GEF-6 REQUEST FOR ONE-STEP MEDIUM-SIZED PROJECT APPROVAL

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT IDENTIFICATION

Project Title:	Renewable Energy for the City of Marrakech's Bus Rapid Transit System		
Country(ies):	Morocco	GEF Project ID:[1]	9567
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5890
Other Executing Partner(s):	Delegate Ministry in Charge of Environment (MdE)	Submission Date: Resubmission:	21 July 2016 11 August 2016
GEF Focal Area(s):	Climate Change Mitigation	Project Duration (Months)	24 months
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐		
Name of Parent Program:	[if applicable]	Agency Fee ($)	125,387

A. FOCAL AREA STRATEGY FRAMEWORK AND PROGRAM[2]:

Focal Area Objectives/programs	Focal Area Outcomes	Trust Fund	(in $)	
			GEF Project Financing	Co-financing
CCM Objective 2: Demonstrate Systemic Impacts of Mitigation Options	*Program 3: Promote integrated low-emission urban systems, technologies and practices operationalized in given urban target area*	GEFTF	1,319,863	56,173,683
	Total project costs		1,319,863	56,173,683

B. PROJECT FRAMEWORK

Project Objective: To support the low-carbon integration of the Bus Rapid Transit (BRT) System under implementation by the City of Marrakech through the installation of 1 MW solar farm based on High Concentration PhotoVoltaics (HCPV) technology. The energy produced by the farm will help power electric buses to showcase an integrated low-carbon transport system that can be replicated in other cities in Morocco.

Project Components/ Programs	Financing Type[3]	Project Outcomes	Project Outputs	Trust Fund	(in $)	
					GEF Project Financing	Confirmed Co-financing
1. Integrated financial planning, capacity-building and MRV systems for the low carbon BRT System	TA	City of Marrakech integrates low-carbon transport principles into its municipal planning documents; builds its capacities; and ensures proper monitoring and reporting of implemented actions	1.1: Sustainable transport financial strategy for development and operationalization of all current and future BRT lines 1.2: An MRV system for the BRT system, integrating sustainability dimensions across all facets of operation, is in place	GEFTF	169,875	200,000

[1] Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.
[2] When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCF*.
[3] Financing type can be either investment or technical assistance.

			1.3: Municipal capacities on energy efficiency best practices in transport contexts are developed			
2. Commissioning of 1 MW solar farm for powering of electric buses for the City's BRT System	Inv	Installation and operationalization of 1 MW Solar farm based on High Concentration PhotoVoltaics (HCPV) technology	2.1 Construction and commissioning of the solar farm using a BOT model with partial funding from GEF 2.2 Sustainable O&M system in place for solar farm	GEFTF	950,00	55,573,683
3. Knowledge management and awareness	TA	Communication and awareness of the replication potential of the scheme shared nationally	3.1: Lessons learnt, experiences and best practices related to the system are compiled and disseminated to other cities in Morocco 3.2 Communication and public awareness campaign for BRT utilization developed[4] 3.3: A multi-stakeholder committee (within City of Marrakech) on low carbon mobility is established and operational	GEFTF	80,000	100,000
				Subtotal	1,199,875	55,873,683
				Project Management Cost (PMC)[5]	GEFTF	119,988	300,000
				Total GEF Project Financing	1,319,863	56,173,683

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ( )

C. SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include confirmed co-financing letters for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
National Government	Delegate Ministry in charge of Environment	In-kind	300,000
Municipal Government	City of Marrakech	Cash	55,473,683
Municipal Government	City of Marrakech	In-kind	300,000

[4] The actual awareness campaign activities will be done with funding from co-finance

[5] For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

National Government	Energy Investment Company (SIE)	In-kind	100,000
Total Co-financing			56,173,683

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES), FOCAL AREA AND PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee a) (b)	Total (c)=a+b
UNDP	GEF TF	Morocco	Climate Change Mitigation	N/A	1,319,863	125,387	1,445,250
Total Grant Resources					1,319,863	125,387	1,445,250

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS[6]

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	*hectares*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*hectares*
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	*Number of freshwater basins*
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*Percent of fisheries, by volume*
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	*-Lifetime direct GHG emissions avoided: 27,327 metric tons -Range of lifetime indirect GHG emissions avoided: 75,748 to 103,554 metric tons*
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	*metric tons*
	Reduction of 1000 tons of Mercury	*metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*ODP tons*
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	*Number of Countries:*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries:*

[6] Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund) in Annex B.

G. PROJECT PREPARATION GRANT (PPG)[7]

Is Project Preparation Grant requested? Yes X No If no, skip item G.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS*

GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in $)		
					PPG (a)	Agency Fee[8] (b)	Total c = a + b
UNDP	GEF-TF	Morocco	Climate Change Mitigation	NA	50,000	4,750	54,750
Total PPG Amount					**50,000**	**4,750**	**54,750**

PART II: PROJECT JUSTIFICATION

1. Project Description.

a) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed:

Morocco's commitment to to a low-carbon future

Morocco, which will be the host of the 22nd international climate change negotiations in 2016, committed itself early and voluntarily to the international effort against climate change by joining the United Nations Framework Convention on Climate Change (UNFCCC) during the 1992 Rio Summit[9]. Morocco was an early participant in the Clean Development Mechanism (CDM) under the Kyoto Protocol, and is thus one of the first countries in Africa and the MENA region to establish in 2002 a Designated National Authority (DNA), a required institutional framework for national validation of CDM projects.

The country has developed several different types of nationally adapted mitigation instruments, such as Nationally Appropriate Mitigation Actions (NAMAs). As highlighted in its first Biennial Update Report (BUR) submitted in the 7th of May 2016[10], Morocco has thus far developed a set of 5 NAMAs in the following sectors: agriculture, waste management, housing, solar pumping in agriculture and roof top PV. The first three NAMAs (agriculture, waste management, housing) were developed within the framework of the Low Emission Capacity Building (LECB[11]) programme implemented by UNDP and MdE and the renewable energy-related NAMAs (solar pumping and roof top PV) were developed within the framework of the project Facilitating Implementation and Readiness for Mitigation (FIRM[12]) implemented by UNEP and the Moroccan Ministry of Energy. While notable these NAMAs do not fully cover the enormous Green House Gas (GHG) abatement potential in Morocco but rather reflect early sectoral initiaves supported by international donors.

As part of its commitment to ensure a successful agreement of the COP21, Morocco submitted an ambitious Intended Nationally Determined Contribution (INDC) in June 2015[13]. According to its INDC, Morocco has committed to reduce its GHG emissions unconditionally by 13% below the BAU by 2030 considering 2010 as the baseline year. An additional 19% of emissions could be reduced versus the BAU scenario contingent on the

[7] PPG of up to $50,000 is reimbursable to the country upon approval of the MSP.
[8] PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.
[9] Morocco signed the UNFCCC in 1992 in Rio and ratified it in 1995.
[10] http://unfccc.int/resource/docs/natc/marbur1.pdf
[11] http://www.lowemissiondevelopment.org/
[12] http://www.lowcarbondev-support.org/
[13] http://www4.unfccc.int/submissions/INDC/Published%20Documents/Morocco/1/Morocco%20INDC%20submitted%20to%20UNFCCC%20-%205%20june%202015.pdf

Government gaining access to new sources of finance and enhanced international support within the context of the Paris Agreement under the auspices of the UNFCCC.

As indicated in its recently submitted Third National Communication, Morocco has seen a steep increase in its GHG emissions in recent years driven mainly by increased energy demand (TCN, 2016[14]) – see Figure 1. Total GHG emissions almost doubled in the last decade and the emitted 94 million tons (MT) of GHG in 2010 are again expected to increase by more than 80% to 171 MT in 2030 under a BAU scenario. For the unconditional target, the pledged 13% GHG reduction translates into an increase to 129 MT in 2025 and 148 MT by 2030, which equals a cumulative GHG mitigation of 142 MT compared to the BAU scenario. If the required conditions for the 32% target are met, emissions would still increase but will be significantly slower, reaching only 104 MT in 2025 and 117 MT by 2030, thereby saving 401 MT GHG over the BAU period 2010-2030 (see Figures 2 & 3). For a developing country with annual GHG emission growth projected to reach levels of 7% and whose main focus going forward will be concentrated in adaptation due to its high climate vulnerability, the difference between a 13% emissions reduction and a 32% reduction (contingent upon support) is substantial.

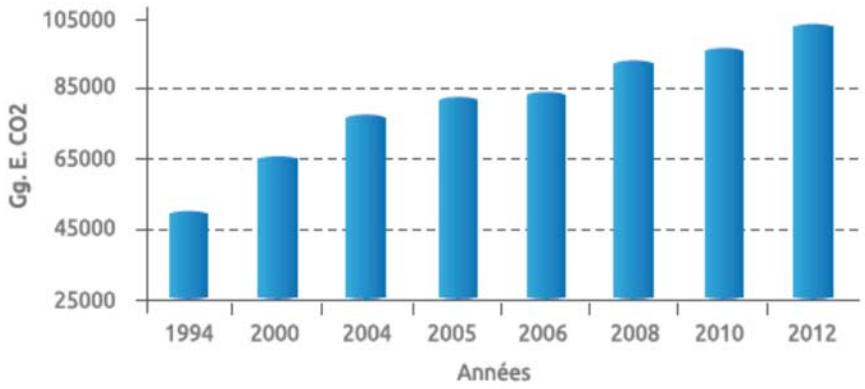

Figure 1: Global GHG emissions of Morocco from 1994 to 2012 (Source: TNC – 2016)

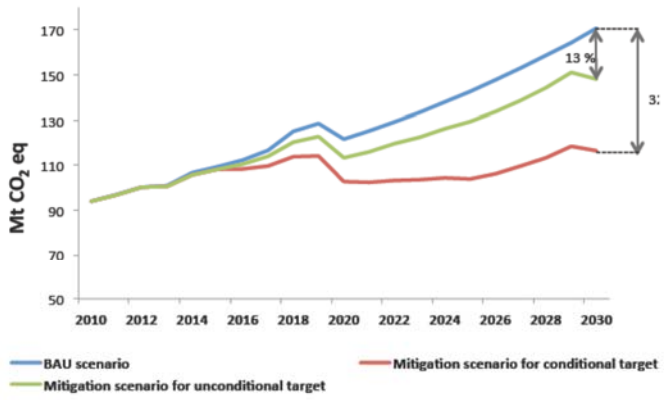

Figure 2: BAU and mitigation scenarios (Source: INDC – 2015)

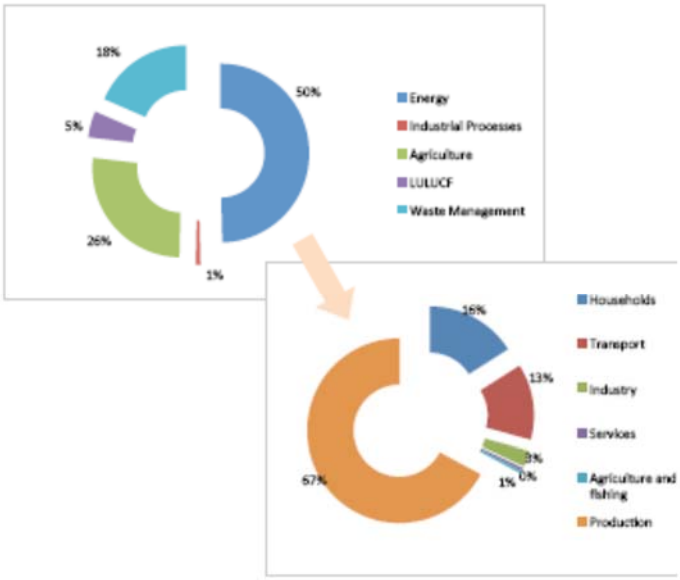

Figure 3: Distribution of the GHG mitigation effort among key sectors between 2020 and 2030 to achieve the conditional target (Source: INDC – 2015)

[14] http://unfccc.int/resource/docs/natc/marnc3.pdf

In order to achieve the target set in the INDC, the country has provided clear and transparent indications on the additional mitigation actions needed by considering a comprehensive set of sectoral actions and targets over the period 2010-2030. Energy production and demand (i.e., households, transport, industry services) is the highest priority sector with a 50% emission reduction target. The special focus on energy is expected to be achieved through:

a) the extension of the national solar and wind programs in order to increase the installed capacity of renewables to more than 50% by 2025;

b) reducing energy consumption in buildings, transport and industry by 15% by 2030; and

c) the phasing out of fossil fuel subsidies.

