

**EGYPT**



# NDC IMPLEMENTATION IN EGYPT THROUGH GREEN INVESTMENTS BY PRIVATE SECTOR

**A SCOPING STUDY**

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AFRICAN DEVELOPMENT BANK GROUP  
GROUPE DE LA BANQUE AFRICAINE  
DE DEVELOPPEMENT







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The African Development Bank

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## FOREWORD

In 2015, the Paris Agreement on Climate Change acted as a stepping stone for climate change mitigation and adaptation until 2030, notably by mandating all signatory countries to keep global warming below 2°C through the submission of Nationally Determined Contributions (NDCs).

To date, at least 50 of the 54 African countries have ratified the Paris Agreement's objectives with an estimated cost of about US 1.2 trillion by 2030. It is expected that 75% of this budget will come from the private sector, whose participation to climate change actions requires to be strengthened and to be guided towards opportunities for bankable and green investments on the continent.

Egypt is a country that is highly affected by climate change. Several key sectors such as health, agriculture, water resources, coastal areas, tourism, and biodiversity are vulnerable to climate impacts. Several measures though insufficient due to limited resources have been put in place by the Government to enhance resilience in these sectors. In addition, greenhouse gas emissions from industry, energy, water, agriculture and transport sectors are being assessed in the national communication reports in order to inform the planning and decision making for the transition towards a low carbon emission development in the country.

In alignment with its Sustainable Development Goals, Egypt has submitted its Nationally Determined Contribution (NDC) with social, economic and environmental dimensions. The successful implementation of its NDC adaptation and mitigation commitments recognize the involvement and development of Micro, Small and Medium Enterprises (MSME) as a national priority. Moreover, the Government seeks climate finance and green

investments from local and foreign private investors as well as bilateral and multilateral funds to implement several national mega green projects identified in the NDC and other development planning documents of Egypt. AfDB therefore consider NDC as another avenue to strengthen collaboration with the Government of Egypt.

The AfDB sees Egypt as a founding member as it is the Bank's second largest regional shareholders. Since 1974, the Bank has financed more than 100 projects especially in infrastructure, energy and the social sector. In line with the Country Strategy Paper for Egypt, the Bank focuses its guidelines in developing infrastructure to encourage sustainable growth and in improving the efficiency of public sectors to create a favourable business environment.

We are delighted that Egypt was selected as one of the six pilot countries under the Fund for Africa Private Sector Assistance (FAPA) for its Private Sector Investment Initiative for NDCs in Africa. The FAPA technical assistance will help the country leverage its strong private sector to mobilise green investments for NDCs implementation.

The Bank is pleased to present this report, which will contribute in helping us build the private sector portfolio in Egypt's green business.

AfDB Country Manager

Ms. Malinne Blomberg

Egypt Country Office





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## LIST OF ACRONYMS

<b>AFD</b>	French Development Agency	<b>KFW</b>	German Development Bank
<b>AfDB</b>	African Development Bank	<b>Ktoe.</b>	kilotonnes of oil equivalent
<b>AFOLU</b>	Agriculture, Forestry and Other Land Use	<b>LECB</b>	Low Emission Capacity Building
<b>BAU</b>	Business As Usual	<b>LEDS</b>	Low Emissions Development Strategy
<b>BUR</b>	Biennial Update Report	<b>MAPS</b>	Mitigation Action Plans and Scenarios
<b>CAPMAS</b>	Central Agency for Public Mobilization and Statistics	<b>MLDB</b>	Multilateral Development Banks
<b>CDM</b>	Clean Development Mechanism	<b>MOF</b>	Ministry of Finance
<b>CIF</b>	Climate Investment Funds	<b>MPMAR</b>	Ministry of Planning, Monitoring and Administrative Reform
<b>CO<sub>2</sub>e</b>	Carbon Dioxide Equivalent	<b>MSMEs</b>	Micro, small and medium-sized enterprises
<b>COVID</b>	Coronavirus disease	<b>Mt</b>	Million Tonnes
<b>CSR</b>	Corporate Social Responsibility	<b>MTI</b>	Ministry of Trade and Industry
<b>CTCN</b>	Climate Technology Centre and Network	<b>MW</b>	Mega Watt
<b>CTF</b>	Clean Technology Fund	<b>NAMAs</b>	Nationally Appropriate Mitigation Actions
<b>DAC</b>	Development Assistance Committee	<b>NBE</b>	National Bank of Egypt
<b>EBA</b>	Egyptian businessmen abroad	<b>NCCC</b>	National Council for Climate Change
<b>EBIRD</b>	European Bank of Reconstruction and Development	<b>NDCs</b>	National Determined Contributions
<b>EEAA</b>	Egyptian Environmental Affairs Agency	<b>NINO</b>	NAMA Information Notes
<b>EFSA</b>	Egyptian Financing Supervisory Authority	<b>NREA</b>	Renewable Energy Authority
<b>EGP</b>	Egyptian Pounds	<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>EGX</b>	Egyptian Exchange	<b>PPP</b>	Public-Private Partnerships
<b>EIB</b>	European Investment Bank	<b>PSE</b>	Private Sector Engagement
<b>FAO</b>	Food and Agriculture Organisation	<b>RE</b>	Renewable Energy
<b>GCF</b>	Green Climate Fund	<b>SDS</b>	Sustainable Development Strategy
<b>GDP</b>	Gross Domestic Product	<b>SEFA</b>	Sustainable Energy Fund for Africa
<b>GEF</b>	Global Environmental Facility	<b>SEMED</b>	Southern and Eastern Mediterranean
<b>GGF</b>	Green Growth Fund	<b>UNDP</b>	United Nations Development Programme
<b>GHG</b>	Green House Gas	<b>UNFCCC</b>	United Nations Framework Convention Climate Change
<b>GIZ</b>	German Agency for International Cooperation	<b>USD</b>	United States Dollars
<b>GNI</b>	Gross National Income		
<b>GoE</b>	Government of Egypt		
<b>GW</b>	Giga Watts		
<b>HDI</b>	Human Development Index		
<b>ICT</b>	Information and Communication Technology		
<b>IDA</b>	International Development Associations		
<b>IEA</b>	International Energy Agency		
<b>IFAD</b>	International Fund for Agriculture Development		
<b>IFC</b>	International Finance Corporation		
<b>INDC</b>	Intended National Determined Contributions		



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## EXECUTIVE SUMMARY

### Context

Egypt is committed to implement its NDC adaptation and mitigation actions under the Paris Climate Agreement. For this to be successful, the Government of Egypt needs external support to provide necessary means of implementation including: climate financing, estimated at the range of 73.04 billion USD, capacity building and technology development and transfer.

The Government recognizes the critical role of the private sector and is expecting it to contribute significantly to the NDC implementation process through green investments.

### Objectives

This study is conducted as part of technical assistance to strengthen the private sector to take advantage of the abundant opportunities for green investments in Egypt. The specific objectives of this scoping study are to assess private sector challenges and opportunities as well as the needed support in accessing green financing for NDC implementation in Egypt. This study focuses on seven (7) key sectors that include: climate-smart agribusiness, sustainable transport, green buildings and smart cities, renewable energy (RE) and energy efficiency (EE), waste management, water and irrigation and the financial sectors.

### Private sector and climate finance landscape for NDC implementation

Our analysis shows that the Egyptian private sector is already involved in a number of NDC-aligned projects financed by dedicated climate change funds such as the Green Climate Fund (GCF) and the Clean Technology Fund (CTF) as well as other multilateral financial institutions such as the International Finance Corporation (IFC), African Development Bank (AfDB) and the European Bank for Reconstruction and Development (EBRD). The table below presents some of the examples of NDC-aligned projects that could be replicated at scale and as best practices.



SECTOR	PROJECTS WITH PRIVATE SECTOR INVOLVEMENT	FUNDING SOURCE
<b>Climate-smart agribusiness</b>	Angel yeast Egypt	EBRD
<b>Sustainable transport</b>	Egypt electric train project	China Exim Bank
<b>Green building / cities</b>	Eco- city Alexandria	PPP, City Council
<b>Renewable energy</b>	Benban solar park	IFC, World Bank
<b>Waste management</b>	Waste management and SME entrepreneurship Hub	AfDB
<b>Financial sectors</b>	Transforming financial systems for climate program	GCF

In these NDC-aligned projects, most of the private sector actors however, are big companies. Due to the high volume of finance involved in most NDC projects, accompanied by very stringent and complex processes, the Egyptian SMEs have little or no direct access to these projects but can however be involved through subcontracting from the project proponents. The effective involvement of SMEs will entail a well-coordinated platform or institution that provides technical support to SMEs and promotes collaboration with the Government and large private companies directly involved in NDC-aligned projects.



## Cross-cutting challenges for private sector involvement in NDC implementation

The cross-cutting challenges facing the private sector are related to technical knowledge, access to funds, unclear policies, weak case for adaptation and Covid-19 pandemic.

**Knowledge gap and limited skills on NDC and climate change:** The NDC is a very high-level summary document that doesn't provide enough details for the private sector. This makes it difficult for the private sector to take informed investment decisions due to the poor understanding of the NDC document, climate change adaptation and mitigation processes and actions, and how they can benefit businesses.

**Insufficient access to climate funds:** While the implementation of some green projects are ongoing, a vast majority of Egyptian private companies have had little success in accessing dedicated climate funds and concessional green loans. The procedures and requirements to access these funds remain a big challenge and in turn limits private sector involvement and financing of NDC implementation.

**Bad design and poor communication of enabling policies and regulations:** Private sector investors need more clarity on the laws, regulations and policies put forward by the government (World Bank 2018). Policies that are beneficial to the private sector need to be made clearer as a way of encouraging private companies to venture into NDC-aligned green investments.

**Weak business case for green investment in adaptation projects:** Egypt faces challenges to make a good business case for adaptation projects, hence, making it difficult to attract private investments. On the other hand, a good number of mitigation projects in Egypt have strong involvement by the private sector especially in the domain of clean energy.

**Increasing focus on COVID-19 and decreasing focus on green projects:** The government of Egypt has shuffled its policy priorities for the short term with a strong focus on health and social spending for the most vulnerable groups and further advancing reforms to position Egypt for sustained recovery (IMF 2020). Green projects are very important for Egypt's growth but they might not be the short term priority in a COVID-19 pandemic situation.



## Cross-cutting long-term strategic opportunities for private sector involvement in NDC

The key opportunities for private sector involvement in NDC implementation constitute a combination of green initiatives that include the following:

- The implementation of 691 green projects worth about \$27.6 billion;
- The creation of a carbon market to serve Egypt, Africa and the middle East;
- The issuance of green bonds;
- The establishment of 15 new green cities that will require a strong private sector investment.
- The Integrated Sustainable Energy Strategy (ISES) to step up RE target of 42% of the electricity mix by 2035 with a total installed RE capacity of 62.6 GW.



## Cross-cutting Recommendations

**Technical capacity development:** Private universities and technical colleges can play an important role for both targeted higher studies and Vocational Educational Training (VET) to address skills mismatch and enhance training and skills standards to better match the requirements of the labour market. On the other hand, capacity development for private investors and local financial institutions (LFIs) needs to be strengthened and be part of the government's agenda to incorporate private sector investments in NDC implementation.

**Increase access to climate finance:** The Government could partner with local financial institutions (LFIs) and international donors to provide more flexible financial guarantees to private sector investors, as well as reducing the risks attached to such instruments. LFIs should strive to “green” their lines of credits and open up new green finance opportunities for SMEs. Moreover, Egyptian institutions should engage in GCF accreditation process to get direct access to GCF funds.

**Strengthening the enabling policy and regulatory environment:** Erasing bureaucratic red tape from government institutions would also go a long way in easing policy implementation, as well as simplifying the procedures for private sector investments. Past experiences on PPP should be used to inform the Government's policies related to new win-win PPP models.

**Exploring innovative business approaches for adaptation projects:** This can be achieved by Implementing mitigation project activities that reduces climate vulnerability, (ii) Developing a project with clear and separate adaptation and mitigation objectives, results and investments, and (iii) Building on new adaptation business-centric approaches such as the “Adaptation Benefit Mechanism”.

**Pursue a green “Build Back Better (BBB)” post-COVID-19 approach:** While the first wave of COVID emergency measures focuses on stopping the spread of the virus in Egypt, the second wave of transitional response measures should realign policies and take into account the BBB principle and approaches as well as explore potential synergies with NDC implementation to stimulate green growth and jobs.

## Conclusion

For each of the seven sectors covered in this study, we have also presented specific sectoral challenges, opportunities and recommendations. Moving forward, the revision and implementation of Egypt's NDC provides a unique opportunity for the government and development partners to work closely with the private sector to address these cross-cutting and sectoral challenges, opportunities and recommendations. The process of engagement with the private sector should be long term, sector specific, disaggregated to micro, small, medium and large private sector actors and it should be connected to other national and internal climate finance initiatives, donors and platforms.



## 1. INTRODUCTION

In 2015, world leaders negotiated the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). The agreement that was later on signed by 195 and ratified by 187 countries around the world, provided a framework for the global community to express commitments on how Greenhouse Gas (GHG) emissions will be reduced and climate change impacts will be tackled after 2020 in the short, medium and long term. Commitments were expressed through mitigation, adaptation, financing, capacity building and technology transfer among others. Since then, international, regional, and, national policy processes have been reflecting on the urgency both of increasing finance for mitigation of emissions and adaptation to the effects of climate change, and of making financial flows consistent with a pathway towards low-carbon, climate resilient development.

In the context of the African region, governments have set ambitious targets in their commitments, however, the resources needed to realise these goals exceed available domestic and international public finance. The Nationally Determined Contributions (NDCs) developed by African countries to combat climate change are estimated to cost USD 1.2 trillion to implement. At least 75% (USD 900 billion) of that cost is expected to come from the private sector between 2020 and 2030 (AfDB 2020). Thus, measures that direct private funding to climate investments are needed.

The government of the Arab Republic of Egypt is part of the global movement to combat climate change. Through its commitments, the country has the potential to contribute to global emission reduction targets and the capacity to support the resilience of national economic, social and ecological systems. Both climate change adaptation and mitigation are important for Egypt. Economic and social development depend on sectors that are vulnerable to climate change and they include agriculture, water and energy, tourism, and health among others (GoE, 2016a). The most critical aspect of climate vulnerability in Egypt is the dependence on one water source, the Nile river, which is responsible for driving key social and economic development aspects related to potable water supply, agriculture, industry, fish farming, power generation, inland river navigation, mining, oil and gas exploration, cooling of machinery and power plants.(GoE, 2016a). The Nile River is negatively affected by sea rise and salt water intrusion, which adds onto the level of vulnerability of Egypt's water resources and agricultural sector. On climate change mitigation, major GHG emission sectors include energy, industrial production, agriculture, waste management among others (GoE, 2016a; GoE, 2018).

Current and future government measures and efforts to combat climate change and its impacts have been expressed by the National Determined Contributions (NDCs), as part of the Paris Agreement. Adaptation and mitigation measures have been put forward in all the relevant sectors and their implementation will depend on international support in relation to financial flows, capacity building and technology transfer. Initial estimates indicate that Egypt, with the help of international support, will need about 73.04 billion USD to implement adaptation and GHG emission reduction measures for the period 2020-2030 (GoE, 2015). To mobilise the required financial resources, Egypt like other African countries, will need diverse internal and external funding sources in addition to public sources.



