government. ☑ Implementing an effective waste management strategy as well as laws and institutional structures at the national, governorate, and local levels. Mobile garbage collecting and transportation devices for primary and secondary waste. ☑ Pilot projects in four governorates to test different primary collecting systems in urban and rural locations.
General Authority for Cleanness & Beautification (GAFCP)	☑ The "Cleansing Department," or what is now known as the "Environmental Improvements and Cleansing Department," is responsible for Municipal Solid Waste (MSW) management services in districts and local units.
Local Governorates	☑ Governorates, markaz, districts (sub-divisions of major cities), and local units are the four tiers of local governance (at the village level). A governorate consists of several markaz. There is the main city and several mother villages in each markaz. Satellite villages and (ezab) hamlets are affiliated with each mother village. ☑ Governorates approve the MSW management budget and investment plans, then transfer the budgets to the districts and local entities in charge of implementing MSW management. The collection of street debris and waste from public spaces, the management of existing composting plants, and the supervision of landfill and dumpsite operations are all responsibilities of local governments (districts or units). If private corporations are hired to carry out these tasks, local governments are still responsible for regulating and controlling the actions and performance of these businesses. Local governments are responsible for enforcing Article 39 of the executive regulations to Law 4/ 1994, which mandates that garbage and solid waste collectors be held accountable for keeping rubbish bins and vehicles clean. ☑ The local government, in collaboration with EEAA, determines the location of solid waste treatment, burning, and disposal facilities. ☑ Issuing permits for the transportation and disposal of these MSW.

Private Sector	☑ The private sector represents the main executer for governmental and industrial sectors as it takes on most of the collection and all the treatment, recycling, and dumping processes.
Supporters	
Non-Governmental Organisations (NGOs)	☑ These organisations tend be successful in supporting waste management projects. They are familiar with the Egyptian market's requirements and characteristics. They support the government to ensure better waste management practices and systems.
Financial Institutions	☑ For being able to implement and develop the desired plans for promoting the WM in Egypt, there is a need to have the required financial support.

Table 17: Examples of Private sector companies and NGOs

Waste Management Companies in private sector	Specialisation
Green Environment Consultants	More than 300 green experts, consultants, and full-time employees use cutting-edge methodology, technology, and equipment, adapting them to local demands, conditions, and resources everywhere they work.
EcoConServ Environmental Solutions	EcoConServ provides integrated waste management services for all types of hazardous and non-hazardous solid and liquid wastes in an environmentally sound, safe, and dependable manner in accordance with Egyptian environmental legislation. The "El Masreya Hazardous and Non-hazardous Waste Centre," a licensed waste management facility located in El Saff, Giza Governorate, is owned and operated by EcoConServ.
Go Clean	For recycling: Plastics, paper, and metal. It buys waste from users
Bekia	Bekia takes all types of waste materials from your home, such as pans, cans, and cooking oil, and replaces them with a wide choice of brand new products. It operates via a mobile application.
Recyclobekia	A Middle Eastern electronic trash recycling company established in Egypt. Recyclobekia provides a unique service in the form of electronic trash disposal and secures data deletion. Due to its toxic substances, electronic waste, which includes hard drives, screens, printers, and other items, is considered the second most dangerous waste after nuclear waste.
Dawar	Dawar is a street-cleaning mobile app, created to help citizens report garbage and wastes in the street using pictures from citizens. Dawar also facilitates communication between waste-related entities such as the Waste Management Authority, the MoE, and others.
BioMisr	BioMisr is an Egyptian company that has been operating since 2013 in the field of managing and treating organic waste to produce bioenergy. The company provides innovative engineering or biological solutions to make the most of this national wealth called “waste.” The company uses all kinds of organic waste including agricultural waste, animal waste, household waste, used oils…etc. BioMisr uses all of these raw materials to produce clean energy and supplements for organic agriculture.
BariQ	Committed to the finest quality, BariQ brings state-of-the-art, cutting edge, and green technology to the region and re-processes post-consumer plastic PET bottles into top quality food-grade pellets. BariQ’s products are processed according to the sustainability pillars of being economically justified and environmentally sound. The company caters to major international bottle and food container makers and fiber producers throughout Europe and the United States.
ECARU	The Egyptian Company for Solid Waste Recycling (ECARU) takes a unique approach, collaborating with renowned local and international research institutions and specialists to develop top-tier solutions for integrated solid waste management. The company collaborates with leading international companies to obtain the most up-to-date solid waste management technologies and equipment.
Triple RE	A waste management solutions company, certified by the Ministry of Trade to recycle and refine electronics waste.