Climate Change Mitigation in Morocco's Transport Sector

So far Morocco has been able to demonstrate its willingness and capacities to design and implement large scale GHG mitigation projects and programmes mainly in the energy sector, while the transport sector has received less focus. In Morocco, the transport sector (road, rail, air and sea) is characterized by its high consumption of energy as it consumes up to 38% of the national energy use. In terms of emissions, the sector generates 14,813,300 tCO2 eq, which is equivalent to 14.7% of the total GHG emissions of the country (TCN, 2016). With 100% consumption based on petroleum products, road transport ranks first in emissions since its represents 88% of total consumption in the transport sector. Road transport fuel consumption is experiencing a continuous uptake since it is correlated with the annual increase rate of about 5% in the number of road vehicles (National Forum of Energy Efficiency, ADEREE).

In the road transport category, freight, individual and collective passenger transports are the main sub-categories that comprise the total fuel consumption. Freight tranport ranks first in terms of fuel consumption with a rate of 41.2%, followed by individual transport and collective passerger transport, with 35.2% and 24 % respectively (see Table 1).

Table 1: Distribution of the energy consumption of road transport by category in 2011 (source: National Forum of Energy Efficiency, ADEREE)

Road Transport Category	Consumption (in %)	Consumption (in ktep)
Freight Transport	41.2%	1 918
Individual transport	35.2%	1 642
Collective passenger transport	24.0%	1 077
Motocycles	< 1%	23
Total	100%	4 660

Various GHG mitigation initiatives are on-going in this sector in Morocco targeting different types of transport (e.g., freight transport, urban transport, intercity transport). For instance, the National Logistics Strategy and Roll-Out of Integrated Logistics Platforms aim, among other objectives, to reduce CO2 emissions by 35% in the road freight transport sector in Morocco by optimizing movement of goods throughout the Kingdom. A UNDP-GEF project now under implementation is supporting the operationalization of this target and integration of climate change considerations into the strategy through implementation of integrated Multi-Flow Logistics Zones; rail to road modal shift; fleet renewal; eco-driving; and maintenance improvements. Regarding urban transport, cities such as Casablanca and Rabat have taken the lead by opting for electrical tram systems as low-carbon transportation modes. The Government is also supporting other programs such as the fleet renewal of old freight trucks, buses and taxis via support for new and more efficient vehicles.

Responding to the Climate Action Challenge: The City of Marrakech

In line with such initiatives, the City of Marrakech has been planning an upgrade of its public bus transport system in order to meet the needs of the growing local population and an increase in tourist visitors. This upgrade will have

several benefits for the local population since the public transport coverage of suburban areas (which are the areas hosting the majority of the city's population, often represented by modest to low income families) will improve. A bus system with a large geographic coverage will help alleviate the social exclusion of populations living in peri-urban areas. Improved accessibility to adequate transport will allow for better access to employment opportunities and other essential social components such as health and education facilities. Moreover urban public transport generates far less traffic accidents than transport by individual cars or motorcycles, which are the current dominant modes of transport in Marrakech.

To respond to these challenges, the Council of the City of Marrakech decided to integrate a Bus Rapid Transit (BRT) with two lines scheduled to open in the short term (L1 and L2) and two more lines (L3 and L4) in a medium term (see Figure 4). So far, the City of Marrakech has spent a total budget of about 35 million USD on infrastructure investments (see Figure 5 for a picture of BRT lanes). Furthermore, in line with COP22 commitments, the City Council also decided to introduce electrical buses into the BRT system (switching from using standard diesel-run buses) in order to reduce GHG and air pollutant emissions. A first line of the BRT is scheduled to be inaugurated before COP 22 with 15 electric buses. To procure this first set of electrical buses, the City of Marrakech will mobilize an additional financing of about 21 million USD.

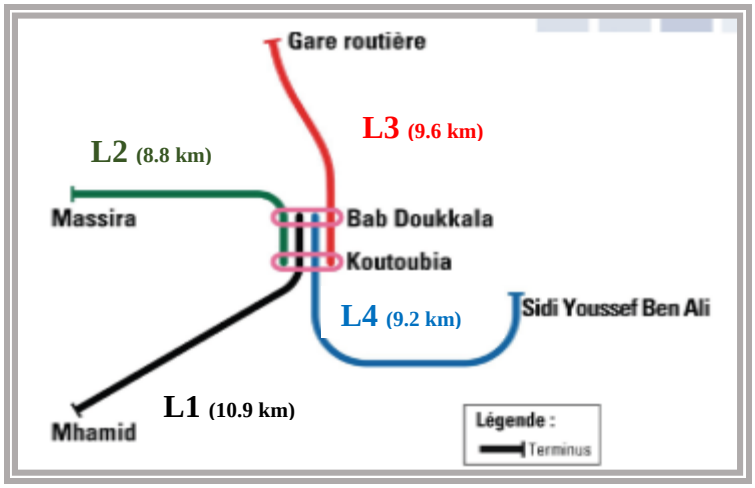

Figure 4: BRT lines expected in Marrakech

Figure 5: Dedicated road infrastructure of the BRT lines already in place

To mobilize the necessary financial resources and ensure high quality management of the future BRT system, the City Council decided in March 2016 to create a dedicated entity, the Transport Local Development Company

(TLDC[15]). The TLDC is now being established as a parastatal legal entity with more than 50% of the capital shares allocated to the City of Marrakech (the largest shareholder) and almost 30% to the Council of Marrakech-Safi Region as the sub-national governing body. A formal request was sent on the 18th of March 2016 by the City of Marrakech to the Minister of Interior to obtain the necessary financial resources for the procurement of electrical buses from a dedicated national transport fund (FART: *Fonds d'Accompangnement des Réformes du Transport routier urbain et interurbain*[16]). The plan is for the procured electric buses to be owned by the TLDC and operated by a designated private bus system operator already contracted by the City (ALSA[17]).

To further the low carbon transformation of the BRT system, the City of Marrakech is now considering the installation of a Solar Photovoltaic (PV) farm in order to (partially) power the electrical buses for lines 1 and 2 (in the short term) and lines 3 and 4 in the medium term. The Energy Investment Company (SIE[18]), a State-owned entity, is already providing technical assistance to the City of Marrakech in identifying a qualified manufacturer of electric buses to meet the required technical specifications, level of adaptability to the local climate, timely delivery before COP22, etc. A preliminary analysis was done and it was decided that High Concentration PV (HCPV) technology is the most appropriate technology for the farm given the excellent solar potential of Marrakech (3,000 hours/year of sunshine with an irradiation of more than 5 kWh/m^2/day); the fact that it withstands high temperature effects and has relatively low water requirements; and the significant capacity factor of around 40%.[19] The key principle of HCPV is the use of cost-efficient and environmentally-friendly concentrating optics that dramatically reduce the cell area, allowing for the use of more high-efficiency cells and a levelized cost of electricity (LCOE) competitive with Concentrated Solar Power and standard flat-plate PV technology in certain sunny areas with high Direct Normal Irradiance (DNI) (such as the case in Marrakech).

According to the technical specifications of the electrical buses to be powered, SIE advised the installation of a 1 MW HCPV farm at an estimated upfront capital cost of approximately 1,700,000 USD and an annual estimated cost of operations & maintenance of 28,000 USD. The TLDC will eventually own the 1 MW HCPV solar farm and sign a contract with a private firm on a build-operate-transfer (BOT contract) basis to build the plant and cover operations & maintenance of the solar farm in the short and medium term (the date for the handover or the running of the plant to TLDC is TBD). The site where the solar farm will be located has been identified at the far end of line L2 (West of Marrakech) near an electrical sub-station. The selected site belongs to the City of Marrakech and will also host the offices of the TLDC, a training center, and a maintenance center.[20]

At present the financial resources of the municipality – the largest shareholder of the TLDC – are highly constrained by COP22-related preparatory works. In addition, the level of indebtedness of the city is relatively high; hence the

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[15] According to the Municipal Charter, municipalities are allowed to develop Local Development Companies (LDC) as Public-Private-Partnerships to improve the quality of their services. So far, more than 20 LDC are operational and many cities in Morocco are relying on to this type structures to manage public service such as transport (e.g., Tramways of Casablanca and Rabat), parking (e.g., Avilmar in Marrakech), public lighting, etc.

16 The Fund « FART » is co-managed by the Ministry of Transport and Ministry of Interior. The part managed by the Ministry of Interior concerns the renewal of urban transport modes (buses and taxis), whereas the part managed by the Ministry of Transport concerns the inter-urban transport modes. The FART has an annual budget of about 22 million USD for each ministry.

[17] ALSA is a private company operating the current diesel bus system of Marrakech under a delegated management contract of public services

[18] SIE (www.sie.ma) represents the financial arm of the State for the execution of the energy mix by 2020. SIE is entrusted with the development of the medium voltage sector mainly via photovoltaics or energy efficiency. SIE provides support to municipalities for projects implementation in order to promote renewables and improve energy efficiency in many sectors.

[19] Photovoltaic generators do require water to wash dust and dirt off of the front of modules, as cell efficiency is reduced when the modules are dirty. Fthenakis and Kim (2010B) estimate that the water use during PV and CPV plant operation is 15 L/MWh, and this estimated is corroborated for CPV by Hartsoch (2010). Schell (2009) estimates that CPV water usage during operation to be similar to be 7.2 L/MWh, with the value for non-concentrator PV as double the CPV value because of the larger module area requiring maintenance relative to CPV. Therefore from a water-usage perspective HCPV is among the best options compared to standard flat-plate PV technology.

[20] No people are currently living on the site selected. The construction and operation of the plant will be done in conformity with applicable national environmental regulations and will be subject to all relevant required environmental approval and permits.

reason why City officials want to avoid taking on an additional bank loan to finance the investment cost of the plant which would weigh on the City's balance sheet. The present project is intended to address this financial barrier (**Barrier #1**) through a partial financial contribution by the GEF for the procurement and installation of the HCPV solar farm that will ensure that the City of Marrakech has the first low-carbon BRT system in all of Morocco.

Financial constraints are not the only barrier. To secure this low carbon investment over the long-term, proper management arrangements are critical. The project will also address the City's lack of capacity and experience in managing such a low-carbon BRT system (**Barrier #2**). Through technical assistance activities, the project will support the City of Marrakech and the newly created TLDC by setting-up specific MRV tools and building capacities on best practices of energy management.

The City of Marrakech is planning an expansion of the BRT system (lines L3 and L4) in the short to medium-term to ensure that most of the outer areas of the city are serviced by the new transport mode. Although the related engineering studies of the additional BRT lines are on-going, the City still lacks a broader transport sustainability strategy and detailed financial plan to ensure that all the necessary financial resources for the expansion are mobilized and made available, including an analysis of possible financing sources for the new lines and a broader plan on how to ensure allocations of sufficient recurring resources for operations and maintenance (**Barrier #3**). The necessary financial resources to procure the initial fleet of 15 electrical buses was mobilized within the particular context of COP22 and it is expected that in the case of the BRT expansion the City will need to find their own revenue sources for additional bus purchases/fuel switch platforms as well as operations and maintenance. In this regard, the project will support the TLDC in developing a transport sustainability strategy[21] and all required financial planning documents and studies for the future BRT lines (L3 and L4).

