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CEO Endorsement (CEO) entry - Medium sized Project Child – GEF - 7

## Support the Shift to Electric Mobility in the Seychelles

### Part I: Project Information

#### Name of Parent Program

[Global Programme to Support Countries with the Shift to Electric Mobility.](#)

#### GEF ID

10274

#### Project Type

MSP

#### Type of Trust Fund

GET

#### CBIT/NGI

☐ CBIT

☐ NGI

#### Project Title

Support the Shift to Electric Mobility in the Seychelles

#### Countries

Seychelles

**Agency(ies)**

UNEP

**Other Executing Partner(s)**

Ministry of Transport (Department of Land Transport)

**Executing Partner Type**

Government

**GEF Focal Area**

Climate Change

**Taxonomy**

Focal Areas, Climate Change, Climate Change Mitigation, Sustainable Urban Systems and Transport, Influencing models, Transform policy and regulatory environments, Demonstrate innovative approaches, Strengthen institutional capacity and decision-making, Stakeholders, Type of Engagement, Information Dissemination, Participation, Consultation, Communications, Behavior change, Awareness Raising, Civil Society, Non-Governmental Organization, Community Based Organization, Academia, Private Sector, SMEs, Financial intermediaries and market facilitators, Capital providers, Individuals/Entrepreneurs, Large corporations, Gender Equality, Gender results areas, Access to benefits and services, Participation and leadership, Gender Mainstreaming, Beneficiaries, Sex-disaggregated indicators, Capacity, Knowledge and Research, Knowledge Generation, Capacity Development, Learning, Innovation, Knowledge Exchange

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 2

**Climate Change Adaptation**

Climate Change Adaptation 0

**Submission Date**

4/30/2021

**Expected Implementation Start**

10/1/2021

**Expected Completion Date**

9/30/2025

**Duration**

48In Months

**Agency Fee(\$)**

38,134.00

## A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCM-1-2	Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technology and electric mobility	GET	423,716.00	1,886,000.00
Total Project Cost(\$)			423,716.00	1,886,000.00



**B. Project description summary****Project Objective**

Mitigate GHG emissions by accelerating the introduction of electric mobility in Seychelles through demonstration in public transportation, capacity building, and preparation of upscaling and replication through development of adequate electric mobility policies and financing concepts.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Component 1. Institutionalization of low-carbon electric mobility	Technical Assistance	1. The government has established a coordinated institutional framework and adopts a gender sensitive strategy for the promotion of low-carbon electric mobility in Seychelles	1.1: A national inter-sectorial electric mobility steering committee is established.  1.2: A gender sensitive National Electric Mobility Strategy that includes electrification of Seychelles Public Transport Corporation is developed and formally proposed.  1.3: Key stakeholders are trained in the EV Global Programme activities and through private sector engagement (national and regional workshops, trainings and thematic working groups) and awareness is raised among key stakeholders on electric mobility	GET	77,066.00	283,000.00
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Component 2. Short term barrier removal through low-carbon electric mobility demonstrations	Investment	2. The e-bus demonstration provides evidence of technical, financial, and environmental sustainability enabling SPTC to plan for scale-up of Seychelles' e- bus fleet.	2.1: A comprehensive feasibility study and implementation plan for electric bus demonstration for testing on different routes is developed including data collection, reporting and analytical frameworks  2.2: One demonstration bus and charging equipment are procured, staff trained, demonstration project on different routes is implemented, monitored and data collected, analyzed and disseminated.	GET	167,525.00	934,000.00
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Component 3. Preparing for scale-up and replication of low-carbon electric mobility	Technical Assistance	3. The government creates conditions for removing existing barriers by developing plans and financing concepts, and by submitting policies and regulations for adoption to accelerate the introduction of EVs in Seychelles	3.1: Based on the demonstration project, priority routes for scaled-up e-bus deployment are selected and technical specifications for electric buses and the respective charging equipment are developed	GET	65,875.00	243,000.00
			3.2: Fiscal policies, and regulatory measures to incentivize the uptake of electric mobility are developed and formally proposed.			
			3.3 One e-bus up-scaling financing concept is developed and submitted to a financier			

Component 4. Long-term environmental sustainability of low-carbon electric mobility	Technical Assistance	4. Measures are developed by the government to ensure the long-term environmental sustainability of low-carbon electric mobility	4.1 A sustainable e-mobility study including a brief technical assessment of the usability of an Extended Producer Responsibility (EPR) scheme for the collection of used EV batteries, an evaluation of the potential to charge EVs with renewable power and the impact of EVs on the integration of renewable is developed with the support of the Global Programme	GET	46,000.00	243,000.00
Monitoring & Evaluation	Technical Assistance			GET	30,000.00	
Sub Total (\$)					386,466.00	1,703,000.00
Project Management Cost (PMC)						
				GET	37,250.00	183,000.00
Sub Total(\$)					37,250.00	183,000.00
Total Project Cost(\$)					423,716.00	1,886,000.00

## C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Ministry of Transport	In-kind	Recurrent expenditures	748,000.00
Recipient Country Government	Ministry of Agriculture, Climate Change & Environment	In-kind	Recurrent expenditures	748,000.00
Recipient Country Government	Ministry of Transport / Seychelles Public Transport Corporation	Public Investment	Investment mobilized	120,000.00
Recipient Country Government	Ministry of Transport / Seychelles Public Transport Corporation	In-kind	Recurrent expenditures	250,000.00
GEF Agency	UNEP	In-kind	Recurrent expenditures	20,000.00
<b>Total Co-Financing(\$)</b>				<b>1,886,000.00</b>

**Describe how any "Investment Mobilized" was identified**

Investment mobilized was identified through bilateral meetings with the potential co-financiers within the government: • The Ministry of Transport will grant USD 120,000 cash contribution to the Seychelles Public Transport Corporation (SPTC), which is a public entity domiciled within the Ministry of Transport established to provide public transport services focused on Mahé and Praslinto. This cash contribution is to support the purchase of one electric bus to demonstrate and prepare the scaling-up of electric buses within SPTC.

## D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Seychelles	Climate Change	CC STAR Allocation	423,716	38,134
Total Grant Resources(\$)					423,716.00	38,134.00

**E. Non Grant Instrument**

**NON-GRANT INSTRUMENT at CEO Endorsement**

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**



## F. Project Preparation Grant (PPG)

PPG Required



PPG Amount (\$)

35,000

PPG Agency Fee (\$)

3,150

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Seychelles	Climate Change	CC STAR Allocation	35,000	3,150
Total Project Costs(\$)					35,000.00	3,150.00

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	0	23117	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	0	86901	0	0

### Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)				
Expected metric tons of CO <sub>2</sub> e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

### Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)		23,117		
Expected metric tons of CO <sub>2</sub> e (indirect)		86,901		
Anticipated start year of accounting		2021		
Duration of accounting		15		

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)		267,291,488		

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
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Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female		387		
Male		604		
Total	0	991	0	0

## Part II. Project Justification

### 1a. Project Description

#### 1a. Changes in project design

*Describe any changes in alignment with the project design with the original child project concept note (i.e. changes in component, outcome or output wording, changes in GEF funds allocation per component/outcome, changes in co-finance commitments and allocation per component/outcome, etc.).*

The concept envisioned an electric vehicle demonstration study with solar recharging in Mahé together with an electric bus demonstration with SPTC in Mahé. The concept did not specify numbers of vehicles for either study. The final project reduces the scope of the electric vehicle demonstration study to Mahé with one electric bus to be demonstrated there. The final project will support scaled-up deployment of electric buses – for example through the donation of up to 22 electric buses into the SPTC fleet as part of a government-to-government agreement between the Republic of the Seychelles and China, which is currently under development. The final project will also conduct a sustainable electric mobility study including the assessment of EV renewable charging and grid integration, and the evaluation of an Extended Producers Responsibility scheme for used EV battery collection.

Both the concept and the final project have four components. The concept components were:

- 1) Institutionalization of electric mobility;
- 2) Electric vehicle demonstration project;
- 3) Preparation of scale-up and replication of electric mobility, and
- 4) Promotion of long-term sustainability of electric mobility

The final project four components are:

- 1) Institutionalization of low-carbon electric mobility;
- 2) Short term barrier removal through low-carbon electric mobility demonstrations;
- 3) Preparation of scale-up and replication of low-carbon electric mobility; and
- 4) Long-term environmental sustainability of low-carbon electric mobility.

Budget allocations between the components have shifted slightly in the final project to ensure that the demonstration projects are adequately resourced to ensure that this critical introduction of electric mobility will see to scalable uptake after the project.

As per the project concept (PFD), Seychelles was supposed to provide a total project co-financing of USD 1,496,000 of which USD 374,000 represented in-kind contributions and USD 1,122,000 was to be mobilized from related public investment. The total project co-financing stands at USD 1,866,000 comprising USD 120,000 of public investment, with the remainder being in-kind contributions.

## 1b. Project Description

### 1) Global environmental and/or adaptation problems, root causes and barriers that need to be addressed

A global transition to low- and zero- emission mobility is essential to meet international climate commitments, including the Paris Climate Agreement. The transport sector is currently responsible for approximately one quarter of energy-related carbon dioxide emissions, this is expected to grow to one-third by 2050. In addition, the transport sector is a leading contributor to short-lived climate pollution, especially black carbon.

The global vehicle fleet is set to double by 2050, and almost all this growth will take place in low- and middle-income countries. By 2050 two out of three cars will be found in developing countries. This means that achieving global climate targets will require a shift to zero emissions mobility in all countries, including low- and middle-income ones.

The Republic of Seychelles is an archipelago of 115 islands on the Indian Ocean in Eastern Africa. Three-quarters of the 94,737 population lives on the main island of Mahé (UN, 2017) (Figure 1). Seychelles has the highest Gross Domestic Product (GDP) per capita in Africa (\$15,410 in 2016), but inequality is significant.



**Figure 1 Map of The Main Districts of Seychelles**

Categorized as a Small Island Developing State (SIDS) with a large dependency on tourism, the “Seychelles National Climate Change Strategy” states that Seychelles is economically, culturally and environmentally vulnerable to the potential effects of climate change and associated extreme events. Vulnerability characteristics such as concentration of development on narrow coastal zones, non-resilient populations and ecosystems make the Seychelles extremely sensitive to climate change and its associated impacts. The impact of climate change on coastal livelihoods as a result of sea level rise, storm and tidal surges, extreme sea-surface temperatures, and coastal flooding will have serious consequences for livelihoods in the Seychelles. The effects of climate change on tourism in small islands are expected to be largely negative. Furthermore, recent studies suggest that changes in long-term rainfall patterns and temperature changes will also have adverse consequences for water, food and health<sup>[1]</sup>. As such, it gives priority concern for adaptation to climate change as communicated in its Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC) in September 2015. Further, the Republic of Seychelles is putting in place efforts to mitigate climate change as part of its commitments to the UNFCCC which will in turn enhance its energy security and reduce its energy bill.

According to the Seychelles' Second National Communication (2011), in 2000, the total Seychelles CO<sub>2</sub> emissions were 0.273 Mt CO<sub>2</sub>. According to the World Bank, total global CO<sub>2</sub> emissions were 24,690 Mt CO<sub>2</sub> in 2000, indicating Seychelles emissions contributed approximately 0.001% of global emissions. Between 1990 and 2011, GHG emissions increased by 285% in the Seychelles (2015, GHG in Southern Africa). Although Seychelles currently contribute only about 0.002% to global greenhouse gas emissions, the archipelago state is vulnerable to global climate change and pollutant emissions from transport are significantly reducing air quality.

About 95% of the Seychelles emissions of CO<sub>2</sub> in 2000 were from fuel combustion as shown in Figure 2 below, whilst 5% were from changes in forest and other woody biomass stocks. Some 57% of the CO<sub>2</sub> emissions from fuel combustions were from public electricity production, 25% were from transport (19% from road transport), 11% were from the commercial and institutional sector, 3% were from manufacturing and construction, 3% were from residential sector, and 1% from other sectors. The inventory concluded that the most significant source of GHG in Seychelles is the consumption of fuel oil both to produce electricity and for transportation. Public electricity and transport are therefore priority sectors for emissions reductions in Seychelles

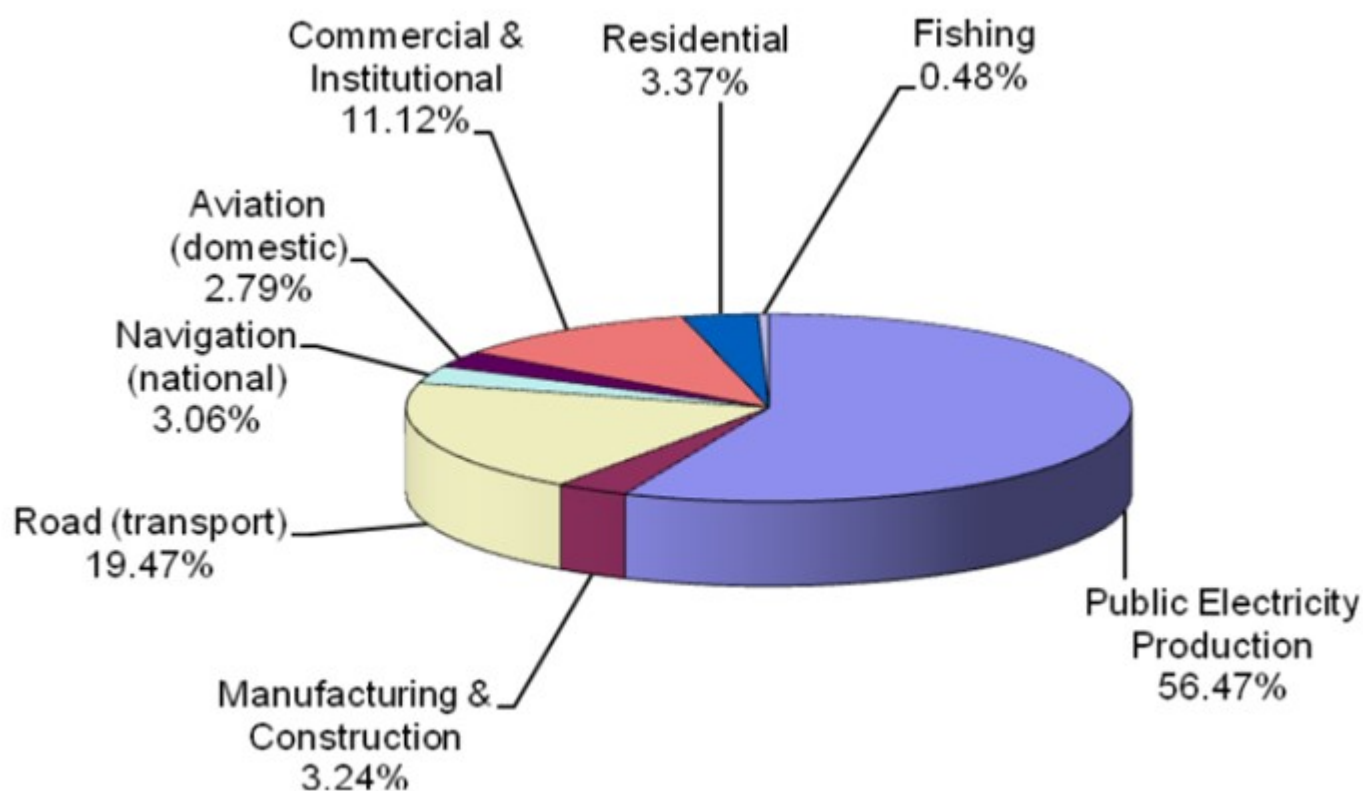


Figure 2 CO<sub>2</sub> emissions by sector in 2000 (Source: Government of Seychelles, 2011)

In 2007, Seychelles primary energy consumption reached 115,000 toe (2009, Seychelles National Climate Change Strategy). According to the European Union Emissions Database for Global Atmospheric Research (EDGAR) *Fossil CO<sub>2</sub> and GHG emissions of all world countries report*, in 2016, the total Seychelles CO<sub>2</sub> emissions were 0.520 Mt CO<sub>2</sub> indicating a doubling of CO<sub>2</sub> emissions in Seychelles in less than twenty years. This is clear indication that without intervention,



Seychelles GHG emissions will continue to grow significantly.

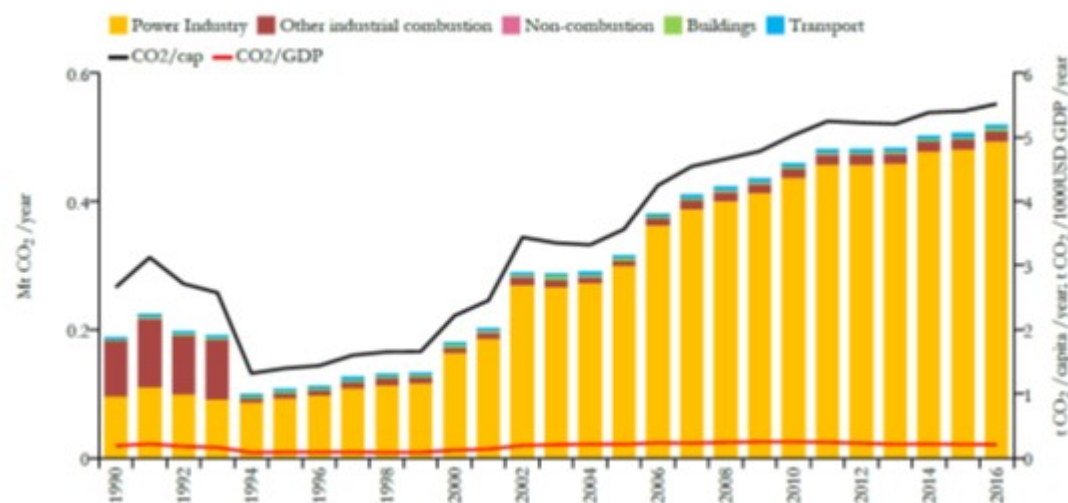


Figure 3 Seychelles Sectoral CO2 Emissions (Source: EU EDGAR)

Fuel imports were 22% of the GDP in 2005, and the Seychelles energy import bill rose from 6 million US\$ in 1998 to approximately \$84 million in 2008. However, Seychelles only consumes one-third of what is imported, the remainder is exported as international bunker. Nevertheless, Seychelles 100% dependence on fuel imports has great economic implications with fluctuations in international oil prices directly impacting GDP. There is therefore great impetus to reduce this exposure to economic hardship from oil price fluctuation by transitioning from fossil fuel-based transport and electricity production.