Private sector climate finance for NDCs is considered to be a critical part of the financial landscape. However, African countries including Egypt, have not yet attracted the levels of private climate finance that are widely believed to be necessary. This gap can be related to the fact that the role of the private sector, which is key in driving climate finance and climate innovation has not been clearly defined and understood in the African context. Thus, enhancing private sector participation in NDC-related investments in Africa in general and Egypt in particular is crucial.

## 1.1. Objectives

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In Africa, it is estimated that the implementation of NDCs will cost about USD 3 trillion by 2030. All projections indicate that about 75% of this cost will come from the private sector. By all accounts, engaging the private sector in climate-smart investments is a cornerstone to growing climate business opportunities. However, private sector participation in climate actions in Egypt and other African countries is currently weak. It is in this context that this scoping study is conducted as part of a technical assistance to strengthen the private sector to take advantage of the abundant opportunities for green investments in Egypt and five other pilot countries.

The objectives of this scoping study are therefore: (i) to assess challenges and opportunities for NDC implementation by the private sector and (ii) to support the private sector in accessing green financing for NDC implementation in Egypt. This study focuses on seven (7) key sectors that include:

1. Climate-smart agribusiness and forestry;
2. Transport and infrastructure;
3. Green buildings and smart cities;
4. Renewable energy (RE) and energy efficiency (EE);
5. Waste management;
6. Water and irrigation; and
7. The financial sector.

Analyses and findings from this study can be a valuable resource in informing the revision, development and implementation of the national NDC process and actions in Egypt.

The report is structured in 8 chapters. The introduction and country context are presented in chapters 1 and 2 respectively. The institutional and strategic framework for climate change follows in chapter 3 while an overview of NDC implementation in Egypt is covered in chapter 4. Chapter 5 looks into private sector involvement in green investment. The climate finance landscape in Egypt is covered in chapter 6. The private sector's challenges and opportunities for NDC implementation through green investments is presented in chapter 7 while chapter 8 presents the conclusions and recommendations.

In this report the word “green” as in green investments, green finance, green bonds, green projects, green jobs and green growth refers to investments, funds, bonds, jobs, projects and economy growth that are environmentally friendly because they reduce pollution especially greenhouse gas emissions,



reduce the vulnerability and increase the adaptive capacity of communities, ecosystems and development sectors to different climate risks and impacts.

## 1.2. Methodology

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### 1.2.1. Data collection and analysis

The data used in this study relied on primary and secondary sources. The secondary sources included national policy and strategy documents related to climate change and sustainable development, among others. Other types of documents consulted include working papers, scientific articles as well as project and program documents. Online sources provided access to these documents and other relevant information. Information was collected from the websites of relevant ministries, UNFCCC, GEF, CIF, AfDB, Arab development portal, development and technical partners implicated in climate change and development issues in Egypt, among others. Primary data was collected through telephone, online and email interviews with experts working in Egypt and focus group discussions with donors and experts from Egypt through a virtual setting (webinar on green economy in Egypt).

The study used a mix of qualitative and quantitative data analyses to triangulate perspectives, both internal (Egyptian experts) and external (donors and AfDB). The analysis also benefited from the many years of experience of the national expert working on climate change and sustainable development issues in Egypt. Three general methods were utilized in conducting the analysis of the secondary and primary data: content analysis, interviews and synthesis of existing external evaluations. More information on each of these is presented below:

- **Content Analysis:** This entailed quantitative and qualitative descriptions of NDC, green investment, climate finance and private sector landscapes in Egypt. Content analysis of individual reports, documents and scientific articles helped to capture and summarize trends and findings across the seven focal sectors.
- **Interviews:** Data collected through open ended questions were analysed to bring out the challenges, opportunities, and recommendations regarding the involvement of the private sector and, particularly, SMEs in the implementation of Egypt's NDC and related green investments.
- **Synthesis:** The content of existing external climate change, NDC, green investment and private sector studies were aligned with stated objectives of this study and findings in these studies summarized. In a few cases, the studies themselves provided a synthesis across studies to draw more general conclusions.



## 1.2.2 Limitations of the study

Some of the individual and group consultations including face-to-face workshops that were planned according to the initial data collection approach, did not take place as a result of the COVID-19 response measures that were put forward by the government.

## 2. COUNTRY CONTEXT

### 2.1 Geography and population



The Arab Republic of Egypt covers a total area of about 1,001,450 km<sup>2</sup>, with a land area of 995,450 km<sup>2</sup> and a coastline of 3,500 km on the Mediterranean, and the Red Sea (GoE, 2016a). The general climate of Egypt is dry, hot, and deserts, with temperatures ranging between an average minimum of 14°C in winter and an average maximum of 30°C in summer.

**Figure 1: Map of the Arab Republic of Egypt and its governorates (CAPMAS, 2018)**

The population of Egypt is about 100 million (CAPMAS, 2018). About 95% of the population lives in the Nile Valley and Delta on 4% of Egypt's total land area. This yields an average population density in that area of 1,136 inhabitants per square kilometre and really puts a strain on the ecosystem of the Nile river. Over 20% of Egypt's total population is located in the Greater Cairo area, with an estimated population of approximately 20.9 million as of 2020. The second most populated city in Egypt is Alexandria, with 5.24 million inhabitants (Macrotrends, 2020). Around 57% of the total Egyptian population lives in rural settings (GoE, 2016a).



## 2.2 Economic and social development context

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Recent information indicates that growth in Egypt increased to 5.6% in FY2018/19 (up from 5.3% the previous year), a situation that was sustained throughout the first quarter of FY2019/20. The sectors responsible for driving this growth are wholesale and retail trade, agriculture and manufacturing (World Bank, 2020a). In the FY2017/18 the poverty rate, based on the national poverty line, increased to 32.5%, up from 28.5% in 2015 (World Bank, 2020a). Egypt ranks 166/189 on the human development index (0.7) with an average life expectancy of 71.8 years (UNDP 2019).

In terms of national development, Egypt's "Sustainable Development Strategy; Egypt's Vision 2030" aims to achieve a high economic and social development during the next 15 years by implementing mega-projects. Examples of such projects as outlined in the NDC include, but are not limited to: The New Suez Canal project, diverse land reclamation initiatives, Egypt's infrastructure and paving roads project, social housing program, the development of social services (education / health), and the plan to build a new administrative capital in the city of Wedian (GoE, 2016b). The implementation of these mega-projects as a part of NDC activities in Egypt, calls for more involvement of the private sector in a bid to foster green economic growth, either in private-public partnerships (PPP) or as investors, donors, and/or lenders. These projects also require capacity building and technology transfer in the domain of climate finance and green investments as stipulated in the NDC, which is an opportunity to foster private sector engagement (PSE).

## 2.3 Climate change context

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The government of Egypt (GoE) is part of the UNFCCC, and thus recognizes the importance of collectively meeting the ultimate objective of the Convention, which is mainly to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Egypt submitted the Initial National Communication in 1999, the Second National Communication in 2010, the Third National Communication in 2016 and the first Biennial Update Report (BUR1) in 2018. Climate policies, strategies and actions revolve around the two key areas of climate change vulnerability and adaptation and climate change mitigation.

### 2.3.1. Vulnerability context

Egypt is one of the most vulnerable countries to climate change impacts. The sectors most threatened are health, agriculture, water resources, coastal areas, tourism and biodiversity (GoE, 2016a). Over the past 25 years, increasing trends in temperature rise have been observed. From 1960, temperatures in Egypt have increased on average by 0.31°C per decade (GoE, 2016). Projections into the future of Egypt's climate show an increase in the mean annual temperature by 1.07°C to 1.27°C by the year 2049, and by 1.64°C to 2.33°C by 2059 (Climatelinks, 2015).



In terms of rainfall, Egypt receives between 20 mm to 200 mm annual average precipitation along the Mediterranean coastline, which is considered the most humid area of the country. Rainfall is more concentrated over Alexandria and Rafah. The rest of the country except the small strip of the Mediterranean coastline rarely receives rain and is dominated by arid desert climate (GoE, 2016a; GoE, 2018). Annual average rainfall in Egypt was 41.88mm from 1961 to 1990, which is generally in the period between December and March each year. It is projected that by the year 2030, average rainfall will change by 0.1mm per day, though with a high level of uncertainty in the rainfall projections even up until around 2059.

Periodic droughts are currently common in Egypt, given that the level of rainfall is pretty low, and the agriculture of the country is irrigated and not rain-fed. There is a high level of vulnerability to multiyear droughts and this makes it uncertain to project into the future. There has been a constant rise in sea levels by 3.1mm averagely each year since 1992 especially across the Mediterranean coastline. This is projected to continue rising by between 3 and 61cm within the present century, with high risk areas being the eastern part of Alexandria and parts of the Nile Delta. When it comes to winds and storms, Egypt currently experiences more of dust storms (locally referred to as Khamsin) during spring and early summer. This wind which is dry and loaded with dust, is foreseen to increase in frequency and severity, but projections into the future are uncertain (Climatelinks, 2015).

The government has made efforts and assessed climate change vulnerability and impacts on the key sectors and has put forward approaches and measures to enhance resilience in these sectors. Table 1 presents the vulnerability and adaptation measures identified in the key sectors.

**Table 1: Climate risks, vulnerability and adaptation measures in selected sectors**

KEY SECTORS	CLIMATE RISKS	CLIMATE VULNERABILITY	ADAPTATION MEASURES
<b>Water resources</b>	<p>Increases in evaporation and evapotranspiration as a result of increased temperature coupled with decrease in precipitation could reduce the levels of the Nile's water flows</p> <p>Sea level rise will affect the quality of groundwater in coastal aquifers</p> <p>High level of pollution further aggravating the effects of climate change on water resources</p>	<p>Egypt faces water scarcity and deficiency, given that the country is dependent on the Nile River as its main water source, which supplies over 95% of its water needs</p> <ul style="list-style-type: none"> <li>• Decreased hydropower supply</li> <li>• Increase in domestic and transboundary water conflict</li> <li>• Increase Nile flows causing floods</li> </ul>	<p>Efficient Irrigation systems. Water conservation measures in agriculture, industry and municipal drinking water supply (DWS). Recycling treated sewage and industrial effluent - Recycling used water, mainly from agriculture</p> <ul style="list-style-type: none"> <li>• Increased optimum use of deep groundwater reservoirs</li> <li>• Minimize pollution by upgrading water quality and sanitation</li> <li>• Construction of infrastructure for water collection and storage in flash flood areas</li> <li>• Awareness raising on rationalization of water use for different purposes</li> <li>• Establishment of bigger storage capacity and a larger conveyance and distribution network</li> </ul>



<p><b>Agriculture</b></p>	<ul style="list-style-type: none"> <li>• Fluctuated and consequent precipitation</li> <li>• Nile water flow</li> <li>• Increased temperature and transpiration</li> <li>• Extreme heat</li> <li>• Decreased precipitation</li> <li>• Increase in seawater temperature</li> <li>• Increase in pests and plant disease</li> <li>• Increased evaporation due to rising temperature</li> </ul>	<p>Water scarcity will lead to reduced productivity of subsistence food production:</p> <ul style="list-style-type: none"> <li>• Egypt's ever-growing population depends on staple foods produced locally for livelihood</li> <li>• Less productivity will impact the livelihoods of agricultural communities</li> <li>• Loss of agricultural employment</li> <li>• Increased water requirement by crops and increase irrigation</li> <li>• Conflicts between sectors over water allocation and use</li> <li>• Reduction in cattle and poultry growth rate and productivity</li> <li>• Loss of arable agricultural land due to erosion</li> <li>• Fish moving into deeper waters</li> <li>• Reduced productivity</li> <li>• Increased water salinity and acidification affecting fish species and marine life in general</li> </ul>	<ul style="list-style-type: none"> <li>• Development of new crop varieties and expansion of irrigation systems</li> <li>• Increasing water storage capacity- Rainwater harvesting</li> <li>• Improving irrigation and draining systems</li> <li>• Improve coordination between different institutions responsible for water use and management and resolution of conflicts between users.</li> <li>• Better control on water usage and more efficient and reliable water delivery</li> <li>• Augmented farm productivity and raised farmers income</li> <li>• Empowerment and participation of stakeholders</li> <li>• Use of new technologies for weed control</li> <li>• Redesign of canal cross-sections to reduce evaporation losses</li> <li>• Cost recovery systems</li> <li>• Improvements of the drainage systems</li> <li>• Change of cropping patterns and on farm irrigation systems</li> </ul>
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<b>Coastal zones</b>	<ul style="list-style-type: none"> <li>• Sea level rise</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal inundation and salt water intrusion</li> <li>• Increased financial cost of developing new areas with climate migrants</li> <li>• Migration of people</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of coastal buildings and constructions and electricity, water, and sanitation grids</li> <li>• Reinforcement of anti-flood protection structures and construction of new ones</li> </ul>
<b>Tourism</b>	<ul style="list-style-type: none"> <li>• Increased/ extreme temperatures and heat islands from hot air</li> <li>• Sea level rise</li> <li>• Increased frequency of extreme climate (heat waves, floods, drought) and recurrent storms and hurricanes</li> </ul>	<ul style="list-style-type: none"> <li>• Energy use caused by?</li> <li>• Inundation of sandy beaches and the gradual regression of shorelineRisk of losing the national heritage such as ancient monuments and antiques</li> <li>• Damage to tourism infrastructure,</li> <li>• Deterioration of coral reef in the Red Sea</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of integrated environmental management approaches in touristic sites</li> <li>• Re-direct tourism growth away from climate vulnerable areas</li> <li>• Early warning and monitoring systems in touristic sites</li> </ul>
<b>Health</b>	<ul style="list-style-type: none"> <li>• Increased frequency of heat waves</li> </ul>	<ul style="list-style-type: none"> <li>• Higher death rates from heat stress. Increased cardiopulmonary disease</li> <li>• Potential increase in vector-borne disease</li> <li>• Risk of propagation of water-borne pathogens and vector borne diseases</li> <li>• Risk of increase of climate sensitive health problems like</li> <li>• Spread of diseases linked to climate change impacts</li> <li>• Heavier demand for health services from malaria and dengue fever, diarrheal diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping of risk areas and vulnerable populations</li> <li>• Mapping the effects of a given event attributed to climate change</li> <li>• Raise awareness on climate risks and means of adaptation</li> <li>• Increase efficiency of the health care sector and improve quality of health care services</li> </ul>

Source: GoE, 2016a, GoE 2015, USAID 2018, UN Environment 2018



### 2.3.2. GHG emission context

A vast majority of GHG emissions in Egypt come mainly from the energy sector. This is mainly because Egypt is highly dependent on fossil fuels, namely oil and natural gas; thus, carbon dioxide is the main greenhouse gas emitted. Moreover, there is high energy consumption in the electricity, industry, transportation, petroleum, residential and commercial as well as the agriculture sectors. Other sources of GHG include industrial processes, agricultural practices and waste management issues. Specific data on sectoral emission contributions for the base year 2005/2006 are presented in table 2, while figure 2 presents GHG emissions from energy consumption in different sectors.

