



Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 25-Nov-2019 | Report No: PIDC28099

**BASIC INFORMATION****A. Basic Project Data**

Country Egypt, Arab Republic of	Project ID P172548	Parent Project ID (if any)	Project Name Egypt: Greater Cairo Air Pollution Management and Climate Change Project (P172548)
Region MIDDLE EAST AND NORTH AFRICA	Estimated Appraisal Date Apr 01, 2020	Estimated Board Date Jul 30, 2020	Practice Area (Lead) Environment, Natural Resources & the Blue Economy
Financing Instrument Investment Project Financing	Borrower(s) Arab Republic of Egypt	Implementing Agency Ministry of Environment	

Proposed Development Objective(s)

To reduce air and climate pollutants from critical sectors in Greater Cairo.

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	505.00
Total Financing	505.00
of which IBRD/IDA	500.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	500.00
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Non-World Bank Group Financing

Counterpart Funding	5.00
Borrower/Recipient	5.00



Environmental and Social Risk Classification

High

Concept Review Decision

Track II-The review did authorize the preparation to continue

Other Decision (as needed)



B. Introduction and Context

Country Context

- The Arab Republic of Egypt (“Egypt”), located in the northeastern most point of the African continent, has a total surface area of approximately 1 million square kilometers and is bordered by the Mediterranean Sea to the north and the Red Sea to the east. Egypt's population is expected to exceed the 100 million mark by 2020 and is largely concentrated in the Nile Delta and notably in the Greater Cairo Area (GCA includes Cairo Governorate and the urban areas of Giza and Qalyubia governorates) which houses about 20 percent of the population (20 million). Poverty is a persistent problem in Egypt with 32.5 percent of the population living below the poverty line in 2018¹ (up from 27.8 percent in 2015) and is prevalent in several districts of GCA.² The country's GDP per capita reached US\$ 3,379 in 2018 and its growth (3.19 percent) has exceeded population growth (2.03 percent) for the first time during the current decade.
- Egypt's 2016/17 economic reform program endorsed by both the World Bank's programmatic Development Policy Financing and the three-year Extended Fund Facility of the International Monetary Fund (IMF) in 2016 is reaping positive results by mid-2019/20. Hence, fiscal consolidation (e.g., reduction of energy subsidy and extending the value-added tax to the services' sector), prudent monetary policy (sustained disinflation easing lending market interest) and foreign exchange market liberalization (e.g., the repatriation mechanism was introduced to guarantee the availability of foreign exchange for capital repatriation to portfolio investors) has helped improve the macroeconomic environment, further the climate for the private sector, reinvigorate the tourism sector and enhance competitiveness. Thanks to strong ownership of the reform program, the Government of Egypt (GoE) has been able to boost economic growth that reached 5.3 percent in 2017/18 and was maintained during the first quarter of 2018/19, curb inflation to return to almost single digits, and bring back the Debt-to-GDP ratio to below the 100 percent mark. More specifically, the elimination of most fuel subsidies has shown a positive effect on the balance of payment and the Central Bank of Egypt foreign reserves resulting in more leverage to deal with possible future endogenous and exogenous shocks. Also, it encouraged energy efficiency, improved the environment, curbed the health burden attributable to air pollution and freed up fiscal space for social spending.³
- The 2018 Environmental Performance Index ranks Egypt 66 out of the total of 180 countries ranked with a score of 61 over 100. Both numbers show a slight improvement over the previous reports.⁴ Despite improvements, air, water and land pressures are taking their toll on the local and national environment with people living in poverty being particularly affected. GCA ranks as the world's third most air polluted mega city in 2015 according to WHO Global Ambient Air Quality Database in terms of fine particulate matter (PM).⁵ The latter accounts for about 90 percent of air pollution-related negative health outcomes worldwide. Subsequently, the GCA cost of environmental degradation (COED) attributed to air pollution is by far the highest in the country, with a mean estimate equivalent to 1.35 percent of GDP in 2017 (NB: this measure only captures the GCA cost with respect to national GDP). Conversely, the GCA COED attributed to waste (net of air pollution damages, via the burning of waste) is half the air pollution's COED and results in a mean estimate equivalent to 0.68 percent of GDP in 2017 which includes the opportunity losses from composting, recycling, methane capture, etc.⁶

¹ World Bank Country Profile: Egypt. <www.worldbank.org/en/country/egypt/overview>.