Finally, the public bus system of the City of Marrakech is characterized by a very low usage rate that does not exceed 5% as compared to other transport modes (taxis, motorcycles, etc.). For various reasons (lack of comfort, irregular schedules, low frequency, etc.), the population currently gravitates towards other means of transport, in particular taxis, motorcycles and individual cars. The current bus network also suffers from various weaknesses in terms of geographical coverage. The peripheral areas (suburbs) of the City are presently served in only a limited way – despite the significant demographic density of these areas which presently constitute around 27% of the total population of Marrakech. It is also important to note that these areas are witnessing large urban development projects, which is inducing increased demand for adequate transportation options. To improve the level of ridership (**Barrier #4**), the project will provide support in the designing the most appropriate communication and awareness campaigns and products for the BRT system in line with the local context. The actual public awareness campaign will be implemented by City authorities (with co-finance) based on products designed by the GEF project.

b) The baseline scenario or any associated baseline projects:

Morocco is seeking to position itself as a developing-world leader in the fight against climate change by raising its already ambitious energy targets even further from those stated at the COP21 global climate talks; it now aims to obtain 52% of its energy supply from renewable sources by 2030, which will allow the country for the first time in its history to have a greater share of electricity produced from renewable sources than that produced from fossil energy sources. As early as 2009, the government laid out programmes to reach 2,000 MW of installed capacity each of solar, wind and hydroelectric power by 2020, which would be equivalent to 42% of total forecasted power capacity by that date. These programmes are progressing as planned.

[21] The concept of sustainable transportation promotes a balance between transportation's economic and social benefits and the need to protect the environment. In further articulating this idea, one definition is a sustainable transportation system as one that: 1) Allows individuals and societies to meet their access needs safely and in a manner consistent with human and ecosystem health, and with equity within and between generations; 2) Is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy; and 3) Limits emissions and waste within the planet's ability to absorb them, minimizes consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise. Within the context of transportation planning, the term "sustainable" can also refer to a plan itself – whether its objectives are achievable in view of the various financial, political and technical factors that will ultimately influence its success.

Regarding the hydroelectric power, the Kingdom of Morocco already has an installed electrical capacity of 1,770 MW of which 460 MW is in the form of ETSP (Energy Transfer Station by Pumping). A new 350 MW ESTP under construction will be commissioned by 2020. Over 100 MW of small hydropower plants will be developed by the private sector between 2017 and 2019 as part of the 13-09 law on renewable energy. An additional capacity of 850 MW is likely to come on line between 2021 and 2030.

As part of the integrated wind energy program, more than 800 MW of wind farms are already in operation; 550 MW are under development; an 850 MW integrated project was recently awarded to a international-national consortium; and an additional 2,500 MW is targeted to be developed between 2021 and 2030.

From the solar energy perspective, the country's first large-scale solar plant, the 160 MW Noor 1 CSP plant near Ouazarzate begun full production in February 2016 and two other CSP plants in the same complex, Noor 2 and Noor 3 (with a combined 350 MW of additional capacity), are currently under construction. The tendering process for an additional 170 MW of solar PV is planned in three other sites (Ouarzazate, Laayoun and Boujdour) and engineering and financial studies for more than 1,200 MW of solar energy are now underway.

While Morocco has prioritized the development of CSP with storage to meet the urgent needs of the national electricity system in order to ensure a better modulation of the peak power demanded via storage capacity, it has also planned for the development of a large scale PV programme as part of the National PV Roadmap launched in November 2014 by the Ministry of Energy. The establishment of mid and large capacity PV solar farms totaling an installed capacity of 3,440 MW is expected between 2016 and 2030, of which 40% is expected before 2020 (i.e., 1,340 MW). To support the development of this program, various reforms have been put in place:

i) Promulgation of Decree n°2-15-772 in October 2015 that sets the regulatory framework to connect **medium voltage renewable sources** to local grid networks under the 2010 renewable energy law 13-09;
ii) Amendment of law 13-09 by law 58-15 in 2015, which introduced – among other reforms – the opening of the electricity market from **low-voltage renewable sources**, which will promote the development of the industrial sector of small and medium installations, particularly for PV and creating jobs in the renewable energy sector;
iii) The establishment of an independent regulatory agency of the electricity sector to regulate the developments affecting the energy sector. This agency will ensure compliance with applicable regulations, approve tariffs, and ensure access conditions to the electricity grid;
iv) Increased technical capacities - there has been the creation of a series of Training Institutes for Renewable Energy Jobs and Energy Efficiency (IFMEREE[22]), the first of which is already operational in Oujda and the second of its kind will open in Tangier in 2017;
v) Promotion of R&D – strenghtening of the R&D infrastructure by the creation of a Research Institute (IRESEN[23]) and the realization of the "Green Energy Park" complex, with an area of 8 hectares including 3,500 m² of advanced laboratories and several test platforms and pilot projects; and
vi) The establishment of a solar cluster as a platform bringing together professionals and private sector companies.

For the transport sector, as the highest energy consuming sector, energy efficiency has been recently introduced through various govermental initiatives, some of which are supported by international donors namely a World Bank program aiming at the the strengthening of the capacity of urban transport institutions to plan, implement, and monitor infrastructure and services, and to improve the level of service of urban transport in some cities in Morocco. This program is supported by a Development Policy Loan (DPL) from the Word Bank and EBRD (200 million USD from 2015-2020[24]). This program is structured arround the following three results areas:

Results Area 1: Strengthened central capacity to plan and monitor urban transport;
Results Area 2: Strengthened local capacity to plan, implement and monitor urban transport; and
Results Area 3: Reduced bus journey time in targeted corridors in select cities.

[22] *Institut de Formation aux Métiers des Energies Renouvelables et de l'Efficacité Energétique* : http://www.ifmeree.ma
[23] *Institut de Recherche en Energie Solaire et Energies Nouvelles :* www.iresen.org
[24] http://www.banquemondiale.org/projects/P149653?lang=fr

As part of the targeted cities[25], the City of Marrakech will benefit from all of the capacity building activities that are part of the Results Area 2 for which a budget of 70 million USD has been allocated. The City of Marrakech will also benefit from the financial support packages that are part of Results Area 3, for which a budget of 140 million USD has been allocated to improve infrastructure and systems [including Area Traffic Control (ATC), Intersection Signal Control (ISC) systems, Intelligent Transport Systems (ITS), integrated fare collection systems, transfer stations, and bus lanes]. Based on the annual expenditure planning of Results Area 3 from 2015 to 2019 among the beneficiary cities, the City of Marrakech has been allocated a total budget of 20 million USD (4 million USD for ISC system, 7 million USD for transfer stations and 9 million US for bus lanes). These budgets are considered by the City of Marrakech in their project co-financing letter.

However it is important to note that while substantial these current initiatives are limied to certain types of activities and fall short of comprehensively addressing the challenges facing the City's transport sector which would benefit from support for an additional suite of complementary activities. This project will add on to these on-going efforts by supporting the use of HCPV technology in the transport sector in an innovative and integrated way and contribute to GHG mitigation, technology transfer, capacity building and increased social inclusion (Outcomes 1 and 2). The project will also capitalize on and incrementally build on a number of best practices gained from already implemented initiatives and on-going actions described above in order to generate maximum synergies.

c) The proposed alternative scenario, GEF focal area strategies, with a brief description of expected outcomes and components of the project:

As mentioned, the public bus transport system in Marrakech is currently undergoing a major transition through the integration of the BRT system and the establishment of the necessary infrastructure, equipment and management structures for its operation. The project supports this system by integrating a low-carbon energy component through the installation of a 1 MW HCPV solar farm. The energy produced by this plant will primarily be dedicated to powering electrical buses of the BRT system and feed excess power into the national grid, thus contributing to the reduction of energy consumption and GHG emissions. The project also includes support for eco-driving training for bus drivers, another proven low-carbon measure. The medium-term objective of the project is to pilot a complete low-carbon tranport model that can be replicated in other cities of the Kingdom and elsewhere.

The project can be categorized under the GEF focal area Climate Change Mitigation Programme 2 as it supports integrated low-emission urban systems, technologies and practices operationalized in the City of Marrakech, one part of a broader national transformational shift towards a low-emission and climate-resilient development pathway through the accelerated adoption of low-carbon technologies. The Government of Morocco will capitalize on the pilot case in the City of Marrakech by scaling up the initative into other cities in the Kingdom at a later stage.

The immediate objective of the project is to support the transition of the public transport system of the City of Marrakech to an innovative low-carbon BRT model powered by a 1 MW solar farm. To achieve this objective, the project will develop and implement the following interrelated components.

Component 1: Integrated planning, capacity-building and MRV systems for the low carbon BRT System

This component supports planning, monitoring, reporting, verification and the building of capacities of the entire BRT system (new and future lines, L1 – L4). The elaborated studies and concluded financial arrangements so far only apply to the first two BRT lines (L1 and L2). The BRT system would have to expand by adding two more lines (L3 and L4). Through this component, the project will support the TLDC in developing a transport sustainability strategy (covering the entire BRT system) and all required financial planning documents and studies (as well as a maintenance strategy) for the future BRT lines (L3 and L4).

To evaluate the efficiency and efficacy of the BRT system, MRV activities will have to be implemented from the onset. Therefore, it is important to support the MRV system in order to set real time monitoring and verification practices as management means for continuous improvement, mainly to the new low carbon components. Support will be provided in part by helping TLDC identify the adequate profiles of human resource staff to be recruited.

[25] Greater Rabat, Casablanca, Tangier, Marrakesh, and Agadir are the targeted cities of the World Bank urban transport program

The project supports the city's efforts in removing all institutional capacity and planning barriers that might impact the development of the BRT system. Even though awareness was integrated progressively at the institutional level, building capacities of main stakeholders – from public or private sector – is key to the success and durability of the project results. Therefore, this component's role is also to build technical and managerial capacities.

This component aims to ensure capacity building at an operational level. Technicians from the TLDC will be trained on relevant best practices of energy management. Furthermore, and in order to ensure complementarity between the electrical BRT system and existing diesel buses, bus drivers will receive continuous eco-driving training in order to ensure less GHG emissions. The diesel bus drivers will first receive an eco-driving training certificate and the project will ensure that continuous trainings are provide to sustain the positive impact on fuel consumption.

This component will have the following three main outputs:

Output 1.1: Sustainable transport financial strategy for development and operationalization of all current and future BRT lines;

Output 1.2: An MRV system for the BRT system, integrating sustainability dimensions across all facets of operation, is in place;

Output 1.3: Municipal capacities on energy efficiency best practices in transport contexts are developed.

Component 2: Commissioning of 1 MW solar farm for powering of electric buses for the City's BRT System

As part of its on-going technical advisory support to the City of Marrakech, the SIE will be in charge of preparing all the technical specifications and tendering documents for the installation of the 1 MW HCPV solar farm. Since the project will be implemented following UNDP's "National Implementation Modality-NIM", according to the Standard Basic Assistance Agreement between UNDP and the Government of Morocco, the tendering process will be executed according to the national modalities of public tendering. Accordingly, a Tender Evaluation Committee will be established, with representatives from SIE, Delegate Ministry in Charge of Environment and City of Marrakech, TLDC, and other relevant national or local entities (see section *3. Stakeholders*). As indicated in section 1(a), the competitively selected solar energy company will sign a Build-Operate-Transfer (BOT) contract with the TLDC and will be responsible for the engineering, procurement, construction and operation of the solar farm.

This component is related to the procurement of all necessary upfront equipment to implement the innovative low carbon BRT system. The GEF investment will partially support the capital costs of the 1 MW HCPV farm to power the electrical buses with the remainder paid by the City. Based on the estimated capital cost, the GEF investement will represent a share of 55.88% with the remainder to be provided by the City of Marrakech via TLDC.