The total power generation capacity in Seychelles consists of 82.8 megawatts (MW) of fuel oil power generation, 6MW of wind power generation and 3.8MW of solar power generation each representing 97, 2 and 1 percent of overall power generation, respectively (Seychelles Public Utilities Corporation). In 2010, the Cabinet approved and adopted the **2010 Seychelles Energy Policy**<sup>[2]</sup> (developed with support from UNDP), with an aim to diversify the energy supply. Renewable energy integration targets of 5% and 15% share of renewable energy supply have been set for 2020 and 2030 respectively. In 2012, the Government of the Seychelles enacted Energy Act, 2012 (No. 11 of 2012), which “[...] concerns the control and licensing of electricity generation and distribution. It establishes the Seychelles Energy Commission, the Seychelles Energy Board and provides with respect to renewable energy, energy efficiency and designates the national authority for purposes of the Clean Development Mechanism as denoted in Article 12 of Kyoto Protocol to the United Nations Framework Convention on Climate Change”.<sup>[3]</sup> More specifically, the Energy Act states “1- The use of RE will be promoted in all sectors. 2- The Energy Commission may develop specialized power purchase agreements depending on the nature of RE resource and on the capacity of proposed project. 3- The Commission will carry out and facilitate the provision of RE related information to encourage the use of renewable energy”<sup>[4]</sup>.

It needs to be highlighted that while the power supply of Seychelles today is dominated by large diesel gensets ranging between 1.2 MW and 8 MW electrical power output, **the use of electric buses would result in immediate emission reductions in the range of 30% to 35% compared to a diesel bus**. This is due to the fact that while both primary energy conversion technologies (i.e. the diesel engine in the bus to propel the bus and the diesel generator in the electricity grid to generate power) use diesel as primary energy carrier, the conversion efficiency to transform diesel into electricity is around 42% to 45% for large diesel

gensets of more than 1MW power output[5] compared to the efficiency of a diesel engine in a bus to convert diesel into motion of less than 20%[6]. The more than twice as high efficiency of the diesel genset compared to the diesel bus engine is then only lowered by 15% to 20% stemming from losses in power transmission and distribution (~5%), e-bus charging (10% to 15%) and the electric engine to propel the bus (~5%)[7].

The Government of Seychelles recognizes that reducing dependence on fossil fuels for the transport sector through low carbon transport strategies is not only desirable to reduce air pollution and GHG emissions, but also sustainable. Seychelles in its **NDC identified the need for maintaining a high penetration of public transport, targeting fuel efficiency and biofuels import regulations, and moving towards electric vehicles**, as these have the potential to reduce oil imports for transport purposes by 15% to 30% (or perhaps more) by 2030 compared to the baseline[8].

Specifically, Seychelles identified the following mitigation actions for land transport: 1.) 30% of private vehicles to be electric by 2030 at an estimated cost of 66.7 million USD; and 2.) 15.8 MW of solar PV for meeting the energy demand of electric vehicles (capital expenditure, and operation & maintenance costs) at a cost of 29.8 million USD. This project is working towards both of these targets, supporting the Government of Seychelles with the accelerated introduction of electric mobility and linking the use of renewable power for EV charging.

In 2015, the Seychelles Infrastructure Action Plan[9] supported by the African Development Bank (AfDB) suggested the development of a “Transportation Master Plan”, to encourage public transportation, which is proposed to play a much more prominent role to tackle the challenges of growing population and increased vehicle ownership. The report outlines that the greatest challenge faced by Seychelles Public Transport Corporation (SPTC), which is responsible for about 20% to 25% of all trips made lies with “the replacement of the bus fleet, lowering the average age with the aim of reducing annual maintenance costs”. It concludes that “external funding will be required to facilitate the gradual introduction of greener buses, given that such an investment would not otherwise be economically viable”.

Indeed, the government’s ability to invest in large infrastructure projects (including transport and energy) is reduced “due to the ongoing debt reduction programme” and “mechanisms permitting ‘project finance’ solutions not involving government guarantees will therefore need to be found”[10]. Between 2008 and 2016, public debt as a percentage of GDP has been halved but is still above the average debt of comparable countries[11]. While the constraint to take on new debt has been relaxed in the recent past, this still poses a significant barrier. This barrier is amplified by the absence of a “Transportation Master Plan or indeed any strategic planning tool for infrastructure”[12]. The use of public private partnerships (PPPs) has therefore been identified as an option to circumvent the financing barrier. Under a PPP, the private sector would finance, develop and operate the infrastructure, and provide a service to the public. Transforming SPTC into a PPP is currently being considered to unlock the financing barrier in the public transport sector. However, the Seychelles Infrastructure Action Plan (2015) also stated that Seychelles was not ready to effectively implement PPPs in areas other than in public infrastructure due to a policy framework and legal and regulatory framework which at the time was not prepared for the implementation of PPPs as well as a general absence of capacity and a clear implementation plan. Equally, the World Economic Forum Global Competitive Index ranks access to finance as the most problematic factor for doing business in the Seychelles[13].

This project supports the Republic of Seychelles in its efforts to promote public transportation through the demonstration of 1 electric bus, which will prepare the planned upscaling of the e-bus fleet through the development of a financing concept, and finally the total switch to electric buses within the fleet of SPTC. By promoting electric public transportation, and by developing an adequate strategic and policy framework, the project will work towards the intended plan to electrify public and private vehicle fleets in the Seychelles. By further investigating the interdependencies between renewable power supply and flexible power demand, e.g. through the introduction of electric vehicles, the project will also work towards the renewable power supply target of 15% by 2030 set in the 2010 Seychelles Energy Policy.

## 2) Baseline scenario and any associated baseline projects

### *Transport sector*

Between 2000 and 2015, the total vehicle fleet in Seychelles more than doubled (**Figure 4**), with the fleet of passenger cars almost tripling. Overall fleet growth is clearly driven by (private) passenger cars. Motor vehicle driving licenses have also increased steadily, at a rate of approximately 10% per year, standing at 10,037 in 2011. Motor vehicles registration between 2000 and 2015 indicated that Seychelles has a relatively high motorization rate per capita fleet at 176 vehicles per 1000 people in 2014. Globally, this placed the small island archipelago at number 77 out of 191 that year. This is approximately at the same level as Singapore and Hong Kong.

<b>NEW REGISTRATIONS</b>					
<b>Year</b>	<b>Passenger cars <sup>(1)</sup></b>	<b>Omnibuses</b>	<b>Commercial vehicles <sup>(2)</sup></b>	<b>Motor cycles</b>	<b>Total</b>
2000	275	24	83	2	384
2001	270	19	88	11	388
2002	475	11	202	5	693
2003	518	39	172	15	744
2004	427	39	143	15	624
2005	511	9	215	13	748
2006	931	2	308	6	1,247
2007	1,319	4	373	11	1,707
2008	1,025	33	373	9	1,440
2009	493	42	233	4	772
2010	1,314	72	327	26	1,739
2011	1,579	142	377	76	2,174
2012	1,250	42	233	131	1,656
2013	1,285	15	331	107	1,738
2014	2,273	23	480	50	2,826
2015	1,345	30	357	149	1,881
<b>NEW PLUS RE- REGISTRATIONS</b>					
2000	6,970	216	2,267	55	9,508
2001	5,384	203	2,521	59	8,167
2002	6,448	193	2,833	33	9,507
2003	7,376	171	2,405	42	9,994
2004	7,373	200	2,486	50	10,109
2005	7,831	226	2,426	34	10,517
2006	8,195	215	2,581	21	11,012
2007	9,104	191	2,524	34	11,853
2008	10,361	227	2,796	44	13,428
2009	10,409	269	2,886	28	13,592
2010	12,071	293	2,878	74	15,316
2011	12,102	473	3,105	173	15,853
2012	12,911	439	2,885	335	16,570
2013	14,606	458	3,235	307	18,606
2014	15,952	475	3,624	240	20,291
2015	15,788	566	3,558	516	20,428

Figure 4 Seychelles vehicle registration and fleet growth  
(Source: Seychelles Licensing Authority)

There is broad agreement on the need to provide more public transport to discourage greater private car ownership - a recent survey indicated that all young Seychellois aspire to own a car. The high motorization has negative ramifications – with congestion, traffic safety and pollution increasingly becoming major concerns. It is recognized that several key existing roads cannot be widened, since the rights-of-way are fully occupied to the edge of pavement by buildings or retaining walls on steep slopes, which amplifies the problem of congestion.

Vehicle importation and registration is ruled by the “Road Transport Act” (Laws of Seychelles, Chapter 206) which sets that currently, all motor vehicles imported require an import permit and should be new, unless for returning residents (3 year age limit). To further discourage motorization uptake, Government has imposed a 50% increase in the levy on imported private vehicles in 2014, albeit with little to no success. This is in part because road infrastructure is well-established with more than 95% of roads being paved<sup>[14]</sup>. One other intervention proposed to discourage the use of private vehicles, is to raise the parking fees in the Central Business District (CBD) and introduce a toll to enter the CBD, in recognition of the pending challenges in providing additional roadway capacity. During the scoping mission, the government spoke of interest in looking into vehicle scrappage or removal of older cars to reduce congestion and roll back emissions from existing vehicle fleets.

An overview of current vehicle import taxation for conventional, hybrid and battery electric vehicles (BEVs, including plug-in hybrids) is shown in Figure 5. Clearly, the import of vehicles is highly taxed, with total tax burden varying 81% and 184% of the Cost, Insurance and Freight (CIF) value of the vehicle. Compared to ICE vehicles, hybrids and BEVs benefit from quite substantial tax incentives (excises are waived 100% for BEVs) – which, based on the assumed vehicle CIF values, has varying effect on total costs, depending on the size and power of the vehicle (captured through the outdated parameter “engine displacement”). For example, for smaller vehicles with engine displacement below 2,000cc the incentive is not enough to bring hybrid and BEV cost on par with conventional vehicles, while for large and powerful cars (displacement over 2,000cc) BEVs naturally become the most economic option. As such there is an incentive to purchase vehicles with smaller internal combustion engines, which often goes along with lower power and higher efficiency, but there is little incentive to buy fully electric vehicles in the segments accounting for the largest market shares.

There would be much better ways of taxation, directly linking the various excises and levies to fuel economy or CO<sub>2</sub> emissions. Since only cars not older than 3 years are allowed to be imported to the Seychelles, collecting the relevant information is easy, since all vehicles of this build year need to come with tested fuel economy / CO<sub>2</sub> emission data complying to various standards around the world. However, with about 500 EVs sold to date (including BEVs and plug-in hybrids), Seychelles has more private EV sales per capita than any other African country. Most of the EVs are imported from South Africa and India, however, local dealers have started to establish local presence providing consumers local support.

The Seychelles Revenue Commission and Ministry of Finance are responsible for value added taxes (VAT), excise tax, trade tax and levies. Legislation with regards to vehicle registration and use lies with Ministry of Transport.

	below 1600cc			1600cc to 2000cc			2000cc to 2500cc			2500cc to 3000cc			exceeding 3000cc		
	ICE	Hybrid	BEV	ICE	Hybrid	BEV	ICE	Hybrid	BEV	ICE	Hybrid	BEV	ICE	Hybrid	BEV
Example CIF value, USD	23,000	30,000	36,000	28,000	36,000	43,000	35,000	46,000	54,000	70,000	91,000	109,000	90,000	117,000	140,000
Trade tax, ad valorem, %	25%														
Goods and service tax, %	15%														
Excise tax, ad valorem, %	25%	13%	0%	50%	38%	0%	75%	75%	0%	100%	100%	0%	100%	75%	0%
Levy, USD	1,500			2,500			5,000								
Total taxes & levies ad valorem, USD	16,450	17,250	15,900	27,700	30,400	19,700	45,250	57,900	26,600	103,000	132,400	48,600	131,000	139,550	61,000
VAT, %	15%														
VAT, USD	5,918	7,088	7,785	8,355	9,960	9,405	12,038	15,585	12,090	25,950	33,510	23,640	33,150	38,483	30,150
Total taxes & levies, USD	22,368	24,338	23,685	36,055	40,360	29,105	57,288	73,485	38,690	128,950	165,910	72,240	164,150	178,033	91,150
Total vehicle price incl. taxes & levies, USD	45,368	54,338	59,685	64,055	76,360	72,105	92,288	119,485	92,690	198,950	256,910	181,240	254,150	295,033	231,150
% share of taxes on CIF price	97%	81%	66%	129%	112%	68%	164%	160%	72%	184%	182%	66%	182%	152%	65%

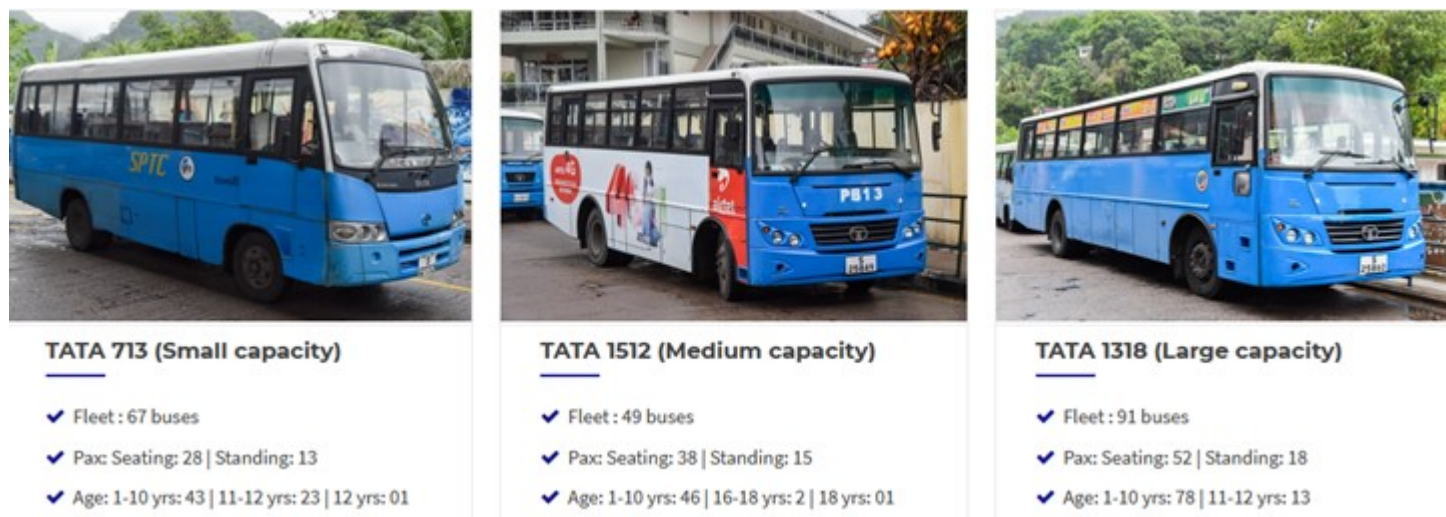
Figure 5 Vehicle import taxes and levies (source Seychelles Revenue Commission)[15]

### Background on Seychelles Public Transport Corporation

The SPTC was established in December 1977 in accordance with the Seychelles Public Transport Corporation Decree 1977. The Decree mandated SPTC to provide an efficient, adequate and economical public transport system within Seychelles for the general public, that charges a reasonable and adequate level of fares. To date, SPTC is 100% government owned but plans exist to either privatize the corporation or to convert it into some form of public private partnership. The Corporation has grown to offer an expansive range of services including special hires, maintenance services and advertising opportunities. SPTC is the only public transportation service provider in Seychelles with over 55,000 passengers accessing their service every day in the islands of Mahé and Praslin.

In 2016, SPTC's total revenue[16] amounted to about 8.0 million USD, of which 5.02 million USD were generated through fare collection, 834,000 USD were generated through special services hire contracts and 2.14 million USD were covered through government subsidies, accounting therefore for about 27% of SPTC income (a value which is rather moderate as usual subsidies for bus public transport usually reaches levels of 50% and more in European cities[17]).





**Figure 6 Vehicle fleet of the SEYCHELLES PUBLIC TRANSPORT CORPORATION (SPTC)**

SPTC operates a fleet of 265 buses, of which 207 are manufactured by Tata Motors, India's largest buses & chassis manufacturer. The SPTC bus fleet mainly consists of three models, the TATA 713, TATA 1512 and the TATA 1318 (see **FIGURE 6**). These are rated for approximately, 28, 38 and 52 seating passengers, respectively. Seychelles does not have clean fuel standards or heavy-duty emissions standards, hence the buses are highly pollutive.

SPTC Fleet Replacement Policy specifies that only buses of up to 12 years are kept in active service, as such, over the last four years, 107 buses have been replaced and about 45 buses are expected to be introduced into the fleet in 2020 and 2021. The average SPTC fleet age is 8 years, but some buses are up to 15 years old and could be associated with higher maintenance costs. The SPTC has a fleet replacement plan that targets an average fleet age of 5 years or less. To achieve this external financing will be required.

SPTC is currently operating a network of 41 routes and service is starting by 5.50 am and ending by 7pm at the latest, providing ample time for e-bus charging. SPTC is operating 5 bus depots distributed over the islands of Mahe and Praslin. Data on duty hours and kilometers driven indicate (Figure 7) that daily distances driven on many of the routes are relatively short (between 52 km/d up to 194 km/d) and therefore well suited for electric buses. Whilst daily distances seem moderate, the geographical profile includes hilly terrain with steep gradients, demanding for sufficient engine power and battery range. Bus speeds are limited to 50 km/h on free road and 60 km/h on highway, being well suited for e-bus operation.

Fuel consumption of the bus fleet increased over the past years, averaging to about 250,000 liters per month costing the company around 800,000 USD per year (equal to almost 30% of annual government subsidies). In addition, at fuel cost of SCR 4.75 or about USD 0.22 per liter, diesel for use by SPTC is currently highly subsidized by government (compared to diesel pump price of SCR 20 per litre or USD 0.98 per litre<sup>[18]</sup>). The use of e-buses would significantly reduce expenditures on diesel fuel, and hence also reduce the amount fuel subsidy expenditures. At the same time, the subsidy on diesel fuel substantially distorts the TCO of electric buses when benchmarked against diesel buses. It is therefore proposed to evaluate whether better ways of subsidizing SPTC exist, e.g. directly via the ticket price. This would also create an incentive to use the remaining ICE buses more efficiently, e.g. through training drivers to drive more fuel economical.