² World Development Indicators. 2019. The World Bank. Washington, D.C.

³ IMF Extended Fund Facility for the Arab Republic of Egypt 2016-19 website: <www.imf.org>.

⁴ EPI benchmarks the environmental performance of 180 countries: <<https://epi.envirocenter.yale.edu/epi-country-report/EGY>>.

⁵ WHO website: <www.who.int>.

⁶ Larsen, Bjorn. 2019. Egypt: Cost of Environmental Degradation: Air and Water Pollution. The World Bank. Washington, D.C.; and Back of the envelop calculations performed by the Team.



Sectoral and Institutional Context

- Air pollution source attribution studies carried out in 2013 and 2002 show that motor vehicle emissions and transportation and open burning of waste are the largest contributors to PM concentrations, both accounting for about 1/3rd of pollution concentrations (see figure 2 in the Appendix for more details). Fortunately, the pollution from other sources has been tackled in the recent decade(s). Air and climate pollutant emissions related to the open burning of rice straw/husks is being reduced due to policies introduced by the GoE since 2017.⁷ Also, industrial pollution is being managed by an ongoing successful multi-donor project initiated by the World Bank in 1998 (Environmental Pollution Abatement Project I, II and III -see Annex II for detailed Context).
- Although transportation and waste burning remain the major contributors to GCA air pollution, significant progress was also made in improving GCA air quality since 2010: the opening of metro line 3 in 2012 and its extension in 2014 contributed to improving the city's PM air pollution by more than 3 percent.⁸ Moreover, the reduction of fuel subsidies under the 2016-19 World Bank/IMF reform program was linked to a reduction of PM by about 4 percent by 2017 (this effect only relates to the first two waves of subsidy reform due to available data; the effect of the overall subsidy reform program should therefore be even larger).⁹ Despite these improvements, GCA pollution levels are still several times the WHO recommended concentrations (20 µg/m³) and about two times as high as the national guidelines (80 µg/m³). Despite the high congestion in Egypt, the private car ownership rate actually remains among the lowest worldwide at approximately 45 cars per 1,000 inhabitants, and increases up to 130 cars per 1,000 in Cairo Governorate. Of GCA 22 million motorized trips a day, 63 percent are made on public transport which includes the metro, public buses, mini buses and minibuses running mainly on diesel fuel (which in turn is of very low quality¹⁰). Hence, vehicle emissions contribute to about one-third of GCA air pollution with public transportation assuming the largest share of GCA air pollution from the sector.
- Municipal waste in GCA is generated at a rate exceeding 1.2 kg/person/day and collection coverage is about 70 percent. As a result, uncollected waste and poorly treated waste such as unrecycled plastic (more than half) are dumped into open sites that are subject to open burning. Hence, poor solid waste management (SWM), especially in terms of organic treatment, recycling and disposal is responsible for human-made or self-igniting waste burning in dumps also contributing to about one-third of GCA air pollution in terms of PM.
- These significant sources of air pollution (vehicle emissions and open burning of solid waste) are also directly linked to emissions of greenhouse gases (GHGs), including *inter alia*, black carbon, ozone, CO₂, methane and nitrous oxide (NOx). As a party to the United Nations Framework Convention on Climate Change, the Government of Egypt is committed to the reduction of GHG emissions and has already formulated their Nationally-Determined Contribution (NDC) which indicated the importance of taking actions to reduce emissions, including in the solid waste management sector. As stated in its NDC the GoE's goal is to "develop and implement a strong, economically feasible mitigation program which would achieve proposed emission reductions for 2030." Among the country's priority initiatives is establishing a national monitoring, reporting and verification system. In addition, the country is working to develop several programs addressing climate change as part of its sustainable development strategy: Egypt Vision 2020, including: Policy and Infrastructure Improvement for Reduction of Air Pollution and Combatting Climate Change. Given the commonalities in addressing emissions of both particulate matter and GHGs, actions such as improved emissions monitoring, as well as those undertaken to control air pollution through the implementation of proposed project components are expected to yield significant mitigation and climate co-benefits in line with national and international goals.
- The municipal solid waste policy and management environment is relatively complex, with responsibilities for different aspects of the issue falling to different ministries, governorates, and agencies. The MoE, through its Waste