Beyond the investment aspect, the legal issue of the grid connection represents a key success factor of the project. SIE is already in discussions with Marrakech's autonomous water and electricity distribution board (RADEEMA[26]) on the legal and financial arrangements for feeding the excess power into the grid. As part of its technical advisory service, the SIE will provide technical assistance on the plant's connection to electrical grid and net-metering system to design the most appropriate agreement according to the newly promulgated Decree n°2-15-772 (October 2015) that sets the regulatory framework to connect medium voltage renewable sources to local grid networks under the 2010 renewable energy law 13-09. It should be noted that the SIE, City of Marrakech and RADEEMA are already collaborating on another project regarding the production of electricity from biogas and its injection into the city grid and therefore the template/PPA used for that project will be replicated for this project.

Component 2 will generate the following outputs:

Output 2.1 Construction and commissioning of the solar farm using a BOT model with partial funding from GEF;

Output 2.2 Sustainable O&M system in place for solar farm.

[26] RADEEMA was heavily involved during the PPG phase and demonstrated a great wiliness to collaborate on the project (www.radeema.ma).

Component 3: Knowledge management and awareness

This component will ensure the project and BRT system is successful through support for the development of communication and awareness activities targeted at the public to encourage the BRT system's utilization; these will not be executed via GEF funds but rather through Government cost-sharing or Government channels. Additionally, this component aims to create a governance framework to ensure the replication of the project elsewhere in Morocco. A multi-actor committee will be created to capitalize on the experience of Marrakech that will include national, sub-national and local stakeholders. The component will include the following three outputs:

Output 3.1: Lessons learnt, experiences and best practices related to the system are compiled and disseminated to other cities in Morocco

Output 3.2: Communication and public awareness campaign for BRT utilization developed

Output 3.3: A multi-stakeholder committee (within City of Marrakech) on low-carbon mobility is established and operational.

d) Incremental/ additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF/SCCF and co-financing:

GEF resources are being requested to provide technical assistance and capital investment to improve the urban public transport of the City of Marrakech by ensuring the integration of low carbon components into the BRT system. The proposed activities of this unique project will showcase the Morocco-GEF partnership to Marrakech inhabitants, visiting tourists, as well as COP22 participants since the launch of the low carbon BRT system is planned during COP22. For the solar farm, it is not expected to have the installation ready for COP22; however it is hoped that some of the plant may be under construction by that time if the procurement of the contractor is successful. Accordingly, GEF financing is expected to play a key catalytic role in this project as it will take advantage of Morocco's role as the host of the COP 22 to initiate a model urban transport system with a contribution to climate change mitigation..

The GEF funds will be used for incremental activities designed to remove the identified barriers and expand the scope of - or supplement - the baseline activities in leading to or enhancing global environmental benefits. A component-by-component assessment of the incremental activities and their linkage to co-finance is described below:

Table 2: Components and Incremental Reasoning

Incremental Activities (GEF Project Outputs) vis-à-vis baseline co-finance
Component 1: Integrated financial planning, capacity-building and MRV systems for the low carbon BRT System
This Component addresses Barriers #2 & 3 and builds on baseline co-finance activities from the City of Marrakech. The City of Marrakech is forecasting to allocate US$ 200,000 for activities related to the planning of future BRT lines (L3 and L4) and putting in place the appropriate management capacities. Part of GEF grant for this component will be dedicated to the design and implementation of an MRV system, as a key element to track the effectiveness and efficacy of the low carbon BRT system, and support the financial planning of future BRT lines. Although the related engineering studies of the additional BRT lines are on-going, the City still lacks a broader transport sustainability strategy and detailed financial plan to ensure that all the necessary financial resources for the expansion are mobilized and made available, including an analysis of possible financing sources for the new lines and a broader plan on how to ensure sufficient recurring resources for operations and maintenance. In this regard, the project will support the TLDC in developing a transport sustainability strategy and all required financial planning documents and studies for the future BRT lines (L3 and L4).This is not provided for in the cp-finance and this GEF support is needed. Without GEF support, the City of Marrakech will miss the opportunity to properly upscale the BRT system and integrate proper financial planning and MRV procedures for its low carbon components.
Component 2: Commissioning of 1 MW solar farm for powering of electric buses for the City's BRT System
This Component addresses Barrier #1 and builds on baseline co-finance activities from the City of Marrakech and SIE.

The City of Marrakech is allocating an investment of US$ 55,473,683, in which US$ 34,421,052 is related to the BRT infrastructure and US$ 21,052,631 corresponds to the procurement of electrical buses and partial financing for a 1 MW HCPV solar farm. On the other hand, SIE will contribute with in-kind co-financing of US$100,000 consisting of technical assistance during the selection process of the manufacturer of electrical buses; legal advice on solar farm connection to the city electrical grid; preparation of the solar farm tender documents; and follow-up on activities during implementation. GEF financing for this component is intended as an investment to partially support the procurement and installation of the 1 MW HCPV solar plant. This investment represents a key element for a successful implementation of this project, and the GEF contribution is vital. Without GEF financing, the City of Marrakech – with its limited financial resources and a high debt load – cannot proceed with the procurement of the 1 MW solar farm in the near term, thereby delay the the powering of electrical buses by a clean energy source.
Component 3: Knowledge management and awareness
This Component addresses Barrier #4 and builds on baseline co-finance activities from the City of Marrakech. The City of Marrakech is forecasting to allocate US$ 100,000 for public awareness activities. Considering the importance of knowledge management and benefits from awareness and communication activities, GEF support for this component will be dedicated to strategic advisory products related to the design of a locally-specific awareness campaign and communication activities in order to expand the expected project effects. GEF financing will also support the work of the organizational framework dedicated to low-carbon urban mobility to ensure capitalization, replication and dissemination of Marrakech experience in other cities in Morocco.

e) Global environmental benefits (GEFTF), and adaptation benefits (LDCF/SCCF):

The main expected environmental benefits of the project are related to reductions in greenhouse gas emissions and air pollution.

Direct GHG emissions reductions:

- Installation of 1MW solar plant: The solar power plant is based on the HCPV technology which is characterized by a capacity factor of 40%. The energy produced from the solar farm for the buses would otherwise have to be supplied by the national grid, which has an emission factor of 0.59 tCO2 / MWh. The calculated direct emissions reductions from the 1 MW HCPV solar farm are estimated to 16,780 tCO2. The detailed calculations are provided in Annex C.

It is important to note that given that a sizeable portion of the electricity produced by the plant is envisioned to be directly supplied to powering electric buses that would otherwise run on diesel under a BAU scenario, ideally we would calculate the direct emissions for Component #2 by collecting information on how many gallons of diesel would be avoided (with the equivalent tCO2 avoided derived from applying a mobile combustion factor for diesel) in a given year from the bus fleet switching to the clean zero-carbon electricity provided by the plant.. Annex D "ESTIMATED CALCULATIONS OF DIESEL SAVINGS AND SHARE OF RENEWABLE ENERGY IN THE BRT ENERGY MIX" estimates that as much as 992,994 leters of diesel will be replaced by renewable energy sources by the end of the project" but this is an estimate. However since we do not have detailed information at this stage on exactly how much of the plant's energy production will be used to directly power the fleet of buses and how much will be fed into the grid during the project implementation, we decided to use the most conservative estimate and make a simplified assumption that all energy produced is fed into the grid and therefore the ERs are calculated based on the grid emissions factor and not the mobile combustion factor for diesel. Similarly we do not yet have detailed information to calculate all the direct ERs from support to the BRT system that will come from modal shift. As such the direct ERs presented for the plant are considered as very conservative; the benefits will be improved and quantified during the project implementation once more detailed information is collected..

- Eco-driving: even after the introduction of the BRT system, the public urban transport in the city of Marrakech will continue to use diesel fueled buses. To reduce the diesel consumption of these buses, drivers will receive initial eco-driving trainings and the project will sustain such an initiative by supporting continuous eco-driving trainings. The application of eco-driving practices can provide a GHG emission reduction of 10% compared to current practices. The calculated direct emissions reductions from eco-driving are estimated to 10,547 tCO2. The detailed calculations are provided in Annex C. Similarly as noted the total ERs from the BRT will be better

quantified (where possible) during project implementation and in connection with the development of the MRV system under Component #1.

The total combined direct emissions reductions are estimated at **27,327 tCO2** based on the lifetime investments of the project.

Indirect GHG emissions reductions:

The indirect emission reductions that will result from the implementation of the GEF project have been calculated using the top down and the bottom-up approaches for each measure. Details are provided in Annex C.

Bottom-up approach:

According to this approach, the calculation of the indirect emissions reductions for each measure (i.e., HCPV solar plant and eco-driving) is based on the direct emissions reductions explained above and the application of a replication factor. A replication factor of 2 is used for the indirect emissions reductions related to the HCPV solar plant assuming that this project will be replicated in at least one other city ten years after project closure (i.e. during the period 2020-2029). A replication factor of 4 is used for the indirect emissions reductions related to eco-driving considering that the intended format for training will be used beyond the project period in follow-up training sessions for the expected timeline until 2029.

The bottom-up approach gives a total of indirect emissions reduction of 75,748 tCO2e.

Top-down approach:

Calculation of indirect emissions reductions via the top-down approach has also been calculated for each measure to reach an aggregate figure. This approach takes into account the technical and economic potential GHG savings with the perspective application within 10 years after the project (P10); multiplied by an assumed GEF Causality Factor (CF) which indicates to what degree the GEF intervention can claim causality for the reduction. The top-down indirect impact calculation generally constitutes the high extent of the range of the potential of indirect impacts. A conservative CF of 60% was used for both PV and eco-driving corresponding to Level 3 “GEF contribution is substantial, but modest indirect emission reductions can be attributed to the baseline”. For eco-driving, a CF of 60% seems reasonable given the amount of savings generated through a more efficient driving pattern and the relatively high cost of fuel that is expected to prevail in the country and transport sector, which would lead in any case to some improvement in driving behaviour. Similarly, for the HCPV solar farm, the on-going reforms at various levels (regulatory, institutionnal, financial, R&D, industrial integration, etc.) that are part of the national PV road map will inevitably lead to the introduction of more groud and roof-top MV and LV PV installations.

The top-down approach gives a total of indirect emissions reduction of 103,554 tCO2 e.

Accordingly, the 1MW solar plant generates 33,559 tCO2 and 40,271 tCO2 as emissions reductions through the bottom-up and top-down approach, respectively. Emission reductions due to eco-driving are estimated to 42,189 and 63,283 tCO2 for the bottom-up and top-down approach, respectively. As such, total aggregated indirect emissions reductions are estimated to range from **75,748 tCO2 to 103,554 tCO2**.

Overall the project’s main GHG benefits are indirect, emanating from the pilot scale demonstration aspect, capacity development and institutional strengthening aspects of the project.

The direct global environmental benefits of the project include also reduced air pollution. Presently all the diesel buses connect at a hub station located near "Jamma Lafna" which generates significant air pollution at this high density tourist area due to emissions of air pollutants such as Particulate Matter (PM) and Nitrogen Dioxide (NO2). By integrating the electrical BRT sytstem, fewer diesel buses will have to access the center of the city for refueling which will lead to an improvement of air quality.

f) Innovation, sustainability and potential for scaling up.

Innovation:

The project idea of the BRT system supported by HCPV is an innovative pilot case in Morocco (HCPV by itself has already been done in Morocco). The project is a response to the specific need for clean energy to power electrical

buses of the future BRT of the City of Marrakech to make it a bona-fide, vertically-integrated low carbon transport system. Characterized by its significant solar potential, the choice was made for the implementation of a solar power plant based on HCPV technology. By introducing low-carbon technologies in the day-to-day life of local population and tourists visiting the city, the project raises public awareness on climate change in a familiar environment to achieve a higher acceptance, understanding, and support for the installed low-carbon technologies, which is expected to facilitate the planned scaling-up process.

Sustainability:

The project is in line with the country's overall policy objectives on GHG emissions reductions, improvement of public transport and development of renewable energy sources. The project takes advantage of a globally structured foundation, a clear national vision embeded in the INDC (NDC in the future) and a strong leadership at the local governmental level.