**Table 8: Examples of duty hours versus kilometres driven**

Depot	Duty number	Start time	Finish time	Total hours	Duty duration	Km driven
Victoria	0137	5.45am	5.45pm	12 hours	9 hours 35 mins	52.5
Port Launay & Barbarons	0171	6.05am	4.05pm	10 hours	8 hours 25 mins	69.5
Victoria	0009	5.35am	7.10pm	13 hours 35 mins	10 hours 15 mins	101.0
Baie Lazare	0071	6.05am	5.25pm	11 hours 20 mins	9 hours 5 mins	149.5
Baie Lazare	0075	6.35am	6.40pm	12 hours 5 mins	9 hours 25 mins	154.0
Anse Aux Pins	0108	4.45am	5.05pm	12 hours 20 mins	9 hours 35 mins	167.5
Baie Lazare	0082	5.50am	5.30pm	11 hours 40 mins	10:20hrs	168.0
Anse Aux Pins	0109	5.30am	5.35pm	12 hours 5 mins	09:35hrs	172.5
Baie Lazare	0084	5.40am	5.30pm	11 hours 50 mins	10:45hrs	194.0

Source: OAG Analysis of duties as per the SPTC Scheduling Unit

**Figure 7 Duty Hours and kilometres driven on various routes**

SPTC has managed to operate an efficient and reliable public transportation system. The 2018 Performance Audit on SPTC operation conducted by the Office of the Auditor General titled 'Efficiency and Effectiveness of the Public Bus Service' established that:

- SPTC operated 99 per cent of its scheduled trips and kilometres between 2013 and 2016
- SPTC has been able to increase number of trips between 2013 and 2016 to meet public demand, as articulated in consultations with public stakeholders

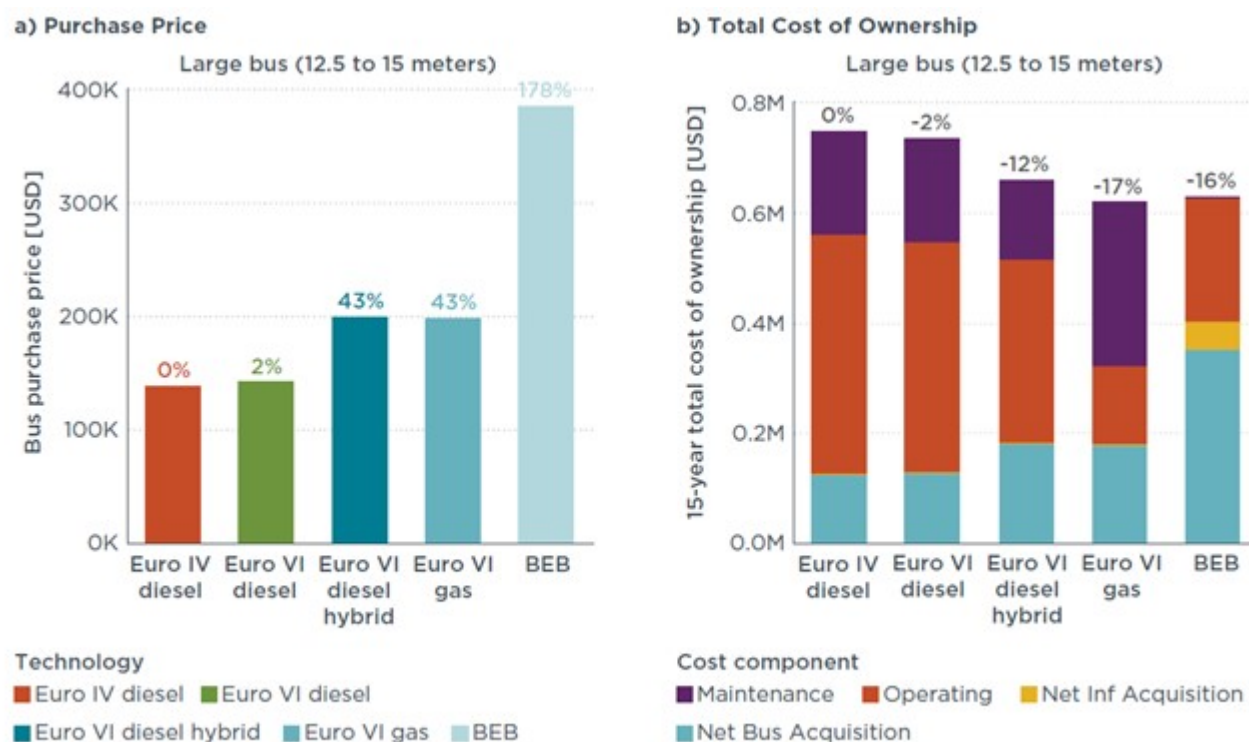


- In addition to training of new bus driver recruits, SPTC offers continuing education and training to its existing drivers at its Driving School, raising the level of proficiency of the fleet drivers
- SPTC observes a thorough monthly service schedule for all its buses as part of its preventive maintenance program. This has resulted in a declining bus breakdown over the years. This coupled with a quicker response to bus breakdowns has seen a significant reduction in down times due to breakdown.

Undoubtedly, the audit did establish several areas of operation that required corrective measures and/or improvement but largely, this audit underscored the fact that SPTC has been successful in meeting the mandate with which it was charged. SPTC running a well-maintained scheduled service is therefore in a good position to pilot electric buses in, with potential for providing outreach and replication to other developing and transitional countries.

A public transport survey conducted by the SPTC as part of this audit found that 95% of daily commuters rely on the SPTC bus service to travel to work or school. While the ridership numbers are impressive.

Research from the International Council on Clean Transportation (ICCT) found in 2017 that total cost of ownership for new 12.5m electric buses in Bangkok would be about 16% cheaper compared to a Euro IV diesel bus. This analysis also included a thorough dive in the analysis of maintenance costs, which for example reveals that an engine of a conventional diesel bus needs a complete overhaul each 5 years costing about 38,000 USD in the Bangkok example, which is about equivalent to the cost of a 200 kWh battery (at USD 200 per kWh), which should be sufficient for a trip distance of max 200 km for a 30 to 40 seater bus. While the analysis is not based on Seychelles data, the main takeaway remains the same: All cost including fuel cost (cleaned from subsidies) internalized, electric buses are the more economic option over the entire lifetime of the investment.



**Figure 8 Total cost of ownership comparison for 12.5 m buses in Bangkok***Energy sector*

Seychelles depends heavily on imported fuel products. Its primary energy consumption is about 1.86 tons of oil equivalent (TOE), which is higher than the average for Africa (0.7) and the world (1.8). Seychelles' per capita energy consumption in 2010 averaged 4,300 kWh. The energy sector falls under the Ministry of Agriculture, Climate Change & Environment. The energy regulator is the Seychelles Energy Commission (SEC). The Public Utility Corporation (PUC) is the main producer of power in Seychelles. There is some power production by private operators, but these are overwhelmingly from diesel engines on the smaller islands. PUC is also responsible for transmitting and distributing electric energy in Seychelles. Since 2012, 100% of the population has had access to electricity. The legal framework for energy is provided by the Public Utilities Corporation Act (1985). The main sector policy the Seychelles Energy Policy for 2010-2030 which was formally approved by the Cabinet and adopted as social government policy in 2010. It recommends a sustainable development of the energy sector focusing on energy efficiency, renewable energy and reducing the dependence on oil to improve energy security. With an aim to diversify the energy supply, a 5% and 15% share of renewable energy is targeted for 2020 and 2030, respectively.

The Seychelles Energy Policy includes analysis of historical, existing and projected energy demand and supply, and proposes key changes to the institutional and regulatory framework for energy in the country, including strengthening the SEC, the creation of an independent energy regulator, and clearly defined independent power producers (IPPs) regulations to promote renewable energy development. According to the terminal evaluation report of the GEF funded project "Grid-Connected Rooftop Photovoltaic Systems, Seychelles" (led by UNDP), a PV net-metering scheme has not yet been formalized in Seychelles' legislation but "has been approved by SEC [Seychelle Energy Commission] and is implemented effectively by PUC [Public Utilities Corporation]"[19]. The Energy Policy also represents the first formal recognition by the Government of Seychelles of the importance of renewable energy production. On the other hand, the Energy Policy is not a traditional policy or planning document and does not provide detailed targets, methods, or timeframes for instituting changes to energy management in the country. Four renewable energy technologies are identified that may be appropriate in the country: solar PV, wind, micro-hydro, and biomass/municipal solid waste.

kWh per month	USD/kWh	
	20 A	40 A
200	0.04	0.07
300	0.04	0.06
400	0.07	0.08
600	0.09	0.11
1000	0.13	0.14

**Figure 9 Power price for domestic consumers by connection type (PUC 2018)[20]**

Electricity price in the Seychelles is moderate, ranging from USD 4ct/kWh to USD 14 ct/kWh depending on the capacity rating of the power connection and the monthly consumption. Tarication incentivizes economic use of power since it increases progressively with monthly consumption. Differentiated tarication for EV charging would be preferential to incentivize the use of EVs over the use of conventional vehicles.

Given the emissions arising from fuel combustion in Seychelles for the generation of electricity and for mobility (the two main consumers of the imported fuel), there is need for a concerted effort and an integrated approach to transition these two sectors to renewable energy models so as to wean Seychelles off fossil fuels.

### *Associated Baseline Renewable Energy Projects*

PUC is building the 5MW Ile de Romainville Solar Park – a solar photovoltaic (PV) power plant with battery storage. The project which will be commissioned in 2021 is projected to cost 12 million USD with 8.4 million USD being financed by a loan from Abu Dhabi Fund for Development (ADFD) and the rest from the government (including PUC's own equity). The project's engineering, procurement and construction (EPC) contract scope includes subsea cabling, switch gear extensions, and an underground water piping system for module cleaning. The new project will also include an energy storage system (ESS) with a capacity of 5MW and 3.3 megawatt-hours (MWh), allowing for the safe and stable supply of electricity to the main island of Mahé, while also addressing the intermittency challenges of renewables, further consolidating Seychelles' energy security. The cutting-edge Ile de Romainville Solar Park project harnesses the latest efficiency enhancements in solar power technology, including the optimisation benefits of battery storage, demonstrating the benefits of renewable energy ventures in long-term socio-economic development. The new Ile de Romainville solar PV project will be installed on the same artificial island hosting five of the eight wind turbines comprising the 28 million USD 6MW Port Victoria Wind Farm. Operational since 2013, the eight wind turbines of the Port Victoria Wind Farm supply approximately 2,100 households on Mahé Island. The PV array has been specifically designed to maximise the use of available land, while allowing for the maintenance of the wind turbines and minimising any shading losses resulting from them. By combining solar energy with wind power, Seychelles will double its renewables capacity while freeing up resources for economic development.

Africa's first utility scale, private sector financed floating PV project is being implemented in the Lagoon le Rocher, a shallow body of water separated from the sea by the Providence Industrial Estate on Mahé Island. The project which is expected to have a capacity of 5.8 MW is on track for commissioning during year 2021, after having experienced Covid-19 related delays. The project is being implemented by the Seychelles government and PUC with additional support from the Clinton Foundation. A consortium of private developers who won the competitive project bid will finance, design, build, own and operate the plant and the electricity will be sold to the PUC at a fixed tariff under a 25-year power purchase agreement.

In addition, the government has incentivized the adoption of home solar panel (PV) installations by providing subsidies and rebates for PV components.

The project seeks for close collaboration with the renewable power projects, especially on questions on grid operation, renewable power integration and storage.

The development of policies, regulation and strategies related to the power sector and the generation, transmission and retail of power is under the responsibility of Ministry of Agriculture, Climate Change & Environment and its implementing agency Seychelles Energy Commission.

### *Electronic waste and batteries*

A recent study carried out by ETH Zurich<sup>[21]</sup> investigated the electronic waste management system in the Seychelles and developed a roadmap towards improving it. The following challenges were identified:

- High and rising waste volumes due to relatively high population density and fast economic growth

- Limited availability of land for waste management activities
- Small market sizes and limited potential for economies of scale
- Vulnerability to supply and demand shocks
- Lack of capital and financing options
- Limited institutional and human resources capacity
- High operational costs
- High costs of products that must be imported or exported

Seychelles is a signatory of the Minamata, Stockholm and Basel convention, which all have effects on the treatment of e-waste. In her thesis, Rapold explains that currently, the Seychelles do not have in place detailed legislation on waste management, including e-waste. Some broad legislation is contained in the Environment Protection Act (EPA, 2016). It states that dumping waste in places other than designated disposal areas is illegal and that hazardous waste (as defined under the Stockholm convention and including some parts of electronic waste) cannot be disposed without government authorization. The study identified the National Waste Policy 2018 – 2023 (Ministry of Agriculture, Climate Change & Environment, MEECC 2018) to be the guiding instrument with regards to waste management, being based on Extended Producer Responsibility and the Polluter Pays Principle. The study finds that “With regards to recycling, the policy points out the use of deposit-refund schemes to encourage waste segregation and specifically mentions the objective to establish a scheme for the separation and collection of Electrical and Electronic Equipment (EEE) to be able to recycle and export it”<sup>[22]</sup>. The Department of Environment (DoE, under MEECC) and the Landscape and Waste Management Agency (LWMA) have been identified to be the lead institutions for treatment of waste, including e-waste.

According to Rapold, electronic waste, which is generally recognized as hazardous waste in the Seychelles, is currently disposed through landfilling, which poses a significant risk for the environment. This practice is unsustainable and needs to be changed in particular with the arrival of EVs. Since Seychelles is a small island with a manageable amount of vehicle importers, and since generally no used vehicles can be imported, obliging vehicle importers to collect used EV batteries for re-use and recycling through an Extended Producer Responsibility mechanism seems to be a viable measure to propose.

As outlined in the baseline scenario, various policies, regulations and incentives have already put in place both in the transport as well as in the energy sector. Coordination among ministries and in particular between Ministry of Transport, Ministry of Agriculture, Climate Change & Environment and Ministry of Finance Trade Investment and Economic Planning needs to be improved to work towards an aligned implementation of e-mobility in the Seychelles.

### 3) Proposed alternative scenario with a description of project components, outcomes, outputs and deliverables

The project will develop the environment for a transformative shift to electric mobility in Seychelles. This will be achieved through the development of a Seychelles E-Mobility Strategy, the establishment of a National Inter-Sectorial Electric Mobility Steering Committee, capacity building on EV procurement, operation and maintenance among key stakeholders from government, private sector and academia and through putting in place the right institutional and policy framework to facilitate the implementation of the E-Mobility Strategy, which will lay out milestones for a complete shift to e-mobility in the Seychelles driven by the electrification of public transportation starting with SPTC.

Through demonstration of one electric bus alongside the required charging infrastructure, this project will prepare the upscaling of electric buses within SPTC, which can be based on e-buses donated by the Government of the People's Republic of China to the Seychelles (see Box 1). The e-bus demonstration targeting the electrification of the Seychelles Public Transport Corporation (SPTC) will provide the necessary data and experience to make an informed choice to put in place e-buses which are fit-on-purpose.

Assessments of EV grid integration and energy storage will provide evidence of technical, financial and environmental sustainability of combining renewable energy generation and electric mobility within a SIDS. The assessment of the sustainability of e-mobility will furthermore include the development of an initial scheme for the collection of used EV batteries for re-use, recycling and safe disposal, and will recommend concrete action to policymakers, consumers and investors.



### **Box 1: Donation of 22 electric buses from the People's Republic of China to the Government of the Seychelles**

In February 2020, former President of the Republic of Seychelles Danny Faure announced in his State-of-the-Nation-Address that “In the last 40 years, our public transportation has used diesel as the main source of energy. The time has come for SPTC to move toward cleaner energy. Following our discussions with the Government of China, next year we will receive 22 new electric busses” (<http://www.nation.sc/articles/3547/2020-state-of-the-nation-address-by-president-danny-faure-on-february-20-2020>). Discussion about the provision of 22 electric buses as part of a government to government development agreement between the Republic of Seychelles and the People's Republic of China were started already in 2019. Discussions have been led by Ministry of Foreign Affairs. With the election of a new government following the vote of the Seychelles in November 2020, discussions were stalled and have only recently revived. However, both parties have expressed interest to continue the negotiations, and at this point in time we anticipate that the provision of electric buses will be agreed and that these buses would potentially be ready to start operation in the Seychelles Public Transport Corporation (SPTC) in 2023.

The demonstration project, which is an integral part of this proposal, is to prepare for the implementation of e-buses at scale within SPTC, including but not being limited to the anticipated 22 electric buses part of abovementioned agreement. Therefore, it is the aim of the project to demonstrate one electric bus on at least 5 different routes and over a time frame of at least 10 months in order to define technical and operational specifications of e-buses suitable for the conditions found in the Seychelles, such as 1.) passenger capacity; 2.) engine power; 3.) range and battery capacity; 4.) climbing ability / gradeability; 5.) need / dimensioning of air conditioning; 6.) charging equipment (including rated capacity, standard, charging type) among other yet-to-be defined parameters. The project aims equally at the definition of technical and operational specifications of the necessary charging equipment, including an assessment of preconditions which need to be put in place at the depots of SPTC to ensure adequate power supply for the charging of at least 22 electric buses.

For this, the project plans the testing of one electric bus and its corresponding charging equipment, which is partly funded by the GEF, on different routes of the SPTC public bus network on Mahé and eventually Praslin Island.

In addition, the project is envisaged to rely on the support of in-kind contribution leveraged by UNEP, and based on the European Union funded SOLUTIONSplus project (Grant Agreement number: 875041 - SOLUTIONSplus - H2020-LC-GV-2018-2019-2020/H2020-LC-GV-2019, which has started implementation January 2020). This in-kind contribution provided through an EC SOLUTIONSplus industry partner, and supported by UNEP SMU would be used to test and integrate innovative charging solutions alongside the identified demonstration routes. Through the SOLUTIONSplus partner project, additional expertise as part of a comprehensive industry partnership could also be directed towards the Seychelles E-Mobility Project.

*Outcome 1: The government has established a coordinated institutional framework and adopts a gender sensitive strategy for the promotion of low-carbon electric mobility in Seychelles*

This first component will set the basis for the long-term impact of the project through 1) the establishment of an institutional framework and the National Inter-Sectorial Electric Mobility Steering Committee; 2.) through the development of a comprehensive National E-Mobility Strategy; and 3.) through capacity building of project stakeholders. In addition, the market place events carried out as part of the Global E-Mobility Programme will provide the opportunity to present on the implementation and lessons learnt of the Seychelles E-Bus demonstration to kick-start discussions and to develop concepts for the financing of electric buses as part of the SPTC, with the ultimate goal to fully electrify the SPTC bus fleet.

The National Electric Mobility Strategy will serve as a central guidance document for a long-term approach in the uptake of a sustainable electric transport in Seychelles. This strategy will cover all areas and modes of e-mobility and including concrete targets and milestones for the EV market development as well as the necessary regulatory, fiscal, financial and infrastructural actions required to achieve the set targets.