⁷MOE has struck a deal with a local company to use rice straw in cement production while MOE is also collecting the waste and recycling it into fertilizer and fodder in four regions. Moreover, MOE monitoring through satellites and the introduction of fines have significantly curbed rice straw open burning that used to contribute to the 'black cloud' phenomenon during autumn.

⁸ Heger, Martin, David Wheeler, Gregor Zens and Craig Meisner. 2019. Motor Vehicle Density and Air Pollution in Greater Cairo: fuel subsidy removal and metro line extension and their effect on congestion and pollution? The World Bank. Washington, D.C.

⁹ Ibid.

¹⁰ Imported fuel has Sulphur levels of more than 1000ppm, and locally refined fuel has Sulphur levels of more than 5000ppm. The Ministry of Petroleum is working towards improving the quality.



Management Regulatory Agency (WEMRA), undertakes the following: (i) establishes the overall direction of waste management policy, including tariff policies and enhancement of the role of the private sector; oversees the preparation and provides guidance for the implementation of the National SWM Strategy and the specific Governorate SWM Master Plans in collaboration with MoLD and the concerned governorates; and (iii) plays a regulatory enforcement role (handled through its Egyptian Environmental Affairs Agency, EEAA). The MoLD works directly with governorates responsible for implementation of these policies on the ground. MoLD also sees itself playing a technical assistance role to improve service quality in governorates around the country. A range of international and national private companies, small private contractors and the Cairo Cleaning and Beautification Agency (CCBA) provide collection and transfer waste to treatment facilities.

- Various other concerned authorities in the Government of Egypt have also started to explore parallel policies that could impact positively air quality management and leverage the line ministries efforts to reduce pollutants. Attention on the potential benefit of electric vehicles has grown just over the last several years as GoE launched a number of initiatives promoting Electric Mobility (E-Mobility) across ministries. The Ministry of Environment, in partnership with the Center for Environment and Development for the Arab Region and Europe (CEDARE), released a Policy Brief “Mainstreaming Electric Mobility in Egypt” in 2018 in which a series of regulatory and policy issues were laid out for reform. The Ministry of Electricity and Renewable Energy is currently finalizing a strategy for e-mobility and organized a workshop to raise awareness and strengthen cooperation among public bodies. The Ministry of Military Production has started to produce electric buses through a national e-bus manufacturer, the Arab Organization for Industrialization. The first two vehicles came out of the production line in October 2019. The Governorate of Alexandria has also started pilot for the introduction of electric buses in the public transport network. The Alexandria state Owned agency in charge of the regulation and operation of public transport is currently operating 15 electric buses.¹¹ Eventually, The Ministry of Transport has created a new regulatory body for public transport which objective is to plan and organize the public transport services in order to improve its efficiency and the quality of the services. The Land Transportation Regulatory Authority will be in charge of issuing licenses for passengers and goods transportation and registering vehicles of any kind. Creating the enabling regulatory environment for e-vehicle registration and the e-bus service provision should be one of its responsibilities.