Institutional strengthening and capacity building are significant components in this project and key for establishing a basis for sustainability. As an ongoing process, institutional strengthening and capacity building are fundamental components that will ensure project sustainability and continued success through the effective management of the low carbon BRT system. With institutional capacities strengthened – particularly those of the City of Marrakech and TLDC – these organizations will be able to provide the coordination and monitoring required for futur extensions of the BRT system. The use of a BOT model by a qualified private sector firm will ensure that local capacities are built among local actors.

Furthermore, Morocco has several projects and programs aimed at capacity building and the provision of technical assistance in the mitigation of GHG emissions which will help support this project with respect to the use of PV technology and eco-driving. Various other international initiatives [such as the UNDP-GEF Logistics project, UNEP FIRM and UNDP Low Emission Capacity Building (LECB) projects] that are designed to strengthen Morocco's technical and institutional capacities relating to low carbon development, design of robust MRV systems, development and implementation of NAMAs, etc will help make sure this project has the required support for long-term sustainability. These initiatives will provide significant support for the project yielding results over the short and long term.

The commitment expressed by the partners will help ensure the funding and implementation of the various measures planned as part of this project. The financial sustainability of these measures will require the mobilization of additional resources that can go beyond national funding capacities. Morocco's current desire to shift its development towards a low-carbon pathway will be the main driver of future initiatives. So far, Morocco has shown strong leadership in the MENA region and globally[27] in attracting international finance and has all the capabilities to sustain this commitment. It ranks first in attracting private capital to the RE sector among MENA counries in the 2015 Arab Future Energy Index which is a testament to its commitment to market-based models.

Potential for scaling up:

Improvement of management, particularly through capacity-building for a dedicated TLDC and the multi-stakeholders' committee, will contribute and facilitate the project's potential for scaling-up. The TLDC mandate is to ensure a proper and efficient management of the BRT system as well as its scaling-up by adding more lines to serve the growing population needs and expanding urbanization. On the national side, the multi-stakeholders committee will focus on capitalizing on Marrakech's experience and ensuring its replication elsewhere in the country among the many large and mid-size cities in Morocco planning their new public transport system. In this perspective, the Energy Investment Company (SIE) will play a major role given its leading role in promoting the development of new energy platforms through investment and project development in Morocco, with Municipalities as their chief partner.

[27] According to the web site http://www.climatefundsupdate.org, Morocco is ranked first in the MENA region as a recipient of multilateral and bilateral fundings. In terms of multilateral fundings, Morroco is the 4th recipient on the global level.

2. *Child Project?* If this is a child project under a program, describe how the components contribute to the overall program impact.
NA

3. *Stakeholders.* Will project design include the participation of relevant stakeholders from civil society organizations (yes ☒ /no☐) and indigenous peoples (yes ☐ /no☒)? If yes, elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project.

	Stakeholder	Envisaged role in the project
Main Executing Partner	Delegate Ministry in Charge of Environment to the to the Ministry of Energy, Mining, Water and the Environment	The Delegate Ministry in Charge of Environment has significant experience designing and implementing GHG mitigation projects. The Ministry is also the GEF and UNFCCC focal points and is presently heavily involved in the organization of COP22. The Ministry will be the lead executing agency of the proposed project and will Chair The Project Board (PB). The project components will be implemented by the Municipality at the request of the Delegate Ministry. The Ministry will also assist local partners during project implementation with the support of its permanent team of engineers and managers based in Marrakech at the Regional Observatory for Environment and Sustainable Development.
Main Responsible Partner	Municipality of Marrakech	The Municipality of Marrakech is the major stakeholder in the implementation of all project components. The municipality of Marrakech will be the responsible partner of the project and will be involved in planning, implementation, monitoring and funding of all activities. The Municipality has a key role in mobilizing a significant part of the project co-financing and in issuing the necessary municipal permits.
Main Counterparts and Stakeholders	Transport Local Development Company (TLDC)	Created by the Municipality of Marrakech with more than 50% of capital shares and supported by the Council of Marrakech-Safi Region (30% of capital share), the TLDC will manage the BRT system. TLDC will own the electrical buses and the solar farm and oversee the BOT contractor. The TLDC will be the recipient of the financing from the Ministry of Interior and any other public or private funding source supportive of the BRT system.
	Energy Investment Company (SIE)	SIE is already assisting the City of Marrakech in various projects, such as the improvement of the energy efficiency of public lighting, production of electricity from waste biogas, procurement of electrical buses, etc. For this project, SIE will be in charge of preparing all the technical specifications and tendering documents for the installation of the 1 MW HCPV solar farm on behalf of the City. SIE will provide also provide legal advice on solar farm connection to the city's electrical grid and net metering.
	Marrakech's autonomous water and electricity distribution board (RADEEMA)	Created as a local utility in 1970 upon a decision of the Council of the City of Marrakech, RADEEMA is in charge of the distribution of electricity and water and treatment wastewater. RADEEMA is supplied electricity from the national grid and distributed through its high voltage network (100% underground and 1288 km long) and low voltage network (57% underground and 2041 km long). RADEEMA's involvement in this project will relate to the connection of the HCPV solar farm to the city's electrical grid and establish of a net metering system with TLDC as the future owner of the solar farm.
	BOT company (private firm)	The company that will be selected as a result of the bidding process of Component 2 and will be in charge of the engineering, procurement and construction of the 1 MW solar farm. The company will be also be in

		charge of operation and maintenance activities for a certain period to be decided in the tender document (the transfer timeline to TLDC is TBD).
	National Agency for the Development of Renewable Energy and Energy Efficiency (ADEREE)	ADEREE is a public institution working for the widespread use of both renewable energy and energy efficiency. Framed by the Law 16/09, ADEREE's mission is to contribute to the implementation of the national renewable energy and energy efficiency policy. ADEREE has gained significant experience in the regional deployment of RE and EE through its territorial strategy "Jiha Tinou" in 3 pilot municipalities selected through an expression of interest (i.e.; Agadir, Oujda & Chefchaouen). ADERRE will support the Tender Evaluation Committee, provide technical assistance during the construction and operation of the solar farm. The TLDC can also benefit from the training courses that ADEREE intends to organize to build capacities at a local level. Regarding eco-driving, ADEREE has also some training experiences to be shared with the project.
	Research Institute for Solar Energy (IRESEN)	IRESEN was established to bring R&D in applied science nationwide, develop innovation and encourage networking. IRESEN also aims to ensure the definition of research areas; and to implement, fund and manage projects of Research and Development. IRESEN and OCP Group (national phosphate company) have joined forces to create a state of the art platform for research and training in renewable energy, namely The Green Energy Park[28], with various solar energy testing facilities (PV, CSP). IRESEN will share its R&D expertise to assist the solar farm Tender Evaluation Committee, share its knowledge with the TLDC during operations, and capitalize on the project results to improve R&D in Morocco.
	Ministry of Interior	The Ministry of Interior, particularly the Planning and Infrastructure department from the General Direction of Local Authorities (DGCL), provides technical and financial supports to local authorities (Provinces, Prefectures and Municipalities) in improving their urban transport planning. In this project, the Ministry of Interior will play an important role by providing the necessary financial resources for the purchase of electrical buses from the dedicated national transport fund "FART".
	Civil Society Organizations (CSOs)	CSOs and local associations will be widely consulted and involved in project implementation. They will play a crucial role in various activities, specifically Outputs 3.2 and 3.3. More detailed explanations of how CSOs will be engaged in the project will be elaborated in the project inception report.

[28] http://www.greenenergypark.ma

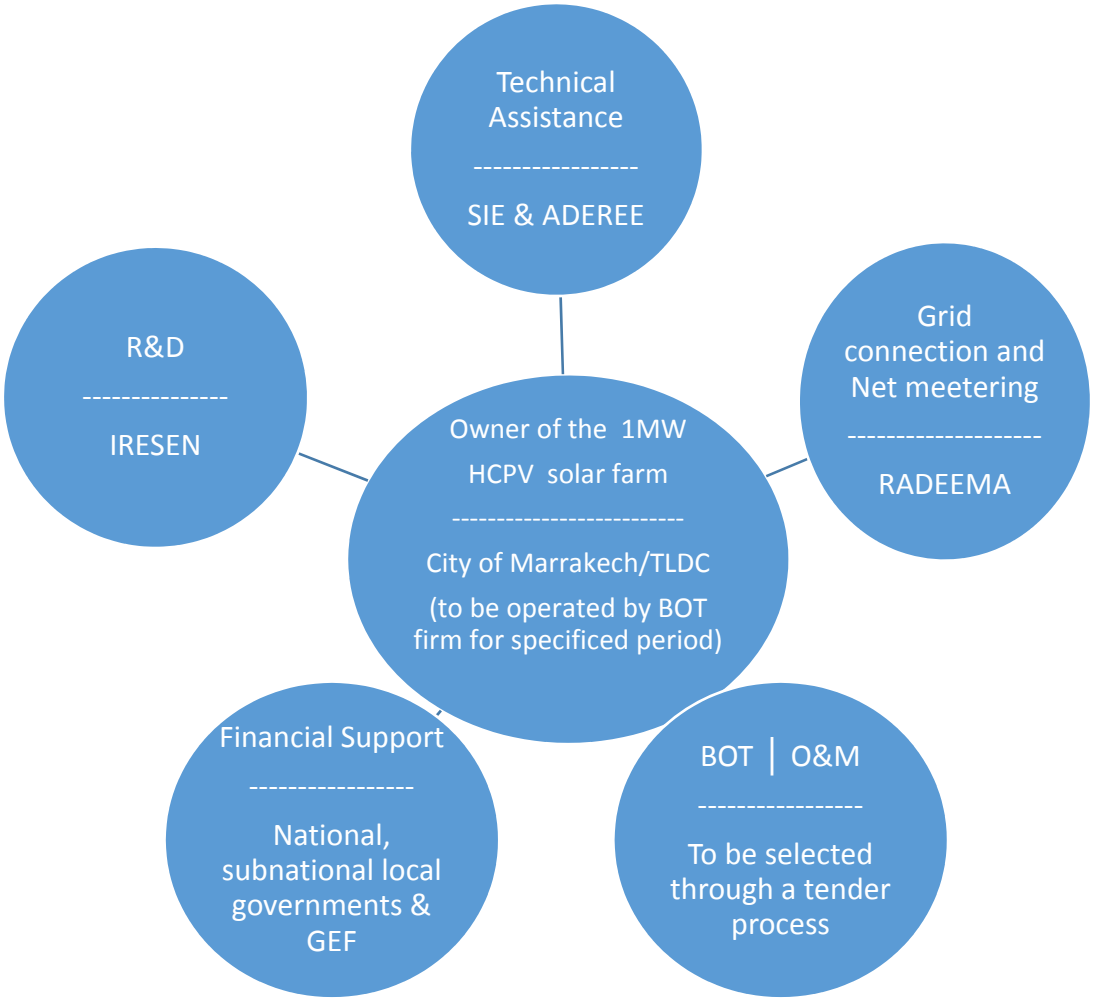

Figure 6: Role of the different stakeholders involved in Component 2

4. Gender Equality and Women's Empowerment. Are gender equality and women's empowerment taken into account (yes ☒ /no☐)? If yes, elaborate how it will be mainstreamed into project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men.

Gender issues in public urban transport are particularly relevant in Morocco. Indeed, women are significantly less likely than men to have a driving license. Instances of misbehavior, harassment, or violence towards users in general and women in particular have been reported. A majority of women in major cities consider that the state of public transport, particularly in terms of safety, obstructs their access to basic social services, limits their labor force participation, and potentially reduces their income.

Recognizing the importance of gender equality, the Municipality of Marrakech relies on this project to foster gender mainstreaming by quantifying and monitoring the number of direct beneficiaries disaggregated by gender. Women tend to choose their public transport means according to specific criteria, such as comfort and security. During the design phase of the Urban Transport Plan, safety and comfort aspects were considered as high priorities by the Municipality to ensure an optimal and equal utilization of the system by men and women. In this context, the BRT network was expanded to serve the suburbs that are presently less serviced by the actual bus system and less attractive to women especially for security reasons. Furthermore, the new buses will offer a great improvement in comfort and quality of service, which will meet the needs of not only women but also the needs of other vulnerable categories of beneficiaries such as the elderly, pregnant women and disabled people.