The development of the Strategy will be also assisted by the international best practices and expertise to be made accessible through the Global Thematic Working Groups. As the Seychelles project is part of the UNEP-led Global Electric Mobility Programme, it will enjoy the benefits offered by the Global E-mobility Project through the knowledge products developed by the Global Thematic Working Groups (especially the Heavy Duty Vehicle Working Group, which will have a particular focus on e-buses) and the Africa Support and Investment Platform. Both the Heavy Duty Vehicle Working Group and the Africa Support and Investment Platform will be led by UNEP.

The National Inter-Sectorial Electric Mobility Steering Committee will include representatives from relevant ministries such as the Ministry of Transport, the Ministry of Agriculture, Climate Change & Environment, the Ministry of Finance, Trade Investment and Economic Planning, the Seychelles Revenue Commission, the Seychelles Energy Commission, SPTC and the Road Transport Commission and will have the mandate to propose relevant policies for adoption by parliament (National Assembly). The National Inter-Sectorial Electric Mobility Steering Committee will initially be constituted by the Project Steering Committee (PSC) of this Seychelles E-Mobility Project, which will prepare for the establishment and formal recognition of the National Inter-Sectorial Electric Mobility Steering Committee by the government of Seychelles by the end of Year 3 of the project. The goal is to ensure that the National Inter-Sectorial Electric Mobility Steering Committee will live beyond the life of this GEF funded project, and for this purpose the government will need to commit regular budget to sustain it beyond the end of Year 3 of this project.

The two e-mobility market place events and the replication event organized by the Global E-Mobility Project in year 2, 3 and 4 of the project will provide a platform to present the progress, challenges and lessons learnt of the e-bus demonstration in the Seychelles to financiers (comprising development banks, the Green Climate Fund, private sector investment companies etc.) in order to start developing concepts for e-mobility upscaling (including the plans to implement a fleet of up to 22 electric buses donated under a Government to Government agreement between the Republic of the Seychelles and China), which has been extensively discussed under the former Government of the Seychelles, and which has been recently revived under the new government which was elected in November 2020.

*Output 1.1: A national inter-sectorial electric mobility steering committee is established*

A Project Steering Committee will be established, which will formally transform into the National Inter-Sectorial Electric Mobility Steering Committee after year three of the project, and which will ensure the successful implementation of e-mobility policies, regulations and financial schemes after the lifetime of the project. The PSC will be chaired by the Department of Land Transport within the Ministry of Transport and will include representatives from Ministry of

Agriculture, Climate Change & Environment, Ministry of Finance, Trade Investment and Economic Planning, the Seychelles Revenue Commission and the Seychelles Energy Commission, the Public Utilities Cooperation, the Seychelles Public Transport Corporation, the National Bureau of Statistics, the Seychelles Licensing Authority, the Seychelles Bureau of Standards, the Enterprise Seychelles Agency and the Seychelles Motor Vehicle Dealers Association, among others when required.

Key responsibilities of the PSC will include to 1.) provide supervision to Department of Land Transport in its role as Executing Agency; 2.) establish clear roles and responsibilities for all parties for the delivery of the proposed activities; 3.) coordinate all e-mobility activities in Seychelles and 4.) to ensure comprehensive stakeholder engagement throughout the project.

#### Deliverables

- D 1.1.1 Draft mandate, institutional structure, rules and procedures of operation, host entity, representation requirements, and workplan of the National Inter-Sectorial Electric Mobility Steering Committee
- D 1.1.2 Meetings of the proposed National Inter-Sectorial Electric Mobility Steering Committee held three times a year to guide the development of the e-mobility strategy, to comment and review on draft policy proposals and other project outputs
- D 1.1.3 Government notification to establish the National Inter-Sectorial Electric Mobility Steering Committee as a strategic, national, multi-stakeholder steering committee on e-mobility is issued
- D 1.1.4 Report compiling all the best practices and lessons learned based on studies / reports produced as part of the e-mobility project in Seychelles (to be shared with the Global E-mobility Programme)

*Output 1.2. A gender sensitive National Electric Mobility Strategy that includes electric ation of Seychelles Public Transport Corporation is developed and formally proposed.*

A gender sensitive National E-Mobility Strategy including the electrification of SPTC will be developed under this output. The strategy will be developed upon vehicle eet data provided by the National Bureau of Statistics and will include the denition of aspirational electrification targets and milestones for all main vehicle modes, including passenger cars, buses and commercial vehicles such as delivery trucks. Based on these targets nancing needs will be evaluated and initial nancing mechanisms pr oposed.

The National E-Mobility Strategy can start of the e-mobility market penetration scenarios, which underly the CO<sub>2</sub> emission mitigation calculations in this project document. These targets foresee the share of BEVs on new buses to account for 30% by 2025, 50% by 2030 and 100% by 2050. The small numbers of annual sales of buses of around 40 to 60 units per year, as well as the generally very favorable conditions (low daily mileages, long overnight charging times, low speeds etc.) allow for an ambitious target to sell only electric buses from 2040 onwards. The respective target for electric LDVs, is much more conservative, accounting for 3% of new vehicle registrations in the Seychelles by 2025 (including BEVs and PHEVs), 20% by 2030 and 75% by 2050 is ambitious, yet feasible under the conditions found in Seychelles and can be evaluated during the development of the strategy.

The strategy will be developed in close coordination with all members of the project steering committee and the National Inter-Sectorial Electric Mobility Steering Committee. It will also include action items to address gender-based inequalities in the public transport sector, women's representation and participation in decision-making, and investing in women's capacity in the e-mobility industry. The Project Management Unit will liaise with and seek the support of the Gender Secretariat of the Ministry of Family Affairs on this aspect. It will be submitted for review to the National Inter-Sectorial Electric Mobility Steering Committee, prior to submission for adoption by the government.



Deliverables

- D 1.2.1 Set-up of the national strategy development team
- D 1.2.2 Gender-sensitive national e-mobility strategy workshop (1 report with an outline of the national strategy)
- D 1.2.3 Transport and energy sector data is collected and consolidated and a draft strategy is developed (summary report)
- D 1.2.4 Gender-sensitive national e-mobility strategy finalized and presented to National Inter-Sectorial Electric Mobility Steering Committee

*Output 1.3. Key stakeholders are trained in the EV Global Programme activities and through private sector engagement (national and regional workshops, trainings and thematic working groups) and awareness is raised among key stakeholders on electric mobility.*

Key stakeholders from government, private sector, civil society, and academia participate in global events as agreed with the Project Management Unit. The participants will include decision-makers and/or operational staff as targeted by the platform event. The Chief Technical Advisor will be responsible for identifying and selecting the individuals to participate in the different events, in consultation with the Project Management Unit (PMU) and the National Inter-Sectorial Electric Mobility Steering Committee. The Chief Technical Advisor will seek to ensure at least 30% of the participants selected for participation in the events are female, as outlined in the Gender Action Plan.

The training events will aim at 1.) developing a community of practice to exchange lessons learnt among all e-mobility projects in the region on demonstration project design and implementation, data collection and analysis, business model etc.; to 2.) train project stakeholders on technical, financial and operational aspects of e-mobility and in particular e-buses; and 3.) to prepare for scale-up and replication of the demonstration project through dedicated market place events bringing together project leads, electric vehicle suppliers and financiers. The training events will contribute to develop the capacity needed within the relevant Ministries, the SPTC, and the Public Utilities Corporation (PUC), among others yet to be identified, to implement electric buses at scale, and to generally support the achievement of milestones and targets set in the E-Mobility Strategy.

Deliverables

- D 1.3.1 Participation in three Africa Platform / Community of Practice events (+ 1 report for each event)
- D 1.3.2 Participation in three electric mobility / electric bus training events (+ 1 report for each event)
- D 1.3.4 Participation in two financing / marketplace events (+ 1 report for each event)
- D 1.3.5 Participation in one e-mobility replication event (+ 1 report for each event)

**Component 2: Short term barrier removal through low-carbon electric mobility demonstrations**

*Outcome 2: The e-bus demonstration provides evidence of technical, financial, and environmental sustainability enabling SPTC to plan for scale-up of Seychelles' e-bus fleet.*

This component will prepare for the introduction of electric buses at scale, including but not being limited to the donation up to 22 e-buses of as part of the Government-to-Government development agreement between the Republic of the Seychelles and China (see box 1).

Therefore, this component focuses on the demonstration of one electric bus alongside its charging equipment, to provide the data basis for informed decision making with regards to e-bus and charging technology, and to gain on-the-ground experience with an electric bus in the Seychelles. A comprehensive feasibility study will be developed to identify at least three routes, which are suitable for electrification, taking into account daily trip length, mission profile, bus

intervals, depot situation and access to high capacity power supply, among other parameters. Based on the identified routes, technical specification for the demonstration bus will be developed, aiming at a passenger capacity of about 30 seats, and targeting a reasonable battery size to provide for sufficient range and power under the geographical condition found in the Seychelles. The GEF, through this project, will support the purchase of the bus with USD 80,000 and SPTC will cover the rest (estimated at USD 120,000 both parts adding up to a total of USD 200,000 for one e-bus with 30 to 35 seats, based on data from NREL[23] for a BYD bus with 31 seats and 162 kWh battery capacity including a 15% safety margin).

Upon completion of the required studies and implementation plans, the e-bus and the charger will be procured, including technical support through UNEP SMU. It is envisaged, that the e-bus charger will be provided through an industry partner of the EC SOLUTIONSplus project for the time of the demonstration.

The demonstration bus will then be tested for at least 9 months on the identified routes and data will be collected and analyzed. After the end of the demonstration project, the bus will become the property of SPTC and will be used in common service on the most suitable route identified for this e-bus.

The demonstration project will increase the visibility and assist with awareness raising for electric mobility. In addition to the awareness raising impact of the pilots, this will also help in providing critical technical information regarding uptake barriers and solutions, quantifying infrastructure gaps and potential policy interventions.

*Output 2.1: A comprehensive feasibility study and implementation plan for electric bus demonstration for testing on different routes is developed including data collection, reporting and analytical frameworks*

The feasibility study and implementation plan will be developed for the demonstration of one pilot electric bus and associated charging infrastructure in Mahé. The data to be collected and analyzed during the demonstration will provide the data basis needed to plan for the upscaled deployment of at least 20 electric buses within SPTC. In addition, the experience gained and challenges identified will feed into the target-setting process part of the national electric mobility strategy. The data will also be used in the assessment of grid integration and energy storage of electric vehicles on Mahé. All feasibility assessments will be conducted in close consultation with the Global Thematic Working Groups and the Africa Support and Investment Platform to ensure global best practices are incorporated into the demonstration studies.

The implementation plan will be developed in close collaboration with the EC SOLUTIONSplus industry partner, which is envisaged to provide an EV charger capable to charge the demonstration e-bus. Ideally, the provided charger would be mobile to the extent that, upon availability of the required input power, it can be moved to different locations, e.g. different depots, and therefore enable a testing of the e-bus on a broader choice of routes.

Both, feasibility study and implementation plan for the e-bus demonstration will be developed based on a combination of international and local expertise and in close cooperation with SPTC. While the International E-Mobility Technology expert is most knowledgeable in e-bus technology, charging, operation (including routing etc.) and maintenance, the National E-Mobility and Power Market expert is most knowledgeable about the local power market and has a good overview on general aspects of e-mobility. A field trip of at least 7 days will be organized to collect the necessary input for the feasibility study and the implementation plan.

The technical electric bus feasibility assessment will evaluate the following key aspects of the bus pilot:

- Electric Bus Technology: identify the electric bus technical specs and configuration suitable for Seychelles and SPTC taking into account local geographical and climate conditions, and the selected route specifications

- Route analysis: identify 3 viable SPTC routes on the island of Mahé on which the electric buses will be deployed over a period of at least 10 months (e.g. at least 2 months per route). Suitable route selection needs to be based on daily distance travelled, frequency of service, number of passengers, stops, elevation change, road conditions, seating capacity, in line with electric motor power specifications, battery capacity, and charging scheme (i.e. overnight charging) and the possibility to install the mobile charger (at least 50kW power output) provided by the EC SOLUTIONSplus industry partner.
- Charging Assessment: ensure connectivity between the charging equipment provided by the EC SOLUTIONSplus industry partner and the demonstration e-bus and evaluate different charging alternatives for SPTC (e.g. at various depots and eventually taking into account the option of opportunity charging along routes, upon availability of respective equipment), based on the equipment, which can be provided by the EC SOLUTIONSplus industry partner.
- Conduct operations & maintenance impact assessment of electric buses in Mahé; identifications of gaps to be addressed for managing new technology, in particular with regards to overnight charging.

The implementation plan for the electric bus pilot in Mahé will involve the following key aspects:

- Identification of key performance indicators (e.g. reliability of service, trips performed, kilometers travel, passenger carried, energy used, monitoring of state of charge of battery, charging patterns and logistics, maintenance issues, comparison to internal combustion engine vehicles in terms reliability of service x ed and operational costs etc.).
- Development of a detailed planning to use the demonstration bus on at least 3 routes for at least 3 months each, including plans to transfer the charging station and to prepare the respective depots to provide the necessary power supply (at least 50 kW continuous)
- Development of a detailed agreement between SPTC and the EC SOLUTIONSplus industry partner to use the charging equipment provided by the EC SOLUTIONSplus industry partner as part of the EC SOLUTIONSplus project and with support of UNEP SMU. The Seychelles bus demonstration will be operated under the umbrella of the “replication projects”, which are part of the EC SOLUTIONSplus grant agreement, and which are led by UNEP SMU. The agreement needs to cover all operational and liability aspects related to the demonstration project and the use of the charging equipment. The EC SOLUTIONSplus industry partner is envisaged to cover all costs related to the shipping of the charging equipment (as part of their involvement within the EC SOLUTIONSplus project) and is envisaged to provide technical support throughout the demonstration, including at least 2 eld visits over the time of the project implementation. UNEP SMU will provide coordination support to manage the relationship between the GEF Seychelles e-mobility project and the EC SOLUTIONSplus project for which the dedicated UNEP in-kind contributions will be used.
- Development of a detailed staff plan including a technology assistant to overview and manage the demonstration project (SPTC), various bus drivers (SPTC), charging operators (SPTC), mechanics for bus maintenance (SPTC), electrician for charging equipment connection and operation monitoring (SPTC)
- Development of a detailed data collecting and analysis plan for the identified k ey performance indicators
- Preparation of bus user surveys to get feedback.

### Deliverables

- D 2.1.1 Detailed terms of references with timelines and deliverables for hiring of local and international expertise developed
- D 2.1.2 Workshop and eld visit t o collect data for the e-bus feasibility assessment and implementation plan conducted (eld visit r eport + workshop report)
- D 2.1.3 Feasibility assessment for demonstration of 1 electric bus as part of the SPTC eet in Mahé, including technical specifications of the demonstration bus and charger, and selection of routes (at least 3) and charger locations carried out;

D 2.1.4 Implementation plan for e-bus operation (including operation on three different routes and possibly within different depots), charging and maintenance, data collection, reporting and analysis framework developed

*Output 2.2: One demonstration bus and charging equipment are procured, staff trained, demonstration project on different routes is implemented, monitored and data collected, analyzed and disseminated.*

Based on the detailed feasibility study and implementation plan, the demonstration bus is procured and imported to the Seychelles. All procedures to import the demonstration bus tax free need to be prepared in advance to minimize delays eventually related to the clearance of the bus by customs and technical inspection. The UNEP Sustainable Mobility Unit (SMU) will ensure the bus demonstration is closely coordinated with the EC SOLUTIONSplus industry partner, as part of the GEF – EC SOLUTIONSplus project cooperation, to ensure that readiness of the e-bus and the charger are ensured and on time. The EC SOLUTIONSplus industry partner is envisaged to provide a technician to supervise the initial installation of the charging equipment and to train local engineers on the conditions to be put in place in the envisaged other locations where the charging equipment shall be installed for overnight charging. Local engineers (SPTC) will be trained on the connection and installation of the mobile charger so that the EC SOLUTIONSplus industry partner staff is not required to be physically present each time the mobile charger changes location. The EC SOLUTIONSplus industry partner is envisaged to provide remote technical advice throughout the duration of the demonstration project.

During a second field trip of the International E-Mobility Technology expert, bus operational staff will be trained on the usage of the e-bus and the charging plan lined out in the implementation plan will be operationalized.

As per the detailed planning described in the implementation plan, the e-bus and the charger will be tested on at least 3 different routes to collect data for the operation and charging of electric buses on the SPTC network. SPTC will monitor the bus operation and collect all relevant KPI's defined in the feasibility study. Final analysis of the data will be compiled led by the international e-mobility technology expert with support of the local e-mobility and power market expert.

All testing, data collection and analysis is geared towards the preparation of technical specifications for e-buses and chargers (component 3), for scaled up deployment of e-buses within SPTC, including but not being limited to the e-buses donated under the envisaged Government-to-Government development agreement between the Seychelles and China (detailed in Box 1 above). The data will be used to identify suitable e-bus models, their respective charging equipment, as well as charging operation modes. The data will also be used to identify the most suitable routes for upscaled e-bus deployment. All data to be collected will be disaggregated by gender.

After finalization of the demonstration project, the ownership of the demonstration bus will lie with SPTC. The demo bus will be integrated in the daily operation of SPTC fleet on the route most suitable for the demo bus. In the case that the EC SOLUTIONSplus industry partner will retract its mobile charging system, SPTC will need to buy one stationary 50kW charger to be installed at the depot, which will be used for the ongoing operation of the e-bus. For this, SPTC need to commit for the purchase (USD 30,000) and installation of one 50kW charger (to be decided during project implementation).

#### Deliverables

- D 2.2.1 Procurement of electric bus based on specifications established in D 2.1.3, to be managed by SPTC in Mahé
- D 2.2.2 A second field trip and workshop is carried out to prepare for e-bus operation and to train SPTC on the use of the bus (field visit report + workshop report)

- D 2.2.3 Provision of charging equipment by the EC SOLUTIONSplus industry partner and installation at first charging point identified in the implementation plan (D 2.1.4)
- D 2.2.4 The e-bus together with the mobile charging equipment is used for at least 9 months on at least 3 different routes and data is collected and analyzed
- D 2.2.5 Final report on the demonstration results, technical assessments and data analysis is presented to the national inter-sectorial electric mobility steering committee (Output 1.1) and shared with the Global E-Mobility Programme

### Component 3: Preparing for scale-up and replication of low emission electric mobility

*Outcome 3: The government creates conditions for removing existing barriers by developing plans and financing concepts, and by submitting policies and regulations for adoption to accelerate the introduction of EVs in Seychelles*

Under this component the project will prepare scale-up and replication of electric mobility in Seychelles. It will build on the results of the demonstration project and prepare for meeting the targets and milestones set in the National E-Mobility Strategy. It will focus on the following objectives: 1.) Based on the e-bus demo, preparing the scaling up of electric buses within SPTC; 2.) The development and implementation of e-mobility policies to prepare for the scale-up of the e-mobility market in the Seychelles; and 3.) The development of one e-bus scale-up financing proposal. While the first objective focuses on the development of detailed technical specifications and an implementation plan for the use of at least 20 e-buses on appropriate routes of the SPTC (including but not limited to the donation of e-buses as outlined in Box 1 above), the second part of this component focuses on the improvement of some key policies to better incentivize e-mobility in the Seychelles. The third part is targeting to raise additional funding to scale-up the number of electric buses within the fleet of SPTC, working towards the ultimate target to completely electrify the fleet of SPTC.

