

CLIMATE INVESTMENT FUNDS

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UPDATE ON INVESTMENT PLAN FOR EGYPT
(SUBMITTED BY THE GOVERNMENT OF EGYPT)

**CLEAN TECHNOLOGY FUND
INVESTMENT PLAN FOR EGYPT**

Update Note

World Bank and African Development Bank

OCTOBER 2012

EGYPT

CLEAN TECHNOLOGY FUND INVESTMENT PLAN

Update Note

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List of Abbreviations

AfD	Agence Française de Développement
AfDB	African Development Bank
BRT	Bus Rapid Transit
BOO	Build Own Operate
CSP	Concentrated Solar Power
CTA	Cairo Transport Authority
CTF	Clean Technology Fund
DANIDA	Danish International Development Agency
EETC	Egyptian Electricity Transmission Company
EIB	European Investment Bank
GHG	Green House Gas
GoE	Government of Egypt
GOPP	General Organization for Physical Planning
IBRD	International Bank for Reconstruction and Development
IP	Investment Plan
IPP	Independent Power Producer
KfW	Kreditanstalt für Wiederaufbau
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LRT	Light Rail Transit
NIF	Neighborhood Investment Funds
NREA	New and Renewable Energy Authority
NSS	National Strategy Studies
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PSA	Production Sharing Agreement
WB	World Bank

1. Executive Summary

The Clean Technology Fund (CTF) Investment Plan for Egypt, agreed among and owned by the Government of Egypt, the World Bank, the African Development Bank (AfDB) and IFC, is a proposal for the use of CTF resources in Egypt, including a potential pipeline of projects and notional resource envelopes.

This document updates the CTF Investment Plan for Egypt¹ which was endorsed on January 30, 2009. The plan provides funding of US\$300 million for the following components (1) transmission system upgrade, (2) Renewable Energy Fund, (3) 200 MW Wind Farm project implemented through PPP, and (4) Urban Transport Infrastructure Development project.

The priority areas and objectives of the original Investment Plan remain unchanged.

- Components 1 and 2 - The World Bank project for upgrading the transmission system and supporting development of wind independent power producers with a CTF allocation of US\$150 million is in the implementation stage.
- Component 3 - The AfDB project to finance construction of the 200 MW Wind Farm implemented through a Public Private Partnership (PPP) with a CTF allocation of US\$50 million is under preparation. The CTF allocation, project scope and design remain unchanged.
- Component 4 - The CTF approved allocation of US\$100 million for the World Bank urban transport development project remains the same in this update. The project design has been amended excluding the investment in Bus Rapid Transit lines and adding investments in (i) modernization and capacity building of the Cairo Transport Authority, (ii) establishment of the Greater Cairo Urban Transport Authority and (iii) common fare collection systems among various public transport modes.

¹ The CTF IP for CSP in the MENA Region endorsed on December 2, 2009 provides funding of US\$95 million for a proposed Egypt Komo Ombo Solar Power project. This project will support the construction and initial operation of a 100 MW CSP plant in Upper Egypt.

Table 1: Egypt CTF Indicative Financing Plan Endorsed in January 2009 (US\$ million)

Financing Source	Urban Transport (World Bank)	Wind (transmission line, Wind Energy Fund, and PPP projects) (World Bank, AfDB)	Total
CTF	100	200	300
GoE/MDBs	435	550	985
Private Sector	330	306	636
Total	865	1056	1921

Table 2: Egypt CTF Indicative Financing Plan After Reallocation (US\$ million)

Financing Source	Urban Transport (World Bank)	Transmission System Upgrade (World Bank)	200 MW Wind Farm (AfDB)	Total
CTF	100	150	50	300
GoE	320	54.8	210	1035
Private Sector		450		
MDB/Others	310	70.0 (IBRD) 71.2 (Others)	140	591
Total	730	796	400	1926

2. Introduction

Egypt ranks among the 11 countries in the world showing fastest growing GHG emission. The analysis undertaken as part of the National Strategy Studies (NSS) in 2002 indicates that by 2017 emissions could reach more than three times the 1990 levels. The overall energy sector (including transport) is expected to remain by far the largest source, with the growth rate of 4.9%. The actual growth of emissions, based on IEA/OECD database, has been slower compared to the NSS projections (in large part due to a lower GDP growth) but still show well over 30% increase from the 1990 levels.

The growth of the GHG emissions in Egypt is primarily linked to the strong economic growth and the attendant increases in energy demand, especially through higher demand for electricity and transport services. Electricity demand is growing at 7-8% per year, which implies adding about 1,500-2000 MW per year over the next several years (FY2010 installed capacity is close to 27,747 MW of which 25,031MW were available). The increase in energy demand has been met primarily by increased use of fossil fuels, leading to the high energy and carbon intensity of the economy. The Government's power generation expansion plan is based primarily on natural-gas fired combined-cycle and steam technology, supplemented by wind power and nuclear plants. About 60% of the domestic natural gas production is utilized by the power sector and the domestic gas demand is increasing, both in power generation and in other uses, competing with increasing gas exports through pipelines and LNG terminals. These trends are driven by the Government's objectives to (a) reduce the use of fuel oil, gasoline and LPG in the domestic market; (b) to position itself as a global exporter of natural gas; and (c) foster regional integration through the interconnection of natural gas pipelines.² Furthermore, the foreign partners engaged under production-sharing agreements (PSAs) in Egypt are increasingly demanding to export their share of natural gas rather than to sell it into the domestic market due to the higher prices and (to some extent) better credit-worthiness that exports bring.

The objective of this Investment Plan update note is to highlight the changes to the original CTF Investment Plan for Egypt.

One of the expected outcomes of the Wind Power Development Project is the reduction of GHG emissions through facilitating the development of clean energy resources (wind power) which result in displacing thermal (fossil-fuel) generation. It is expected that there will be an annual reduction of GHG emissions of 7.0 MT from the 2,500 MW of new wind capacity.