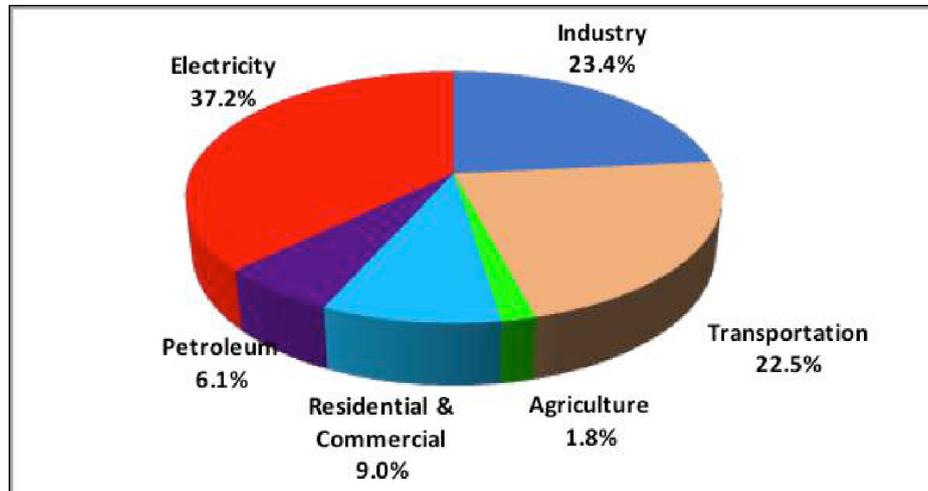
**Table 2: GHG emissions from key sectors in Egypt (2005/2006)**

SECTORAL GHG SOURCES AND CATEGORIES	MT CO <sub>2</sub> E	%
<b>Energy (combustion and fugitive emissions) – petroleum, natural gas</b>	147.324	59
<b>Industrial processes – Cement, lime production, iron and steel etc.</b>	42.013	17
<b>Agriculture - Enteric fermentation, manure management, rice cultivation, agricultural soils, field burning of agricultural residues</b>	39.446	16
<b>Waste – solid waste, wastewater, incineration</b>	19.19	8
<b>Total GHG emissions in Mt CO<sub>2</sub>e</b>	247. 97	100%

Source: GoE, 2016a



**Figure 2: GHG emissions from energy consumption in different sectors (2005/2006).**



Source: GoE, 2016a



## 3. INSTITUTIONAL AND STRATEGIC FRAMEWORK FOR CLIMATE CHANGE

### 3.1. Institutional Framework

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The Ministry of Environment is responsible for piloting the environmental and climate change affairs of the Arab Republic of Egypt. The ministry in collaboration with national and international development partners, defines environmental policies, sets priorities and implements initiatives within the context of sustainable development. The actions of the ministry are executed by the Egyptian Environmental Affairs Agency (EEAA). The agency assists the ministry in formulating environmental policies, preparing plans for environmental protection and environmental development projects and following up on their implementation. The Agency is the national authority in charge of promoting environmental relations between Egypt and other countries as well as regional and international organizations (GoE, 2016a; GoE, 2018). To enable private sector participation and investment in Egypt's NDC process, the EEAA should put in place and enhance a coordinated strategy to engage with and support the private sector in green investment.

Currently, the National Council for Climate Change (NCCC) provides specific orientations for climate change policy development and implementation both at the national and international level. The council is comprised of representatives from the Ministries of Foreign Affairs, Water Resources & Irrigation, Agriculture & Land Reclamation, Electricity & Energy, Petroleum, Trade & Industry, Economic Development and Defense, including experts from relevant agencies (GoE, 2016a). The composition of the council is a clear indication that the country recognizes the multisectoral nature of climate change and the private sector must be brought on board.

Orientations for economic development in Egypt depend on a number of key ministries such as the Ministry of Finance, Ministry of Planning and Economic Development, and Ministry of Trade and Industry. The Ministry of Finance is responsible for formulating and implementing the country's economic and financial policies in order to achieve inclusive economic growth, financial control, equitable and efficient distribution of the country's resources (MOF, 2020). The Ministry of Economy is responsible for promoting the economy and achieving economic growth rates. The ministry leads the effective implementation of development plans by developing the necessary frameworks for the participation of the private sector and civil society (MPMAR, 2020). The ministry of trade and industry provides the enabling environment for sustainable inclusive economic investments driven by competitiveness, diversity, knowledge, and innovation, amongst others (MTI, 2020).



There also exists a Public Private Partnership Central Unit (PPPCU) in the Ministry of Finance, responsible for enhancing the PPP policy framework and the development and implementation of PPP projects and programs (Kamel, 2017).

## 3.2. Strategic framework

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### 3.2.1. National development framework

The development strategy of Egypt is based on the Egypt Vision 2030 Sustainable Development Strategy (SDS), as described in Box 1, and the Egypt 5-year Macroeconomic Framework and Strategy (AfDB, 2015). The strategy gives considerations to sustainable and green development, active involvement and partnership with the private sector and food security (AfDB, 2015). Egypt sees the private sector as an important player in realising national sustainable development priorities, for example, the private sector's contribution to GDP is expected to move from 60% in 2016 to 65% in 2020 and to 75% in 2030 (GoE, 2016b). The SDS is an important meeting point between the private and the public sector in terms of mobilising financial and technological resources for green growth and social prosperity in the short, medium and long-term. Key areas for synergies between SDS and NDC implementation include: developing the infrastructure required to face climate change, adopt policies to address climate change, transforming different sectors to increase the competitiveness of the private sector that will, in turn, increase green job opportunities, promoting public private partnership as well as encouraging green tourism, green buildings and green projects and programs.



### BOX 1. EGYPT VISION 2030 SUSTAINABLE DEVELOPMENT STRATEGY (SDS)

*“By 2030, the new Egypt will achieve a competitive, balanced, diversified and knowledge based economy, characterized by justice, social integration and participation, with a balanced and diversified ecosystem, benefiting from its strategic location and human capital to achieve sustainable development for a better life to all Egyptians”.*

Egypt’s SDS comprises of 10 pillars established on social, economic and environmental dimensions.

- The social dimension consist of 4 pillars: Social justice; health; culture; and education and training.
- The economic dimension consists of 4 pillars: Economic development; energy; knowledge, innovation and scientific research; and transparency and efficiency of governmental institutions.
- The environmental dimension consist of 2 pillars: environment and urban development.

Each of the pillars has a strategic vision that is enshrined in the overarching vision of the strategy, that stipulates that pillars are defined by objectives and sub-objectives, including performance indicators, quantitative targets, policies, programs and projects to enhance the enabling environment in relation to legal, institutional and regulatory reforms, human resource development initiatives, among others.

Source: GoE, 2016b.

### 3.2.2. Climate change policy framework

Egypt ratified the UNFCCC in 1994 and the Kyoto Protocol in 2005. Egypt signed the Paris Agreement on climate change in April 2016 and ratified the agreement in September 2017. For almost two decades now, Egypt has been making efforts to develop national level policies, strategies, programs and projects in the domain of climate change adaptation and mitigation to respond to national and international expectations. The national climate change policy framework in Egypt is underpinned by a National Strategy for Adaptation to Climate Change and Disaster Risk Reduction. The strategy provides technical and political orientations to increase the flexibility of the Egyptian community when addressing the risks and disasters resulting from climate change and its impact on various sectors and activities (GoE, 2011). From a mitigation perspective, there is no comprehensive national Low Carbon Development Strategy (LCDS). Egypt has, rather, put in place a new coal regulation and the Low-Carbon Roadmap in 2017 that seek to set the pathway for the Egyptian cement industry to reduce its CO<sub>2</sub> emissions and improve energy performance. At the international level, the country has been informing the international community through national communications on the national circumstances, GHG inventory, mitigation policies and measures, vulnerability and adaptation measures, national efforts to achieve the objectives of the convention, capacity building and institutional and technical needs.

Despite the effort in defining and communicating on adaptation and mitigation policies and measures, Egypt is still facing a number of barriers that need to be overcome for climate change policies to have meaningful impacts in the medium and long term:

- First, there is a need to overcome the data gaps and constraints in GHG inventory estimation, tracking of progress of mitigation and adaptation measures, identification of specific needs, information regarding climate support received, and distinguishing climate finance from the overall funding received. All of this can be done by putting particular emphasis on the participation of the private sector, to be able to identify lessons learnt and best practice case studies to be replicated / scaled up. Moreover, there is lack of inventory for achieved development projects and programs and such inventory is important to track the progress of achievements and associated development impacts of project and programs.
- Second, there is also insufficient technical and financial capacity for developing bankable projects that respond to national development priorities and the expectations of funders (GoE, 2018).



## 4. NDC IMPLEMENTATION

### 4.1. NDC commitments

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Egypt submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC in 2015. In its contribution statement, the country proposed both adaptation and mitigation measures. In its NDC, Egypt does not provide quantified targets for adaptation or for the reduction of its GHG emissions by 2030. Instead the NDC lists actions that will be undertaken to reduce climate risks and emissions. Its adaptation policies and measures focus on agriculture, water resources, and coastal zones. On the other hand, its energy, transport, waste, and industry sectors are at the core of Egypt's mitigation actions and commitment to transit into a low carbon future.

The implementation of NDC adaptation and mitigation actions is 100% conditional and dependent on the provision of the means of implementation which includes international financing, estimated at approximately 73.04 billion USD, capacity building and technology development and transfer. This is where the private sector can step in to fill some of the gaps related to the means of implementation. Egypt's NDC implementation will strengthen the alignment of its SDS to the 2015 Paris Agreement. While Egypt is advancing with the implementation of its NDC, some challenges remain in terms of tracking and monitoring all the adaptation and mitigation actions carried out by the different stakeholders (Abdallah, 2020).

### 4.2 Sectoral overview, impacts and measures

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#### 4.2.1 Climate-smart agribusiness

##### Overview

Egypt's economy depends a lot on the agriculture sector which contributes about 16% of the country's GDP and employs an estimated 33% of the labour force of Egypt (GoE, 2016). Agricultural production in Egypt is estimated to decrease by 8 to 47% by 2060 due to climate change, with reductions in agriculture-related employment of up to 39%, although in one scenario employment increases by 3% as food prices increase by 16 to 68% (UNDP, 2013). Welfare losses in agriculture in 2060 are estimated to range from 40 to 234 billion Egyptian pounds (EGP). The value of property in the Nile River Delta threatened by sea level rise could be 7 to 16 billion EGP (UNDP, 2013). Egypt included climate smart agriculture (CSA) in its NDC adaptation contributions, which allows farmers to increase agricultural production while enabling them to adapt to climate change. GHG emissions in the agriculture, forest and other land use (AFOLU) sector, about 14.9% of national GHG emissions in Egypt, result from enteric fermentation, manure management, field residues' burning, agriculture soil and rice cultivation. Between 2005 and 2015, there was a general decrease in emissions from the AFOLU sector by 7%, due to the reduced use of both natural and synthetic fertilizers and urea (GoE, 2018).



## Climate impacts on the agriculture sector

In addition to the key climate risks, vulnerability and adaptation measures highlighted in Table 1 above, the agriculture sector shows that water availability will become a great challenge, especially as crops will consume more water as the evaporation rate will increase due to increase in temperatures. This will put a higher demand for water which is already getting increasingly scarce. The consequence will be a drop in the productivity of staple crop foods such as rice, maize, wheat and tomatoes. The growth rates of cattle and poultry will also be affected, resulting in a drop in milk production which will impact livelihoods. Flooding and erosion will become common due to sea level rise, which will lead to loss of agricultural land and reduce yield and productivity (UNDP, UN-Environment and GEF, 2018).

## Climate change adaptation measures and actions indicated in the NDC

On climate change adaptation in the agriculture sector, the NDC will take the following actions and measures:

- Build an effective institutional system to manage climate change associated crises and disasters at the national level;
- Activate genetic diversity of plant species with maximum productivity;
- Achieve biological diversity of all livestock, fishery and poultry elements to protect them and ensure food security;
- Develop agro-economic systems and new structures to manage crops, fisheries and animal production, which are resilient to climate change;
- Increase the efficiency of irrigation water use, while maintaining crop productivity and protecting land from degradation;
- Review of new and existing land use policies and agricultural expansion programs to take into account possibilities of land degradation in Delta and other affected areas resulting from Mediterranean sea level rise;
- Develop systems, programs and policies to protect rural community and support its adaptive capacity to the expected trend in land use change plant and animal production, and internal migration due to climate change.



## Climate change mitigation measures and actions indicated in the NDC

In the agriculture sector, the NDC outlines mitigation measures that will be undertaken to reduce GHG emissions such as improvements in energy efficiency, enteric fermentation, manure management, rice cultivation and field burning of agricultural residues. To mitigate climate impacts, climate smart agricultural programs and projects are being introduced with the aim of softening these impacts on Egypt. A typical example in Egypt is agriculture in Sinai; organic agriculture; livestock; aquaculture that is practiced in the country. Afforestation by planting suitable types of trees is another mitigation but also adaptation measure which will be carried out in addition to the development of man-made forests.

### 4.2.2 Water resources and irrigation

#### Overview

Water consumption in Egypt is mainly dominated by agriculture, municipal and industrial activities. Total water withdrawal in 2000 and 2010 was respectively estimated at 68.3 km<sup>3</sup> and 69.25 km<sup>3</sup>. Another important use of water in Egypt is for the production of hydropower. Hydropower plants exist at the Aswan High Dam (2100 MW), the old Aswan Dam (270 MW), power plants at Esnaweir (90 MW) and Naga Hammadi weir (64 MW). Together these plants accounted for 16% of installed electricity generation capacity in 2004. The Nile is also important for navigation, especially for tourism, which makes it necessary to maintain a minimum flow of the Nile year-round (GoE 2016).

#### Climate impact

Climate change is likely to affect water availability in Egypt although the direction of change is uncertain. Table 1 already highlights some of the key climate risks and vulnerability. In addition, some studies predict a decline of up to 70 percent in Nile water availability, while others project an increase in Nile water levels by 25 percent (GoE, 2016). As for the vulnerability of the Nile delta to sea level rise there is a diversity of predictions: one study estimates that 30% of the Delta and Alexandria coast is vulnerable, 55% is “invulnerable” and 15% was artificially protected in 2003 (GoE, 2016). Regarding seawater desalination, which is used in some resorts on the Red Sea, it is likely to become an increasingly important source for municipal water supply in coastal areas of Egypt. For example, in October 2009 the West Delta Electricity Production Company awarded a contract for a power plant with a 10,000 m<sup>3</sup>/day seawater desalination plant near Alexandria (GoE, 2016).

## Climate change measures and actions indicated in the NDC

Egyptian agriculture is significantly impacted by climate change. One of the key adaptation measures proposed in the NDC to reduce the vulnerability of the water and agriculture sectors is to increase the reliance on irrigation, considered by the government as critical for the agricultural sector in Egypt. Egypt’s National Drainage Program, a key part of the government’s Water Resources Development Strategy, seeks to optimize the benefit of irrigation and efficiency of water resource use as well as improve the efficiency of the drainage systems in agricultural land.



In addition to Government support for the sector, there are several other development partners intervening in the sector such as the World Bank, AFD, KfW, EU, IFAD as well as the private sector especially through mega private public partnership (PPP) projects. Some of the PPP projects in irrigation include: El-Salam Canal, Project West Nile Delta Project, and the Toshka Development Project. These initiatives represent some of the best practices that can be replicated under NDC adaptation actions.