Improved urban mobility will have various positive impacts on women, mainly those living in suburbs that are socially disadvantaged, via the following: i) by shortening distances in a secure and comfortable way, thereby creating more access to economic opportunities and new jobs; and ii) easier access to some vital social services available at the city center such as education facilities (universities, technical training centers, private schools, etc.) and health care centers.

Mainstreaming gender and monitoring project results will be expressed in the gender-specific objective indicator based on the number of proejct beneficiaries disaggregated by gender (see Annex A). Based on the estimated gender impact and level of gender mainstreaming set by UNDP , the project is considered gender targeted. The project addresses the gender aspects and will significantly contribute to meeting the needs of the various above-mentioned social groups (women, elderly and disabled).

Moreover, the project will aim to ensure that both women and men are provided equal opportunities to participate in and benefit from the project, without compromising the technical quality of the project results, in particular:

vii) Efforts will be made to promote participation of women in training activities, both at managerial and technical levels, as participants and facilitators;
viii) Gender-sensitive recruitment will be practiced at all levels where possible, especially in the selection of project staff;
ix) All decision-making processes will consider gender dimensions. At project management level, Project Steering Committee meetings will invite observers to ensure that gender dimensions are represented. At the level of project activity implementation, effort will be made to consult with stakeholders focusing on gender equality and women's empowerment issues;
x) When data-collection or assessments are conducted as part of project implementation, sex-disaggregated data will be collected, for instance data related to male and femal bus utilization ratio;
xi) Gender-sensitive language will be used in all communication and awarness activities.

5. *Benefits.* Describe the socioeconomic benefits to be delivered by the project at the national and local levels. Do any of these benefits support the achievement of global environment benefits (GEF Trust Fund) and/or adaptation to climate change?

Public urban transport is an integral part of the socio-economic development of countries. The benefits of this project can be grouped into two categories:

Socioeconomic Benefits for the Municipality of Marrakech

The profitability of urban public transport is key element for the city because of its added value. Indeed, at this stage, the current system of urban public transport is not economically viable. The increase in the usage rate targeted by the project will increase the added value of the sector and its profitability. Improving the system's profitability will be a significant source of support to the city because of the revenues generated.

Furthermore, urban public transport acts as an accelerator of economic activity. Therrefore increasing the usage rate will strengthen the economic vitality of the city. Also, the system to be introduced will strongly contribute to the reduction of traffic congestion, reducing non-productive hours, etc..

The introduction of electrical buses will reduce the use of diesel buses, which will provide a real budget savings for the City of Marrakech. Based on the diesel consumption data provided by the City of Marrakech for the year 2015 and considering the introduction of 30 elecrical buses to opereate BRT lines L1 and L2 (15 buses during the first year of the project), the City of Marrakech will save (from their current fuel budget) an estimated $2,221,172 at the end of the project (i.e; after 2 years) and $28,875,233 after 15 years as the lifetime of the electrical buses. More details on theses calculations, data and assumptions are provided in Annexe D.

These budgetary savings can be considered as a miminum since more savings will be provided by the introduction of electrical buses in the futur lines L3 and L4 and also by the consistency of eco-driving practices with at least a 10% saving on diesel consumption. Calculations of these extra savings will be reviewed during the project implementation.

Moreover the introduction of solar energy to power the BRT electrical buses will have a significant impact on the precentage of total energy derived from renewable sources of the public transport. The rate of renewable energy in the BRT energy mix is estimated at 24% (see Annex D). As an objective indicator of the project, this rate will be monitored and recalcultated during the project implementation once real data becomes available from the operations of the electrical buses and HCPV solar farm.

Benefits for the population

The project will provide benefits for the population with regard to the quality of transport and environment. In a quantifiable manner, introduction of the BRT system in the City of Marrakech will improve some of the following indicators suggested by the ISO 37120[29] "*Sustainable development of communities -- Indicators for city services and quality of life*":

xii) Number of Km of high capacity public transport system per 100 000 population : by end of the project this number will reach 2.18 once the two BRT lines (L1 and L2) becomes fully operational and servicing a population of 900,000 inhabitants covered by the BRT system. This number will reach a value of 4.27 beyond the project implementation period once the future lines L3 and L4 becomes operational in a medium term. This indicator is part of the project objective indicators (see Annex A);

xiii) Annual number of BRT trips per capita: this number is estimated to 28,8 trips/capita based on a daily number of trips of 71,000 (in both lines L1 and L2), which would represent an improvement with respect to the actual number of trips using the diesel buses. This annual number will certainly double once the future lines L3 and L4 become operational;

xiv) Particulate matter concentration (PM10): according to the data provided by World Health Organisation[30] the mean annual value of the PM10 is 58 µg/m^3. Since diesel buses will not access the city center once the electrical BRT system is fully operational, a decrease of PM10 concentration by about 10 to 20% in that area can be expected. This indicator will be tracked and reported ob by using data from the air monitoring stations that are available in Marrakech[31];

xv) NO_2 (nitrogen dioxide) concentration: according to the National annual air quality report prepared by National Directorate of Meteorology for 2013, the annual mean concentration of NO_2 in Marrakech is close to the regulatory norm of ambiant air in Morocco, i.e. 50 µg/m^3. Since NO_2 emissions are closely related to transport, mainly from diesel fueld engines, the introduction of the electrical buses would trigger a decrease of about 10 to 20%. Similar to PM10 concentrations, this forecast of air quality improvement will be acertained by data from the air monitoring stations available in Marrakech.

6. *Risks.* Indicate risks, including climate change, potential social and environmental future risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks:

Project risks					
Description	**Type**	**Impact & Probability**	**Mitigation Measures**	**Owner**	**Status**
Insufficient funding to ensure the procurement of electric buses and the HCPV solar plant	Financial	P = 2 I = 4	Support will be provided by the National Government given its engagement in COP22	Project Manager	
Lack of sufficient funding to cover the maintenance cost of the HCPV solar plant	Financial	P = 2 I = 3	The maintenance cost will be integrated in the annual operational budget of the Local Development Company of Transport (TLDC) which will own the solar plant.	Project Manager	
Additional lines of the BRT	Political	P = 2 I = 2	Engagement of the City of Marrakech in organizing COP22 and high political will in	Project Manager	

[29] This ISO standard defines and establishes methodologies for a set of indicators to steer and measure the performance of city services and quality of life: http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=62436

[30] Source: http://www.who.int/phe/health_topics/outdoorair/databases/cities/en/

[31] Three ambiant air monitoring stations are available in Marrakech

system are not approved by the City Council			demonstrating the sustainable development capacities supported by the National Government.		
The BRT system is not appropriately managed and monitored	Operational	P = 3 I = 4	The Local Development Company of Transport is expected to have all the necessary support and means to ensure a proper management of the BRT system. The contractng of a BOT firm in the short-term will assure thatr the capacity is built over time before TLDC takes over running of the solar farm. Capacity building efforts of the project will strengthen all the BRT stakeholders in their capacity to maintain successful operation of the transport system.	Municipality of Marrakech	
The drivers do not respect the eco-driving principals	Operational	P = 3 I = 1	Continuous training every year and implementation of an incentive scheme for energy efficient drivers. Monitoring of diesel consumption per each single driver.	Local Development Company of Transport	
Low share of bus travels with respect to other urban transport modes	Operational	P = 2 I = 3	Implementation of awareness campaigns targeting potential users. The City is committed to ensuring that the ticket cost will remain affordable.	Local Development Company of Transport	
Inadequate and/or non-capacitated human resources to successfully implement the project and support the mainstreaming of its results.	Operational	P = 2 I = 4	The project includes significant capacity building and outreach components to help overcome this risk.	Project Manager	
Management of obsolete electric bus batteries	Environmental	P = 2 I = 2	This risk will not occur during the project implementation period. However, the TLDC will work closely with the MdE to ensure conformity with the national waste regulations. All waste management from the plant construction and operations will follow national standards. As with standard PV systems, CPV installations are typically warranted for at least 25 years, thus they have to be reliable. The standard IEC 62108 called “Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval” issued by the International Electrotechnical Commission (IEC) in 2007 is a mandatory step to enter the market. Today most companies have certified their products according to this standard. Please note that additional UL and IEC standards (e.g. for power and energy rating, module safety, tracker, optics, cell assembly) have been published or are under preparation. It is assumed that for decommissioning, the energy inputs are determined from the installation stage. It is assumed that the dismantled components, except for the foundation, are shredded in a local scrap processor where recyclable metals are separated, and non-recyclable residues are sent to landfill facility.	Local Development Company of Transport	

			The water and land requirements for HCPV technology are much less than CSP and normal PV plants and will be minimal for this plant.		

7. *Cost Effectiveness*. Explain how cost-effectiveness is reflected in the project design:

The GEF financial resources are particularly important for the project implementation. Indeed, in absence of the GEF support and the associated stakeholders mobilization and financial leveraging, the envisioned low carbon development of Marrakech's urban transport sector will be sub-optimal and delayed in terms of operationalization. It should be mentioned that without these resources, the Municipality of Marrakech would not be able to carry out the different phases of the project on its own, namely HCPV funding, acquisition and implementation, along a regular monitoring of activities.

The GEF financing of the proposed project components and activities was specifically chosen to build on and leverage various sources of public financing. The launch of the electrical BRT system is part of numerous low-carbon initiatives that the Government of Morocco and the City of Marrakech would like to exhibit during COP22.

Based on the available information, preliminary estimations of the CO2 savings per US dollar of GEF contribution has been calculated. With a total GEF contribution of 1.5 million USD, the unit abatement cost that will be achieved by the project will be a mimimum 54.89 US$/tCO2e based on direct emissions and a range of 14.48 – 19.80 - US$/tCO2e for indirect emissions. As mentioiend it is likely that the actual emission reductiosn from the fuel switch and modal shift will be much higher and this will be quantified and tracked during project implementation. The indirect emissions are considered a more appropriate proxy of the cost-effectiveness of the project given the innovative nature of the project and high potental for replication.

8. Coordination. Outline the coordination with other relevant GEF-financed projects and other initiatives [not mentioned in 1]:

The project will ensure close coordination with other related initiatives to create synergies and ensure sustainability of the implemented activities. Close and regular communication will be ensured with other GEF-funded initiatives including:

i) Greening COP22 in Marrakesh – A UNIDO-GEF project aiming at demonstrating Morocco's commitment to combat climate change by reducing the carbon footprint of COP 22 via support for low-carbon initiatives in the host city of Marrakesh and ensuring broad-based climate change awareness among decision-makers and the general public;

ii) Programme for Cleantech Innovation and Green Jobs in Morocco – A UNIDO-GEF project aiming at creating green jobs by promoting clean technology innovations and entrepreneurship through the development of a Cleantech Innovation Platform and Accelerator Programme. This project will be part of the activities conducted in preparation for the COP 22;

iii) Mainstreaming climate change in the National Logistics Strategy and Roll-Out of Integrated Logistics Platforms – A UNDP-GEF project aiming to operationalize the mitigation potential of the National Logistics Strategy through facilitation of the Government's roll-out of integrated logistics platforms in a NAMA framework. Synergies are to be established regarding the eco-driving training and PV installation aspects.

The project will ensure also coordination with other relevant intiatives, namely the UNDP LECB Programme and UNEP FIRM Programme. The project would have to capitalize on the MRV knowledge and expertise developped through the NAMAs developed by that project.

Finally althought this project is not formally part of the GEF Sustainable Cities IAP, it will closely collaborate with knowledge management activities and Global Knowledge Sharing platforms developed by the World Bank Group (WBG) as Lead Implementing Agency of the Sustainable Cities IAP program.

9. Institutional Arrangement. Describe the institutional arrangement for project implementation:

The project will be implemented according to the UNDP procedures "National Implementation by the Government – NIM".