The demand growth for energy in the transport sector -- by some estimates at over 6% per annum (Gelil; see www.idrc.ca) -- has been driven by the economic and population growth, and the increasing pace of urbanization. Road transport is the dominant mode of internal transport in both passenger and freight operations: in 2003–2004 the volume of people transported by road had reached nearly 115.6 billion passenger-km, while freight transport amounted to nearly 43.1 billion tons-km (State Information Service, 2006). The opportunities for more energy-efficient rail and inland waterway transport are clearly underutilized. The transport demand is

² The current situation in the country shows high growth of natural gas demand. Egypt will have to import natural gas through LNG terminals to see real industrial development in the coming 5 to 10 years. Hence, realizing those objectives is very unlikely in the foreseeable future.

concentrated on a few transport corridors starting from or ending in Cairo. Half of all motorized vehicles in Egypt operate in Greater Cairo Metropolitan Area (GCMA), at one of the fastest growing motorization rate in MNA (4% per year, reaching more than 2.5 million by 2022). The GCMA is also the preeminent transport center of Egypt accommodating over 20 million motorized person trips and 7 million non-motorized trips daily. As a result, about 2/3 of transport sector emissions is due to urban transport, especially in GCMA (13 million CO₂ tons/year).

Since about 2/3 of all motorized trips are made by public transport, there are tremendous opportunities for the achieving energy efficiency through accelerated modal shift (transformation to mass transit system that depends on low carbon technology) and fuel switching. The government has committed itself to significantly support modal shift, large scale fuel switching in the urban transport sector and cost effectiveness of alternative options for emission reductions have been identified. The government's vision for transforming the transport sector is reflected in the Greater Cairo Urban Transport Master Plan (JIKA 2003). The Master Plan studies provided a new framework for consideration of an integrated urban transport system that emphasized putting "people's mobility before that of vehicles."

3. Status of Original Investment Plan Implementation

Table 3: Status of Approval of CTF Projects

Project Title	TFC Approval Date	Actual / Projected MDB Board Approval Date	CTF Funding (US\$ million)	Leveraged Funding (US\$ million)
Wind Power Development Project (Transmission System Upgrade) (World Bank)	May 6, 2010	June 15, 2010	150	646 GoE (54.8) Private (450) IBRD (70) others (71.2)
200 MW Wind Farm (AfDB)	Q1 2014	Q2 2014	50	350 NREA/Private (210) AfDB (140)
Urban Transport Infrastructure Development Project (World Bank)	June 2013	November 2013	100	630 GoE/Private (320) IBRD (310)
Total Financing			300	1626

Component 1: Transmission System Upgrade³ (World Bank)
(US\$ 150 million, CTF)

Description: The transmission system upgrade is part of the Wind Power Development Project, which was approved by the CTF Trust Fund Committee on May 6, 2010. This project involves several sub-components that together contribute to the full transmission infrastructure development and brings together financing from IBRD/CTF, European donors led by European Investment Bank (EIB), but including Agence Française de Développement (AfD)/Neighborhood Investment Funds (NIF) and Kreditanstalt für Wiederaufbau (KfW)/NIF.

Rationale: This project supports one of the key pillars of the GoE's energy strategy which is greater reliance on renewable energy sources. As renewable energy electricity generation technologies, particularly wind and Concentrated Solar Power (CSP) have matured, the renewable energy strategy of Egypt has given the utmost priority to the large scale renewable energy electricity generation projects which can serve both national and regional objectives of achieving fossil fuel savings, environment protection, creation of jobs and technology transfer. About 550 MW of wind turbines have been installed by end-2011; the government plan calls for

³ This component is being implemented under the Wind Power Development Project

over 3,000 MW of installed wind power capacity by 2020. Overall, the 2012-2017 investment plan includes development of about 2,750 MW in renewable energy (predominantly in wind power and some in solar technology), of which about half is to be developed by the private sector, assuming the political situation stabilizes and the private sector regains confidence in investing in Egypt.

The Wind Power Development Project will connect the future wind parks at Gulf of Suez and Gabel El-Zait to the national network. All project components are interrelated and the completion of these components expected to bring up the following outcomes:

- Implementation of the first private sector investments in wind power generation and progress of the competitive bidding program
- Infrastructure to evacuate over 3000 MW of wind power from the Gulf of Suez and Gabel El-Zait to the main load centers; and
- Reducing GHG emissions through facilitating the development of clean energy resources (wind power) which result in displacing thermal (fossil fuel-based) generation
- Leveraging of public and private funds for the transmission and the first BOO project.

The activities under this component include:

(i) Construction of a 500kV double-circuit Overhead Head Transmission Line from Ras Gharib 500 kV substation to Samallout (about 280 km). This includes the single responsibility Design, Supply and Installation rate based contract for all components (towers, cable, insulators and materials, ground wires with fiber optics communication links, and foundations for the complete construction of the transmission line.

Progress: The project is under implementation. Tendering for the transmission line (CTF is US\$148.25million) is based on the preliminary route survey that is now complete to provide estimated quantities of tower types, foundations, conductors etc.

(ii) Consultancy services for the development of the wind BOO program (CTF is US\$1 million): This component provides consultant support to the EETC in the competitive bidding program for the first 250 MW project. The advisory services are being provided in two phases with the first phase having already commenced with support from the PPIAF to provide support in the preparation of the Request for Proposals (RFP) and the second phase to be supported under the CTF to provide legal and financial advisory support through financial closure.

Progress: Phase One of the advisory services is now complete and preparation for Phase Two should start after the approval of the Central Bank.