### 4.2.3 Transport sector

#### Overview

The transport sector is vulnerable to climate change impacts in Egypt, but also a major consumer of fossil fuels as well as a major emitter of GHGs. GHG emissions in the energy sector are partly caused by energy needs in the transport sector, as this sector uses a lot of electricity. Transport emits between 25-30% of the national GHG emissions in Egypt, mostly as carbon dioxide (CO<sub>2</sub>). The transport sector is the main source of air pollutants such as carbon monoxide (CO) and non-methane hydrocarbons (NMHC), which also increase the concentration of GHGs in the atmosphere. Poor public transport, especially in large cities like Greater Cairo, significantly exacerbates the problem by increasing the number of private vehicles, increasing fuel consumption and causing traffic congestions, hence more GHG emissions. Road transport accounts for over 90% of total passenger and freight transport activity as opposed to railway and river transportation. This implies that the road transport is the most used, the least efficient and most polluting compared to the other modes of transport.

#### Climate impacts on the Transport sector

The reduction of water availability which will affect rivers, lakes and River Nile will have an impact on transportation in Egypt. River-based transport will be limited if the flow levels of the Nile are affected by either the rise in sea levels or reduced water availability. Intense precipitation and floods will affect roads and bridges, while erosion will negatively affect roads within the country. Roads in Egypt are constructed using asphalt, which will be damaged by high temperatures because of climate change. This will affect not only the transport sector but other sectors like tourism and agriculture which depend a lot on the transport sector.



## Climate change measures and actions indicated in the NDC

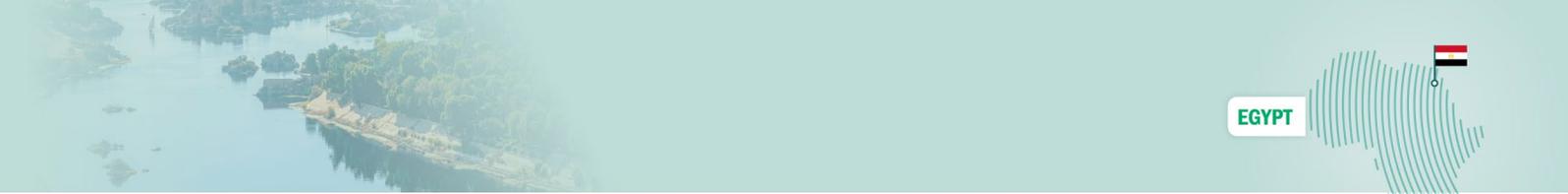
The NDC clearly outlines mitigation measures that are geared at greening the transport sector. They include:

- Introducing natural gas as a transportation fuel to replace fuel oil;
- Improving road transport efficiency, through electrification of inter-city and intra-city railways, metro line extension and testing electric and hybrid buses;
- Switching from road to river transport in the transportation of freight;
- Switching from road to rail transport for freight displacements;
- Encouraging passengers to share passes for railways, buses, metro and river transportation; and
- Discouraging the use of private cars and facilitating freight transport through more efficient truck operations.

These measures would imply an improvement in the necessary transport infrastructure within the country, to enable a shift from predominantly road transport for both freight and passenger to rail and river. The aim of these mitigation measures is to reduce energy consumption and its related GHG emissions within the transport sector in Egypt, while reducing the local environmental and other problems linked to increasing traffic such as deteriorated urban air quality and congestion.

Investments in the transport sector will provide better market access, improve the value chain for agricultural produce and link local and international markets. By developing a more integrated transport system, Egypt could become a trade and logistics hub within the region and would increase connectivity and cater to the urban demands of the ever-growing population. Mitigation options and measures within the transport sector, in summary, can be subdivided into 4 categories namely:

- **Efficient technologies:** This includes the use of more aerodynamic cars, hybrid motor engines, friction reducing technologies and kinetic energy recovery breaking.
- **Consumer behaviour:** This category includes consumers buying smaller cars, driving more efficiently and increase use of rail and water transport as a substitute for road transport which is more energy demanding.
- **Alternative fuels:** The use of biofuels, electricity and hydrogen to replace dirty fossil fuels within the transport sector.
- **Infrastructure/policy changes:** Making urban public transport more accessible and affordable, creating more bicycle lanes, introducing fuel taxes and traffic/congestion charges (Ahmed, 2015).



## 4.2.4 Green buildings and smart cities

### Overview

With the increasing population and urbanization trends in Egypt, there is a call for the development of more residential and commercial property to accommodate this population increase. The impacts of climate change also pose a situation where cities will not only be developed but countries would need to consider incorporating the mitigation of climate risks into their development planning. A lot of commitments have been taken to promote green cities in Egypt. As Hegazy et al. (2017) reports, these commitments include the following: Reduction in energy and carbon dioxide emissions, implementation of good land use policies, low-density sprawl, availability of green space per person, extensive advanced public transportation systems, and waste recycling. Great efforts have been made through sustainable urban design to improve the quality of life in some Egyptian cities.



## Climate impacts on buildings and cities in Egypt

As climate change impacts are increasingly felt in different parts of Egypt, cities are expected to suffer from migration caused by temperature rise, sandy winds and sea level rise. Low-level, coastal cities such as Alexandria and Port Said are believed to be more vulnerable and will therefore suffer the most from climate change impacts. This will affect the efficiency of different social services and put a financial burden on the government. It is foreseen that some coastal cities in Egypt will be flooded between 2040 and 2050. Increase in pollution and the use of energy in buildings will cause heat islands in urban cities as well as GHG emissions.

## Climate change measures, actions and targets indicated in the NDC

Green buildings and smart cities in Egypt are aimed at achieving social and economic development as well as environmental protection, and will contribute to mitigate the impacts of climate change on buildings and cities. Environmental protection pillars that are to be considered in the construction of green buildings and smart cities include: forest and soil management, waste and recycling management, energy efficiency, water management, air quality conservation and climate adaptation/mitigation. One of the mitigation actions or measures to be considered in the development of green buildings and smart cities is the installation of solar water heaters in residential buildings. Energy efficiency improvements are being carried out as part of a continuous improvement process in both residential and governmental buildings as well as on streets as planned in the NDC. Examples of such projects include the project to replace sodium bulbs with LED in 7 new cities (El Obour, El Shorouk, New Cairo, Borj El Arab, 6<sup>th</sup> of October, El Sheikh Zayed and 10<sup>th</sup> of Ramadan). Energy efficient labelling for household appliances will also be reinforced. These are all areas where the private sector can play an important role in the investment and implementation phases.

As per Egypt's Third National Communication (2016), all mitigation actions to be implemented in buildings and cities fall under the following categories:

- Improvements in principles of EE (reduce heating, cooling and lighting loads, utilize active solar energy and other environmental heat sources and sinks, increase efficiency of appliances, heating and cooling equipment and ventilation, utilize high efficient motors for water pumping and other uses, implement commissioning and improve operations and maintenance, change behaviour, utilise system approaches to building design, consider building form, orientation and related attributes and minimise halocarbon emissions);
- Thermal envelope (insulation, windows and air leakage);
- Heating systems (passive solar heating, space heating systems);
- Cooling and cooling loads (reducing the cooling load, passive and low-energy cooling techniques, air conditioners and vapour-compression chillers);
- Heating, ventilation and air conditioning (HVAC) systems (principles of energy-efficient HVAC designs, alternative HVAC systems in commercial buildings);



- Building energy management systems (commissioning as well as operation and maintenance and performance benchmarking),
- Active collection and transformation of solar energy (building-integrated PV);
- Domestic hot water (solar thermal energy for heating and hot water);
- Lighting systems (high efficiency electric lighting);
- Daylighting;
- Household appliances, consumer electronics and office equipment;
- Supermarket refrigeration systems;
- Energy savings through retrofits (conventional retrofits of residential, institutional and commercial buildings, solar retrofits of residential, institutional and commercial buildings);
- Trade-offs between embodied energy and operating energy; and
- Trade-offs involving energy-related emissions and halocarbon emissions.

#### 4.2.5 Renewable energy and energy efficiency

##### Overview

Egypt's economic development depends on the energy sector, which represents 13.1% of overall GDP - with the majority of the contribution coming from oil and gas and not RE and EE. To meet the increasing demand for energy, the Egyptian government has put forward an energy diversification strategy, known as the Integrated Sustainable Energy Strategy (ISES) to 2035, to ensure the continuous security and stability of the country's energy supply. This strategy involves stepping up the development of RE and EE, with RE targets of 20% of the electricity mix by 2022 and 42% by 2035 (NREA, 2018). The total installed capacity of RE sources is expected to reach 19.2 GW by 2021/22 and increase to 49.5 GW and 62.6 GW in the FY 2029/30 and 2034/35 respectively (IRENA, 2018). Table 3 shows the evolution of installed power capacity for the different renewable sources from 2009 to 2035.



**Table 3: Evolution of installed renewable energy power capacity in GW**

ENERGY SOURCE	2009/10	2021/22	2029/30	2034/2035
Hydro	2.8	2.8	2.9	2.9
Wind	0.5	13.3	20.6	20.6
Photovoltaic systems	0.0	3.0	22.9	31.75
Concentrated Solar Power	0.0	0.1	4.1	8.1
<b>Total</b>	<b>3.3</b>	<b>19.2</b>	<b>50.5</b>	<b>62.6</b>

Source: IRENA 2018

### Climate change impacts on the renewable energy and energy efficiency subsector

Changes in temperature, precipitation, sea level, and the frequency and severity of extreme events will affect how much energy is produced, delivered, and consumed in Egypt. Egypt's NDC in a broad manner underscores the potential impacts of climate change in the power generation sector. It states that the increase in temperature could negatively affect the efficiency of conventional power plants and photovoltaic cells, while sea level rise will threaten the electric power plants and networks located along the coasts. Changes in rainfall patterns in terms of rainfall rates and rain distribution across different regions could negatively affect power generation from hydropower plants. Furthermore, electricity consumption rates could increase as a result of the use of air conditioners and other cooling appliances (GoE, 2015).



## Climate change measures and actions indicated in the NDC

Concerning adaptation, Egypt's NDC indicates the need for enhancing the resilience of the energy sector to climate change. For example, it stresses that comprehensive studies should be undertaken to guide decision making where findings related to adaptation measures and their costs should be demonstrated, and the identification of low and high-risk zones to guide the selection of locations to construct power generation installations. The NDC further highlights the need to build institutional and technical capacities of different units in the energy sector on climate change issues, and to support research and technological development to enable the electricity sector to deal appropriately with climate change (GoE, 2015).

On mitigation, Egypt's NDC generally, underscores the need for improving energy efficiency and the use of solar energy and other renewable energy types in the housing, transport, industry, and agriculture sectors (GoE, 2018).

### 4.2.6 Waste management sector

#### Overview

The waste management sector in Egypt requires attention and upgrades across almost the entire country. In 2012, solid waste generated in Egypt was estimated at 89.03 million tons, (Table 4).

**Table 4: Estimates of solid waste generated in Egypt in 2012 (million tons)**

SOURCES	QUANTITY
Municipal solid waste (MSW)	21
Agricultural waste	30
Industrial waste	6
Hazardous medical waste	0.03
Construction and demolition waste	4
Waterway cleansing waste	25
Sludge	3
<b>Total</b>	<b>89.03</b>

Source: GIZ, 2014



Daily MSW generated in 2012 was highest (15000 tons) in the Cairo governorate and lowest (100 tons) in the New Valley governorate. Dumpsites for MSW are scattered across the different governorates, with an estimated 135 and 239 public and random dumpsites identified respectively (GIZ 2014).

## Climate change measures, actions and targets indicated in the NDC

The NDC of Egypt has not put forward any specific measure and/or action concerning waste management in terms of emission reductions. It provides no clarity for private sector project developers to initiate the conceptualisation of projects in the waste management sector. However, the third national communication lists a number of opportunity action areas in the context of the nationally appropriate mitigation actions (NAMA) in the waste management subsectors. For example, improved landfilling, incineration with energy recovery, gasification, anaerobic digestion, composting, co-firing in Cement Kilns, and recycling, are proposed actions that can be developed across the waste management subsectors (MSW, agriculture waste, sewage sludge management among others) (GoE, 2016a).

### 4.2.7 Financial sector

#### Overview

Egypt's financial sector is one of the oldest and most developed sectors in the whole of the North African region. It is considered one of the most mature and attractive markets in North Africa due to the availability of many national banks, brokerages, investment banks and private equity houses that encourage foreign investments from local and international firms (Institute of Export and International Trade, 2016).

The financial and banking sectors are exceptionally growing on a solid ground due to the regulatory reforms conducted by the Egyptian government in the past six years including capital adequacy requirements, the privatization of public-sector banks and the consolidation of small private institutions into more robust entities (Institute of Export and International Trade, 2016). Despite the wave of privatization sales, mergers, acquisitions and expansions, the sector still holds massive untapped potential in sectors ranging from retail and commercial banking to insurance, mortgage finance, equities and advisory services.

#### Climate change and the financial sector of Egypt

The increase in frequency and severity of climate change impacts in Egypt especially sea level rise, floods, droughts, and storms is negatively affecting infrastructures, buildings, cities, and reducing agricultural productivity. For example, a study on the economic impacts of climate change on agriculture in Egypt showed that a rise in temperature would have negative effects on farm net revenue in Egypt (Eid et al. 2007). This shows that the impacts of climate change on various sectors can lead to losses for insurance companies, banks, and other financial intermediaries in Egypt with direct and indirect exposure to different affected industries and assets.



## 4.2.8 NDC-aligned activities implemented by the private sector

The following section presents examples and case studies that demonstrate successfully implemented green projects by the private sector that align with the proposed actions identified in the NDC of Egypt. Some of these projects have been implemented while others are still underway. The examples were selected due to: the direct or indirect involvement of the private sector, success in securing green finance, and their focus on one of the seven sectors covered in this study.

### Agribusiness

Climate-smart interventions have the potential to soften the devastating impact that climate change could inflict on the agricultural sector in Egypt. This might render large portions of the Nile Delta (Egypt's bread basket) unsuitable for agriculture.

#### CASE 1: ANGEL YEAST EGYPT

##### ABOUT THE PROJECT

The project will finance the construction and the commissioning of a new yeast processing plant as well as a wastewater treatment facility in the city of Beni Suef in Egypt. The planned new yeast extraction plant will be operated with high quality, environmental, health and safety standards, demonstrated by its certifications to ISO 9001 for quality, ISO 14001 for Environmental Management, OHSAS 18001 for Occupational Health and Safety, and ISO 22000 for Food Safety. The Company has the adequate resources in place and has a strong environmental, health and safety (EH&S) culture. Angel Yeast Egypt employs around 370 people and is expecting to hire an additional 200 employees with the projected extension.

##### FINANCING STRUCTURE

Provision of USD 52 million senior unsecured loan (the "Loan") to Angel Yeast Egypt (the Company"), a fully-owned subsidiary of Angel Yeast Co. Ltd ("AY").