Public and private sectors, civil society and academia will participate in the review and update of policies and regulation related to the electric mobility.

*Output 3.1: Based on the demonstration project, priority routes for scaled-up e-bus deployment are selected and technical specifications for electric buses and the respective charging equipment are developed*

Based on the results of the demonstration of one electric bus alongside the charging infrastructure provided by the EC SOLUTIONSplus industry partner, technical specifications and an implementation plan for the scaling up of the electric bus fleet to at least 20 e-buses within SPTC are developed. The technical specifications for the e-buses comprise (among other details yet to be defined): passenger capacity, seating configurations, engine power, torque and hill climbing capacity, battery capacity and range, charging standard and charging power, air conditioning requirements, monitoring equipment (e.g. GPS, state of the charge of the battery, etc.). The implementation plan furthermore defines specs for the e-bus chargers and comprises an installation plan (including location and power supply) to charge a fleet of 20 e-buses.

The implementation plan contains allocation of buses on routes, schedules and depots, charging plans, maintenance plans, staff plans for drivers and technicians. The implementation plan furthermore specifies requirements for power supply to charge the buses overnight at the depots, costs out the necessary works to upgrade and ensure local power supply, and plans for additional investment and in-kind contributions eventually required from the local utility PUC. The implementation plan also plans for power supply monitoring and data collection. It builds on the local expertise built with piloting the demonstration bus.

#### Deliverables

- D 3.1.1 A workshop for e-bus upscaling is carried out (1 report)
- D 3.1.2 Technical specifications for e-buses for scaling-up as well as the necessary chargers are developed
- D 3.1.3 A detailed implementation plan for the operation and maintenance of a scale-up fleet of about 20 electric buses is developed

*Output 3.2: Fiscal policies, and regulatory measures to incentivize the uptake of electric mobility are developed and formally proposed*

The Department of Land Transport, with support from UNEP, will lead in developing and implementing policies and measures that will support the introduction of electric mobility (buses, light duty vehicles and motorcycles) in Seychelles. Similarly, the Department of Land Transport, with the help of international and national expertise will process the data from the assessments and from the demonstration study for policymakers to help with development of the necessary policies for Seychelles. This process will be supported by the (UNEP-managed) African Support and Investment Platform of the GEF 7 Global Electric Mobility Programme, which will organize and implement training and knowledge exchange on electric mobility for all the African projects under this programme including the Seychelles PSC.

Policies to be developed will include:

- Regulation: Electric vehicle standards and specifications for EV import including the setting of a charger standard based on the internationally available standards and the expected provenience of the imported EVs.
- Fiscal incentives: The government has zero rated excises on EVs but the uptake has not been as high as intended. There is need to better examine why the uptake is slow and to identify what additional incentives need to be implemented e.g. waiving of additional tax components, direct subsidies for an EV purchase etc. Most importantly, the project suggests to replace the current vehicle import taxation scheme based on engine displacement (refer to Figure 5 in the Baseline scenario section) by a scheme based on fuel economy (Litres of gasoline equivalent used per 100 kilometres) or vehicle CO<sub>2</sub> emissions (grams of CO<sub>2</sub> emitted per 100 kilometres). In doing so, a technology-agnostic way of incentivising the import of low-emission vehicles to the Seychelles would be incentivized while the uptake of large, powerful and relative to smaller cars inefficient hybrid and plug-in hybrid SUVs could be mitigated.
- Evaluation of the diesel subsidy for SPTC: The project will investigate whether there are better ways for the Government of the Seychelles to subsidize the operation of SPTC. The current support for diesel purchase is distorting the economic viability of electric buses and is incentivizing the inefficient use of fuel in the conventional buses.

All policy interventions and recommendations will be developed consultatively, coordinated by the National E-Mobility Steering Committee and guided by the National E-Mobility Strategy.

Deliverables

- D 3.2.1 A workshop on e-mobility policies is carried out including stakeholders from all relevant line ministries (1 report)
- D 3.2.2 Based on currently available regulation in other countries, EV and EV charging technical standards are adapted and drafted for the Seychelles.
- D 3.2.3 A vehicle import tax scheme based on CO<sub>2</sub> emissions is proposed.
- D 3.2.4 An alternative scheme to subsidize SPTC and to remove subsidies on diesel is proposed.
- D 3.2.5 The draft package of policy proposals is presented during a workshop and submitted for review by the National E-Mobility Steering Committee

- D 3.2.6 Final Policy package submitted for adoption by the government

*Output 3.3: One e-bus up-scaling nancing concept is de veloped and submitted to a nancier*

Progress and results of the Seychelles e-bus demonstration will be presented during the E-Mobility Market Place and Replication events organized by the Africa Support and Investment Platform and led by UNEP SMU. With the support of UNEP SMU, one e-bus up-scaling nancing concept will be developed to be submitted to a nance institution identified during the e vents.

The nancing concept to be developed could for example include the development of innovative business models to de-risk investment in electric buses for SPTC, based on private sector ownership and operation of the buses, and SPTC collecting fares and paying the bus operating company for the provided service. It could furthermore include the development of a strategic partnership with the PUC (Public Utilities Corporation) or other independent power producers (IPPs), including elements of the approach used to introduce electric buses in Santiago de Chile, where utilities not only provide the electricity for the buses but also act as nancial agents which lease the buses t o the bus operating companies[24].

The concept could also potentially look into replicating the “Seychelles Sovereign Blue Bond”[25], which has been jointly implemented by the World Bank and the GEF, and which constitutes a mechanism to issue grants and loans to support sustainable marine and sheries projects (managed by the Seychelles’ Conservation and Climate Adaptation Trust (SeyCCAT) and the Development Bank of Seychelles).

During the October 2019 Scoping Mission, the Government expressed interest in evaluating the potential for developing innovative mechanisms for nancing electric mobility in Seychelles, however the limited resources of the GEF E-Mobility Project in the Seychelles are not suicient to set-up a fully operational nancing mechanism, but will be used t o draft and assess one initial concept.

#### Deliverables

- D 3.3.1 Development of one e-bus upscaling nancing concept and submission t o targeted nancing institution

### **Component 4: Long-term environmental and economic sustainability of low-carbon electric mobility**

*Outcome 4: Measures are developed by government to ensure the long-term environmental sustainability of low-carbon electric mobility*

Through Component 4 the project will ensure promotion of long-term environmental and economic sustainability of electric mobility by developing plans to integrating it with renewable energy and outlining robust lifecycle management of batteries.

It is noteworthy to mention that e-mobility has the potential to increase energy justice and to support the development of local value chains. While petroleum-based fuels are imported in Seychelles, electricity is generated locally, with the potential to integrate the locally generated renewable power. Electrification of the transport sector in Seychelles has therefore the potential to increase national energy security and to hedge against fluctuating oil prices. Beyond that, the total cost of ownership of electric vehicles are already lower than for conventional vehicle fleets today, especially when used in fleets such as public transportation fleets. This can in turn can lead to better service and lower cost of transportation for the end consumer.

*Output 4.1: A sustainable e-mobility study including a brief technical assessment of the usability of an Extended Producer Responsibility (EPR) scheme for the collection of used EV batteries, an evaluation of the potential to charge EVs with renewable power and the impact of EVs on the integration of renewable is developed with the support of the Global Programme*

Based on the knowledge products provided by the Global Programme focusing on the options to re-used, recycle and safely dispose used EV batteries, a brief technical assessment will be conducted to assess the option of basing a scheme to collect used EV batteries on Extended Producer Responsibility in the Seychelles. Therefore, the current treatment of e-waste will be further assessed and the role of vehicle dealerships and importers in the effort to collect used EV batteries will be evaluated. The findings developed by the Global Programme on the re-use, recycling and safe disposal will be put in the context of the Seychelles and presented during a workshop.

A more comprehensive study will be developed focussing on the potential to charge EVs with renewable power and the impact a significant fleet of EVs can have on the integration of renewable power in the Seychelles power grid, based on services EVs can provide to the grid. To date, renewable power generation is only covering some 3% of Seychelles power consumption, while the majority of electricity is generated using diesel gen-sets. Seychelles has formulated ambitious targets to ramp-up renewable power generation – according to the “Seychelles Energy Policy for 2010-2030” plan, 15% of power demand shall be covered based on renewable energy by 2030. As highlighted before, the study “Solar Power Integration on the Seychelles Islands”, concludes that “Seychelles can reach its target of 15% load coverage by renewables by 2030 even with conservative operating practice. By using innovative technologies such as demand side management and allowing the diesel generators to operate for short periods of time at lower turn-down rates (to provide additional spinning reserves to compensate sudden losses in PV production), the Seychelles could cover up to 28% of its electrical demand from clean energy sources. The same study finds out that the impact of power storage, for example by using batteries (which can be EVs connected to the grids and used EV batteries used for power storage), is comparable to the above cited demand-side management in that it bumps up the maximum PV integration by 4.4 MW, see Figure 10.



Scenario	PV [MW]
<b>Base Case (BC)</b> (65% min. generator loading, no extra technology)	29.1
<b>BC + 7 MW of Demand-Side Management</b> (customers can decrease/increase their load within 5 minutes to support PUC's power balancing)	34.3
<b>BC + 7 MW of storage</b> (such as batteries and/or pumped hydro storage)	34.3
<b>BC + Limit PV inverters to 80% of PV panel size</b> (reduces PV peaks with tiny effect on energy production)	36.4
<b>BC + Curtailment of large units during bottlenecks</b> (only when simultaneously feed-in is high and load is low)	38.8
<b>BC + Keep a 15 MW backup generator on standby</b> (so that it can start up in a shorter period, e.g. 5 minutes)	39.5
<b>Conservative scenario</b> (75% min. loading, no changes to existing system)	21.5
<b>Moderate scenario</b> (65% min. loading, DSM, 80% inverter limit, curtailment)	57.2
<b>Advanced scenario</b> (50% min. loading, DSM, 80% inverter limit, curtailment, standby generator)	85.8

Figure 10 PV integration limits [MW] on Mahé in 2030 in scenarios[26]

The study on e-mobility and renewable power integration will expand on the work carried out in “Solar Power Integration on the Seychelles Islands” and will investigate: 1.) To which extent charging of EVs (including the bus fleet of SPTC) can be based on renewable power, also integrating decentralized solar power generation (domestic and workplace); and 2.) How grid services provided by EVs can contribute to ramping up the integration of renewable power generation in the Seychelles grid through controlled charging based on differentiated tariffs and future potential to use of electric vehicles to grid (V2G) for electricity storage and demand side management. The latter would also include a brief description of the role of EVs for back-up power, e.g. as a consequence of extreme weather events services controlled EV charging during off-peak hours based on differentiated tariffs;

Collaboration with on-going renewable power projects and in particular the Ile de Romainville Solar Park and the Lagoon le Rocher floating PV project will be pursued during project implementation.

#### Deliverables

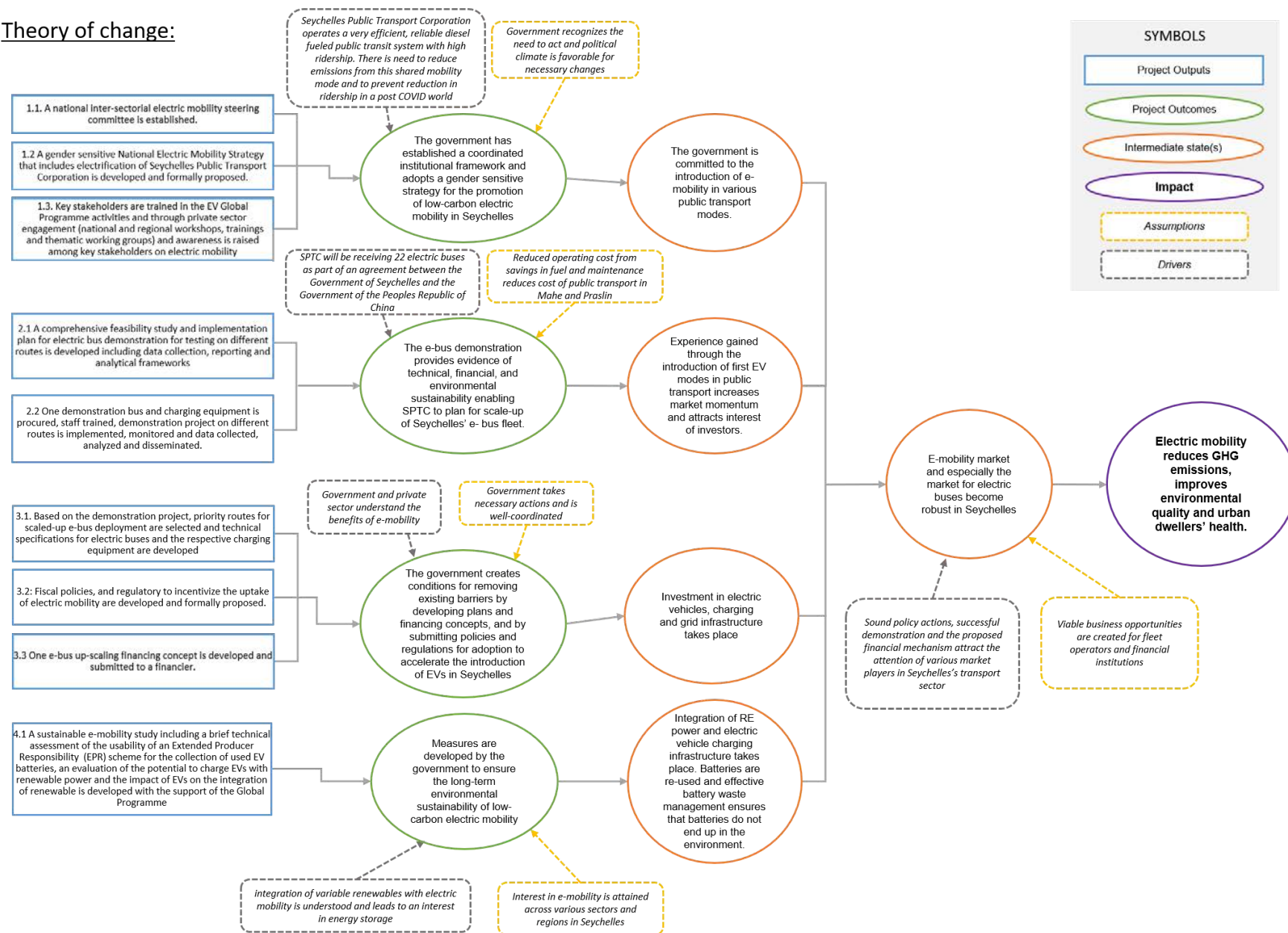
- D 4.1.1 Detailed terms of reference incl. timelines and deliverables for hiring the International Battery Technology, Charging & Renewable Energy integration expert

- D 4.1.2 A workshop on sustainable e-mobility in the Seychelles is carried out focusing on the A) the development of an initial scheme for re-use, recycling, and sound disposal of used electric vehicle batteries; and B) a plan for the integration of renewable power for electric vehicle charging;
- D 4.1.3 A brief technical assessment on the usability of an EPR scheme for used EV battery collection is prepared and recommendations for an initial scheme for battery EOL issues are developed
- D 4.1.4 A study focusing on the integration of renewable power for electric vehicle charging and the impact of EVs on renewable power integration in the Seychelles is developed and disseminated;

### Theory of Change

Below is the overall project's Theory of Change (ToC). The ToC provides a visual representation of the project complete intervention logic. Through institutionalization of e-mobility (national inter-sectorial electric mobility steering committee and National Electric Mobility Strategy, outputs 1.1 and 1.2) and capacity building (output 1.3), in combination with on-the-ground experience with e-mobility through the demonstration of an electric bus (outputs 2.1 and 2.2), the basis will be laid for upscaling of e-buses deployment (output 3.1) for informed policy making (output 3.2) and for the development of an e-mobility financing concept (output 3.3) to prepare for the upscaling of e-mobility in Seychelles. Preparing the long-term sustainability of e-mobility through an initial assessment of ways to integrate higher shares of renewable power for e-vehicle recharging and the development of a preliminary scheme for extended producer responsibility for the collection of used EV batteries (output 4.1) ensure a holistic approach to introduce e-mobility in Seychelles.

## Theory of change:



## 4) Alignment with GEF Focal Area and/or Impact Program strategies

This programme is aligned with Objective 1 of the Climate Change Focal Area to “Promote innovation and technology transfer for sustainable energy breakthroughs”, through CCM 1-2 - Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility.

### **5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF and co-financing**

Seychelles government has already invested in electric mobility by zero rating import duties for 100% electric vehicles. This has resulted to increased sales of approximately 500 electric cars, however, this translates to only about 1.5% of all on road vehicles in Seychelles today. This project is therefore designed to identify the reasons for this lag in uptake and meet the incremental cost to remove those barriers. This incremental cost-GEF funds will serve to overcome the gaps in awareness raising, capacity building, developing policy frameworks, supporting demonstration studies and most critically conducting assessments for appropriate interventions. One of these assessments – the electric bus feasibility study – and pilot demonstration bus project in the Mahé will help see to the deployment of 22 electric busses in SPTC's fleet, representing 10% of the current fleet at an investment cost of approximately US\$ 8 million.

Furthermore, the GEF funding will provide the technical assistance necessary to introduce the reforms required for the public transport sector to facilitate a shift to EVs, and to establish adequate financial and business models that will allow operators and users to access EV at reasonable costs. This will be made possible once the demonstration and policy reforms improve the perception of local and international financial institutions towards the risks associated to the use of EVs in Seychelles.