(iii) Consultancy services to support Management of Wind Power Integration in Egyptian Power Market (CTF US\$500,000): The objective of this component is to support the rapid development of the wind energy market in Egypt by recommending guidelines to the system operator (load dispatch) for the optimal scheduling of complementary generation and demand so as to integrate wind generated power into the Egyptian power market while ensuring the security of the transmission system operations.

Progress: The technical and financial evaluations to hire a consultancy service to conduct the assessment are now complete.

(iv) Knowledge Management (CTF US\$250,000): This sub-component addresses three basic elements related to the wind program: (i) communications with local stakeholders, including Civil Society Organizations (CSOs) and the private sector on project activities, results and lessons; (ii) capture of lessons during the project implementation process; and (iii) the sharing of such lessons with other CTF country partners.

Progress: Coordination with client is ongoing to finalize a knowledge management plan that addresses the element of this sub-component.

(v) Technical Assistance to perform Environmental Assessment including Ornithological survey (KfW US\$650,000). An environmental and social assessment including ornithological survey is underway covering roughly 200 Sq km area (roughly 1000 MW) including the site of the proposed 250 MW BOO project with support from the KfW. Although this component is not CTF funded, it is a necessary prerequisite for the aforementioned subcomponents to be successfully implemented.

Progress: This is being implemented in cooperation with NREA.

Overall Progress: The overall progress towards achievement of development objectives and implementation progress of the Wind Power Development Project is rated moderately satisfactory. Progress was somewhat affected by the major political and social transformation in Egypt since January 2011.

Component 2: Renewable Energy Fund (World Bank)
(US\$ 50 million, CTF reallocated to the transmission system upgrade)

Activities under the Fund have been incorporated into the transmission system upgrade, which is being implemented under the Wind Power Development Project approved by the CTF Trust Fund Committee on May 6, 2010.

Component 3: 200MW Wind Farm (AfDB)
(US\$ 50 million, CTF)

Description: The project involves the construction of a 200 MW Greenfield wind farm in the Gulf of Suez. The Gulf of Suez area is characterized as one of the best regions enjoying excellent wind resource as the average wind speed reaches about 10.5 m/s and the capacity factor could exceed 40%. The wind farm will likely comprise 80 to 100, 2.0 MW 80 m high wind turbines. Other project components include MV cables for connection to the 220 kV transmission network, control system and civil works.

The project will be implemented as a PPP between NREA and a private developer. Together, they will create a special purpose vehicle that will be responsible for the development, construction, commissioning and operation of the 200 MW wind farm. The GoE will grant the special purpose vehicle a power purchase agreement.

Rationale: Egypt has set an ambitious target to achieve 20% electricity generation from renewable resources by the year 2020. This target comprises 12% from wind energy, which translates into 7,200 MW of installed capacity. The private sector is expected to contribute up to 60% of the 12% wind energy target, whereas the remaining 40% is to be developed by the public sector. Despite of the targeted larger contribution by the private sector, to date, only some 545 MW of wind capacity have been realized through public investments using very concessional financing. The current marginal electricity production cost in Egypt is about US cents 3.75/kWh, which is mainly based on thermal generation with gas price of US\$3/mmbtu. Wind power capital costs are typically higher than thermal power generation such as the combined cycle and the cost of production is therefore typically estimated to be in the range of 8-10 US cents/kWh, depending on site conditions. While operation costs would be lower over time, the higher capital costs constitute a serious financial barrier for investment in wind power generators. The wind project proposed in this IP would supply capital for wind energy generation infrastructure investments, which may otherwise not be readily available, and accelerate the development and scaling-up of wind power generation. It is expected that the availability of concessional financing will be central to decisions about investing in wind power, as such financing would allow promoters to internalize some of the climate externalities and allow for a break-even with non-renewable generation resources. The project will provide a key milestone along the gradual transition from relying primarily on grant and highly concessional resources through the public sector in wind energy development in Egypt to the promotion of competitive, efficient and sustainable wind energy through private sector investment and engagement. The wind project will be the first to be implemented in Egypt through a PPP arrangement, and would therefore provide the basis for the promotion of other similar investments. Furthermore, the project will provide an opportunity for strengthening the capacity of NREA to enable the institution to promote and manage future PPPs and private sector investments in wind energy.

Progress: The project is under preparation. No changes to the objective, CTF funding, scope and design are envisaged. The site originally allocated to the project was the subject of an ESIA study that was concluded by the end of 2011. The ESIA study highlighted the possibility for some high risk of project impact on migratory birds. As a result, NREA has decided to fully abandon that site and select a new one for the project. Consequently, a new ESIA study for the new site has been launched. Because of the seasonal nature of bird migration in that region, the ESIA would require about one year in order to complete the ornithological study. These environmental concerns related to the site originally selected for the project have therefore delayed the progress of this wind project.

The CTF has approved a US\$1.0 million preparation grant for the project, which will support the technical feasibility study for the project, among others. The feasibility study will include wind resource assessment, which typically require at least one year of wind/meteorological data measurement in the site. The contract for the feasibility study consultancy services has been signed in February 2012, and the consultant is currently in the process of procuring and installing wind masts in the new project site. The project is expected to seek TFC approval in early 2014.

Component 4: Urban Transport Infrastructure Development Project (World Bank)
(US\$100 million, CTF)

Description: The World Bank assisted the Government, under the Greater Cairo Urban Transport Strategy (World Bank, GOPP 2006), to prioritize investment needs. The proposed short-to-medium investment plan includes cost-effective measures that, in combination, can make significant impact in improving mass transit system, reducing traffic congestion and reducing emission by 1.5 million tCO₂ per year:

- Implementation of 3 major Bus Rapid Transit (BRT) corridors (6th of October West Wing corridor, Metro Line # 4 corridor, and the Ring Road corridor) and 3 other shorter BRT corridors in Cairo (replacing obsolete tramway lines).
- Implementation of Light Rail Transit (LRT) linking Cairo main urban agglomeration with New Cairo City, as well as four other suburban railway connection between four new cities and their nearby major urban agglomerations- namely, Borg Al Arab New City-Alexandria; 10th of Ramadan New City -Line #1 Ain Shams; Salhiya New City-national railway network; and Sadat New City –Menoufiya.
- Replacement of 613 old and polluting public minibuses with new 1310 large capacity buses operating on compressed natural gas (CNG) or GNC-hybrid drive.