##### OUTCOME AND IMPACT

The project will improve the adaptive capacity of the communities and the company to climate change by supporting job creation and training, enabling the production of a new, higher value-added product (yeast extract) and increasing the production of organic fertilizer input as a waste by-product - which is one of the ways to reduce GHG from the waste sector as per Egypt's NDC

Source: EBRD, 2017



## Transport sector

The Government of Egypt introduced the Sustainable Transport Program (STP) with an aim to create an enabling policy and institutional environment for sustainable transport sector development, and leverage the necessary financial resources through PPPs. Another NDC-aligned activity that has been successfully implemented is the Expansion of Cairo Metro Network (CMN) which came to completion in 2015. This project expanded the Greater Cairo underground metro network with the participation of the private sector, and emissions were reduced by 1.05 million tCO<sub>2e</sub> in 2015 from lines 2 and 3 of the Cairo metro. An estimated 1.4 million tCO<sub>2e</sub> of GHG emissions was to be reduced over the next 20 years as a result of the STP and CMN program. Work is currently underway to adjust the environmental conditions of 16 ports to become green ports, which are in line with the international environmental standards and positively impacts the marine environment in Egypt. The Ministry of Transport is trying to include the private sector in green investments of the transport sector (e.g. in the electrification of many railway lines).

### CASE 2: EGYPT ELECTRIC TRAIN PROJECT

#### ABOUT THE PROJECT

The electric train project is part of the Egyptian government's \$27.6 billion green investment plan for the coming years. The project's objective is to develop and implement an electric train line that will link Al-Salam, the new administrative capital and 10th of Ramadan City located on the outskirts of the city of Cairo. The project will be executed by China Civil Engineering Construction Corporation (CCECC) and will extend over a length of 67 km, with 11 stations.

#### FINANCING STRUCTURE

This project is being financed to the tune of \$ 67 million dollars by the Exim Bank of China while the Egyptian government will invest \$739 million.

#### OUTCOME AND IMPACT

The project will be able to accommodate 340,000 passengers per day, generate savings of about \$130 million in fuel subsidies related to car traffic per year for the state, and reduce traffic on a motorway linking the capital to the Suez Canal in the port city of Ismailia, northeast of Cairo, by 30%. The project has the potential to reduce GHG emissions from the transport sector contributing to the estimated 1.4 million tCO<sub>2e</sub> to be reduced under the STP over 20 years. Moreover, the project is mentioned in Egypt's NDC under the transport sector as one of the key actions to be taken by the government to reduce GHG emissions. Source: Ministry of Transport, GoE 2019



## Green buildings and smart cities

In order to accommodate the growing population, the Government of Egypt is increasing the urban development area from 6% to 12%. This will be achieved through the establishment of 15 new fourth-generation green-cities that will follow sustainable energy standards, sustainable transportation, water and waste management and recycling among other green best practices.

### CASE 3: ECO-CITY ALEXANDRIA

#### ABOUT THE PROJECT

Eco-City Alexandria is a strategic effort to achieve sustainability in Alexandria. Alexandria, the Mediterranean port and second largest city in Egypt, with a population of 5.2 million, joined the EBRD Green Cities program in 2019. By joining the program, the city has put more emphasis on addressing its key climate change and environmental challenges. The city's Green City Action Plan (GCAP) known as Alexandria Environmental Action Plan 2040 highlights key sectors of focus and defines targets as presented below.

Metric	Short-term	Mid-term	Long-term
<b>CLIMATE CHANGE</b>			
Total GHG emission reduction over 2005 base year			50% by FY2030 and 80-100% by FY2050
<b>ENERGY</b>			
Renewable offset of City-owned facilities electrical use	100% by 2020		
Improve energy efficiency for City-owned facilities and affiliated transportation		Reduce by 25% by FY2027 over FY2018	
Reduce GHG emissions per capita	10 metric tons per capita by FY2022	6 metric tons per capita by FY2030	4 metric tons by FY2040 and 1-3 by FY2050
<b>LAND USE AND OPEN SPACE</b>			
Tree Canopy percent			40% by FY2035
Open Space Acres per 1,000 residents	7.3	7.3	7.3
<b>SOLID WASTE</b>			
Reduce GHG emissions from solid waste over a 2019 base year	By FY2023 reduce by 12%		
<b>WATER RESOURCES</b>			
Achieve stormwater phosphorus pollution reduction (MS4) target	By FY2023 to 70%	By FY2025 to 100%	
<b>TRANSPORTATION</b>			
Reduce vehicle miles traveled	By FY2023 reduce 1% per year		
Increase transit, walking, and biking	By FY2023 Increase by 15% over 2018		
Increase dedicated bus lanes			By FY2030, double to 1.5 miles
<b>AIR QUALITY</b>			
Reduce ozone	By FY2023, reduce to 70 ppb or lower		



## FINANCING STRUCTURE

A mix of financing sources will be used to implement the GCAP: Support by the Government of Austria, PPPs, and Alexandria City Council's fiscal planning and budget.

## OUTCOME AND IMPACT

The City of Alexandria has:

- Earned a SolSmart Silver designation for fostering the development of local solar markets.
- Developed landscaping guidelines to fight climate change and create urban green space.
- Adopted the new green building policy to meet “net zero energy” standards and higher stormwater requirements for new private development.
- Raised the green building standard from “certified” to “silver” and making it easier for developers to use LEED, Green Globes, or Earthcraft third-party green building systems.
- All the sectors mentioned in the Eco city are priority sectors in Egypt's NDC, hence they will contribute directly to Egypt's NDC mitigation and adaptation actions.

Source: City of Alexandria 2019 and EBRD 2019

## Renewable energy

The private sector in Egypt has been involved in relevant NDC-aligned RE activities principally through solar and wind power generation investments since 2016. Their involvement is through 3 mechanisms. The first mechanism is the BOOT (Build, Own, Operate and Transfer), where the Egyptian Electricity Transmission Company (EETC) issues tenders to private sector companies to build, own, operate and transfer RE power stations and sell the generated electricity to EETC at the terms and prices agreed between the EETC and the investor. Secondly, the private sector is involved through the Feed in Tariff (FiT) where private sector investors are allowed to build, own and operate RE power stations and sell the generated electricity to EETC or to licensed distribution companies via power purchase agreements (“PPA”) in consideration for a pre-announced FiT. Thirdly, through the Independent Power Producer Scheme (IPP), where RE independent power producers (IPP) are allowed to conclude bilateral purchase agreements with eligible consumers and sell the produced electricity directly at a negotiated price. EETC and distribution companies are mandated to allow investors to sell electricity directly to consumers using their grids subject to a grid access fee (wheeling charge) via network connection contracts. So far, several private sector actors are either implementing, constructing developing or planning the installation of solar and wind energy projects, which are directly contributing to the implementation of Egypt's NDC mitigation actions. Some of the projects include : Net metering project (50 MW) , Benban (60 MW), Gulf of Suez (250 MW), PV power plant (600 MW) in West of Nile Area, Gulf of Suez 2 (200 MW), West Nile PV (600MW), (NREA, 2018; IRENA, 2018).



## CASE 4: SHAPOORJI PALLONJI SOLAR PHOTOVOLTAIC POWER PROJECT

### ABOUT THE PROJECT

The Project aims to design, construct, operate, and maintain a 50 MW turnkey solar PV project in Benban, 50km north of Aswan, where the direct solar irradiance is 2,280 kWh/m<sup>2</sup>. The project is to be implemented under the Egyptian Solar Photovoltaic FiT Program Round-2, an initiative where the Government of Egypt seeks to implement 2,300 MW of Solar PV projects. The Project will support the development of clean energy technologies and private sector development in Egypt. It will be executed by Shapoorji Pallonji Energy Egypt S.A.E. (“SPEE”), an SPV incorporated in Egypt.

### FINANCING STRUCTURE

AfDB financed the project with a loan of \$12 million.

### OUTCOME AND IMPACT

The project will:

Enable diversification of the energy mix and further the green growth agenda of Egypt; and

Provide clean power that will help reduce the use of fossil fuels in the energy mix and increase Egypt's power generation capacity, enable fuel savings and reduce carbon emissions.

Source: AfDB 2014



## CASE 5: RENEWABLE ENERGY FINANCING FRAMEWORK

### ABOUT THE PROJECT

The 18-year Framework will support Egypt in meeting its target of 20% renewable energy generation by 2022, through two complementary components:

The first one is a comprehensive technical assistance programme to enhance renewable energy integration, policies, and planning. The Framework will:

Ensure that the new renewable energy capacity developed as part of this framework is successfully integrated into the electricity grid;

Provide the relevant institutions with advice on the practical implementation measures needed for the successful launch and completion of competitive tenders for renewable energy; and

Include technical training to relevant projects to strengthen equality of opportunity for women and men to access and benefit from employment and other economic benefits connected to the development of renewable energy sources.

The second component is to scale up investments to support the development and construction of renewable energy projects in Egypt. The Framework will support the development and construction of renewable energy projects totalling USD 1 billion. The scale of this investment reflects the scale of the need, and opportunity, for renewable energy in Egypt.

### FINANCING STRUCTURE

The 1 USD billion Framework will use loans and equity financing from EBRD of up to USD 850 million, and up to USD 150 million in loans from GCF. EBRD will provide financing representing up to 35% of the cost of each project and the remaining debt is expected to be provided by another international development finance institution or, at a later stage of the programme, by a commercial lender. The equity contribution is 25% of the project costs translating into investment from the private sector of USD 250 million.

### OUTCOME AND IMPACTS

Implemented projects within the Framework are expected to generate around 1,400 GWh electricity annually and result in avoided GHG emissions of about 800,000 tCO<sub>2</sub>e annually once all projects are operational.

Enhance the long-term viability of private sector investments in harnessing Egypt's renewable energy potential, thus enabling the scale necessary to bring the generation sector, and the economy as a whole, onto a low-carbon development path.

Increase the number of small, medium and large low-emission power suppliers.

Source: GCF, 2019

## Waste management

The Egyptian government has been making efforts to increase service quality in the waste management sector through the use of private firms for the collection service. In this regard, governorates and municipalities shifted to privatisation of the service. This was followed by a series of contracts signed in the early 2000s with multinational private waste companies, namely Veolia, FCC, Urbaser and AMA Arab Environment Company, for waste management in Cairo, Alexandria and Giza (Table 6).



**Table 5. Some of the private sector engagements in waste management in Egypt**

COMPANY	YEAR OF PRIVATISATION	CITY	VALUE OF CONTRACT	LENGTH OF CONTRACT
<b>Veolia Environment</b>	2000	Alexandria	\$29.7 million/year	15 years
<b>FCC and Urbaser</b>	2002	Giza	\$7.6 million/year	15 years
<b>FCC and Urbaser</b>	2003	Cairo (east and west)	\$25 million/year	15 years
<b>AMA - Arab Environment Company</b>	2002	Cairo (north)	\$11.5 million/year	15 years

Source: van Niekerk and Wegmann 2019, Elgazzar et al., 2017

The contract between Veolia and the governorate of Alexandria in 2000 was to commence operations of the waste management system in Alexandria city for the a period of 15 years (2001–2015). This contract was the first Public-Private Partnership (PPP) in the waste management sector in Egypt, and it included operations of waste collection and transfer, street cleaning, treatment of waste, and rehabilitation of old dump sites (Elgazzar et al., 2017). The contract was however terminated just after a few years of operation. After six years of legal battle between the two parties, the government prevailed in the ruling. The government succeeded in fighting for the rights of improved wages for the workers against Veolia’s right as a private investor. The lesson here is that PPP is not a silver bullet solution in all cases and there will be situations where disputes will be resolved at national and international tribunals for a fair trial and ruling. This means that both the private sector investor and the government must respect contractual agreements and also do the right things to avoid losing time, money and reputation.



## CASE 6: INDUSTRIAL WASTE MANAGEMENT AND SME ENTREPRENEURSHIP HUB IN EGYPT

### ABOUT THE PROJECT

The project was implemented and managed by the Egyptian National Cleaner Production Center (ENCPC). The objectives were to develop entrepreneurship and create green jobs through the establishment of a sustainable industrial waste exchange (IWEX) system that links waste generators to waste users and recyclers to enhance resource efficiency across the different industrial sectors. The project also aimed at developing policy recommendations towards an enabling environment for industrial waste exchange in Egypt. The direct beneficiaries of the project included industrial private sector actors and entrepreneurs in the pilot area, the 10th of Ramadan city. The project also linked industrial private companies with SME recyclers.

### FINANCING STRUCTURE

The African Development Bank (AfDB) financed the establishment of the SME Entrepreneurship Hub. The project budget was 2 million USD over 3 years and the project linked SMEs with financial institutions in Egypt to facilitate access to finance.

### OUTCOME AND IMPACT

The project identified and implemented 3 demonstration projects that matched the producers of industrial waste with potential users/recyclers and identified the technology to be used to valorize the waste streams. Moreover, the recyclers were supported in acquiring the necessary certificates that provide their subproducts with a comparative advantage in the local as well as the international markets, and linking them with existing sources of green finance. Other outcomes included the realization of several analyses related to the perspective of the generator and recycler of waste (especially SMEs and entrepreneurs) to assess the technical feasibility of the pilots as well as conducting technical and financial feasibility studies for the projects. While this project does not provide specific GHG reduction potentials, it however falls within the kind of actions promoted by Egypt's NDC waste management and recycling actions.

Source: GIZ 2014



## Financial Sector

The Egyptian financial sector needs to take actions to plan for and reduce the potential impacts climate change could have on its activities. New opportunities to access climate finance to fund private sector actions on adaptation and mitigation should be equally explored by the financial sector.

### CASE 7: TRANSFORMING FINANCIAL SYSTEMS FOR CLIMATE (TFSC) PROGRAM

#### ABOUT THE PROJECT

The seven-year program (2019-2026) implemented by the French Development Agency (AFD) aims to engage local financial partners (LFPs) to scale up private sector climate finance. The Program builds on over a decade of experience in implementing the AFD SUNREF initiative (Sustainable Use of Natural Resources and Energy Finance) in 30 countries. The goal of the Program is to create a market for investments in climate technologies in Egypt and 16 other countries by removing the financial and technical barriers faced by LFPs to enable borrowing by, mainly, the private sector. The TFSC program is implemented in 17 countries: Benin, Burkina Faso, Cameroon, Ivory Coast, Ecuador, Egypt, Kenya, Madagascar, Mauritius, Morocco, Namibia, Nigeria, Senegal, South Africa, Tanzania, Togo, and Uganda.

#### FINANCING STRUCTURE

The total project cost is EUR 653 million, of which EUR 240 million of GCF financing and EUR 413 million of co-financing from AFD. The GCF finance is comprised of grants and concessional loans while the additional private sector financing is mainly equity from end-borrowers.

#### OUTCOME AND IMPACT

The Program will facilitate project funding (through credit lines) in the target countries and will develop the capacity of LFPs and project developers to scale up climate finance. The project will deliver GHG reductions estimated at 36 million tCO<sub>2</sub>e over the 20-year lifetime of the mitigation investments, and increased resilience for an estimated 200,000 people from investments in increased resilience (total beneficiaries 1 million). Co-benefits include green jobs and business growth (880 SMEs). For the Egyptian component, AFD and the Egyptian Environmental Affairs Agency (EEAA) reached the common agreement to focus on NDC key areas related to sustainable tourism and waste management, specifically targeting SMEs.

Source: GCF, 2019



## 5. PRIVATE SECTOR INVOLVEMENT IN GREEN INVESTMENT

### 5.1 Private sector landscape and key players for climate action in Egypt

The private sector plays a key role in the economic and social development in Egypt. The private sector contributes about 60% and 70% of GDP and employment respectively, with the manufacturing, agriculture, retail trade and construction sectors as the major contributors to private sector output. The retail trade and manufacturing sectors in particular contribute to private sector GDP significantly (40%) and account for 73 % of the total number of firms (EBRD, 2017).