The project in the Seychelles is part of the UNEP led GEF Global Electric Mobility Programme unifying 29 low and middle-income countries around the world to introduce and prepare for upscaling of electric mobility. It will benefit from the UNEP led Global Project to support countries with the introduction of electric mobility through the knowledge products developed by the Global Working Groups (especially the Heavy Duty Vehicle Working Group with a focus on e-buses led by UNEP) and the Africa Support and Investment Platform (led by UNEP). The project in the Seychelles will furthermore benefit of UNEP Sustainable Mobility Unit's (SMU) experience with e-mobility projects in low and middle-income countries around the world. Seychelles, through the activities of the Global Project and the experience with e-mobility projects within UNEP SMU will benefit from lessons learnt, best practices shared and vibrant exchange with e-mobility experts, the e-mobility industry as well as financiers interested to invest in e-mobility projects.

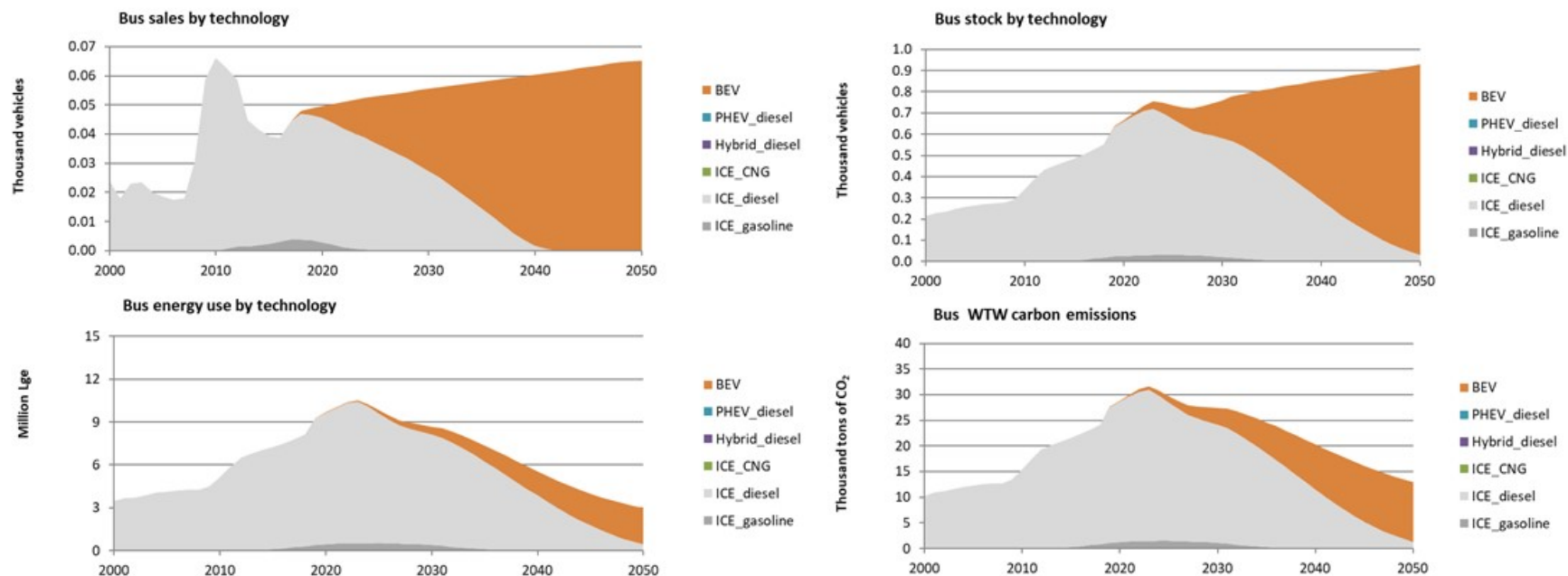
The global knowledge management component of the Global Programme and the Africa Support and Investment Platform approach seek to bundle demand in the region and thus reduce the incremental costs. The Global Programme is a cost-effective way of minimizing the incremental costs, including through the following means:

- Generic tools are produced at global level, disseminated through regional support and investment platforms and adapted to the needs in the country at the country level – thus return on investment for the development of tools and methodologies is maximized;
- Investment risk for demand side – bundling demand for e-vehicles for demonstration in a certain region can lead to lower vehicle prices;
- Technology risk for supply side – through adequate training of vehicle operators and exchange between numerous projects, the industry is less likely to face misuse of technology.

### **6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)**

The projected CO<sub>2</sub> emissions reductions are based on the benefits, which will stem from the introduction of electric buses in public transportation as well as from the policies incentivising the switch to electric mobility most notably in the light duty vehicle (LDV) sector.

It is estimated that in 2019, buses were responsible for about 22,000 tons of CO<sub>2</sub> emissions. In the baseline scenario, it is projected that CO<sub>2</sub> emissions from the bus fleet in Seychelles grow to about 30,000 tons in 2030 and 35,000 tons by 2050.



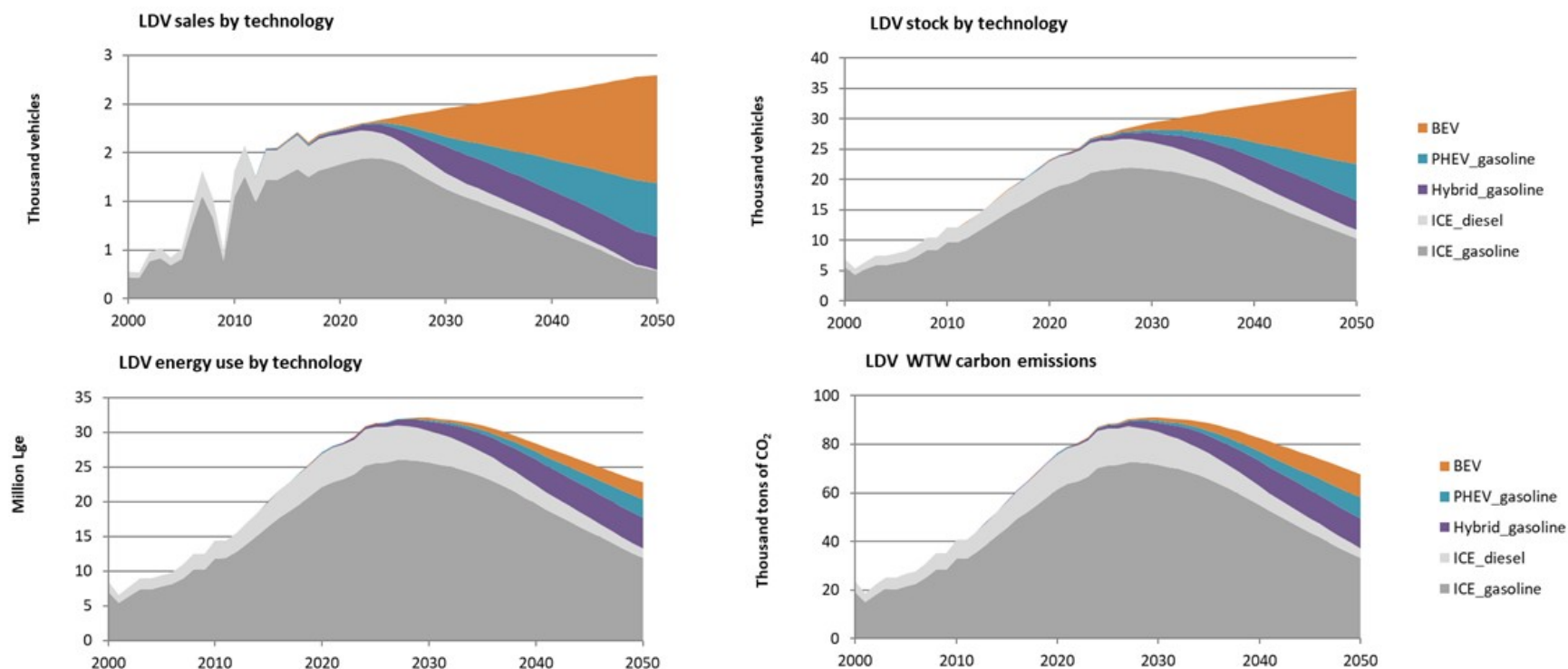


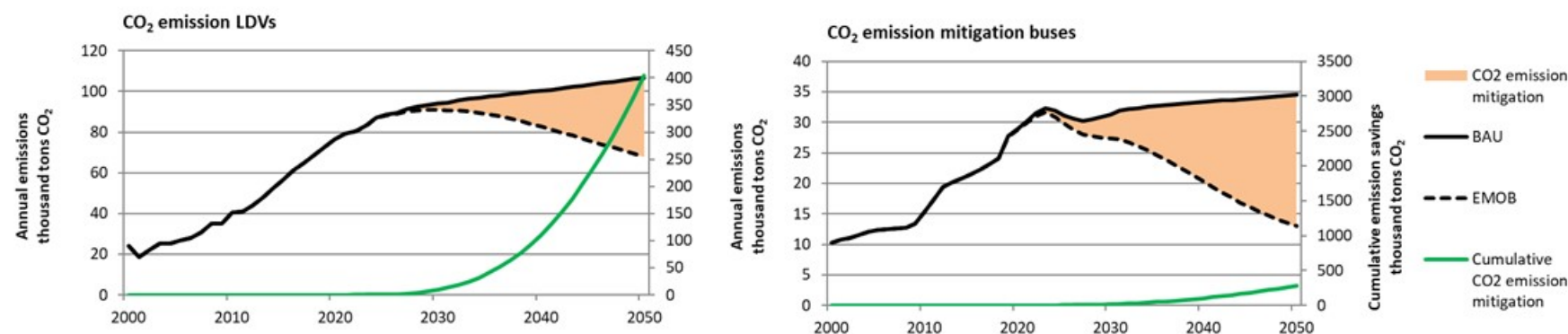
Figure 11 Alternative scenario for bus and LDV sales, stock, energy use and emissions in the Seychelles

EMOB scenario for LDVs	2020	2030	2040	2050
Sales share gasoline ICE	80%	57%	22%	10%
Sales share diesel ICE	18%	8%	3%	0%
Sales share gasoline hybrid	2%	15%	15%	15%
Sales share gasoline PHEV	0%	5%	20%	25%
Sales share BEV	0%	15%	40%	50%
EMOB scenario for buses	2020	2030	2040	2050
Sales share gasoline ICE	4%	0%	0%	0%
Sales share diesel ICE	86%	50%	0%	0%
Sales share CNG ICE	0%	0%	0%	0%
Sales share diesel hybrid	0%	0%	0%	0%
Sales share diesel PHEV	0%	0%	0%	0%
Sales share BEV	10%	50%	100%	100%



For LDVs the baseline scenario projects a growth of emissions from about 70,000 tons CO<sub>2</sub> in 2019 to about 95,000 tons CO<sub>2</sub> by 2030 and more than 100,000 by 2050. This growth of CO<sub>2</sub> emissions goes hand in hand with a growth in air pollutants.

Under the alternative scenario, total sales and stock of buses in Seychelles are identical with the baseline scenario. It is assumed that the institutionalization of electric mobility, the short-term barrier removal as well as the preparation for scale-up of the e-mobility market and in particular the development of a scal and regulatory framework will trigger a substantial shift towards the use of electric buses and LDVs.



Under the top down scenario is assumed that 20% of all new LDVs (including PHEVs and BEVs) and 50% of all new buses added to the eet will be electric in 2030. By 2050, 75% of all new LDVs (including PHEVs and BEVs) and 100% of all new buses to the eet are assumed to be electric. The underlying scenario leads to an overall top-down emission reduction of about 110 kT CO<sub>2</sub>, including post-project emission reductions until the year 2036[27]

<b>Total top down emission mitigation potential, tCO<sub>2</sub></b>	<b>110,018</b>
Thereof	
Total direct emission mitigation from demonstration, tCO <sub>2</sub>	332
Total direct secondary impact emission mitigation, tCO <sub>2</sub>	22,785
Total indirect emission mitigation, tCO <sub>2</sub>	86,901
<b>Total project related emissions reductions, tCO<sub>2</sub></b>	<b>110,018</b>

Since Seychelles is an archipelago of small islands and no other sizeable e-mobility projects are known of at the time of the submission of the project proposal, GEF causality factors of 100% for secondary and indirect emission reductions are used. Therefore, total GHG emission reductions attributable to the project account for 110 ktCO<sub>2</sub> for the time frame 2021 to 2036.

## 7) Innovativeness, sustainability and potential for scaling up

Regionally, Seychelles has enjoyed a stable economic and political environment over the past decades, as evidenced by sound governance indicators. The 2018 Mo Ibrahim Index of African Governance ranked Seychelles as follows:

- Overall Governance: 2<sup>nd</sup> out of 54 African countries with increasing improvement trend

- Safety & Rule of Law: 5<sup>th</sup> out of 54 African countries with increasing improvement trend
- Participation & Human Rights: 7<sup>th</sup> out of 54 African countries with increasing improvement trend
- Sustainable Economic Opportunity: 5<sup>th</sup> out of 54 African countries albeit with warning signs trend
- Human Development: 2<sup>nd</sup> out of 54 African countries albeit with warning signs trend

### Innovativeness

This project is innovative from various angles:

- It promotes a new and innovative clean and low carbon transport technologies. The country is yet to introduce an electric bus, which is one of the project's deliverables;
- It promotes the integration of low carbon renewable energy with transport, including mass urban transit;
- It promotes the deployment of innovative business models for electric buses and LDVs operation and charging;
- It looks at the use of mobility as energy storage using innovative concepts, potentially such as net metering;
- It promotes the development of innovative financing schemes for electric mobility by investigating financing models for climate change mitigation within the transport sector;
- It promotes environmental sustainability by tackling the issue of collection of used EV batteries for re-use, recycling or safe disposal.
- 

### Environmental Sustainability

The project has one output dedicated to environmental sustainability, which will be based on 2 deliverables: (1) A study on integration of renewable power for electric vehicle charging ; and (2) A scheme for re-use, recycling and sound disposal of used electric vehicle batteries (refer to deliverables 4.1.3 and 4.1.4 of the Workplan in Annex L).

Both deliverables ensure that the issue of potentially hazardous waste is tackled right from the beginning of the introduction of EVs in Seychelles and that the long-term sustainability with regards to truly zero- or low-carbon transportation is planned.

In addition, the current diesel bus fleet lacks the latest emission control technologies, hence are a significant source of small particulates and other harmful pollutants. Shifting to electric buses will thus improve urban air quality and led to longer term environmental sustainability.

### Sustainability of market development after the project and potential for scaling up:

The project will be closely linked to the Africa Support and Investment Platform of the Global electric mobility programme. Through this platform and the cooperation with various development banks such as the African Development Bank (AfDB), the World Bank but also private investors such as the Private Infrastructure Development Group (PIDG), it is anticipated that the project will lead to the unlocking of various financial mechanisms to upscale the market for electric vehicles in Seychelles. The Africa Support and Investment Platform will be operational beyond the lifetime of the Seychelles electric mobility project



and is anticipated to become the leading marketplace in Africa where potential project concepts meet potential financiers and potential technology suppliers. It is hence anticipated that the GEF Seychelles electric mobility project will lay the ground for a transformational shift towards electric mobility in Seychelles. This is based on the removal of market barriers outlined above, namely capacity building, the introduction of the technology to Seychelles market, the introduction of an adequate policy framework, and the provision of business models and financial schemes.

It is also envisaged that after the demonstration of the pilot electric bus in Mahe, the government intends to replace all of the SPTC's fleet with electric buses, hence proving scalability of the project.

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[1] Seychelles National Climate Change Strategy November 2009, the Seychelles National Climate Change Committee

[2] Proposal for Energy Policy of the Republic of Seychelles, 2010 – 2030, Jan Van Vreden et al June 2010

[3] <https://www.informea.org/en/legislation/energy-act-2012-no-11-2012>

[4] <https://www.iea.org/policies/457-energy-act?q=seychelles&s=1>

[5] Guidelines for estimating greenhouse gas emissions of Asian Development Bank projects: Additional guidance for clean energy projects. Mandaluyong City, Philippines: Asian Development Bank, 2017.

[6] The much lower efficiency of the bus engine is due to effects of scale (the average diesel genset in the Seychelles has more than 25 times the power output than the average diesel bus) and the operation scheme. While a diesel generator always runs at optimal engine speed, a diesel engine in a bus is subject to a very transient cycle of acceleration and deceleration constantly operating off optimal engine speed, which significantly reduces engine efficiency.

[7] Assumed fuel economies: diesel bus ~46 L/100km; e-bus ~110kWh/100km; both for a 12m city bus w/o air conditioning

[8] Republic of Seychelles Intended Nationally Determined Contribution (INDC) Under The United Nations Framework Convention On Climate Change (UNFCCC), September 2015

[9] Seychelles Infrastructure Action Plan, African Development Bank, May 2015

[10] Seychelles Infrastructure Action Plan, African Development Bank, May 2015

[11] GOVERNMENT OF SEYCHELLES Debt Management Strategy: For the years 2017 - 2019

[12] Seychelles Infrastructure Action Plan, African Development Bank, May 2015

[13] The Global Competitiveness Index 2017-2018 edition – Seychelles, World Economic Forum 2018

[14] The road network in Seychelles includes primary, secondary, feeder and estate roads. There are approximately 508 km of roads, of which 250 km are primary roads, 150 km are secondary roads, and more than 100 km are feeder roads. The bulk of this road network is on Mahé. The primary road network connects the main economic centers and also the different districts of the country on the three main islands of Mahé and Praslin

[15] Source : <https://www.src.gov.sc/pages/pressreleases/VATImportation.aspx>;  
<http://www.seychellesnewsagency.com/articles/7396/Excise+taxes+on+hybrids+in+Seychelles+set+to+increase%2C+closing+luxury+loophole>

[16] SPTC Efficiency and Effectiveness of the Public Bus Service, Office of the Auditor General, March 2018

[17] Comparison of subvention levels for public transport systems in European, Asilang Reynolds Feighin et al, University College Dublin, 2000 cities

[18] <https://www.seypec.com/fuel-prices>

[19] Grid-Connected Rooftop Photovoltaic Systems, Seychelles, GEF Project ID: 4164, GEF PMIS ID: 4052, UNDP Project ID (PIMS): 4331, Atlas Award ID: 00065515, Atlas Project ID: 81971

[20] PUC Domestic Tariff Rebalancing Programme

[21] A Pathway Towards the Implementation of an Electronic Waste Management System in Seychelles - Status Quo Analysis and Assessment of Future Strategies, Nina Seraina Rapold, ETH Zuerich 2019

[22] A Pathway Towards the Implementation of an Electronic Waste Management System in Seychelles - Status Quo Analysis and Assessment of Future Strategies, Nina Seraina Rapold, ETH Zuerich 2019

[23] Surat Municipal Corporation Bus Electrification Assessment , NREL/TP-5400-73600 May 2019

[24] From pilots to scale - Lessons from electric bus deployments in Santiago de Chile, ZEBRA 2020

[25] <https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-rst-sovereign-blue-bond>

[26] Solar Power Integration on the Seychelles Islands, Tom Brown, Thomas Ackermann and Nis Martensen, URL:

<http://journals.openedition.org/factsreports/4148>; ISSN: 1867-8521

[27] Based on the lifetime of the demonstration assets of 15 years

### 1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.





Demonstration sites	Latitude	Longitude
Mahé, Seychelles	-4.666664	55.4666648



### 1c. Child Project?

**If this is a child project under a program, describe how the components contribute to the overall program impact.**



The Seychelles child project is part of current project is hosted under the “Global Programme to Support Countries with the Shift to Electric Mobility”, led by UNEP.