Rationale: As demonstrated in the letter of the Government of Egypt to the World Bank and African Development Bank, dated October 27, 2008, the Government of Egypt is committed to low carbon energy development and has taken a number of steps in this direction including for example in the urban transport sector: a) the preparation with the World Bank of an Urban Transport Strategy for Greater Cairo Region that included short to medium investment plan; b) scaling-up replacement of old public buses and private taxis with a new fleet operating on compressed natural gas (CNG); c) completion of line 1 and 2 of the underground Metro and a commitment to complete line 3 by 2012 and line 4 by 2017; and d) the identification and preparation for implementation specific clean technology projects, including implementation of a Light Rail Transit (LRT) and Bus Rapid Transit (BRT) systems as well accelerated conversion of public buses and private taxis to CNG/hybrid technologies. A key principle underpinning the above projects is the Government's intention to maximize when possible the private sector involvement in the implementation, operation and maintenance of these projects under innovative Public-Private Partnership arrangements.

Progress: The project is under preparation. The original objective and CTF allocation remain unchanged but the scope and design underwent certain modifications (see section 4) based on the discussions with the new Government in April 2012.

The World Bank approved the launch of project preparation during a concept review meeting on 26 October 2009, and preparation has been ongoing since then with the multiple stakeholders involved in the project having difficulties to agree on the main implementing agency that would

be responsible for the loan. The unrest faced by Egypt in the aftermath of the Revolution of 25 January 2011 also contributed to block preparation.

Nevertheless, a World Bank mission revived the project in April 2012 by organizing a round table with all stakeholders, which reconfirmed their interest in the project and their willingness to move forward. The current proposed project scope and components remain mostly similar to those that were initially identified in 2009. Some components have been refined while others have been added to reflect the priorities voiced by the stakeholders during the roundtable of April 2012. The expected TFC approval date is June 2013 and Bank Board approval in November 2013.

4. Proposed Changes to the Investment Plan

Energy Sector

There is no change to the CTF allocation of US\$200 million for the Wind Development Project (transmission line, Wind Energy Fund, and PPP projects). However, the distribution of this amount amongst components has changed. The US\$50 million which was to fund the Renewable Energy Fund is now used for the transmission system upgrade.

Urban Transport Sector

There will be no change in the CTF allocation for the Urban Transport project which remains US\$100 million but the total project cost and the co-financing of the Government and the Private sector is changing due to the new project design.

The table below presents: (i) on the left side, the original components as described in the January 2009 investment plan, and (ii) on the right side, the new or refined investments as of October 2012 which has led to a change in the Investment Plan.

Table 4: Proposed new design of Urban Transport project

Original Investments (January 2009)	Refined and new Investments (October 2012)
<i>Investment 1</i> Implementation of Light Rail Transit (LRT) linking Cairo main urban agglomeration with New Cairo City, as well as four other suburban railway connection between four new cities and their nearby major urban agglomerations- namely, Borg Al Arab New City-Alexandria; 10 th of Ramadan New City -Line #1 Ain Shams; Salhiya New City- national railway network; and Sadat New City –Menoufiya.	<i>Investment 1(refined)</i> Transformation of the obsolete Heliopolis Tram into a modern and fast Light Rail Transit (LRT) and its extension from Heliopolis to New Cairo City

<p><i>Investment 2</i> Replacement of 613 old and polluting public minibuses with new 1310 large capacity buses operating on compressed natural gas (CNG) or CNG-hybrid drive.</p> <p><i>Investment 3</i> Implementation of 3 major Bus Rapid Transit (BRT) corridors (6th of October West Wing corridor, Metro Line # 4 corridor, and the Ring Road corridor) and 3 other shorter BRT corridors in Cairo (replacing obsolete tramway lines).</p>	<p><i>Investment 2 (refined)</i> Replacement of about 500 old buses of the Cairo Transport Authority by new buses running on cleaner and more fuel-efficient technology (CNG or hybrid) and modernization of some of the depots</p> <p><i>Investment 3 (dropped: for the moment, the Government of Egypt has dropped the implementation of BRT lines because of technical difficulties and safety concerns)</i></p> <p><i>Investment 3 (new)</i> Inter-modal integration of public transport services with common fare collection systems</p> <p><i>Investment 4 (new)</i> Traffic management measures, including intersection improvement</p> <p><i>Investment 5 (new)</i> Modernization and strengthening of the Cairo Transport Authority (CTA), the public bus operator</p> <p><i>Investment 6 (new)</i> Establishment of and capacity building of the proposed Greater Metropolitan Cairo Urban Transport Authority</p>
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Table 5: Egypt CTF Indicative Financing Plan Endorsed in January 2009 (US\$ million)

Financing Source	Urban Transport (World Bank)	Wind (transmission line, Wind Energy Fund, and PPP projects) (World Bank, AfDB)	Total
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Table 6: Egypt CTF Indicative Financing Plan After Reallocation (US\$ million)

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CTF	100	150	50	300
GoE	320	54.8		1035
Private Sector		450	210	
MDB/Others	310	70.0 (IBRD) 71.2 (Others)	140	591
Total	730	796	400	1926

5. Potential Impact of Proposed Changes to the Investment Plan Objectives

There are no envisaged impacts to the Investment Plan objectives. All advisory activities accompanied the Transmission System Upgrade project are designed to facilitate and streamline the process of attracting the private sector and strengthen the wind commercialization program. Specifically, those advisory activities are (i) Consultancy services for the development of wind BOO program (ii) Consultancy services to support Management of Wind Power Integration in Egyptian Power Market both of which supports the expansion of the wind generation program, and (iii) Execution of the Environmental Assessment including Ornithological survey.