Development Projects for Waste Management sector in Egypt

Project	Description	Sub-projects	Owner	Status
Developing the hazardous waste disposal system and raising the efficiency of its management	The programme aims to reduce the production of hazardous waste and treat it in a sound manner to avoid impacting the environment and people's health. The programme began in 2020 and is slated for completion by 2030.	Sustainable management of resistant Organic pollutant	MoE , MWIR, WB, GEF	Ongoing
		Protection of human health from waste emissions resulting from burning electronic and medical waste	MoE, MOHP, MCIT	

WM Market's Private Sector

There are two types of stakeholders in WM: formal and informal. The central government, local government, ministries, formal private firms, "national and international" donors, commercial garbage generators and residents, and non-governmental organisations are part of the formal sector (NGOs). Traditional rubbish collectors (Zabbaleen), Roamers (Sarriiha), Robabekia and Saxonia peddlers, Middlemen and intermediary buyers/dealers, and Wholesale merchants of commodities from roamers are all part of the informal sector. The formal private sector includes national and international companies, such as Ertekaa, Enviromaster, Ecaru, and Nahdet Misr for environmental services. There were four contracting agreements between local enterprises and the government before private sector participation.

1- Contracting: The government hired private corporations to provide specific services for a set fee and time. The contract was awarded via a competitive procurement procedure in which one business was chosen. Solid garbage collection, street sweeping, transfer station operation, and beach cleaning were among the services supplied by private companies. These local private enterprises include Misr Service, Care Service, and Europe 2000. During the implementation of these contracts, some flaws were discovered. The contracting procedure was opaque, and corruption was a significant factor. In addition, there was no government oversight or monitoring of the implementation process.

2- Concession: A government-owned facility—a dumpsite—awarded to a private enterprise to set up and Utilise for resource recovery or recycling activities in contracting is not extensively employed in Egypt.

3- Franchise: In most countries, trash is held by the local government, which has the authority to grant a license to a private company in exchange for a fee. The provincial government receives the license fee from the businesses. The firm provides services in the affected area and charges residents fees for the services offered. According to the agreement, the created garbage is owned by a private company.

4- Open competition: Open competition agreements are used differently at the global and national levels. On a worldwide scale, each area's households and commercial trash generators employ a company to provide waste services in exchange for a charge. As a result, multiple firms operate in the same district, resulting in more competition but a significant increase in cost. In Egypt's informal sector, this type can be found. On-demand, these informal groups collect waste created in specific locations, primarily rural areas.

More than 40,000 people are projected to work in the informal sector nationally, collecting, transporting, recovering, and recycling. In Cairo, they were responsible for a third of all SWM activity. Before 2000, Greater Cairo's estimated collected waste was 11000 tonnes per day. Still, it is now expected to be 25000 tonnes per day, which means that the informal sector is a significant stakeholder in the SWM process.

WM Market's SWOT Analysis

Egypt's waste management market is still growing and needs a lot of work from analyzing to inventing flexible ways of implementation to fit the social culture. The country aims to achieve many waste management goals. To fulfill these goals, Egypt has been working on creating an open, fertile, and dynamic market and a legal framework for the unlisted types of waste.

Owing to its large annual waste product, various waste compositions, unexploited resource due to lack of proper collection, Egypt has many opportunities in its waste management market.

Figure 10: Egyptian Ports' Market SWOT Analysis

Strengths

- Policy changes that enabled international arbitrage and the introduction of competitive capacity bidding at auctions have increased market competition.
- The high focus of the government in developing a sustainable waste management system.
- Installation of composting systems and biogas units.

Weaknesses

- Collection efficiency is very low between 20 to 30 of total waste generated.
- Lack of unified, applied, and efficient system to manage all waste types.
- Waste taxation is established in some governorates only.
- Weak infrastructure to handle this amount of waste generated.

Opportunities

- Fast-growing population results in big amounts of waste and rich resources for many elements.
- Different waste compositions between governorates.
- Fertile economic environment.
- Governmental Support.

Threats

- The Egyptian pound's volatility puts foreign currency-denominated renewable projects at risk of dramatically higher costs.
- The social view of waste and unwillingness to separate at the source.
- Spread of informal sector that collects valuable waste components before they are collected by the formal sector.
- No legislation exists on some types of waste.

RE Market Appendices

Appendix 1 (Renewables Studies and Reports):

Report Title	organisations	Year	Link
RENEWABLE ENERGY OUTLOOK (EGYPT)	IRENA	2018	IRENA_RE Outlook Egypt
A guide to Renewable Energy in Egypt and Jordan	Friedrich- Ebert-Stiftung Jordan & Iraq	2016	FES_A guide to RE in Egypt and Jordan
دليل الطاقة المتجددة وكفاءة الطاقة في الدول العربية	جامعة الدول العربية	2019	Daleel
Egypt Renewables Report Includes 10-year forecasts to 2029	Fitch Solutions	2021	Egypt Renewables Report Includes 10-year forecasts to 2029
A Brief Political Economy of Energy Subsidies in the Middle East and North Africa	Oxford Institute for Energy Studies	2015	OIES_A Brief Political Economy of Energy Subsidies in the Middle East and North Africa
Solving Egypt's Subsidy Problem	Cato Institute	2013	CI_ Solving Egypt's Subsidy Problem
انتاج الهيدروجين الأخضر وتصديره من منطقة الشرق الأوسط وشمال افريقيا إلى أوروبا	Friedrich-Ebert-Stiftung Jordan & Iraq	2020	FES_Green Hydrogen Production
الآثار الاجتماعية والاقتصادية للطاقة الشمسية في منطقة الشرق الأوسط وشمال أفريقيا	Friedrich-Ebert-Stiftung Jordan & Iraq	2021	FES_Socio-economic study
Electric Bus in MENA	Friedrich- Ebert-Stiftung Jordan & Iraq	2020	FES_Electric Bus in MENA
التقرير السنوي 2020 لهيئة الطاقة الجديدة والمتجددة	NREA	2020	NREA_Annual Report
Second: National Energy Efficiency Action Plan (NEEAP)		2019	NEEAP
Arab Future Energy Index™(AFEX)	RCREEE	2019	RCREE_Arab Future Energy Index™(AFEX)
Electricity Sector Liberalization in Egypt: Features, Challenges and Opportunities for Market Integration	KAPSARC	2020	Electricity Sector Liberalization in Egypt
The Socio-economic Benefits of Solar and Wind Energy	IRENA, CEM	2014	The Socio-economic Benefits of Solar and Wind Energy