The private sector in Egypt is dominated by micro, small and medium enterprises (MSMEs). Within these MSMEs, a new category of social and green entrepreneurs and start-ups are emerging from different NGOs. The new NGO law of Egypt (Law No. 149 of 2019) encourages the transition from NGOs to green entrepreneurs. In 2017, micro enterprises constituted approximately 91% of all firms, small and medium ones around 8% of the total and large firms less than 1% (EMNES, 2017). In Egypt, MSME are very large in numbers, diverse in type of business and are spread across remote geographies of the country. A large portion of the MSMEs are informal and not registered with the formal systems of MSME (Abdel bary, 2019). The MSMEs are mainly concentrated in the manufacturing and trade sectors as indicated by the 2014 International Finance Cooperation statistics (Table 7).

**Table 6: Proportion of MSMEs per sector of activity**

SECTOR OF ACTIVITY	PROPORTION OF MSMEs (%)
<b>Manufacturing</b>	51
<b>Construction</b>	2
<b>Trade and commerce</b>	40
<b>Tourism</b>	3
<b>Others</b>	4
<b>Total</b>	100

Source: IFC 2014.



The distribution of firms by size and employment contribution shows that large enterprises dominate the manufacturing sector, accounting for 87% of total production and 53% of total employment. In turn, MSMEs contribute to nearly 47% of total employment in the sector and account for only 13% of the overall production (Mokhtar and Abdelwahab, 2014)

MSMEs in Egypt have a pivotal role in generating employment in both the formal and informal sectors, providing nearly 75% of total employment in the private sector, a share reaching 99% in some non-agricultural sectors (EMNES, 2017).

The Egyptian private sector in general and MSMEs in particular appears to have weak exporting capabilities. About 95% of small firms do not have any exporting activity, 18% of medium firms are able to engage in international markets and export. This share reaches 31% in the case of large firms, characterised by higher levels of exporting activity. On the other hand, the business operations of around 46% of small enterprises and 54% of medium enterprises depend on inputs of foreign origin (EMNES, 2017).

The private sector in Egypt has been part of the Clean Development Mechanism (CDM) of the UNFCCC, in terms of the development and implementation of GHG emission reduction projects in the areas of renewable energy, and energy efficiency. Some of the sectors involved are cement production, oil and gas, water management and irrigation, and waste management (RCREEE, 2011).

From an NDC-implementation perspective, only very few, large Egyptian companies might be able to access climate finance directly especially in the areas of manufacturing. The involvement of the private sector actors, either big or small, will be partly determined by a well-coordinated platform or institution to advocate and promote private sector involvement in green investment and climate change in general. Some of these platforms exist in South Africa (National Business Initiative - NBI) and Morocco (General Confederation of Enterprises of Morocco- CGEM) and they provide technical support to promote private sector contribution to fight climate change while making a profit.



## 5.2 Why should the Egyptian private sector be interested in green investment?

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The reason for the Egyptian private sector's involvement in green investment are twofold: (i) Investment opportunities provided by NDC implementation and (ii) the improving general enabling environment for doing business

First, the private sector can act as a major source of current investments in the NDC targeted sectors. They can play an important role in adaptation and emission reduction actions, financial resource mobilisation and investment in the context of NDC implementation. Green investments could therefore provide an opportunity for the private sector in Egypt - especially the MSMSEs - to overcome some of the challenges facing their competitiveness and growth. For example, limited access to concessional loans and technology, inadequate market-based incentives especially in the energy and infrastructure activity sectors (ERBD, 2017). While some of these challenges are also present in the green economy sectors, the government is however providing more incentives and green growth policies and programs. These incentives and policies represent part of the enabling environment that will promote green investments including NDC implementation.

Second, Egypt's general enabling environment to do business including green business, is improving as stated in many reports. Egypt is ranked as the second most attractive investment destination on the continent after Morocco, according to the African Investment Index 2018 (Quantum Global 2018). Egypt is 114<sup>th</sup> out of 190 countries in the World Bank Group's 2020 Ease of Doing Business report, up from 120<sup>th</sup> last year with improvement in the areas of starting a business, tax payments, and protection of minority investors (World Bank, 2020b). In terms of competitiveness, the World Economic Forum's 2019 Global Competitiveness Index indicates improvement in infrastructure, labour market, financial system, business dynamism including financing of small and medium enterprises and the growth of innovative companies. (WEC, 2019).

Transparency International's Corruption Perception Index ranked Egypt 106<sup>th</sup> out of 180 countries in 2019, with the scores indicating a moderate level of corruption (TI, 2020). Concerning innovation driven growth, the Global Innovation Index that provides measurement of an economy's innovation performance ranked Egypt 16<sup>th</sup> among the 30 lower-middle income economies in the index (Cornell University et al., 2018).

The existing legal and institutional framework for PPP - presented in box 2 below - also provides an opportunity for foreign companies to bid for PPP projects in a fair and transparent manner as well as for legal and consultancy work (Institute of Export and International Trade, 2016). Several green PPP projects have been implemented in Egypt such as: the new Cairo wastewater treatment plant, Ras Ghareb wind farm and Scatec solar portfolio.



## BOX 2: PPP LAW AND OTHER APPLICABLE SECTORAL LAWS AND TEXTS IN EGYPT

- Egypt Public Private Partnership Law No.67, 2010
- Egyptian Electricity Law, Law No. 87 for year 2015 last July
- Supreme Committee for Public Private Partnership Affairs (SCPPPA)
- Public Private Partnership Central Unit (PPPCU) within the Ministry of Finance
- Public Private Partnership Contract Law, Law No.67, 2010, art 1
- General Principles Law of publicity, transparency, free competition, equal opportunity and fairness, Law No.67, 2010, art.19§1
- Tendering, contracting and choice of the private partner Law, Law No.67, 2010
- Project Evaluation Law, Law No.67, 2010
- Negotiation and Signature of the PPP contract Law, Law No.67, 2010
- Rights and Obligations of the public partner Law, Law No.67, 2010
- Rights and Obligations of the private partner Law, Law No.67, 2010
- Obligations and Rights of Both Public and Private Partners Law, Law No.67, 2010
- Applicable Law Dispute resolution Law, Law No.67, 2010

### 5.3. SWOT Analysis for green investment

The SWOT analysis presents the strengths, weaknesses, opportunities and threats that Egyptian companies in the private sector have to deal with when considering green investments. Internal factors are within the Egyptian companies in the private sector while external factors refer to factors outside the companies.



STRENGTHS (INTERNAL FACTORS)	WEAKNESSES (INTERNAL FACTORS)
<ul style="list-style-type: none"> <li>• Improvement in corporate social responsibility (CSR), especially in large private companies</li> <li>• Improved economic performance linked to green investments that can lead to stronger bottom line / competitiveness</li> <li>• Private sector is already involved in all the NDC-targeted sectors (success stories as indicated in the case studies)</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient knowledge on NDCs and green investment opportunities</li> <li>• Insufficient financial resources to invest in NDCs through green investments</li> <li>• The private sector lacks dynamism and competition, with a few large firms dominating the market</li> <li>• Short term economic rationale overriding NDC-related green investment's longer-term profitability</li> <li>• Private sector enterprises, especially MSMEs, have limited capacity to access finance for investment in general, and newer, green business opportunities particularly (unproven business models)</li> <li>• Insufficient knowledge, management expertise and capacity to develop viable business plans in general, and particularly for green investments, especially MSMEs</li> </ul>
OPPORTUNITIES (EXTERNAL FACTORS)	THREATS (EXTERNAL FACTORS)
<ul style="list-style-type: none"> <li>• Increased profitability through improved knowledge on climate finance products</li> <li>• Increasing government interest in green investment, for example, \$27.6 billion allocation for green projects for 20/21 investment year</li> <li>• Government effort to support the development of MSMEs through innovation, R&amp;D and access to new technologies</li> <li>• Increasing willingness of the government to enhance PPPs, which are an excellent vehicle for many green investments</li> <li>• Increasing demand for RE</li> </ul>	<ul style="list-style-type: none"> <li>• COVID-19 pandemic economic downturn could delay some green investments</li> <li>• Bureaucratic red tape</li> <li>• Insufficient information available on NDCs and associated green investment opportunities (the Government needs to flesh out their description to attract the private sector)</li> <li>• Insufficient policy and regulatory framework to promote private sector green investments for NDC implementation</li> <li>• Institutional and policy frameworks mostly target the big firms to the detriment of MSMEs, including the development of PPPs relevant for NDC implementation. However, in many instances, large companies subcontract to SMEs</li> <li>• Role of the private sector has not been clearly and strongly underscored in the NDC implementation framework</li> </ul>

Sources: Kamel et al. 2017, Mokhtar and Abdelwahab 2014, Abdel bary 2019, EMNES 2017, EBRD 2017, Afrik21 2020.



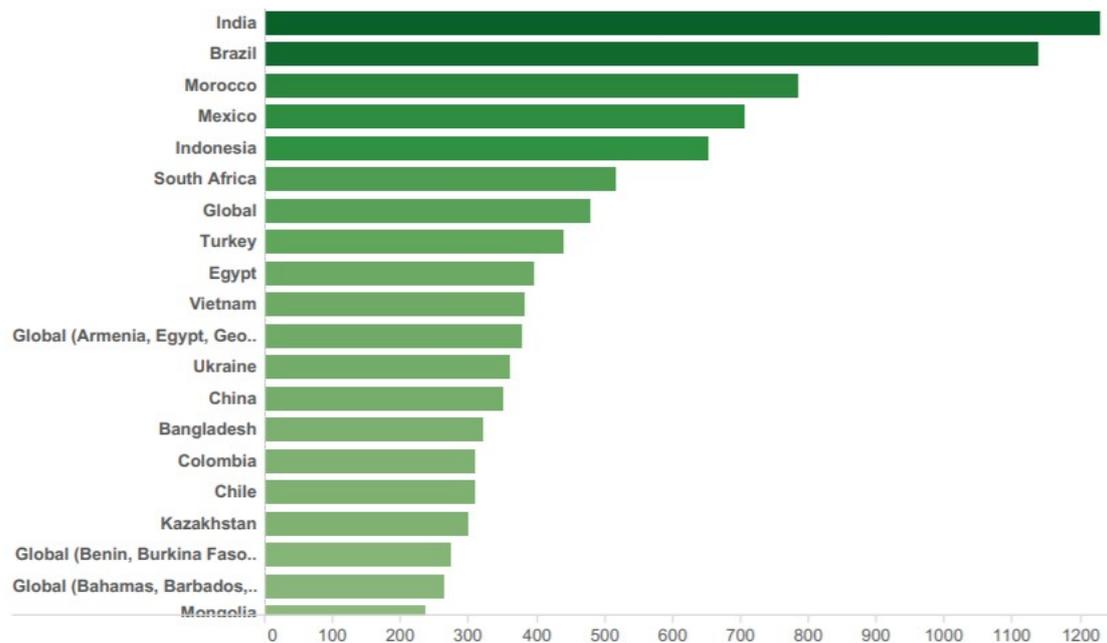
## 6. CLIMATE FINANCE LANDSCAPE IN EGYPT

An overview of the climate finance landscape in Egypt is necessary as it will provide information on the challenges and opportunities for climate finance in general and for private sector involvement in particular. In Egypt, bilateral and multilateral funds are major sources of climate finance. These funds are provided by various donors in the form of grants, concessional loans, technical assistance and debt-swap programmes. Key donors in Egypt include The World Bank, African Development Bank (AfDB), various European Institutions, United States, Germany, France, Japan, Saudi Arabia, Kuwait, Arab Fund (AFESD), United Arab Emirates and South Korea.

From a multilateral perspective, especially in the context of ongoing NDC initiatives, Egypt is yet to join or benefit from the NDC Partnership and the World Bank NDC Support Facility (NDC-SF). These NDC initiatives facilitate the implementation of NDCs through the mobilization of financial and technical support for countries. However, Egypt has been able to attract a good amount of climate finance (396.8 USD million as of 2019) compared to many African countries. Figure 3 below shows the most supported countries by climate finance with Egypt occupying the 9<sup>th</sup> position globally and 3<sup>rd</sup> position in Africa after Morocco and South Africa. Most of the funding comes from multilateral funds dedicated to fight climate change such as the Clean Technology Fund (CTF), Green Climate Fund (GCF), Global Environmental Facility (GEF), Adaptation fund (AF), Special Climate Change Fund (SCCF), Adaptation for Smallholder Agriculture Program (ASAP), Global Energy Efficiency and Renewable Energy Fund (GEEREF), and Global Climate Change Alliance (GCCA). More than 66% of all the climate finance has been so far spent on mitigation actions. Table 7 below provides a list of the bilateral, multilateral and private climate and green investment related funds accessible to Egypt.



**Figure 3: Amount of Climate Finance approved by countries in USD millions (CFU, 2019)**



In summary, the Egyptian private sector is already involved in a number of NDC-aligned projects financed by dedicated climate change funds. Most of the private sector actors are however the big companies. Due to the high volume of finance involved in most NDC projects, accompanied by very stringent and complex processes, the Egyptian SMEs have little or no direct access to these sources. SMEs can however be involved through subcontracting of very specific aspects of bigger NDC project implementation on the ground, but this approach must be clearly integrated in the early conceptual and design phase of the project.