- In 2015, Egypt formulated the Sustainable Development Strategy (SDS): 2030 Vision¹² whose objective is to create a modern, open, democratic, productive, and happy society where progress is measured by a comprehensive monitoring and evaluation system against key performance indicators. The strategy calls for a stable macroeconomic environment and a sustainable inclusive growth characterized by the maximization of value added, and the generation of adequate and productive job opportunities. SDS also promotes sustained improvement of the quality of life for the present generations and awareness raising and programs on the issues of environmental protection and reducing the impacts of climate change in order to provide a clean, safe environment for future generations. Key performance indicators include: reduction of municipal waste generation with waste management based on governance concepts; promotion of recycling with a high environmental cognitive technical content; the percentage of days where the air quality index is less than 100 percent compared to similar countries shall be reduced; and reducing by half the fine particulate matter (PM10) air pollution concentrations by 2030 (with respect to 2015 levels).

- In 2018, Egypt’s new government launched the “Egypt Takes Off” work program with the objective of achieving a competitive, balanced and diversified economy through innovation and knowledge development. More specifically, the program calls for *the improvement of the environment through notably the increase of recycling from 4 percent to 40 percent, and the installation of 27 new air quality monitoring stations.*



Relationship to CPF

C. Proposed Development Objective(s)

To reduce air and climate pollutants from critical sectors in Greater Cairo.

- The project aims more specifically at reducing air emissions which is a key step toward the reduction of pollution concentrations and improvement of air quality. Air pollutants include PM₁₀ and PM_{2.5}, while climate pollutants known as Short-lived climate pollutants (SLCP) include CO₂ or “black carbon” from vehicle emissions.

Key Results (From PCN)

- The project will synchronize the indicators and the targets set in Egypt’s Sustainable Development Vision 2030, and in “Egypt Takes Off” work program and, more specifically, its Fifth Strategic Objective: Improvement of the quality of life of the Egyptian Citizen. The project aims to achieve the following results:
 - **For improved air quality monitoring management systems.** An established and operational air quality decision support system;
 - **For improved climate pollutant monitoring and management systems.** In addition to the air quality monitoring system, which also has benefits for the climate emissions monitoring system, additional components specifically for climate pollution include: setting up of a comprehensive emissions inventory, and a comprehensive monitoring campaign for Short Lived Climate Pollutants, including the detection of black carbon using total carbon analyzers. **For improved air quality.** Reduction of suspended particulate matter emissions on selected corridors and routes from targeted vehicles categories by X percent; Reduction of suspended particulate matter emissions from open burning of solid waste by Y percent; **For reduced climate pollutants.** Reduction of Short-Lived Climate Pollutants (SLCPs): reduction of black carbon emissions from urban mobility interventions by X percent; reduction of ozone in from urban mobility interventions by Y percent; reduction of methane by solid waste interventions by Z percent; reductions in solid waste fires by Z percent, which will lead to reductions in emissions by X percent.
 - **For improved SWM services.** Increase in the percentage of solid waste safely disposed of in controlled landfills; increase in percentage of recycled waste by Z percent.
- **The proposed instrument for financing the project is an IPF with DLIs.** DLIs will be designed to link directly to achievement of the PDO and of the results. A subset of DLIs will also be designed to reflect the effective implementation of policy DLIs once established. Potential DLIs considered for inclusion are the following:
 - Official decree(s) allocating lands for the new landfills in the vicinity of greater Cairo (which remains a major bottleneck for the operationalization of the master plans.
 - Decree(s) to close certain dumpsites (Similar to those issued by the Governor of Cairo, and could possibly be picked up as Prior Actions).

¹¹ <https://www.cairoscene.com/Buzz/egypt-first-electric-bus>, accessed 2019.11.17.

¹² Egypt Vision 2030 website: <<http://mop.gov.eg/Vision/EgyptVision.aspx>>.



- Decree of governors to ban single-use plastics, in GCA governorates" or where alternatives exist.
- Regulation/procedures that would allow the registration of electric vehicles (reform the reliance of cc (cubic centimeters) for assessing the size of the fees, and establish an equivalence for electric vehicles).
- Executive regulation to be issued to organize, promote and monitor e-vehicle registration for trucks and buses.
- Executive regulation to be issued to give a legal and regulatory framework for concessioning or contracting of e-bus and e-waste collection trucks service provision.
- Policies that provide incentives to gas station operators to equip with electric charging stations.
- Exempt electric buses and other Heavy-Duty Vehicles from the 40 percent customs duty.
- Adoption of model contracting for waste collection, sorting, etc. to ensure accountability throughout the value chain (This would build on existing knowledge as well as lessons learned from the stakeholder inclusion and analysis work completed under Component 4).