Appendix 2 (Indicative list of some NGOs working in the field):

Organization Name	Scope	Link
NGOs for Society Development and Environment Protection	A full list of local, regional and national NGOs registered in Egypt	http://www.moss.gov.eg/
Injaz Egypt	Entrepreneurship and development	http://injaz-egypt.org/
Nahdit Elmahrousa	Social entrepreneurship	https://www.nahdetelmahrousa.org/ https://www.linkedin.com/company/nahdet-el-mahrousa/
Ashoka Arab World	Social entrepreneurship	https://www.ashoka.org/en-aaw
Silatech	Entrepreneurship support	https://silatech.org/
Misr El Khair	Social Development	https://mekeg.org/
Gesr	Social entrepreneurship	https://gesr.net/

Ports Market Appendices

Appendix 3: Egyptian Ports Studies and Reports:

Report Title	organisations	Year	Link
MiNTS – MISR NATIONAL TRANSPORT STUDY (INTERIM REPORT I)	JICA	2010	INTERIM REPORT I
MiNTS – MISR NATIONAL TRANSPORT STUDY (INTERIM REPORT 2)	JICA	2011	INTERIM REPORT 2
MiNTS – MISR NATIONAL TRANSPORT STUDY- Final Report (THE MASTER PLAN)	JICA	2012	THE MASTER PLAN
Maritime Transport Sector Achievements	Egyptian Maritime Transport Sector	2020	Maritime Transport Sector Achievements
(EGYPT) Enabling Private Investment and Commercial Financing in Infrastructure	World Bank Group	2018	Enabling Private Investment and Commercial Financing in Infrastructure

Report Title	Organisations	Year	Link
Decoding Egypt's Supply Chain, Logistics and Transport Sector Performance in 2020	DCODE	2021	Decoding Egypt's Supply Chain, Logistics and Transport Sector Performance in 2020
الاستراتيجية الوطنية المصرية لتطبيق الاتفاقية الدولية ل وتصريف مياه صابورة السفن ورواسبها)الصادرة عن المنظمة البحرية الدولية عام 2004 IMO)	JICA	2012	THE MASTER PLAN
Support for Development of Dry Port in 6th of October City, Egypt	KSP-EBRD Joint Consulting Project	2016/ 2017	Support for Development of Dry Port in 6th of October City, Egypt
Maritime Transport and Related Logistics Services in Egypt	The Egyptian Centre for Economic Studies	2010	Maritime Transport and Related Logistics Services in Egypt

Waste Management Market Appendices

Appendix 4: Egyptian Waste Management's Studies and Reports:

Report Title	Organisations	Year	Link
Sustainable Development Strategy: Egypt Vision 2030	MoE	2016	Egypt Vision 2030_Environment
Strategic Master Plan" for the management of wastes in Kafr El-Sheikh Governorate	WMRA, NWSMP	2016	NSWMP-Strategic-Master-Plan-for-Other-Wastes-KES
19 Business Opportunities: Economic Business Models in Egypt's Recycling sector for start ups and SMEs	GIZ, KFW, NSWMP,WMRA, MoE, Chemonics Egypt, Clean Tech Arabia	2019	19 Business Opportunities Economic Business Models in Egypt's Recycling Sector for Startups and SMEs
Country Report on The Solid Waste Management in Egypt	GIZ, SWEEPNET ,ANGED	2014	Country Report on Solid Waste management Egypt
Egypt State of the Environment 2018	MoE	2018	Egypt State of the Environment 2018
Waste Management	JICA,MoE	2016	Waste Management

CONTACT US

Info@practiq-consulting.com

Tel +2 010 2655 6661

www.practiq.net

82 Akhnaton St., 2nd Floor,
Fifth Settlement, Cairo, Egypt 11835

This is a publication of
Netherlands Enterprise Agency
Prinses Beatrixlaan 2
PO Box 93144 | 2509 AC The Hague
T +31 (0) 88 042 42 42
Contact us
www.rvo.nl

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