The new design (as of October 2012) of the Urban Transport Infrastructure Development project components will not affect the transformational and development impact that were expected to take place due to the original design (January 2009). However the magnitude of the expected annual reduction in GHG emissions from the transport sector in target areas will be slightly reduced from 1.5 to 1.0 million ton CO₂ per year due to the investment plan change as described in Section 4. The new results indicators for the urban transport project are provided in Annex II.

6. Updated Risks and Mitigation Measures ⁴

Risk	Mitigation Measure	Residual Risk (low/moderate/ high)
Transmission System Upgrade project		
Procurement delays due to the recent uprising and political transition in Egypt	EETC has been closely supported by all co-financiers during and post the uprising to strengthen the PIU and ensure a proper coordination with the wind development projects managed by NREA. A coordination mechanism between EETC and NREA is to be finalized to revise the commercial operation dates for wind farms and transmission.	Low
Inadequate capacity to manage and financially close the first Wind BOO Project	Substantial progress has been made in the related technical assistance components (B2 and B3). Client is exploring different options of risk mitigation instruments to complement the ongoing government efforts to secure a Central Bank Guarantee for the first round (250MW) of Wind BOO projects.	Moderate
Limited experience of the Project Implementing Unit (PIU) in Bank procurement	EETC is working with an experienced engineering consulting firm to limit any delays that can increase risks. The transmission component is currently at the bid evaluation stage and most of the procurement delays have been addressed. EETC is working closely with the WB to ensure a sufficient support is provided for a timely contract award.	Low
200 MW Wind Farm project		
Reduced commitment from the Government for moving Egypt on a low-carbon growth path after the recent political and social uprisings in the country over the past 18 months.	The implementation of the wind energy development program will help the government achieve some of the top-priority socio-economic objectives such as the creation of employment opportunities through projects construction and operation, as well as the potential for technology transfer and increased local manufacturing.	Moderate
Reduced interest by the private sector for investment in wind energy in Egypt due to the currently perceived non-conducive business environment.	The government has already taken steps to engage the private sector in some wind projects through the signature of memorandums of understanding, pre-qualification of some investors, etc. who have continued to show interest in the business.	Moderate
NREA's inability to manage the expected large number of new RE projects, especially those to be developed by the private sector.	The CTF project preparation grants already approved through the IP for Egypt include components for providing capacity building to NREA. In addition, the main off-taker, the Egyptian Electricity Transmission Company (EETC) has already some experience in managing private IPPs, and is fully involved in the wind IPPs.	Moderate
Overall risk after mitigation	Moderate	

⁴ The Risk Assessment of the Urban Transport Project will be finalized by appraisal

ANNEX I: Updated Concept Note – 200 MW Wind Farm Project (AfDB)

Problem Statement: The energy sector plays a very vital role in fostering socio-economic development in Egypt. So far, the sector has been heavily dependent on fossil fuels, especially oil and gas, with which the country has reasonable resources. On the other hand, Egypt is endowed with plentiful natural resources, amongst which the wind and solar energies are proved by many detailed resource assessment studies. In pursuit of harnessing such a large renewable potential, decreasing its GHG emissions, and improving energy security through resource diversification, Egypt has adopted an ambitious plan to satisfy 20% of the generated electricity from renewable energies by the year 2020. This includes 12% from wind energy, translated into about 7,200 MW of wind farms installed capacity, and 8% from other renewable resources, mainly hydro and solar energies. The private sector is expected to contribute up to 60% of the 12% wind energy target, whereas the remaining 40% is to be developed by the public sector.

Implementation of this ambitious plan is already underway whereby a series of wind farms with a total installed capacity of 545 MW at Zafarana area on the Gulf of Suez are currently in operation. The projects have operated in successive phases with support from Germany, Denmark, Spain and Japan. Meanwhile, this achievement still appears very modest compared to the 7,200 MW ultimate target for 2020. The remaining capacity would require investments of more than US\$10 billion over the next 10 years, which will require leveraging funding from various sources including DFIs and the private sector.

It is within this context that the CTF IP for Egypt includes the proposed 200 MW Wind Farm Project on the Gulf of Suez. The project will be implemented as a PPP between NREA and a private developer. Together, they will create a special purpose vehicle that will be responsible for the development, construction, commissioning and operation of the 200 MW wind farm. The GoE will grant the special purpose vehicle a power purchase agreement.

Proposed Transformation: The Wind Farm Project carries the promise of high additionality, transformational impact and replicability. The transformational impact stems from the fact that the project will provide a key milestone along the gradual transition from relying primarily on grant and highly concessional resources through the public sector in wind energy development in Egypt to the promotion of competitive, efficient and sustainable wind energy through private sector investment and engagement. The additionality of the project is attributed to the fact that it will be the first wind project to be implemented in Egypt through a PPP arrangement. The project will provide an opportunity for strengthening the capacity of NREA – the government agency responsible for the promotion of renewable energy in the country – to enable the institution to promote and manage future PPPs and private sector investments in wind energy. It is to be noted that a US\$1.0 million preparation grant for this project has already been approved by the CTF in November 2010, which includes a component for providing capacity building for NREA on wind energy development. It is anticipated that the PPP model proposed for this project, or similar, will be replicated to support GoE to attract the 60% private investments targeted within its 7,200 MW wind energy development plan.