**Table 7: Example of funds for climate actions and green investment in Egypt**

FUNDING SOURCE PROJECTS AND PROGRAMS	CLIMATE AREA	AMOUNT (US\$M)	FUND FOCUS	7 KEY SECTORS	COUNTRY AND FINANCIAL INSTRUMENT
<b>EBRD</b> <b>Lekela Wind BOO</b>	Mitigation	356	Private	Energy	Egypt Loan
<b>Clean Technology Fund (CTF) and EBRD</b> <b>Wind Power Development Project</b>	Mitigation	803.5	Public	Energy	Egypt Loans and grant
<b>CTF and International Finance Corporation (IFC)</b> <b>Sustainable Urban Infrastructure: Expansion (DPSP III)</b>	Mitigation	175	Public	Transport and infrastructure	Egypt Loans and grant
<b>Green Climate Fund (GCF)</b> <b>Enhancing adaptation in north coast and Nile delta regions</b>	Adaptation	105.2	Public	AFOLU, water, and infrastructure	Egypt Grant



<b>GCF and EBRD</b> <b>Egypt Renewable Energy Financing Framework</b>	Mitigation	1000	Private	Energy	Egypt Grant, loans and equity
<b>GCF and French Development Agency (AFD)</b> <b>Transforming Financial Systems for Climate</b>	A+M	775.5	Private	Energy, AFOLU, water, infrastructure, cities and waste	Egypt and 16 countries Loans and grants
<b>GCF-EBRD</b> <b>Sustainable Energy Financing Facilities</b>	Mitigation	1538.5	Private	Finance and energy	Egypt and 9 countries Loans and grants
<b>African Development Bank (AfDB)</b> <b>Economic Governance and Energy Support Programme I, II and III</b>	Mitigation	1500	Public	Energy	Egypt Loan
<b>AfDB-</b>	Adaptation	387.4	Public	Waste	Egypt

<b>Sustainable Development of Abu Rawash Wastewater Treatment Plant (ARWWTP)</b>					Loan
<b>AfDB</b> <b>Franchising Sector Support Programme - Fapa</b>	A+M	40	Private	All	Egypt Loan and grant
<b>AfDB</b> <b>Solar Photovoltaic Power Project under the Egyptian Feed-in-Tariff Program – Round 2: Alcazar Energy Egypt Solar, Delta and Shapoorji Pallonji Energy</b>	Mitigation	38.6	Private	Energy	Egypt Loan and grant
<b>Global Environmental Facility (GEF) and IFAD</b> <b>Enhancing rural opportunities in Egypt through Innovation and Adaptive Strategic Planning</b>	Adaptation	47.7	Public	AFOLU and water	Egypt Loan and grant
<b>GEF, UNIDO and EBRD</b> <b>Egyptian Programme for Promoting Industrial Motor Efficiency</b>	Mitigation	19.6	Public	Transport and energy	Egypt Loan and grant



<b>GEF and Special Climate Change Fund (SCCF)</b> <b>Adaptation to Climate Change in the Nile Delta Through Integrated Coastal Zone Management</b>	Adaptation	16.9	Public	Infrastructure, water and AFOLU	Egypt Grant
<b>GEF and United Nations Development Programme (UNDP)</b> <b>Sustainable transport</b>	Mitigation	44.3	Public	Transport	Egypt Loan and grant
<b>GEF, UNDP and SCCF</b> <b>Grid-connected Small Scale Photovoltaic Systems</b>	Mitigation	33.9	Public	Energy	Egypt Grant
<b>Adaptation Fund (AF) and World Food Program (WFP)</b> <b>Building Resilient Food Security Systems to Benefit the Southern Egypt Region</b>	Adaptation	6.9	Public	AFOLU	Egypt Grant

A+M= Adaptation and Mitigation



## 7. PRIVATE SECTOR CHALLENGES AND OPPORTUNITIES FOR NDC-ALIGNED GREEN INVESTMENT

There are several challenges and opportunities for the private sector to get involved in the implementation of NDC through green investments in Egypt. Before getting into the specificities of each of the seven focal areas of this study, it is important to first present some of the cross-cutting challenges and opportunities, meaning those that affect all the key sectors in this report.

### 7.1. Cross-cutting challenges

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**Knowledge gap and limited skills on NDC and climate change:** The private sector, before investing, needs to have a good understanding of the NDC document, climate change adaptation and mitigation processes and actions, the benefits to them as businesses and the positive economic, social and environmental impacts of implementing the NDC in Egypt. The NDC is however a very high-level summary document that doesn't provide enough details for the private sector and the general public.

**Insufficient access to climate funds:** While the implementation of some green projects are ongoing, a vast majority of Egyptian private sector actors, including SMEs, have had little success in directly or indirectly accessing dedicated climate funds and other concessional green loans from international sources. The procedures and requirements to access these funds remain a big challenge for the private sector. This, in turn, makes it difficult for the Government of Egypt to meet its NDC conditional contribution to fighting climate change considering its partial dependence on private sector involvement and financing.

#### 7.1.1 Bad design and poor communication of enabling policies and regulations

Potential private sector investors need more clarity on the laws, regulations and policies put forward by the government (World Bank 2018, Global Partnership 2018). Therefore, such policies which are beneficial to the private sector need to be made clearer as a way of encouraging private companies to venture into NDC-aligned green investments.

**Increasing focus on COVID-19 and decreasing focus on green projects:** While some NDC and green projects are currently being implemented in Egypt, the negative impact of the COVID-19 global pandemic is hitting Egypt very hard. The government of Egypt has shuffled its policy priorities for the short term with a strong focus on health and social spending for the most vulnerable groups and further advancing structural reforms to position Egypt for sustained recovery (IMF, 2020). The COVID-19 pandemic is expected to hinder growth through its effect on production and exports. Key sectors, such as tourism and natural gas are expected to witness a slowdown, affected by the restricted international travel and the collapse in oil prices (World Bank, 2020a).



**Weak business case for green investment in adaptation projects:** Egypt, just like many other countries, faces challenges to make a good business case for adaptation, hence, making it difficult to attract private investment in adaptation projects. On the other hand, a good number of mitigation projects in Egypt have strong involvement of the private sector especially in the domain of energy, transport, waste management, and green cities.

## 7.2. Cross-cutting long-term strategic opportunities

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The Government of Egypt's long-term strategic opportunity for NDC implementation through green investments is not explained in one strategic document but rather in a combination of sectoral strategies and initiatives that are focused mainly on mitigation actions. The key strategic, cross-cutting long-term opportunities include the following:

- The implementation of 691 green projects worth about \$27.6 billion. The ministries of planning and economic development, and environment, agreed that 30 percent of Egypt's investment projects in fiscal year 2020/21 plans will be implemented according to environmental sustainability and green economy concepts. Moreover, the Egyptian government is also planning to increase this percentage to 100 percent between 2022 to 2024 (International Finance 2020, Egypt Today 2020).
- The creation of a carbon market to serve Egypt, Africa and the middle East;
- The issuance of green bonds;
- The establishment of 15 new green cities that will require substantial implication of all the seven sectors covered in this report;



## 7.3. Climate-Smart Agribusiness Sector

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### 7.3.1 Challenges faced by the private sector

The private sector in Egypt faces the challenge of labour market deficiencies as well as skills' mismatches. There is therefore the need for more technical and vocational trainings which are important for the private sector, if they are to engage actively in climate-smart agriculture practices. Low access to finance also hinders private sector involvement in the agriculture sector, worsened by high public borrowing and a lack of long-term funding instruments for banks and other financial institutions. SMEs have low access to finance while women-led SMEs face enormous obstacles in accessing bank finance due to the lack of collateral, among others

### 7.3.2 Opportunities for the private sector

In as much as there are challenges faced by the private sector, the implementation of the NDC in the agriculture sector also presents some opportunities. The private sector can play a vital role in addressing issues related to skills mismatch as well as climate-relevant training and skills acquisition that is more targeted to the agribusiness labour market. Private universities and training centres with the right investments, focus and capacity can play a role to produce the needed skills. This will improve the level of employability especially to the youth entering the labour market and at the same time address the skills shortages that hinder business growth and climate-smart innovation.

Farmers and many small agribusinesses in Egypt face the problem of lack of insurance which could help them cope in times of climate-induced poor productivity and/or climate shocks. This may be an opportunity for the local financial institutions (LFIs) to step in and provide financial support in the form of innovative insurance products to farmers and also credit access.

Technologies to enhance irrigation and water use efficiency are highly needed to help Egypt's agriculture and forestry sector cope with reduced water availability and improve yield despite the impacts of climate change on water in the country. This involves technology transfer which is an area where the LFIs could be of good use, by financing greater use of best available technologies.



## 7.4. Transport Sector

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### 7.4.1 Challenges faced by the private sector

The transport sector could make great use of private sector NDC-aligned investment, especially as it requires technology transfer, capacity building and development of infrastructure. Urban infrastructure for transportation development often has large investment needs thereby requiring partnership from the private sector either in terms of capital, expertise or technological knowhow. Though the government has put in place the aforementioned STP to encourage private sector investment, there are still some challenges that remain. They include:

- The limited shift from pilot to full implementation of the STP that is expected to reduce an estimated 1.4 million tCO<sub>2</sub>e over 20 years, hence limiting the attraction of private sector investments into improved public transport; and
- Inadequate policies, awareness campaigns and political commitment to bring about a shift in public attitudes towards non-motorized transport (NMT) (Kamal et al. 2017).



## 7.4.2 Opportunities for the private sector

The private sector could explore some opportunities for investment that present themselves in the implementation of Egypt's NDC and that would also help to create jobs for the youth and better livelihoods for the country in general, while mitigating climate impacts:

- In pushing the switch from oil to gas for public transport, the private sector could fund - either as stand-alone investments or as PPPs - the development and/or ownership of gas plants to power this sector.
- Another opportunity relates to the planned increase in cargo transport and logistic operations using inland waterways. This opportunity, beyond the transport activities themselves, includes the development and operation of river terminals and ports and multimodal logistic centres.
- Private sector interest in the operation of the new high-quality public transport services should be high due to initial financial analyses that indicate more than 15% internal rate of return (IRR) with no need for subsidies (Wong 2013).
- A number of existing NMT projects within the provincial governments are lobbying the private sector for contributions of funds to their NMT projects (Wong 2013).

## 7.5. Green Buildings and Smart Cities Sector

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### 7.5.1 Challenges faced by the private sector

The Egyptian high education system, as stated in the sustainable development strategy 'Egypt's vision 2030', is facing a problem of integration between market needs and high education. (MHUU 2011) This challenge needs to be addressed in order to further encourage NDC-aligned, private sector investment in the building and construction sector. More specifically, there is a lack of awareness and knowledge of the principles of the Green Pyramid Rating System<sup>1</sup> (GPRS) in Egypt's high education system (Moussa 2019). This has led to the training of engineers that are not familiar with GPRS, which was unfortunately established in 2011, two years after NAQAAE (National authority to ensure the quality of education and accreditation) had published the educational curriculum of architects in 2009. NAQAAE should therefore integrate GPRS into the new curriculum.

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<sup>1</sup> The Egyptian Green Building Council (EGBC) developed the GBRS in 2010 to provide a benchmark for good practice that enables buildings in Egypt to meet green credentials through a credible environmental rating system. The ratings assess: the sustainability of the site, energy, water-use efficiency, materials and sources, indoor environmental quality, management and innovation. <http://egypt-gbc.org/ratings.html>



The second challenge is the access to finance for new clean technologies and sustainability practices by SMEs and large construction and civil engineering firms. Loan officers from financial institutions are often not very familiar with Energy Service Company (ESCO) business model and Egypt's GPRS. This therefore limits how far the private sector can go in terms of investing in green buildings and smart cities. The third challenge is the absence of market-based mechanisms for the pricing and delivery of services related to infrastructure due to inefficiency, lack of proper maintenance and poor operational performance. Involving the private sector, alongside the right policies, will help to bring a more market-oriented approach (EBRD 2017).

### 7.5.2 Opportunities for the private sector

The labour and investment needed for developing Egypt's 15 new green cities could be an opportunity for the private sector, which is also a major employer in Egypt. This therefore means that private sector capital, expertise and technology are critical in achieving smart infrastructure through public-private partnerships and as investors, engineering firms, or operators of some of the projects.

## 7.6. Water Resources and Irrigation Sector

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### 7.6.1 Challenges faced by the private sector

Due to some of the negative past experiences with privatization and PPP, there is still a need to carefully examine new PPP models and opportunities in order to open the sector to the long-standing publicly dominated investments. There is also a potential commercial challenge related to constant cashflow from water users to enable private investors or providers to be able to satisfy creditors or discharge liabilities.

### 7.6.2 Opportunities for the private sector

The Government of Egypt has drafted a new "Water Resources and Irrigation Bill" in July 2017 in order to, among others, modernise irrigation infrastructure, which is aligned with Egypt's ambitious mega green projects in Toshka and Sinai to support its transition to a low-carbon and climate-resilient future. This represents a good opportunity for the private sector, including SMEs, to supply farm-level climate-smart irrigation technologies to improve water conservation and management by farmers.



## 7.7. Renewable Energy and Energy Efficiency Sector

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### 7.7.1 Challenges faced by the private sector

Developers and investors of renewable energy sources for electricity production are experiencing a number of challenges in the course of project development and implementation (IRENA, 2018). This can slow down private sector involvement in RE investments in the context of NDC implementation. The key challenges include:

- **Weak institutional capacity for planning:** The capacity of the agencies in charge of power system planning is rather limited, particularly with respect to forecasting RE sources for electricity generation and load for RE sources, the calculation of the capacity of renewable energy systems for electricity plants.
- **Multiple institutions with conflicting roles:** There is the need to clarify specific roles of the concerned institutions and enhance their effectiveness in carrying out their respective roles, which would provide positive signals and confidence to the market and investors.
- **Egyptian Electricity Transmission Company (EETC) financial issues:** The EETC provided government guarantee as the off-taker of the power produced, which is very encouraging for private sector investments. However, the EETC has sometimes had difficulty in meeting its financial obligations for the power received, causing financial strain on electricity generation companies.
- **Access to finance by SMEs:** The high interest rates extended to SMEs by commercial banks discourage SMEs from successful participation in the RE market. Most existing financing schemes provided by multilateral or bilateral development institutions are not leveraged on by commercial banks. They have relatively low interest rates; however, they target large-scale renewable energy projects and are subject to international currency exchange rate fluctuations.
- **Insufficient statistics required by bankable projects:** Assessments of solar and wind potentials are not robust enough to ensure the bankability of projects.



## 7.7.2 Opportunities for the private sector

There are several opportunities linked to the improved enabling environment for clean energy in Egypt (Riad and Riad 2016, NREA 2018). Some include:

- The Integrated Sustainable Energy Strategy (ISES) that aims to step up accomplishment of RE target of 42% of the electricity mix by 2035 with a total installed RE capacity of 62.6 GW.
- Attractive business models: The new RE Law no. 203 of 2014, which encourages the private sector to produce electricity from RE sources, in its article two allows for a set of different off-take schemes for the private development of renewable energy projects, including competitive bids, FiT, and independent power production (IPP) through third party access. This provides clear direction in terms of the alternative business models to make investments attractive / profitable in the sector.
- Technical capacity development: The government of Egypt, mindful of the technical challenges facing the RE and EE sector, introduced training and capacity building as one of the pillars of the RE and EE plan 2018-2020. The plan, if implemented, will provide the job market with capacity in RE and EE improvement. This is relevant for private sector investments in both the short and the long-term.
- Economic incentives: The government of Egypt has also introduced some tax incentives to electricity development projects. For example, trimming sales tax to 5% from as high as 10%, and setting customs duties on equipment used for production at 2%. Other incentives relevant for the private sector include the refunding of expenses paid to extend infrastructure facilities, subsidizing the technical training programs of the employees as well as the social insurance subscriptions, allocating land owned by the government for RE projects at discounted fees. Furthermore, the government is making efforts to increase the demand of RE, for example the Presidential decree no 419 of 2018 laying out an exemption of electric cars from the payment of custom duties.
- Policy reform on energy subsidies: The government of Egypt is making extensive efforts to gradually eliminate energy subsidies that typically favour fossil fuels.