The project implementation structure and institutional arrangements are detailed in the organagram below (Figure 7). The Ministry in charge of Environment (MdE) will be the Implementing Partner. MdE will be responsible for achieving the Project's objectives and for ensuring proper alignment with national policy. MdE will be supported by the UNDP Country Office in conformity with the Standard Basic Assistance Agreement and the UNDP Country Program Action Plan (UNDAF).

The Municipality of Marrakech is designated as a Responsible Party (RP) for all components. RP is selected to act on behalf of the Implementing Partner on the basis of a written agreement to purchase goods or provide services using the project budget. In addition, the RP may manage the use of these goods and services to carry out project activities and produce outputs. RP is directly accountable to the Implementing Partner in accordance with the terms of the agreement. MdE use the Municipality of Marrakech as RP in order to take advantage of its specialized skills, to mitigate risk and to relieve administrative burdens.

The Steering Committee (SC) is the group responsible for making by consensus management decisions for a project when guidance is required by the Project Coordinator, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, SC decisions should be made in accordance to standards that shall ensure best value to money, fairness, integrity, transparency and effective international competition. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Coordinator. This group is also consulted by the Project Coordinator for decisions when project management tolerances (normally in terms of time and budget) have been exceeded. The SC will meet at least twice a year or as needed.

The responsibilities and roles of the Steering Committee include:

- Approve the annual work plan;
- Monitor and evaluate project performance in terms of results and financial disbursements;
- Monitor the progress of discontinued operations;
- Review and validate the progress reports and results;
- Recommend actions and activities that meet the needs and policy;
- Coordinate inter-institutional relations in connection with the project and help remove any difficulties that may arise in its implementation.
- Develop and approve an exit strategy in the previous semester to project closure.

UNDP is the GEF Implementing Agency for the Project. The UNDP Country Office (CO) will ensure that GEF funds are disbursed and administered in accordance with UNDP's fiduciary standards and in alignment with the objective of the Project. The UNDP CO will monitor the Project's implementation and achievement of the project outcomes and outputs, provide overall guidance and recommendations to enhance project performance, and promote the exchange of experiences and lessons learned across its global portfolio and other members of the international donor and financial community.

On request of the MdE, UNDP CO shall provide the following support services for the implementation of the Project: (i) payments, disbursements and other financial transactions; (ii) recruitment of staff, project personnel, and consultants; (iii) procurement of services and equipment, including disposal thereof; (iv) organization of training activities, conferences, workshops, and fellowships; (v) travel authorization, Government clearances ticketing, and travel arrangements; and (vi) international shipment, custom clearance, and vehicle registration. UNDP CO will recover the direct and indirect costs incurred into by the Country Office in delivering such services in conformity with UNDP's Universal Prices List.

The National Project Director (NPD) will administer the Project on a day-to-day basis on behalf of MdE in line with UNDP Policies and Procedures and assume direct responsibility for the successful implementation of the Project towards the objectives and outcomes specified in the Project Document.

The NPD is accountable for the quality, timeliness and effectiveness of the activities carried out, and for the appropriate use of project funds. The NPD will represent the Project at the highest national political level and at

relevant national and international events. He/she will ensure adequate coordination with other Government entities and programs and provide advocacy for the Project at the highest levels. The NPD will further liaise with relevant parallel initiatives and exploit synergies wherever possible and relevant.

The day-to-day management of the Project shall be entrusted to the Project Management Unit (PMU) which will be accountable to the NPD and SC for the performance of the project. The PMU will consist of the following persons: National Project Coordinator (PC) and Project Officer (UNV). The PC and PO (UNV) will be recruited by the UNDP and funded with GEF resources. Both PC and UNV will be full-time positions.

The PMU will have responsibility for, among others tasks: (i) managing and executing the Project; (ii) coordinating the management of financial resources and procurement; (iii) reporting on the application of resources and results achieved; (iv) preparing reports for the PB, UNDP, and the GEF; (v) promoting of inter-institutional linkages; and (vi) monitoring and evaluation, and disseminating project results.

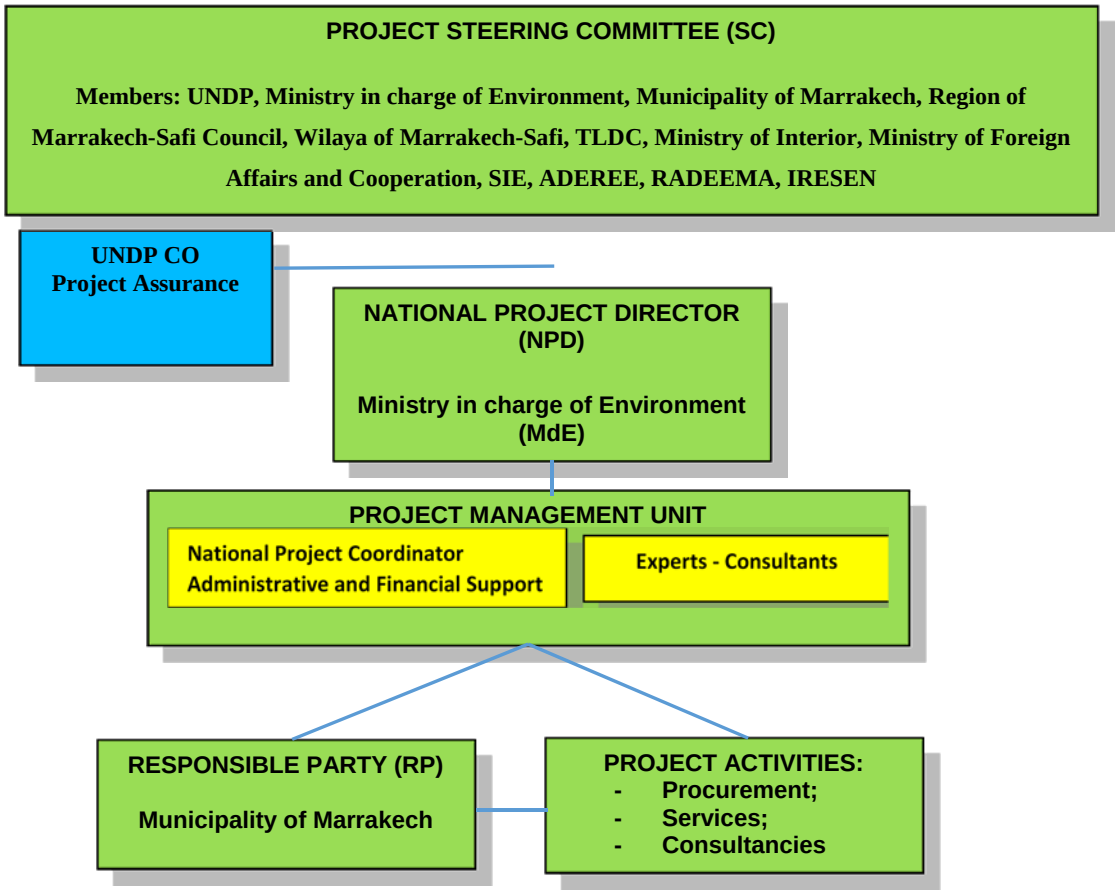

Figure 7: Institutional Arrangements of the Project

10. Knowledge Management. Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management is an integral part of the project strategy and its implementation is included in different ways. Firstly, considering the innovative aspect of the project, R&D is part of the project through establishment of agreements between the City of Marrakech and local and international research partners. The reputable local university of Marrakech is expected to play an important role. R&D can be developed by considering specific project topics for master and doctoral students. Several subjects will be considered such as improvement of solar energy yield, MRV of low carbon transport, energy efficiency of electrical buses, BRT optimization, etc.

Developing such R&D will ensure that project outcomes and deliverables are capitalized and improved even after the project. Development of R&D is also an efficient means to facilitate the dissemination of the acquired knowledge within and beyond the project intervention zone.

Knowledge management will also be supported by setting-up a special low-carbon urban transport governance committee involving local, subnational and national stakeholders, so that the knowledge generated will be institutionalized and disseminated at various levels to serve other cities in the country or even in other countries looking for practical experiences to improve their urban transport system in a green way.

Furthermore, the project will carry out targeted dissemination events and awareness campaigns to reach different audiences among policymakers, experts, youth and the general public. COP22 - as a special event - offers a unique opportunity to shed light on the project and build momentum forward.

It should be noted that the project will also benefits from knowledge management tools and experiences of UNDP to ensure a proper development of knowledge management during the project.At the end of the project, a final report will be produced and distributed to key stakeholders including key officials from the Government of Morocco. This report will provide a comprehensive summary of the activities conducted under the project and its results.

11. Consistency with National Priorities. Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes ☒ /no☐). If yes, which ones and how: NAPAs, NAPs, NBSAPs, ASGM NAPs, MIAs, NCs, TNAs, NCSA, NIPs, PRSPs, NPFE, BURs, etc.

As part of its fight against climate change, Morocco developed several national and sectoral strategies in order to successfully deal with its vulnerabilities. Although Morocco is a low GHG emitter, the country remains highly vulnerable to climate change effects.

All the planned actions inluded in the project are rooted in national priorities and policies, thereby making them part of a coherent, integrated sustainable development strategy.

The project directly supports two key objectives in the INDC:

“the extension of the national solar and wind programs in order to increase the installed capacity of renewables to more than 50% by 2025”; and

“reducing energy consumption in buildings, transport and industry by 15% by 2030”

The most prominent other related strategies supported by the project are the National Strategy for Sustainable Development (NSSD, 2014), the Moroccan Climate Change Policy (MCCP, 2014), the Green Morocco Plan (GMP), the Green Investment Plan (GIP, 2014), the Moroccan Solar Energy Programme (MSEP) and the Moroccan Wind Energy Project (MWEP). The overarching sustainable development strategy (NSSD) represents an operationalization of the Framework Law on the National Charter for Environnement and Sustainable Development (Law 99-12), which is the supreme policy that sets the fundamental objectives of the State in terms of environmental protection and sustainable development. The country's progress in climate policy planning and institution building over recent years has been commendable. Its commitment towards a climate-compatible and low-carbon development pathway is mirrored in its institutional framework, as well as various mutually reinforcing national plans and international agreements.

Part II Section 1 details the relevant strategies in more detail.

12. M & E Plan. Describe the budgeted monitoring and evaluation plan.

The UNDP project document provides a detailed description of the monitoring, reporting and evaluation to be undertaken during the project (see Section 6 of the Project Document). The full details of indicators, baseline values and targets are presented in Annex 1 to this document (Results Framework).

Monitoring and evaluation activities will follow standard UNDP and GEF monitoring and evaluation policies and guidelines. monitoring and evaluation of progress in achieving project results and objectives will be done based on the targets and indicators established in the project results framework (see Annex 1). The project monitoring

and evaluation plan has been budgeted at $65,000 (see table below). A summary of the envisaged M&E activities is provided in the following table.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[32] (US$)		Time frame
		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	3,000	In-kind	Within two months of project document signature
Inception Report	Project Manager	None	None	Within one month .0of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Monitoring of indicators in project results framework	Project Manager	None	None	Annually
GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF Regional Technical Advisor	None	None	Annually
NIM Audit as per UNDP audit policies	UNDP Country Office	3,000	None	Annually or other frequency as per UNDP Audit policies
Lessons learned and knowledge generation	Project Manager Project Board	2,000	None	Annually
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager UNDP CO	None	None	Ongoing
Addressing environmental and social grievances	Project Manager UNDP Country Office BPPS as needed	None	None	Costs associated with missions, workshops, BPPS expertise etc. costs charged to the project budget
Project Board meetings	Project Board UNDP Country Office Project Manager	None	In-kind	At minimum annually
Supervision missions	UNDP Country Office	None[33]	None	Annually
Oversight missions	UNDP-GEF team	None33	None	Troubleshooting as needed
Knowledge dissemination and management as outlined in Outcome 4	Project Manager Project Board	15,000	In-kind	At least three months before the end of the project
GEF Secretariat learning missions/site visits	UNDP Country Office and Project	None	None	Annually

[32] Excluding project team staff time and UNDP staff time and travel expenses.