Implementation Readiness: The State has allocated to NREA a large area on the Gulf of Suez to be dedicated for wind energy development. The area is characterized with excellent wind resources and could accommodate more than 3,000 MW of wind farms. Because wind energy development in that area is going in progressive phases, the necessary preparatory studies for the individual projects are also implemented in a similar sequencing. The site initially selected for the 200 MW wind farm project proposed under this IP was studied to assess the project's potential environmental and social impacts. Although wind energy provides a clean resource for electricity generation, wind farms still pose some environmental risks related to biodiversity, soil erosion, visual and noise impacts, increased traffic, etc. In this regard, the environmental study highlighted the possibility for some high risk of project impact on migratory birds. As a result, NREA has decided to fully abandon that site and select a new one for the project. Consequently, a new environmental and social impact assessment for the new site has been launched. Because of the seasonal nature of bird migration in that region, the environmental study would require about one year in order to complete the ornithological study.

The environmental concerns related to the site originally selected for the project delayed the progress of this wind project. The preparatory studies for the new site (feasibility and environmental) are currently underway in parallel. The studies are expected to be completed by the end of 2013, following which project construction should start.

The CTF has approved a US\$1.0 million preparation grant for the project. The Grant will be used to support the technical feasibility study for the project, among others. The feasibility study will include wind resource assessment, which typically require at least one year of wind/meteorological data measurement in the site. The contract for the feasibility study consultancy services has been signed in February 2012, and the consultant is currently in the process of procuring and installing wind masts in the new project site.

Rationale for CTF Financing: The current marginal electricity production cost in Egypt is about US cents 3.75/kWh, which is mainly based on thermal generation with gas price of US\$3/mmbtu. Wind power capital costs are typically higher than thermal power generation such as the combined cycle and the cost of production is therefore typically estimated to be in the range of 8-10 US cents/kWh, depending on site conditions. While operation costs would be lower over time, the higher capital costs constitute a serious financial barrier for investment in wind power generators. Blending CTF resources with financing from the AfDB and other sources would supply capital for wind energy generation infrastructure investments, which may otherwise not be readily available, and accelerate the development and scaling-up of wind power generation. It is expected that the availability of concessional financing will be central to decisions about investing in wind power, as such financing would allow promoters to internalize some of the climate externalities and allow for a break-even with non-renewable generation resources. Furthermore, the project preparation grant provided by the CTF is helping to ensure the feasibility of the first Wind PPP in Egypt, and strengthening the capacity of NREA in the area of wind energy development and public private partnerships.

Results Framework: The direct output of the project is a 200 MW wind farm comprising 80 – 100 X 2.0 MW turbines, control system and MV cables for connection with the 220 kV transmission substation. The expected project outcomes include 2.78% contribution to the 7,200 MW wind capacity target by 2015/2016, creation of some 1000 jobs during construction and operation, and avoidance of about 0.5 million tons of CO₂ (greenhouse gas) emissions per year

for its 20 years of operation. The expected project impacts include the scale-up of wind energy development in Egypt through increased private sector engagement, improved energy security through resource diversification, promotion of local manufacturing through demand creation for wind turbines, blades and other supply and related “green jobs”.

Monitoring and Evaluation of the 200 MW Wind Farm

The interim results of the 200 MW wind project achieved during implementation will be mainly monitored by the project implementation agency and formally communicated to the Bank regularly through the quarterly project progress reports. In addition, the AfDB will be carrying out regular field supervisions of the project, during which the general project progress will be reviewed and the results achieved will be confirmed.

At the end of the implementation of the project, the project developers and the Bank will jointly prepare a project completion report according to the AfDB’s standard format. The project completion report will benefit from the interim results captured in the project progress reports and the AfDB’s supervision reports, and will further expand to capture and evaluate the developmental impacts of the project. The other main sources of information will be the annual reports published by NREA and by the Ministry of Electricity and Energy.

Financing Plan:

Table 7: Project Indicative Financing (US\$ million)

Financing Source	Amount
CTF	50*
AfDB	140
NREA/Private sector	210
Total	400

* Including US\$ 1.0 million project preparation grant

Table 8: Project Preparation Timetable

Milestone	Date
Feasibility and environmental studies completed	End 2013
TFC Approval	Q1 2014
AfDB Board Approval	Q2 2014

Table 9: Results Framework

Results Indicator	Baseline	Expected Results after Reallocation
Installed capacity of wind power (MW)	545 MW (2012)	3235 MW (2017)
Wind capacity developed by the private sector (MW)	0 MW (2012)	1450 MW (2017)
Contribution of locally manufactured components in wind power (%)	40% (2012)	60% (2017)

ANNEX II: Updated Concept Note – Urban Transport Infrastructure Development Project (World Bank)

I. Problem Statement

1. The Urban Transport Strategy for Greater Cairo Region (World Bank and GOPP, 2006) and the Urban Transport Master Plan (JICA and GOPP, 2008), identified the following urban transport and traffic management issues as the most critical challenges:

- **Aggravated traffic congestion:** GCMA is experiencing traffic congestion. This has serious economic consequences and contributes to deteriorating air pollution conditions.
- The transport demand is concentrated on a few transport corridors starting from or ending in Cairo. Half of all motorized vehicles in Egypt operate in Greater Cairo Metropolitan Area (GCMA), at one of the fastest growing motorization rate in MNA (4% per year, reaching more than 2.5 million by 2022). The GCMA is also the preeminent transport center of Egypt accommodating over 20 million motorized person trips and 7 million non-motorized trips daily. As a result, about 2/3 of transport sector emissions is due to urban transport, especially in GCMA (13 million CO₂ tons/year).
- **Poor public passenger transport system:** GCMA relies on under developed, overcrowded and unreliable passenger transport services.
- **A high accident rate:** The road transport death rate in GCMA is very high. At least 1,000 Cairenes die each year in motor vehicle accidents, more than half of them pedestrians, and over 4,000 are injured.
- **Air and noise pollution:** Mobile source air pollution in GCMA is serious both with regard to particulate matter as well as noxious chemicals. Noise levels are high and aggravated by very old large proportion of the car and taxi fleet.
- **Inadequate financial arrangements:** Overlaying all of the above problems are inadequate financial arrangements leading to under investment in transport facilities, especially in public transport capacity which suffers major shortages.