## 7.8. Waste Management Sector

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### 7.8.1 Challenges faced by the private sector

About two decades ago, Egypt embarked on a mission to manage waste properly and engaging the private sector was a key element in the strategy. This gave birth to some PPPs. However, since then a number of private companies discontinued their partnership with the public sector. The challenges that were experienced during that period can as well influence private sector engagement in the context of the NDC implementation in waste management. Some of these challenges include:

- A market that is not very suitable to the by-products of recycling. For example, it is indicated that selling compost isn't profitable with production cost of about EGP 200/ton as opposed to a selling price of about EGP 50/ton. In addition, electricity produced from waste sells expensive as compared to electricity from renewables such as solar and wind (Enterprise, 2020).
- The disappearance of the "service fee": The government used to pay a "service fee" to companies as an incentive in the beginning to help jumpstart the market for private collection services, but stopped paying it after more investors entered the market. Relying only on the sales of recycled products proved unprofitable, thus discouraging investments (Enterprise, 2020). Many PPPs collapsed as a result of the delay in payments owed to private companies. There was less guarantee to cover private sector investments (van Niekerk and Wegmann 2019, Elgazzar et al. 2017).
- The untimely payment by governorates and municipalities to private companies providing waste management services. Many PPPs collapsed as a result of the delay in payments owed to private companies. Thus, there was less guarantee to cover private sector investments (van Niekerk and Wegmann 2019, Elgazzar et al. 2017).
- Institutional incoherence: Where there are overlaps and inadequate distinction between roles and responsibilities of the governorates, municipalities, service providers and waste generators regarding the waste management value chain, from collection to recycling or final disposal.
- Inadequate robust data on the potential investment opportunities, which normally serve as the bases for private sector analysis of investments options and return on investment. According to Ibrahim and Mohamed (2016), waste generation and disposal statistics in Egypt needs more weighing facilities at disposal sites and waste sampling and analysis including the types and quantities of waste that vary widely in different locations and among urban profiles.



## 7.8.2 Opportunities for the private sector

Despite the challenges facing the private sector investment ventures in the waste management sector, there are opportunities for the private sector to focus and engage in terms of making investments in the context of NDC implementation. Some of these opportunities include:

- Insufficient nationwide collection infrastructure provides an opportunity for PPP in collection services, given the right incentives for private companies.
- The fact that the government, governorates and municipalities are very aware of the role of the private sector in the delivery of waste management services. For example, the most comprehensive strategy document that focused on solid waste management produced in 2000 (though not strongly implemented), prioritized the delegation of solid waste management services to the private sector (Enterprise, 2020). This is an indication of the political interest the government has for private sector implication in the waste management sector. In terms of success story, a new Egyptian agri-waste recycling start-up called Baramoda is developing innovative solutions to solve the problem of water shortage for agriculture by using agricultural waste to produce composts that can reduce by 30% the water needed to irrigate soil.
- Solid waste management is now a high priority of the Egyptian government. The 2019-2023 Solid Waste Recycling Executive Plan launched by the Egyptian Prime Minister Mostafa Madbouly in July 2019 aims at attracting investments to develop the needed infrastructure, funding waste management contracts as well as supporting institutional, capacity and SMEs development in the recycling sector.
- The existence of a waste management authority provides a means and direction and a single point of contact for the private sector to channel their grievances. It also provides opportunities that are relevant to the private sector related to technical support, provision of statistics and information on waste management, including support to technical studies, among others (Enterprise, 2020).



## 7.9. Financial Sector

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### 7.9.1 Challenges faced by the private sector

First, there is a general limited understanding of financial experts and institutions in Egypt of the risks posed by climate change to the economy and financial system of the country, including of potential stranded assets. Economic and financial losses caused by climate-related events, which are likely to increase over time are not sufficiently understood, and, as a result, there is a lack of adequate risk pricing as well as reserves to cover the expected losses.

Second, the inadequate capacity of the Egyptian financial sector to mobilise new and adequate financial resources to support the transition to a low carbon economy. Unlike many African countries such as Senegal, Uganda, Morocco, Rwanda and South Africa, Egyptian institutions, including commercial banks, are yet to become direct access accredited entities to the Green Climate Fund (GCF). Having direct access to the GCF, especially the Private Sector Facility (PSF), will increase the private sector's financing options for NDC-aligned green projects in Egypt.

Third, there is a need to improve the understanding of the financial sector on the technical climate change adaptation and mitigation issues especially during the conceptualization, development, implementation, review, validation and monitoring of climate change projects. Specific limitations are related to the development of adaptation projects that make business sense and are profitable for the private sector, particularly SMEs.

### 7.9.2 Opportunities for the private sector

Several national and international green investment opportunities in the financial sector exist in Egypt for the private sector. At the national level, the Egyptian Government outlined in July 2020 its new ambitious plan to implement 691 green projects worth about \$27.6 billion. Key sectors in this plan for potential private involvement and PPP include renewable energy, clean transport, green cities and waste management. Moreover, in the same month of July 2020, Egypt's financial regulator approved a legal framework for issuing green bonds, with the aim of providing financial resources to green projects. In partnership with the International Finance Corporation (IFC), the Government of Egypt is fleshing out the regulations and measures for the issuance of green bonds in accordance with best international practice and principles. These green projects and bonds show political and policy support by the Government of Egypt to encourage the sector to get involved in the implementation of Egypt's NDC adaptation and mitigation actions.

The NDC proposes the establishment of a national market for carbon trading which may be developed into a regional market to attract foreign direct investment in national carbon credit transactions, especially in the Arab and African region. In such situation, the financial sector will play a key role in the design and operation of the carbon market and related transactions.



Some of the Egyptian financial institutions have received sovereign and non-sovereign concessional loans to stabilize the Egyptian economy as part of the COVID-19 recovery plan. For example, EBRD, through its “Resilience Framework” has provided \$100 million loan each to five Egyptian banks, namely Banque Misr (BM), Commercial International Bank (CIB), National Bank of Egypt (NBE), Qatar National Bank-Egypt (QNB) and National Bank of Kuwait-Egypt (NBK). These financial resources provide the opportunity for Egyptian Banks to support the recovery of the Egyptian economy by building back better through the greening of line of credits to the private sector.

At the international level, the financial sector in collaboration with the private sector in and outside Egypt should explore new and existing initiatives under the UNFCCC. Examples of some of the initiatives are the Internationally Transferred Mitigation Outcomes (ITMO) and the Sustainable Development Mechanism (SDM) that are still to be finalized under Article 6 of the Paris Agreement. ITMOs are used under the Paris Agreement to increase global climate ambition and promote low-carbon exports from Egypt to another country while the SDM will likely replace the Clean Development Mechanism (CDM).



## 8. CONCLUSIONS AND RECOMMENDATIONS

### 8.1. Conclusions

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The Government of Egypt expects a strong engagement of the private sector in the implementation of its NDC under the Paris Agreement, both in terms of adaptation and mitigation measures. Several actions have therefore been taken by the government to attract the private sector. First, a National Strategy for Adaptation to Climate Change and Disaster Risk Reduction to guide adaptation actions across different sectors and where the participation of the private sector is clearly indicated. Second, an Integrated Sustainable Energy Strategy (ISES) aimed at diversifying energy sources and stepping up the development of renewable energy and energy efficiency to reach a RE target of 42% of the national energy mix by 2035. Third, a series of PPP laws aimed at improving the enabling policy environment to attract the private sector, notably the Public Private Partnership Law No.67 of 2010. Fourth, the implementation of ambitious mega green initiatives such as the planned 691 green projects starting 2020 and the establishment of 15 new green cities, including the new administrative capital, to accommodate the increasing population.

On the other hand, the government is shifting its focus in the short term to address the first wave of COVID-19 emergency measures to stop the spread of the virus and protect the people and communities most vulnerable, whether from the virus itself or income and job losses as economies grind to a halt. A lot of financial resources from both domestic and international sources are therefore being used to reduce the health impact of COVID-19 as well as stabilize the economy of Egypt with less focus on climate change in the short term.

From the private sector perspective, several NDC-aligned projects have been and continue to be implemented by the private sector. Some of the examples include: West Delta water conservation and irrigation rehabilitation project, Egypt electric train project, Benban Solar Park, Eco-city Alexandria, renewable energy financing framework, and industrial waste management and SME entrepreneurship hub in Egypt. Most of these projects are funded through bilateral and multilateral funds and in some cases through dedicated climate change funds.

The contribution of the private sector in NDC implementation through green investment in Egypt will likely increase substantially if some of the existing barriers are addressed. These cross-cutting challenges include, among others: Limited access to climate finance, knowledge gap and limited technical skills on climate change impacts and opportunities, the need to further improve the enabling policy and regulatory environment, weak business case for green investment in adaptation projects, and an increasing focus on COVID-19 and decreasing focus on green projects in the short term. For each of the seven sectors, specific challenges have been equally identified.



Moving forward, the revision and implementation of Egypt's NDC provides a unique opportunity for the government and development partners to work closely with the private sector to address these cross-cutting and sectoral challenges. The process of engagement with the private sector should be long term, sector specific, disaggregated to micro, small, medium and large private sector actors and it should be connected to other national and internal climate finance initiatives, donors and platforms.



## 8.2. Recommendations

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The following cross-cutting and sectoral recommendations are proposed for the private sector to address the different challenges and build on emerging and existing opportunities.

### 8.2.1 Cross-cutting Recommendations

**Technical capacity development:** Private universities and technical colleges can play an important role for both targeted higher studies and Vocational Educational Training (VET) to address skills mismatch and enhance training and skills standards to better match the requirements of the labour market. This is important to enhance the employability of young people entering the labour market and to address key skill shortages that hamper business growth and innovation in the green economy space. On the other hand, there are private sector actors who need to improve their technical capacity on climate change issues especially for the development of bankable green projects. Capacity development for private investors and local financial institutions (LFIs) needs to be part of the government's agenda to incorporate private sector investments into the green economy and, more specifically, for NDC implementation.

**Increase access to climate finance:** The government of Egypt, in its budgeting, could include financial support for private sector investors through the provision of appropriate, green economic incentives. The Government could also partner with LFIs and international donors to provide more flexible financial guarantees to private sector investors, as well as reducing the risks attached to such instruments. Moreover, LFIs should strive to “green” their lines of credits, open up new green finance opportunities for SMEs and provide sector-specific technical and business trainings. This would encourage private sector engagement in green investments. Moreover, relevant private sector stakeholders should make more effort to get accredited for direct access to the GCF's PSF.

**Strengthening the enabling policy and regulatory environment:** The government needs to put in place more policies that ensure a balanced approach that allows private investors to participate in the implementation of green investment projects. In this light, certain ministries and projects should consider win-win PPP models, whereby private sector investors are invited to take a pivotal role in projects. Erasing bureaucratic red tape from government institutions would also go a long way in easing policy implementation, as well as simplifying the procedures for private sector investment. Past positive and negative experiences on PPP should be used to inform the Government's policies.

**Exploring innovative designs and business approaches for adaptation projects:** This can be achieved by: (i) implementing mitigation project activities that reduce climate vulnerability and produce “low hanging fruits” in terms of increasing adaptive capacity through short and long term trainings, full time/part time employments, and the creation or strengthening of small businesses especially in the agriculture and forestry as well as infrastructure projects in energy, transport, green cities, water and irrigation sectors, (ii) developing a project with clear and separate adaptation and mitigation objectives,



results and investments, and (iii) building on new adaptation, business-centric approaches such as the “Adaptation Benefit Mechanism (ABM)” being piloted by the AfDB<sup>2</sup>.

**Pursue a green, “Build Back Better (BBB)” post-COVID-19 approach:** While the first wave of COVID-19 emergency measures focuses on stopping the spread of the virus in Egypt, the second wave of transitional response measures should look to realign fiscal and other policies as well as take into account the BBB principle and approaches and explore potential synergies with NDC implementation to stimulate green growth and jobs. The third wave of response should focus on transformative long term climate and social actions. All the three waves of response measures must put people at the centre, in a way that can deliver a safer, more inclusive low-carbon and climate-resilient green growth for Egypt.

## 8.2.2 Sectoral Recommendations

### Agribusiness sector

- Competition should be encouraged against monopoly for some institutions, to reduce state dominance which has proven to be inefficient thus far.
- The government should further engage in vocational education and training (VET) in climate-smart applied technologies and techniques for youth in the agriculture sector, and curb labour market deficiencies and lack of skills.
- Access to finance could be improved by introducing finance schemes specifically to cater to the needs of the agriculture sector. This will entice private sector investors and encourage the creation of PPPs.

### Transport sector

- The government should keep improving the regulatory environment and provide more incentives to further attract private investment to the STP and related green infrastructures. The government could create space for private ownership or partnership.
- Capacity building trainings in the transportation sector should be conducted to boost the Egyptian labour market and improve on skills needed in the development of low-emission transport infrastructure, and also ensure efficient operation and maintenance (O&M) of these infrastructures. In this way, the private sector will have the interest in engaging.

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<sup>2</sup> More information about ABM can be found on the website of AfDB <https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/adaptation-benefit-mechanism-abm>.



## Water resources and irrigation

- Private sector investors should explore modern, low-cost and effective technologies in the areas of filters, pumps and other irrigation products that can be franchised, sold or rented out to smaller investors, SMEs and landholders.
- Investors, SMEs - including small farmers - could be considered for leasing government lands for certain periods, with the condition that they used climat-smart technologies / practices.

## Renewable Energy and Energy Efficiency sector

- Identify and capacitate one institutions to act like a “one-stop-shop” that will act on behalf of all institutions and administrations relevant to RE, permits and authorisations to ease RE and EE project development and the implementation process. This may involve accelerating the selection process of the developers under any of the RE support schemes mentioned above. In addition BOOT, which is a type of development model that might encompass taking advantage of the FiT mechanism, or a PPA or an auction may be considered. Such an institution could go further to handle issues related to issuing EE generation licences, allocating the land for planned RE projects, and handling the contractual process (connection agreements and PPAs) between the developers and EETC.
- Similar to RE, the government should pay more attention to the development of energy efficacy. The institution responsible for promoting and developing EE including all investments should be strengthened.
- The need to encourage the bundling of several smaller-sized renewable energy projects through a uniform project design approach to help achieve the suitable size. This will help reduce project preparation and evaluation (transaction) costs, and enhance the interest from the financial community, including private investors. Support from concessional lending schemes could possibly facilitate engagement of local financing partners, including domestic investors.
- The need to explore the possibility to develop specific lending schemes for RE and/or EE projects that would enable the best use of limited concessional public resources (including those provided by development banks and institutions) to soften the terms of overall project financing. This is relevant to attract both SMEs and the large companies who will likely subcontract part of the project activities to SMEs.
- The need to take finance opportunities from dedicated climate change funds such as GCF and CTF closer to the private sector RE and EE champions and newcomers. This should involve training and capacity building on climate finance and the preparation of bankable proposals to access these dedicated climate funds.



## Green Buildings and Smart Cities Sector

- There is a need to enhance the legislative and regulatory framework to guide the negotiation of sustainable PPP deals. Robust legislative and regulatory frameworks as far as doing business is concerned are relevant for building confidence and for attracting investments in various aspects of green buildings and cities, such as the opportunities offered by the 15 new green cities with multisector options for emission reduction and climate resilient infrastructures.
- Egyptian high education should be flexible and proactive to update the curriculum and introduce new teaching materials on green building standards to provide engineers the necessary skills needed by the job market.

## Waste management sector

- There is the need for in-depth studies to generate recent and robust data in terms of volumes and composition of waste streams to inform project development and investment analysis. This is very relevant for the private sector in terms of developing bankable green projects with the potential to reduce GHG and contribute to Egypt's NDC actions in the waste sector.
- The existing economic incentive structure in the waste management sector is unclear, weak and insufficient. A strong set of incentive mechanisms is required. This will need to start with a comprehensive diagnosis of the waste management sector value chain, in order to identify investment challenges and where support is needed to facilitate private sector green investment.

## Finance sector

- Egyptian financial institutions, including banks, leasing and insurance companies need to devote greater attention to understanding the impact of climate change and its risks to different financial activities and assets, including its implications for integrating climate considerations within their operations (e.g. lines of credit).



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