D. Concept Description

- **The proposed project builds on the analytical work and the various initiatives on air pollution management implemented by the MoE and other concerned authorities in the GoE.** The most recent studies were conducted over four years, from 2016 to 2019, by the World Bank in close collaboration with the MoE and with the active participation of the MoHP. Four main reports were produced and provide most of the technical foundation of the proposed project: (i) Motor Vehicle Density and Air Pollution in Greater Cairo;¹³ (ii) COED, with a focus on Air and Water Pollution;¹⁴ (iii) Particulate Matter Ambient Air Pollution and Respiratory Disease in Egypt;¹⁵ and (iv) Air and Water Pollution Policy Options Report.¹⁶
- **The project will focus on the two main sources of air pollution: open burning of solid waste and vehicle emissions and will geographically cover Greater Cairo (i.e., Cairo Governorate and the urban areas of Giza and Qalyoubia Governorates); and will include four main components aiming at:** (i) enhancing the air quality decision support system in Egypt; (ii) improving SWM services; (iii) reducing air and climate pollutants from vehicle emissions; and (iv) stakeholder engagement, awareness and communication.
- **Operationalization of Greater Cairo SWM Master Plans and the new SWM Law.** The existing context (institutional, regulatory and financial) presents many challenges and does not allow for an immediate or even efficient implementation of the full scope of the master plans. This calls for a two-prong approach: a fast track and a medium- and long-term solution to sustain the investments and preserve the improved service delivery. The preparation for the medium- and long-term solution will be undertaken in parallel with the implementation of the fast track activities. Moreover, implementation should begin with and follow a highly focused approach (geographically or in terms of issues to be tested) in order to achieve tangible results with positive impacts on the ground. Ensuring the financial viability of the SWM system, establishment of a permanent and efficient institutional framework and its sustainable operation will be key project results.
- **The fast track phase for SWM will be characterized by:** (i) enhancement of the contractual and monitoring arrangements for waste collection/transportation and establishing the necessary infrastructure for final and safe disposal

¹³ Heger, Martin; Wheeler, David; Zens, Gregor; and Meisner, Craig. 2019. Motor Vehicle Density and Air Pollution in Greater Cairo: fuel subsidy removal and metro line extension & their effect congestion and pollution? The World Bank. Washington, D.C.

¹⁴ Larsen Op. Cit.

¹⁵ Heger et al. Op. Cit.

¹⁶ World Bank. 2019. Egypt: Air and Water Pollution Management Technical Assistance Programme. Prepared by COWI and Chemonics. Washington, D.C.



of waste; (ii) reliance, whenever possible, on existing institutional structures with possible gradual restructuring; (iii) intensive in-house technical assistance and capacity building of the key institutions responsible for SWM; (iv) creating the enabling environment for enhancing the role of the private sector in financing the capital investments and the operational costs of some elements of the value chain; (v) job creation for women, youth and marginalized groups; and (vi) financing of large infrastructure and /or technical partners. Particular emphasis will be placed on identifying capacity needs and developing strategic interventions to address these for various key players, e.g., national level monitors, municipalities, and private sector partners, including the informal sector. In addition, a rigorous and comprehensive monitoring and evaluation (M&E) system will be put in place to allow for assessment of the performance of the system and its adjustment as and whenever needed. Training and capacity building will be built into the M&E activity to ensure entities responsible for monitoring are effective from the earliest stages of implementation to ensure monitoring of the entire waste chain.