II. Proposed Investments

2. As demonstrated in the letter of the Government of Egypt to the World Bank and African Development Bank, dated October 27, 2008, the Government of Egypt is committed to low carbon energy development and has taken a number of steps in this direction including for example in the urban transport sector: a) the preparation with the World Bank of an Urban Transport Strategy for Greater Cairo Region that included short to medium investment plan; b) scaling-up replacement of old public buses and private taxis with a new fleet operating on compressed natural gas (CNG); c) completion of line 1 and 2 of the underground Metro and a commitment to complete line 3 by 2012 and line 4 by 2017; and d) the identification and preparation for implementation specific clean technology projects, including implementation of a Light Rail Transit (LRT) and Bus Rapid Transit (BRT) systems as well accelerated conversion of public buses and private taxis to CNG/hybrid technologies. A key principle underpinning

the above projects is the Government's intention to maximize when possible the private sector involvement in the implementation, operation and maintenance of these projects under innovative Public-Private Partnership arrangements.

3. The World Bank assisted the Government, under the Greater Cairo Urban Transport Strategy (World Bank, GOPP 2006), to prioritize investment needs. The proposed short-to-medium investment plan includes cost-effective measures that, in combination, can make significant impact in improving mass transit system, reducing traffic congestion and reducing emission by 1.0 million tCO₂ per year:

- Implementation of Light Rail Transit (LRT) linking Cairo main urban agglomeration with New Cairo City, as well as four other suburban railway connection between four new cities and their nearby major urban agglomerations- namely, Borg Al Arab New City-Alexandria; 10th of Ramadan New City -Line #1 Ain Shams; Salhiya New City- national railway network; and Sadat New City –Menoufiya.
- Replacement of 500 old and polluting public minibuses with new 1310 large capacity buses operating on compressed natural gas (CNG) or GNC-hybrid drive.

Investment 1: Light Rail Transit (LRT)

3. The Heliopolis tram system in Cairo has essentially reached a critical point where the rolling stock, infrastructure, and supporting systems need to be rehabilitated and/or replaced. While system usage is still significant, amounting to approximately 74,000 passengers per day, ridership has declined to less than 1/5 of volumes experienced in peak years (1980s) where 370,000 passengers used the system on work days. In the absence of actions the use of the system is likely to decline further leading to an increase in ridership of other modes of transportation especially taxis, buses and minivans, and private vehicles all of which have higher fuel consumption and air pollution, including Greenhouse Gas (GHG) Emissions, per passenger-kilometer travelled. This has also put further strain on the already deteriorating transport infrastructure.

4. While upgrading the entire Heliopolis tram system would be a huge undertaking, at least in the short term, there is a pressing need to improve passenger transport services between Heliopolis/Nasr City and New Cairo as in this travel corridor there are no existing or planned mass transit services. Nasr City currently has an estimated population of approximately 600,000 persons and is the fastest growing portion of the Cairo metropolitan area. New Cairo has a current population of approximately 800,000 (2009) but is projected to house 2 million persons by 2027 according to the master plan. In addition, the Government is planning to relocate several ministries from downtown Cairo to an administrative city in this corridor in the near future.

5. Given this situation, upgrading and extension of the Heliopolis tram between Heliopolis at Stadium and New Cairo (American University of Cairo) via Nasr City over a total length of about 31 km approximately deserves high priority consideration. Government of Egypt therefore is intent at undertaking this operation so that the tramway line becomes a major provider of passenger transport service in Heliopolis, Nasr City and New Cairo while also serving the new governmental district.

6. New Cairo will soon house over 1 million persons, and is expected to house over 2 million persons within 10-15 years. The Government also plans to relocate several ministries to the area between Naser City and New Cairo. Given this reality, the case for substantially improving the public transit system to these areas is particularly important. A first phase improvement of the Heliopolis tram from

Girls College Metro Station (Heliopolis) to Nasr City (two large districts in Cairo where about 700,000 people live), with an extension to New Cairo City will cost about US\$155 million, including conversion of the whole system into a Light Rail Transit (LRT) using 30-40 new trains, tracks change, passenger facilities, workshops and rehabilitation of the power and supporting system. The planned LRT is an integrated system with feeding system within New Cairo. The new system would extend the existing tramline by 4km to a total of about 21 km and from the current 70,000 passengers/day to 400,000 passengers/day. The other 3 lines of the old tramway will be converted into 3 additional BRT corridors (see sketch below).

Investment 2: Clean Technology Bus

7. Currently the Cairo Transport Authority (CTA) runs about 1500 standard sized buses and about 200 mini-buses. Apart from this the city has about 1500 minibuses run by 15 different private operators and about 9000 micro-buses run by several small operators. The total supply of buses is grossly inadequate for a city of about 17 million people and growing rapidly. Besides, about 40% of the buses run by the CTA are more than 20 years old and need replacement. CTA also has 24 garages, used as depots for the buses as well as several terminals and bus stops.

8. Accordingly, this component seeks to replace about 500 old buses with new buses that would be more fuel efficient and less polluting. These would be full sized buses and would help to enhance the public bus supply in the city. As part of this component the depots and terminals of the CTA would be modernized, with improved maintenance facilities and passenger facilities at boarding and alighting points.