[33] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GEF Agency Fee.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[32] (US$)		Time frame
		GEF grant	Co-financing	
	Manager and UNDP-GEF team			
Terminal GEF Tracking Tool by Project Manager	Project Manager	10,000	In-Kind	Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team Consultants	30,000	In-Kind	At least three months before operational closure
Translation of TE reports into English	UNDP Country Office	2,000	None	Directly after the validation of French TE reports
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		65,000	In-Kind	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. Record of Endorsement[34] of GEF Operational Focal Point (S) on Behalf of the Government(S): (Please attach the *Operational Focal Point endorsement letter(s)* with this template. For SGP, use this SGP OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Mohamed Benyahia	GEF Focal Point and Director of Partnerships, Communication and Cooperation	**DELEGATE MINISTRY IN CHARGE OF ENVIRONMENT**	**07/04/2016**

B. GEF Agency(ies) Certification

This request has been prepared in accordance with GEF policies[35] and procedures and meets the GEF criteria for a medium-sized project approval under GEF-6.					
Agency Coordinator, Agency name	**Signature**	**DATE** *(MM/dd/yyyy)*	**Project Contact Person**	**Telephone**	**Email Address**

[34] For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.
[35] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

Adriana Dinu, UNDP-GEF Executive Coordinator		11 August, 2016	Lucas Black UNDP-GEF Regional Technical Advisor – Arab States	+90 538 598 5172	lucas.black@undp.org

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION *(Applicable only to newly accredited GEF Project Agencies)*

For newly accredited GEF Project Agencies, please download and fill up the required **GEF Project Agency Certification of Ceiling Information Template** to be attached as an annex to this project template.

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to the following Sustainable Development Goal (s): Low-carbon public transport				
This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: Outcome 5: The principles of the "National Charter for the Environment for Sustainable Development" are implemented in coherence between sectoral strategies and priorities for the environment, climate change adaptation and risk management and by strengthening territorial convergence in areas and the most vulnerable populations with special attention to gender.				
This project will be linked to the following output of the UNDP Strategic Plan: Output 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)				
	Objective and Outcome Indicators	**Baseline**	**End of Project Target**	**Assumptions**
Project Objective: **To support the low-carbon integration of the Bus Rapid Transit (BRT) System under implementation by the City of Marrakech through the installation of 1 MW solar farm based on High Concentration PhotoVoltaics (HCPV) technology. The energy produced by the farm will help power electric buses to showcase an integrated low-carbon transport system that can be replicated in other cities in Morocco.**	Extent of change in modern energy coverage by users and specific sectors (IRRF Indicator 1.5.2)	0	24% of the BRT syste, supplied by solar power generated by HCPV solar farm	Integration of electrical buses in the BRT system charged by the HCPV solar plant
	Direct number of daily beneficiaries of lines L1 and L2 of the public bus system	50 000 (20 000 for L1 an 30 000 for L2) with a rate of usage by women of 31% in suburban areas and 44% (in urban areas	71 000 (36 000 for L1 and 35 000 for L2) with rate of usage by women of 50% in both urban and suburban areas	A BRT system with a high level of comfort and service will be attractive to new beneficiaires, particularly women, in comparison to other transport modes. Specific communication and awarness campaigns will be designed to improve bus ridership among women with respect to other urban transport modes.
	Tons of incremental CO2 equivalent avoided as a direct result of project activities	0 tCO2 (11 150 tCO2 emitted in 2015 by 121 diesel buses)	27,327 tCO_2	Electric trolleybuses are integrated in the BRT system of Marrakech and powered from a 1 MW HCPV solar farm. Diesel buses drivers are trained on eco-driving practices.
	Km of high capacity public transport system (BRT) per 100 000 population	0	2.18	Two BRT lines will be operationnal by COP22 and will service a population of 900 000. The new lines L1 and L2 will have a length of 10.9 and 8.8 km, respectively. The dedicated road infrascture for these two BRT lines is available.

Component/Outcome 1 **Integrated financial planning, built capacities and MRV systems for the low carbon BRT System**	Completion of sustainability strategy and all required financial planning documents and studies for the future BRT lines (L3 and L4)	No strategy or documents in place for financial planning of L3 and L4	Sustainability strategy and all required financial planning documents and studies for the future BRT lines (L3 and L4) developed and approved by City authorities	The engineering studies of L3 and L4 are ongoing. Political will to follow-through on commitments to extend the BRT system and potentially set user fees at a level that allows for cost-recovery for operations and maintenance
	Number of low carbon indicators in the MRV sytem	0	3	The MRV system of the BRT system will integrate at least 3 low carbon indicators regarding diesel consumption, electrical production of the solar farm, and electrical consumption of the electrical buses
	% of TLDC technical employees and bus drivers trained on the best practices of energy efficiency	0%	100%	High level of involvement and participation rate of TLDC management and technical employees Political will at the City Council. The actual bus operator (ALSA) will provide an initial training to all drivers (270) on eco-driving before COP22 and set-up an eco-driving performance bonus system
Component/ Outcome 2 **Commissioning of 1 MW solar farm for powering of electric buses for BRT System**	Amount of installed MW from the HCPV solar farm	0 MW	1 MW	Succesful tender and selection of an appropriate firm on BOT contract GEF supports the incremental investment cost
	An O&M system is in place	0	1	O&M will be included in the tender specifications to ensure the durability of solar energy production. The BOT company will be responsible for operations and maintenance (as part of its contract) for an initial period while arrangements are put in place at TLDC
Component/ Outcome 3 **Knowledge management and awareness**	Number of events organized to communicate Marrakech's sustainable urban transport experience	No events have been conducted	At least two high-level events	High level of commitment and engagement of all stakeholders COP22 represents an ideal event to communicate and exhibit Marrakech's initiatives
	Number of plastforms (TV campaigns, ads, etc) developed for public communication and	0	10	The City of Marrakech is aware of the importance of using various means to outreach various population groups such as a web site, social media, radio, TV, brochures, etc.

	awareness regarding low-carbon transport and solar energy			
	Number of replication plans proposed by the multi-stakeholder committee for other cities	0	1	High level of commitment and engagement of all stakeholders. COP22 will spur a paradigm shift and other municipalities will be interested in investing in similar systems

ANNEX B: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF Trust Funds or to your Agency (and/or revolving fund that will be set up)

N/A

Direct emissions reductions

- *1 MW HCPV solar plant*

Table below shows the data used for direct emissions reductions estimation:

Number of photovoltaic panels	50
Installed capacity (MW)	1
Electricity produced (MWh/year)	1 896
Emission factor of national grid (tCO2/MWh)	0,59
lifetime of HCPV panels	15

The formula used for the calculations is:

Direct emissions reductions over lifetime investments = Electricity produced (MWh/year) * Emission factor of national grid (tCO2/MWh) * lifetime investments

Based on this formula, direct emissions reductions over lifetime investments are estimated to **16,780 tCO2.**

- *Eco-driving*

Table below shows the data used for direct emissions reductions estimation:

Before introduction of BRT system	
Total number of bus	121
Total emissions in 2015 (tCO2)	11 150
After introduction of the BRT system	
	Bus of 12m
Number of buses in circulation after the introduction of BRT	82
Unit consumption (en l/100km)	60
Total of km traveled (km/year)	7 027 735
Total consumption (l)	2 811 094
Diesel emission factor (kg eq CO2 / l)	2,68
Total emissions of bus circulating after introduction of the BRT (tCO2/an)	7 534
% reduction in emissions from eco-driving (%)	10%

The formula used is as follows:

Direct emissions reductions (tCO2/year) = Total emissions of bus circulating after introduction of the BRT (tCO2/an) * % reduction in emissions from eco-driving

The following assumptions were considered for the realization of calculations:

- *The distance of unmodified lines will remain the same as before introduction of BRT system*
- *Unmodified lines consume the same amount of fuel*
- *The application of eco-driving practices induces a reduction of emissions of 10%*
- *At mid-term of the project, 50% of the diesel bus drivers have received training on eco-driving practices*
- *From the 3rd year of the project, all drivers apply eco-driving practices*
- *Lifetime investments = 15 years*

Total direct emissions reductions over lifetime investments are estimated to 10,547 tCO2.

- Total direct emissions reductions:

Based on the sub-total direct emissions from the 1 MW solar farm and eco-driving, the total direct emissions reductions are **27,327 tCO2.**

Indirect emissions reductions

Two approaches were used:

Bottom-up analysis:

The GEF guidelines provide a formula for Bottom-Up (BU) emissions assessment as:

CO2 indirect BU = CO2 direct * RF

where CO2 direct is Direct emissions reductions over lifetime investments
and RF is a Replication Factor.

For 1MW HCPV solar plant, bottom-up calculations are based on a replication factor of 2 assuming that this project will be replicated in at least one other city. This leads to 33,559 tCO2e.
For eco-driving, a replication factor of 4 has been considered. This leads to 42,189 tCO2.

The total indirect emissions reductions based on the bottom-up approach are estimated to **75,748 tCO2.**

Top-down analysis

The top-down approach is based on the following formula:

CO2 indirect TD = P10 * CF

Where:
P10 is the technical and economic potential GHG savings with the respective application within 10 years after the project,
CF is GEF causality factor

For 1MW HCPV solar plant, top-down calculations are based on a CF of 60%. The project can be replicated in at least 3 other cities, thereby, P10 is estimated at 67,118 tCO2. This leads to an indirect TD reduction of 40,271 tCO2.
For eco-driving, a CF of 60% has been considered. Regarding P10, a great potential related to eco-driving is available. Major cities of Morocco can apply practices related to eco-driving. Based on this, P10 is estimated at 105,472 tCO2 and indirect TD reductions to 63,283 tCO2.

The total indirect emissions reductions based on the top-down approach are estimated to **103,554 tCO2.**

Table below summarizes results obtained from calculations:

		1MW HCPV solar plant (tCO2)	Eco-driving (tCO2)	Total (tCO2)
Direct emissions		16,780	10,547	**27,327**
Indirect emissions	**Bottom-up**	33,559	42,189	**75,748**
	Top-down	40,271	63,283	**103,554**

ANNEX D: ESTIMATED CALCULATIONS OF DIESEL SAVINGS AND SHARE OF RENEWABLE ENERGY IN THE BRT ENERGY MIX

	Data		
	Total number of buses	121	
	Total traveled km	10 012 694	
	Reference year	2 015	
	Total number of travelers	36 227 784	
	Diesel consumption		
		Articulated buses (>12 m)	**Buses 12 m long**
	Number of buses	8	113
	Diesel consumption (L/100km)	60	40
	km traveled by each type of buses (km)	661 996	9 350 698
	Total diesel consumption for each type of buses	397 198	3 740 279
	Total diesel consumed in 2015 (L)		4 137 476,86
	Diesel spent budget for 2015 (based on a unit rate of 8,5 MAD)		35 168 553
	Diesel spent budget for 2015 in USD (considering an exchange rate of 1 USD=9,5 MAD)		3 701 953
	Diesel savings after introduction of the first 30 electrical buses (15 in the first two years)		
	Diesel saved by discarding 15 buses - year 1 (L)		496 497
	Budget saved by discarding 15 buses - year 1 (USD)		444 234
	Budget saved by discarding 30 buses - year 2 (USD)		888 469
	Budget saved by discarding 30 buses - year 3 (USD)		888 469
	Budget saved by discarding 30 buses during project implementation (USD)		2 221 172
	Budget saved by discarding 30 buses during 15 years lifetime investement (USD)		**28 875 233**
	Precentage of the total energy derived from renewable sources of the public transport		
	Total idiesel consumption before integration low carbon BRT system (L)		4 137 476,86
	Diesel consumption to be replaced by renewable energy (by end of project)		992 994
	Percentage of the total energy derived from renewable sources of the public transport		**24%**