• **The vehicle emissions intervention builds on the various GoE’s initiatives promoting cleaner transportation and eMobility. It is a contribution to the implementation of the recommendations of the Policy note on mainstreaming electric mobility in Egypt and the new strategy currently under preparation.** The intervention of the project is intended as a demonstration of possible options for the reduction of air and climate pollutants from mobile sources, within Greater Cairo, eventually building on the Alexandria pilot and adapting it to the context in GCA. Given the GoE’s commitment to transforming a significant portion of the bus fleet to electric vehicles by 2022, the demonstration project will be expedited to ensure lessons learned can be applied to the anticipated ‘scale up’. The project will focus on establishing the necessary framework and the support infrastructure for the demonstration, but also for the long-term sustainability (institutional, technical and financial) of the interventions. In the solid waste sector, service providers for the collection and transportation of municipal solid waste will be encouraged, in the bidding documents, to use cleaner means of transportation including electric or hybrid trucks.

• **Project components:** The approach of the project will be to support a mix of policy and institutional actions linked to needed investments. These actions will be designed in such a way to ensure achievement of the necessary policies as well as their successful implementation throughout the project’s duration and beyond for sustainability. The proposed project components are:

- **Component 1:** Enhancing the Air Quality Decision Support System
- **Component 2:** Support the operationalization of SWM Master Plans in Greater Cairo
- **Component 3:** Vehicle emissions reduction
- **Component 4:** Stakeholders engagement and communication
- **Component 5:** Project Management and Monitoring & Evaluation

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No
Summary of Screening of Environmental and Social Risks and Impacts	



The overall environmental and social benefits of the project should be positive if appropriate environmental and social mitigation measures are well designed and fully implemented. The environmental benefits are represented in: 1) reducing air emissions from open burning of municipal wastes in Greater Cairo through better management of solid waste collection and treatment, removal of accumulated wastes and introducing clean public transport as a pilot in order to be upscaled in the future; 2) improving general public health conditions by reducing air emissions, avoiding accumulation of solid wastes in Greater Cairo neighborhoods and closure of uncontrolled dumpsites which represent significant public health and environmental risk.

The Social benefits of the project can be represented in 1) enhancing citizens satisfaction; 2) the provision of hygienic transfer and disposal facilities, accompanied by the planned improvements in the collection (even though outside the direct scope of the operation), will be sensed positively by the citizens in the form of cleaner neighborhood; 3) less random dumping, more efficient collection and transportation and accordingly higher level of satisfaction about the service; 4) The Project is introducing a solid stakeholders engagement component which is planned to take an upstream, systematic and process-oriented approach that will help enhancing trust and in establishing a constructive relationship with different groups of stakeholders. There is a very good chance that the economic opportunities that the project will be offering will be benefiting the vulnerable and most marginalized groups who are currently engaged on informal basis in the waste related business.

Despite the above expected benefits, the Environmental and Social Risk Classification is High. There are multiple reasons for such high risk classification due to the nature, scale and diversity of the proposed interventions. On the Environmental side, the construction and operation of the integrated waste management facilities, if improperly managed, will be accompanied by significant adverse impacts on almost all environmental parameters: air, noise, ground water, soils, landscapes, health and safety, traffic, wastes, cultural assets, biodiversity (TBD)...etc. The associated negative environmental impacts, in case of absence or poorly developed/implemented mitigation measures, are expected to be significant, irreversible, large scale and of high economical and social costs.

On the social side, the most critical risks related to the projects is the exclusion of the vulnerable group of the informal sector. Given that large spectrum of those groups are among the poor, particularly those whose livelihoods are fully reliant on the waste-related business, the risk of excluding them from the process can lead to very serious impacts on their families and can lead to serious reputational risk to the project. Risks related to land acquisition is also relevant given that the project will support the establishment of a select number of environmentally controlled transfer stations.

Moreover, the project will be conducting assessment of adequate fees for proper waste collection, disposal and final treatment services. With those additional services and the issuance of the new Waste Management Law (In Draft), the potential of service fees increase is quite high and it associates with risk related to affordability for the poor and low levels of willingness to pay.

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APPROVAL

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