The Global Programme to Support Countries with the Shift to Electric Mobility was submitted (June 2019 GEF Council) with child projects in Antigua and Barbuda, Armenia, Burundi, Chile, Costa Rica, India, Cote d'Ivoire, Jamaica, Madagascar, Maldives, Peru; Seychelles, Sierra Leone, Saint Lucia, Togo, Ukraine, Uzbekistan, as well as a global child project. For each child project, a concept note was prepared including national background, policy status, baseline scenario and description of individual national components.

The Global Programme is divided into 4 components:

- Component 1: Global thematic working groups and knowledge materials
- Component 2: Support and Investment Platforms
- Component 3: Country project implementation
- Component 4: Tracking progress, monitoring and dissemination

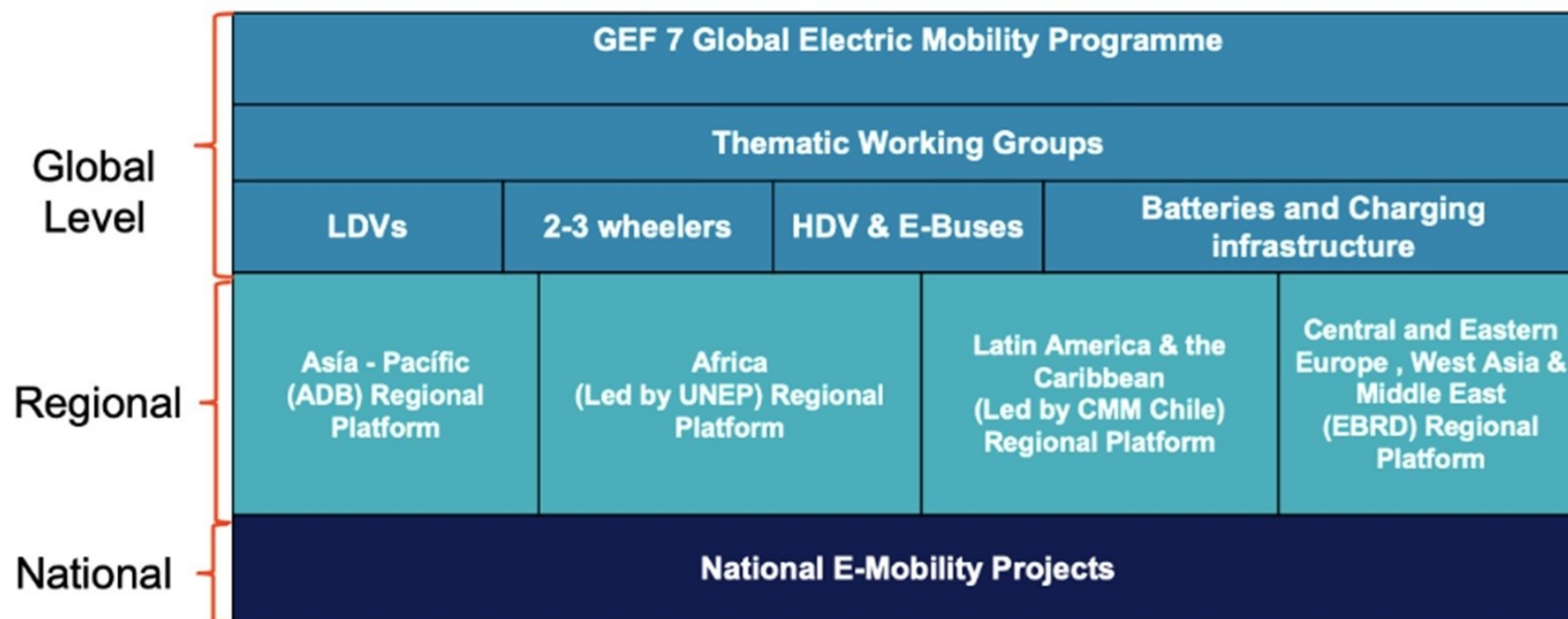
The Global Programme has put in place the monitoring framework below to track progress both globally and at the level of the country child projects. 12 indicators have been designed for this purpose: 6 relying on global level information (highlighted in blue) and 6 relying on country level information (highlighted in green).

Global E-mobility Programme Monitoring Framework			
 Global level monitoring		 Country level monitoring	
Objective level indicators			
Indicator A: Direct and Indirect Greenhouse Gas Emissions Mitigated (metric tons of CO2) mitigated			
Indicator B: Direct and Indirect energy savings (MJ)			
Indicator C: Number of direct beneficiaries (disaggregated by Gender)			
Component 1 Global thematic working groups and knowledge materials	Component 2 Support and Investment Platforms	Component 3 Country project implementation (Child Projects)	Component 4 Tracking progress, monitoring and dissemination
<b>Outcome 1</b> Knowledge products are generated to support policy making and investment decision-making through four global thematic working groups	<b>Outcome 2</b> Conditions are created for market expansion and investment in electric mobility through support and investment platforms	<b>Outcome 3</b> Conditions are created at country and city level for the introduction of electric mobility demonstration projects, and wider uptake of electric mobility	<b>Outcome 4</b> Projects and electric mobility markets are tracked, and key developments, best practices and other lessons learned are shared to promote wider uptake of electric mobility.
<u>Indicator 1.1</u> # of knowledge products developed by the four thematic working groups and used by the Support and Investment platforms in their training and outreach activities	<u>Indicator 2.1</u> % of countries using services and knowledge products offered by the Support and Investment Platform	<u>Indicator 3.1</u> % of countries with an improved institutional framework and a strategy to promote the uptake of low-carbon electric mobility	<u>Indicator 4.1</u> % of countries generating and sharing best practices and other lessons learned on low-carbon electric mobility with the global programme
	<u>Indicator 2.2</u> # of e-mobility scale-up and / or replication concepts facilitated as a result of the match-making	<u>Indicator 3.2</u> % of countries with nationally generated evidence of the technical, financial and/or environmental benefits of low-carbon electric mobility	<u>Indicator 4.2</u> # of e-mobility knowledge products refined based on evidence coming from the country projects
	<u>Indicator 2.3</u> # of financial institutions / development banks (national/regional) that have been engaged through the Global Programme and are actively supporting e-mobility projects	<u>Indicator 3.3</u> % of countries that have improved preparedness to accelerate market transformation towards low-carbon electric mobility	<u>Indicator 4.3</u> # of non-e-mobility programme countries committing to actively promote the uptake of low-carbon e-mobility
	<u>Indicator 2.4</u> # of US\$ leveraged to scale-up low-carbon electric mobility through the support and investment platforms	<u>Indicator 3.4</u> % of countries with measures in place to ensure the long-term environmental sustainability of low-carbon electric mobility	

The global project will report against this framework on an annual basis, using (1) the global level data from the Global Thematic Working Groups and from the Support and Investment Platforms, and (2) country level data provided by each country project during their annual Project Implementation Review (PIR) process.

For this purpose and whenever applicable, the global level indicators highlighted in green are translated into a country-level indicator in the Project Results Framework located in Annex A of the present CEO Endorsement Document. During project implementation, the Department of Land Transport will be requested to report against the indicators of the country Project Results Framework (Annex A) on an annual basis, during the PIR process.

At the global level, a steering committee integrated by the International Energy Agency (IEA) and the United Nations Environment Programme will coordinate and monitor the implementation and the outputs of the GEF 7 Electric Mobility Programme. On technical gaps, four thematic working groups at the global level will support the rapid introduction of electric mobility in GEF recipient countries. These working groups will generate universal knowledge products that contain best practices, factsheets, interactive tools and guidance, as well as experiences from countries that have advanced their e-mobility market. The working groups will be integrated by representatives from the global programme regional platforms, GEF-7 countries, IEA, vehicle manufacturers, utilities, researchers and the civil society. The governance structure is presented in the figure below. For Africa, the regional platform will be led by UNEP.



Governance structure between the global programme, the national e-mobility projects, and the regional Support and Investment Platform:

The coordination between the global program, the steering committee, the thematic working groups, and the national projects will be facilitated by the regional Support and Investment Platform. The role of the regional platform is to provide customized technical assistance to ensure the success of the country projects. Moreover, knowledge products developed by the working groups will be adapted and disseminated by the regional platform according to the regional and national context, specific needs and languages.

The Africa Support and Investment Platform will interact with and support participating countries in the region to link with each other through the following activities:

- The creation of a community of practice for the GEF 7 regional countries;
- Facilitation of knowledge transfer between countries, and regions, especially those with common characteristics like SIDS;
- The creation of thematic groups in light-duty vehicles (LDVs), 2-3 wheelers, and buses at regional level;
- A marketplace between countries, technology providers and financial institutions;
- Help desk for technical assistance to GEF 7 African countries;
- Personalized assistance from international experts in electric mobility;
- Generation of training sessions and workshops.



The national child projects will generate a learning curve on electric mobility that can be transferred to other countries within and outside of the region through the global programme. As a first contact point, the regional Support and Investment Platform will facilitate the flow of learnt lessons from child projects, such as: data and demonstration results, working business models, operational know-how, working financial instruments, and working policies and regulations. At the global level, the scenarios proposed to share country knowledge and experiences on electric mobility are the thematic working groups, while at the regional level the countries will participate in the community of practice, the thematic regional groups, the marketplace, trainings and workshops.

## 2. Stakeholders

### Please provide the Stakeholder Engagement Plan or equivalent assessment.

Stakeholders involved in the project can be categorized into six groups: 1) Government, 2) Private sector and 3) International Organizations 4.) Academia and 5.) Civil Society Organizations (CSO's) and 6.) Financiers. Key government stakeholders include the Ministries which will be part of the Project Steering Committee as well as a larger group of Ministries which will be part of the National Inter-Sectorial Electric Mobility Steering Committee. The ministries that are part of the National Inter-Sectorial Electric Mobility Steering Committee will have the political power to drive the necessary regulatory and scalar reforms to incentivize the introduction of electric mobility and in Seychelles.

The project focuses on the introduction of electric buses within SPTC, which is a state-owned public transportation company. With the new government elected in 2020, and according to the discussions during the validation workshop, there are plans to privatize SPTC and to form a public-private-partnership (PPP). This new development underlines the need to further involve private sector during project implementation. As of today, no private sector partner for the PPP has been identified.

The Seychelles Pension Fund had been identified as a domestic institutional investor interested in investing into renewable power generation as part of a concept note submitted to the Green Climate Fund. Interest of the Seychelles Pension Fund in investing into electric buses for SPTC will be explored during project implementation. The project could also engage in similar discussions with another private investor, the Private Infrastructure Development Group (PIDG).

Initial discussions have taken place with the African Development Bank (AfDB) on the development of a Green Mobility Programme for Africa, funded by the GCF. Upscaling the SPTC electric bus fleet could potentially be a project under such a programme led by the AfDB.

The project will rely on close cooperation with auto manufacturers. For example, the Chinese company Build Your Dreams Auto Company Limited (BYD) is the leading e-bus manufacturer and has a country office in the Seychelles. BYD will be closely engaged as a potential partner for the e-bus demonstration and upscaling. The envisaged introduction of e-buses as part of the above-mentioned government-to-government development agreement will also involve private sector partners, which are still to be defined.

The project validation workshop was held virtually on March 3<sup>rd</sup>, 2021, with a total of 13 participants, including the representatives from the Ministry of Agriculture, Climate Change and Environment, the Ministry of Transport, the Ministry of Family Affairs, the Seychelles Public Transport Corporation (SPTC), the Seychelles Energy Commission (SEC), Public Utilities Cooperation (PUC) and UNEP. Participants had the opportunity to get more clarity on details for the e-bus demonstration setting and stressed the importance of the close coordination between the governments of Seychelles and China regarding the donation of electric buses, as well as between key ministries. Finally, the workshop was also an opportunity to confirm the co-financing commitments of the Ministry of Agriculture, Climate Change and Environment, the Ministry of Transport and the SPTC (through the Ministry of Transport).

Stakeholder main group	Stakeholder name	Existing activities with potential to be leveraged	Content engagement, contributions to the project (identified by Component)
Government	Ministry of Transport (Department of Land and Transport)	· Deliver an effective transport system that contributes to the economic growth, quality of life and environmental sustainability	· GEF Executing Agency of the project · Chair the national inter-sectorial electric mobility committee (Component)

		<ul style="list-style-type: none"> <li>Develop and implement all transport related policies with the ultimate goal of ensuring safe and reliable transport infrastructure and systems</li> <li>Establish regulations to ensure proper enforcement as well as monitoring of transport policies.</li> <li>Provide oversight to following key project stakeholder agencies:               <ol style="list-style-type: none"> <li>Road Transport Commissioner's Office (RTC)</li> <li>Seychelles Land Transport Agency (SLTA)</li> <li>Seychelles Public Transport Corporation (SPTC).</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>electric mobility committee (Component 1)</li> <li>Plan and participate in stakeholder training and capacity building (Component 1)</li> <li>Plan and oversee demonstration studies together with implementing partners (Component 2)</li> <li>Coordinate all transport policy development work (Component 3)</li> <li>Oversee activities ensuring long-term environmental sustainability of low-carbon electric mobility</li> <li>Support RTC, SLTA and SPTC participation in project</li> </ul>
Government	Ministry of Agriculture, Climate Change & Environment	<ul style="list-style-type: none"> <li>Government agency in charge of climate change mitigation and adaptation. Oversees all investment in climate change mitigation, disaster mitigation, preparedness and resilience</li> <li>Acts as GEF Focal Point for Government of Seychelles</li> <li>Oversee supply of affordable energy to all, promote energy efficiency and democratize access to renewable energy,</li> <li>Provide oversight to following key project stakeholder agencies:               <ol style="list-style-type: none"> <li>Public Utilities Corporation (PUC)</li> <li>Seychelles Energy Commission (SEC)</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Liaise with the Executing Agency on day to day project implementation</li> <li>Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>Contribute to development of national electric mobility strategy ensuring that emissions mitigation potential for targeted uptake scenarios link to Seychelles' National Climate Change Policy (Component 1)</li> <li>Participate in stakeholder training and capacity building (Component 1)</li> <li>Coordinate all energy policy development work e.g. incentives for EV charging with renewable energy power etc. (Component 3)</li> <li>Ensure activities gear towards ensuring long-term environmental sustainability of low-carbon electric mobility are consistent with national environmental conservation plans (Component 4)</li> <li>Support PUC and SEC participation in project</li> </ul>

Government	Ministry of Finance, Trade Investment and Economic Planning	<ul style="list-style-type: none"> <li>· Main driver on development of sound and sustainable economic policies in line with Government's vision of a modern and efficient economy</li> <li>· Create a modern and enabling environment that is conducive for the private sector to become the engine of growth and government the facilitator</li> <li>· Formulate and implement fiscal policy framework for the government, whereby the financial resources are managed effectively and efficiently</li> <li>· Provide oversight to following key project stakeholder agencies: <ol style="list-style-type: none"> <li>1. National Statistics Bureau (NSB)</li> <li>2. Seychelles Licensing Authority (SLA)</li> <li>3. Seychelles Revenue Commission (SRC)</li> <li>4. National Tender Board (NTB)</li> <li>5. Seychelles Investment Board (SIB)</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>· Participate in national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Oversee electric vehicle procurement and contracting for demonstration study in line with national procedures, provide waivers/exemptions where feasible (Component 2)</li> <li>· Oversee formulation of fiscal incentives for electric mobility in line with government planning (Component 3).</li> <li>· Spearhead trade agreement negotiations as needed to see too fiscal incentives (Component 3)</li> <li>· The Department of Finance is in charge of budget allocation and monitoring and will support the management of budget for the project</li> <li>· The Department of Trade regulates the Import Permit Policy and will support the regulation of import permit policy in regard to electric mobility</li> <li>· Support NSB, SLA, SRC, NTB and SIB participation in project</li> </ul>
Government	Seychelles Public Transport Corporation (SPTC)	<ul style="list-style-type: none"> <li>· Sole public transport provider in Seychelles.</li> <li>· In addition to its bus operations on Mahé, SPTC is the parent company to the Praslin Transport Company (PTC)</li> <li>· SPTC operates a fleet of almost 2,000 buses transporting approximately 55,000 people daily.</li> <li>· SPTC also provides bus hire services, advertisement services and maintenance and repair services.</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Oversee electric bus demonstration study from providing project co-finance, route planning, defining data parameters, developing specifications, assisting with procurement, operating electric</li> </ul>

			<p>tric bus, providing access to workshop for electric bus pilot, evaluating alternate revenue streams for electric buses, assessing electric bus hire schemes etc. (Component 2)</p> <ul style="list-style-type: none"> <li>· Support the development of an implementation plan for e-bus upscaling (Component 3)</li> <li>· Support the development of a scale-up financing concept (Component 3)</li> <li>· Provide input to electric mobility policy formulation based on pilot data (Component 3)</li> <li>· Based on pilot data, provide input to long-term environmental sustainability of electric mobility (Component 4)</li> </ul>
Government	Gender Secretariat, Ministry of Family Affairs	<ul style="list-style-type: none"> <li>· Ministry of Family Affairs is the umbrella Ministry for the Gender Secretariat</li> <li>· To ensure gender integration into the project</li> <li>· Formulate, review and analyse national social development policies based on research-oriented activities.</li> <li>· Ensure that national, sub national and sectoral development policies, plans and strategies take into account population, gender and HIV/AIDS issues and linkages.</li> <li>· Review development policies and strategies, taking account of result based practices in work activities.</li> <li>· Examine Seychelles population trends and their implications for the country's future development.</li> </ul>	<ul style="list-style-type: none"> <li>· Provide support for gender mainstreaming</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Provide input to electric mobility policy formulation e.g. Develop gender mainstreaming framework and activities, assess impact of policy interventions given Seychelles population outlook etc. (Component 3)</li> <li>· Develop social safeguards to anchor long term sustainability planning for electric mobility (Component 4)</li> </ul>
Government	Public Utilities Corporation	<ul style="list-style-type: none"> <li>· Responsible for the provision of utilities (water &amp; electricity) in Seychelles</li> <li>· State cooperation charged with generation, transmission, distribution</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectoral electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> </ul>