Investment 3: Inter-modal integration of public transport services with common fare collection systems

9. The Cairo metro has plans to introduce contactless smart card ticketing. The proposal is to use this opportunity to introduce the same ticketing technology across other modes of public transport as well and simultaneously attempt integration across the terminals, routes, schedules, passenger information systems and branding (color schemes, logo, signages, uniforms, etc). All of these together would go a long way in enhancing the attractiveness of the overall public transport system in the city and persuade a shift towards public transport

Investment 4: Traffic Management

10. The traffic in Cairo needs improved management. This can help reduce the congestion to some extent. Some of the key problems that are seen in Cairo are the inadequate number of intersections with traffic lights, the use of U turns instead of regular intersections, haphazard parking and inadequate enforcement of traffic discipline. It is proposed to take up a pilot corridor (10-20 km long with adjoining area of 0.5 km on each side) to demonstrate what improved traffic management measures can do to help improve traffic flow. This would serve as a demonstration and can subsequently be scaled up to cover other areas as well.

Investment 5: Modernization and Strengthening of the Cairo Transport Authority (CTA)

11. This investment is to take up a comprehensive modernization of the CTA. Such modernization will encompass the following dimensions:

- Organization structure, staff profile and manpower capacity
- Operational procedures
- Equipment and planning systems
- Management information system
- Financial sustainability

Investment 6: Establishment and Capacity Building for the Greater Cairo Urban Transport Authority

12. The Government proposes to set up a Greater Cairo Urban Transport Authority to regulate and coordinate all transport system in the Greater Cairo region. This Authority is extremely important to ensure a coordinated and efficient transport system in the city. A decree has been drafted by the Ministry of Transport, but needs some amendments and is expected to be passed soon. Given the above, the proposal is to support the establishment and capacity building of the new Greater Cairo Urban Transport Authority.

III. Proposed Transformation

13. These investments would result in the following potentially transformational change in the urban transport sector in Egypt:

Baseline	End of Project Targets
<ul style="list-style-type: none"> • Inefficient and high polluting shared taxis and minibuses account for over 50% of all public transport trips. • 500 old polluting minibuses run in Greater Cairo adding to health hazard and traffic congestion. • Availability of LRT in high demand corridors: 0 • Current bus and tramway rider-ship: 3.1 million passengers per day. • Current buses operate with standard diesel drive. • Annual GHG emissions from the transport sector in target areas: 13 million tons CO₂ per year. • Do nothing scenario would result in increase emission to about 16 million tCO₂ by 2022. 	<ul style="list-style-type: none"> • 20-30% modal shift from passenger vehicles to high capacity and clean technology buses and light rail transit. • 500 old minibuses scrapped and replaced by 1310 large size clean technology vehicles. • 1 modern and clean technology LRT/rail lines constructed and operating. • Bus and LRT rider-ship: 4 million passengers per day. • Buses operate on CT GNC or GNC-Hybrid • Emission reduction: 1.0 million tons CO₂ per year, 20 million tons CO₂ over 20 year • Cost effectiveness of reductions is estimated at US\$36.5/tCO₂ for the entire financing, or about US\$5.0/tCO₂ of CTF resources. • ER targets of replicability: 4-4.5 million tons CO₂ per year, or down to 12 million tCO₂

14. Implementation of the above mentioned program is expected to result in annual emission reductions of about 1.0 m tCO₂ /annum (or 20 m tCO₂ over the 20 year lifetime of the investments). It is estimated that planned investments could achieve a share of 30% of daily trips in targeted cities, with a ridership eventually exceeding 8-10 million passengers per day. A key principle underpinning the above investments is the Government's intention to maximize the private sector involvement in the implementation, operation and maintenance of these projects under innovative Public-Private Partnership arrangements. Replication of CTF investments would result in an estimated 4-4.5 million tons of CO₂ reductions per year.

IV. Rationale for CTF Financing

15. Further urban transport development is seriously constrained by lack of adequate public financing. In view of the competing priorities, availability of CTF funds would accelerate the implementation of the UT investments with the associated modal shift and GHG ER. Without CTF financing, this infrastructure development could be delayed by about 3-5 years and the proposed tendering program would prove less attractive to the bidders. Blending CTF resources (US\$100m) with IBRD (US\$310m) and other financing, including the Government and Private Sector, would make available investment capital in infrastructure which may otherwise not be readily available or facilitate the speed of adoption and scale up. The low cost financing would be instrumental in decisions taken to move faster with the implementation, attract private sector financing for operation and maintenance (O&M) and internalize some of the climate benefits that are not typically rewarded by the financial markets.

V. Financing Plan

Table 10: Project Indicative Financing (US\$ million)

Financing Source	Amount
CTF	100
IBRD	310
GoE/Private sector	320
Total	730

VI. Updated Project Preparation Timetable

Table 11: Project Preparation Timetable

Milestone	Date
Update Submitted to CTF	October 2012
Preparation	April 2012- June 2013
TFC Approval	June 2013
Appraisal & Negotiations	July-September 2013
Board Approval	November 2013
Implementation	December 2013 – December 2017

VII. Updated Results Framework

Results Indicator	Baseline	Expected Results in Egypt Investment Plan (endorsed January 2009)	Expected Results after Reallocation
Share of Taxi and Microbus Trips in total Public Transport Trips	50%	20-30%	20-30 %
Availability of BRT in High Demand Corridors	0	6 Corridors	0 Corridor
Availability of LRT in High Demand Corridors	0	5 LRT line	1 LRT line (31 km)
Bus and Tramway ridership	3.1 million passenger/day	5 million passenger/day	4 million passenger/day
Buses Technology	613 old buses 0 Clean Technology Buses	613 old buses scrapped 1310 large size Clean Technology Buses added	500 old buses scrapped 500 large size Clean Technology Buses added
Annual GHG emissions from the transport sector in target areas	13 million tons CO ₂ per year.	11.5 million tons CO ₂ per year.	12 million tons CO ₂ per year.