		<p>with generation, transmission, distribution and sale of electrical energy on Mahe, Praslin</p> <ul style="list-style-type: none"> <li>· Within energy sector in Seychelles, PUC has sole expertise on metering, billing, procuring equipment and materials, inventory control, inspectorate services, customer services, public relations, system planning and project management</li> <li>· Mandated to increase increasing energy access and security for all Seychellois.</li> <li>· Lead agency in charge of implementing Government's renewable energy initiatives e.g. the target set under the Energy Policy of 5% energy production based on renewables by 2020 and 15% by 2030</li> </ul>	<p>national electric mobility strategy (Component 1)</p> <ul style="list-style-type: none"> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Provide input to electric mobility policy formulation e.g. preferential tariffs for EVs, grid connectivity, grid peak shedding, renewable energy to grid capability etc. (Component 3)</li> <li>· Provide support and manage renewable energy</li> </ul>
Government	Seychelles Energy Commission (SEC)	<ul style="list-style-type: none"> <li>· Responsible for the promotion of renewable energy in Seychelles</li> <li>· Responsible for oversight and planning of the Government's approach on energy issues</li> <li>· Develops, implements and enforces the energy supply standards and regulations</li> <li>· Promotes energy efficiency and conservation of energy and the use of renewable energy</li> <li>· Oversees coordination and implementation of the National Energy Policy and Implementation Plan</li> <li>· Collects and maintains energy data, produces national energy statistics and fulfills any requirements for reporting of energy and emissions data</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Development of harmonized standards and specifications to guide all stakeholders in the electric mobility sector, from importation and installation of PV systems, charging infrastructure etc. (Component 3)</li> </ul>
Government	National Bureau of Statistics	<ul style="list-style-type: none"> <li>· Plans, authorizes, coordinates and supervises all official statistical programs undertaken within the National Statistical System</li> </ul>	<ul style="list-style-type: none"> <li>· Provide data, conduct analyses and simulations for different financing and business models in order to develop ideal financing schemes and business</li> </ul>

		<p>in the National Statistical System, and establishes standards, and promotes the use of the best practices and methods in the production and dissemination of statistical information;</p> <ul style="list-style-type: none"> <li>· collects, compiles, analyses, abstracts, publishes and disseminates statistical information and related material;</li> <li>· assists Government Ministries and Departments in the collection, compilation and publication of statistical information, including statistics related to their activities;</li> <li>· provides advice and assistance to social bodies in relation to statistics; and</li> <li>· co-ordinates the activities of Seychelles and other countries and international organisations in the field of statistics and other related matters.</li> </ul>	<p>provide financing scheme and business models for electric mobility in Seychelles (Component 3)</p>
Government	Seychelles Licensing Authority	<ul style="list-style-type: none"> <li>· Oversee regulation of all licensable activities with the aim of setting minimum standards relating to such activities and to ensure public safety and hygiene, national security and environmental protection</li> <li>· Responsible for regulating the number of vehicles, their usage, and road worthiness standards to ensure road safety</li> <li>· Facilitates business socio-economic development through issuing and enforcement of the Licences Act and Licence Regulations and to create the enabling environment for sustainable business development in Seychelles</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Assist with demonstration vehicles registration (Component 2)</li> <li>· Contribute to formulation of incentives for electric mobility e.g. EV registration incentives, EV SME incentives etc. (Component 3)</li> <li>· Provide support to licence all vehicles in Seychelles</li> <li>· To provide the statistics on vehicles</li> </ul>
Government	Seychelles Revenue Commission	<ul style="list-style-type: none"> <li>· Administers and enforces all laws enshrined in the Seychelles</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee</li> </ul>

		<p>Revenue Commission Act 2009</p> <ul style="list-style-type: none"> <li>· Seychelles Revenue Commission regulates the entry of goods in the country include vehicles</li> <li>· Ensure vehicles are paying the right tax upon entering the country</li> <li>· Advises the Government on matters of policy relating to revenue</li> <li>· Monitors and controls the cost of revenue collection,</li> <li>· Exchange information in terms of any intergovernmental tax agreement or treaty.</li> </ul>	<p>National electric mobility steering committee (Component 1)</p> <ul style="list-style-type: none"> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Participate in stakeholder training and capacity building (Component 1)</li> <li>· Assist with procurement of demonstration vehicles in line with directives from Ministry of Finance, Trade Investment and Economic Planning (Component 2)</li> <li>· Provide monitoring and control on importation at the Port of entry</li> </ul>
Private Sector	Enterprise Seychelles Agency	<ul style="list-style-type: none"> <li>· Mandated to implement policies and strategies of Government relating to micro, small and medium enterprises (MSMEs) and to provide them with the necessary services and support</li> <li>· identify challenges to the sustainable development of MSMEs and to propose solutions</li> <li>· provide start-up services to include needs analysis, business and legal advice, and aftercare for continuous improvement</li> <li>· assist entrepreneurs to plan their business for financial viability</li> <li>· encourage locally made products for domestic and export markets</li> <li>· facilitate programmes and schemes for enterprises</li> <li>· facilitate the use of technology and innovation to expedite and accelerate production</li> <li>· advocate the benefits of inter-enterprise cooperation through cluster networks and business link</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Assist with training and capacity building on EVs in Seychelles (Component 1)</li> <li>· Create synergies between private sector and the demonstration study to ensure technology transfer, value chain creation etc. (Component 2)</li> <li>· Contribute to policy development for electric mobility e.g. ensuring incentives favor local manufacturing of EVs, champion local innovation etc. (Component 3)</li> <li>· Work with project partners to ensure long term environmental sustainability of EVs creates opportunities for local SMEs thus ensuring link to economic sustainability. (Component 4)</li> </ul>



		<ul style="list-style-type: none"> <li>· promote the importance of intellectual property rights among MSMEs</li> <li>· encourage the transition from micro to small to medium-to high technology based enterprises; and promote and develop value addition and semi-industrialization</li> </ul>	
Private Sector	Seychelles Motor Vehicle Dealers Association (SMVDA)	<ul style="list-style-type: none"> <li>· Maintains comprehensive industry data e.g. record of vehicle sales, categorized by make, class, and individual model, with constantly up-dated price lists.</li> <li>· Develops wide array of media and public information on a wide range of motoring issues, offers market and technical expertise to appropriate branches of government</li> <li>· Holds regular industry meetings and hosts member forums to identify and address problems</li> <li>· Represents motor industry in championing for better enabling environment from policies, financing and awareness raising</li> </ul>	<ul style="list-style-type: none"> <li>· Participate in the national inter-sectorial electric mobility steering committee (Component 1)</li> <li>· Contribute to development of National electric mobility strategy (Component 1)</li> <li>· Provide support on importation of vehicles by motor dealers</li> <li>· Provide support on types and quantity of electric vehicles being imported</li> <li>· Assist with training and capacity building on EVs in Seychelles (Component 1)</li> <li>· Assist in development of demonstration pilot, provide technical expertise on procurement and operation (Component 2)</li> <li>· Contribute to policy development for electric mobility, assist with development of financing schemes and business models for EVs in Seychelles (Component 3)</li> </ul>
Private Sector	BYD	<ul style="list-style-type: none"> <li>· BYD is the leading manufacturer of electric buses and has a country office in the Seychelles</li> </ul>	<ul style="list-style-type: none"> <li>· Potential partner for the e-bus demonstration and upscaling</li> <li>· Knowledge partner for e-bus technology</li> </ul>
International Organization (GEF Agency)	UNEP Climate Mitigation Unit	<ul style="list-style-type: none"> <li>· GEF Implementing Agency of the Seychelles child project as well as the Global Electric Mobility Programme</li> </ul>	<ul style="list-style-type: none"> <li>· Overall project oversight</li> <li>· Financial and substantive reporting</li> <li>· Disbursement of funds</li> </ul>
International Organization	UNEP Sustainable	Lead Executive Agency of the	...

International Organization	UNEP Sustainable Mobility Unit (SMU)	<ul style="list-style-type: none"> <li>Lead Executing Agency of the Global E-mobility project.</li> <li>Technical support unit involved in more than 40 e-mobility projects in low and middle income countries</li> </ul>	<ul style="list-style-type: none"> <li>Review of the national electric mobility strategy (Component 1)</li> <li>Support with the demonstration bus and procurement of charging equipment and staff training (Component 2)</li> <li>To facilitate coordination for a charging system to be provided by the EC SOLUTIONSplus industry partner under Component 2 as part of the European Commission SOLUTIONSplus Project (Component 2)</li> <li>Review of policies and support with the e-bus up-scaling concept (Component 3)</li> <li>Support preparation of sustainable e-mobility study including a scheme for re-use, recycling, and sound disposal of used electric vehicle batteries; and a plan for the integration of renewable power for electric vehicle charging; (Component 4)</li> <li>Two additional field visits to the Seychelles.</li> </ul>
Private Sector	EC SOLUTIONSplus industry partner	<ul style="list-style-type: none"> <li>Is a globally leading provider of EV and specifically e-bus charging equipment</li> </ul>	<ul style="list-style-type: none"> <li>Supports the implementation of the demo project through the potential provision of one e-bus charger (at least 50kW) and technical support (Component 2)</li> </ul>
Private Sector	Renewable power projects, namely the Ile de Romainville Solar Park and the Floating PV Project in the Lagoon le Rocher	<ul style="list-style-type: none"> <li>Started implementation of renewable power projects as described under the baseline investment section with particular focus on grid integration under the conditions of a small island</li> </ul>	<ul style="list-style-type: none"> <li>Exchange on technical subjects with regards to the integration of e-mobility and renewable power generation (Component 3 and 4)</li> </ul>
Finance / Government	Seychelles Pension Fund	<ul style="list-style-type: none"> <li>Had been identified as a domestic institutional financier for</li> </ul>	<ul style="list-style-type: none"> <li>Participation in the development of an upscaling concept (Component</li> </ul>

		renewable power projects as part of a concept note submitted to GCF	3)
Finance	African Development Bank	· AfDB currently investigating the development of a Green Mobility Programme for Africa including funding from the GCF	· Participation in the development of an upscaling concept (Component 3)
Private Sector / Finance	Private Infrastructure Development Group (PIDG)	· Mobilises private investment in infrastructure in frontier markets of sub-Saharan Africa, south and south-east Asia, headquartered in London	· Participation in the development of an upscaling concept (Component 3)
Academia	University of Seychelles and the Seychelles Institute of Technology	· The University of Seychelles participated in renewable power projects (e.g. SeyRES 100 - GCF) · The department of information and communication technology (DICT) already has projects to gether with the Seychelles Land Transport Agency (SLTA) for example on online booking services for the Vehicle Testing Services (VTS)	· Could support the development of the demo monitoring plan and the collection and analysis of demo data (Component 2)
CSO	Seychelles Women Commission (SWC)	· 12 Women Organizations were formed into the Seychelles Women Commission (SWC) so as to provide a forum to give women a voice and a platform, to ensure that due weight is given to women's informed opinions when formulating policies pertaining to women and women's issues.	· Support the development of gender sensitive sections of the National E-Mobility Strategy (Component 1)

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement.

Stakeholders will be consulted during project implementation as following:

- Government stakeholders will participate as members of the Project Steering Committee (PSC, meetings foreseen at least three times per year) and in Thematic Working Groups as appropriate.
- Private sector and civil society stakeholders will participate in the Thematic Working Groups as appropriate.

- Selected government and private sector stakeholders will be appointed by the Steering Committee to participate in the Global Programme events as appropriate.
- Private sector and financiers will be consulted during the Global Programme events i.e. the e-mobility market place and replication events for the development of an e-mobility scale-up finance concept

**Select what role civil society will play in the project:**

**Consulted only; Yes**

**Member of Advisory Body; Contractor;**

**Co-financier;**

**Member of project steering committee or equivalent decision-making body;**

**Executor or co-executor;**

**Other (Please explain)**

### 3. Gender Equality and Women's Empowerment

#### Provide the gender analysis or equivalent socio-economic assesment.

##### Gender and mobility in the Seychelles

Transportation planning and design are commonly regarded as “gender neutral.” It is assumed that transport projects equally benefit both men and women and that there are no significant differences between travel needs and patterns of either gender. Investments are therefore oriented towards hard infrastructure and planning towards benefiting different social groups. On the contrary, how women experience mobility is very different from men. This is deeply rooted in community-driven gender roles with economic, social and livelihood influences. By way of example, the aforementioned March 2018 independent performance audit of SPTC services by the Office of the Auditor General (Efficiency and Effectiveness of the Public Bus Service) did not look at the role of gender in enhancing efficiency or effectiveness of SPTC’s bus service, even while assessing issues such as high rate of drivers claiming sick time, over speeding, propensity for working overtime etc.

There is currently no robust data on SPTC bus ridership by gender, but experiences from other countries with similar conditions such as the Seychelles suggest a somewhat lower ridership share of women compared to men. However, robust data exists on indicators such as women employment and gender pay gap: UN Women estimates that around 66% of women are in labour force (compared to 71%). While equality is almost reached in terms of employment, the gender pay gap is significant, with women earning on average 21% less than men for the same work. It is assumed that these indicators are equally true for the public transport sector and the mentioned issues will be addressed in the e-mobility strategy, in particular how to better integrate women in the transport sector value chain.

With regards to roles in government, women still lack representation. As of February 2019, there are only 21.2% of parliament seats held by women. In Seychelles, only 19.4% of indicators needed to monitor the SDGs from a gender perspective are available, with gaps in key areas such as Violence Against Women, Unpaid Care and Domestic Work and other key labour market indicators. In addition, many areas such as gender and poverty, women’s access to assets including land, physical and sexual harassment, and gender and the environment currently lack comparable methodologies for comprehensive and periodic monitoring [1]

The Seychelles Constitution of 1993 does promote non-discrimination and guarantees equal rights and protection to both men and women. The National Assembly of the Seychelles has 44% women and the country has over 45% women at Chief Executive or Middle Management levels. A number of structures exist in government to protect the rights of women.

##### Gender action plan

In line with Seychelle’s constitution to encourage women’s empowerment, the project will seek to disaggregate data collection to capture gender-based differences in public transport use, and to ensure women are included in all awareness-raising activities, decision making and capacity building so that they reap the socio-economic and health benefits of shifting to cleaner technology to the same degree as men do

The Chief Technical Advisor (CTA) will be responsible for implementing and monitoring the Gender Action Plan during project implementation. The concrete activities and means of verification to achieve the above as well as responsible parties are summarized in the following table:

Project Component	Target / Means of Verification
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Components / Outputs	Objectives	Activities	Target / Means of Verification	Responsibility
<b>Overall Project Management</b>	Promote women representation in participatory and decision-making processes and empowerment of women	Prepare a 2-pager guideline on gender representation document for all participatory and decision-making bodies and capacity building measures of the project. The guidelines provide measures to ensure a balanced representation of women in these bodies. The guidelines are prepared in collaboration with the Ministry of Family Affairs and are disseminated to the gender focal points from respective ministries to be appointed.	Gender Representation Guidelines document drafted and issued	CTA with support from the Ministry of Family Affairs
	Monitor women's participation in project meetings, trainings and workshops	Develop an attendance sheet template to collect gender-disaggregated participants data, to be used in all project meetings, training and workshops.	Attendance sheet template prepared	CTA
	Mainstream gender into progress reporting	Report on the project's gender mainstreaming activities in each progress and Project Implementation (PIR) report.	2 reports per year (1 progress report and 1 PIR)	PMU / CTA
<b>Component 1 Output 1.1</b>	Ensure women's representation in project bodies	Based on the Gender Representation Guidelines, encourage member entities of the National Inter-Sectorial Electric Mobility Steering Committee to appoint women as their representatives.	The national e-mobility steering committee has at least 30% female members  (gender-disaggregated attendance sheets)	PMU / CTA
<b>Component 1 Output 1.2</b>	Ensure that the national e-mobility strategy considers gender aspects in an equitable manner	The national strategy to promote low-carbon e-mobility in the Seychelles will include a gender analysis and action plan to mainstream gender equality right from the beginning of the development process. Gender-related action items will be included in the draft n	Final gender-sensitive national strategy prepared	PMU together with the International Policy, Business and Strategy expert

		It items will be included in the draft national e-mobility strategy.		
<b>Component 1 Output 1.3</b>	Empowerment of women through participation in regional / international events	Based on the Gender Representation Guidelines, participation of women in regional/international events, meetings and trainings will be promoted actively. The agencies or institutions that will be invited to participate will be encouraged to nominate women to participate in the events.	At least 30% of participants attending the events are women.  (gender disaggregated attendance sheets)	PMU / CTA
<b>Component 2 Output 2.2</b>	Assess the ratio of women ridership on the demonstrated e-bus	As part of the monitoring and data collection work to be undertaken under Output 2.2, the project will also monitor the use of the demonstrated e-bus by gender.	The final report on the demonstration results (deliverable 2.2.3) includes the statistics on the use of the e-buses, disaggregated by gender	PMU / CTA with the National E-Mobility & Power Market Expert
<b>All Components</b>	Promote women participation in project consultation meetings / workshops.	The participation of female representatives will be encouraged in all project consultation meetings and workshops outlined in the Workplan (refer Annex L for more details)	At least 30% of participants attending the project consultation meetings/workshops are women.  (gender disaggregated attendance sheets)	PMU / CTA

[1] <https://data.unwomen.org/country/seychelles>

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making Yes

Generating socio-economic benefits or services for women

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes



#### 4. Private sector engagement

##### Elaborate on private sector engagement in the project, if any

With China accounting for approximately 98% of all electric buses in the world, leading Chinese electric bus manufacturer Build Your Dreams Auto Company Limited (BYD) is the biggest electric bus manufacturer in the world. UNEP has a Memorandum of understanding with BYD to support uptake of low emission bus technologies in developing and transitional countries. Furthermore, BYD has established an office in Seychelles. The project will potentially work with BYD in developing the electric bus demonstration study at SPTC as well as establishing demonstration study co-financing arrangements with BYD ranging from provision of in-kind technical support to SPTC, training and capacity building as well as supply of charging equipment and discounted electric bus(es). Finally, the project stands to leverage significant co-finance from the supply of 22 electric buses from China as per the announcement by the President of Seychelles in early 2020<sup>[1]</sup>.

Private sector involvement in the project is expected to increase during project implementation as the newly elected government has plans to eventually transform the government-owned public transport company SPTC into a PPP. The private sector partner for such a PPP has not been identified yet, but will need to play a major role within the project if the decision is taken to form a PPP. Electrification of the SPTC bus fleet will be a key-component of such a PPP.

In addition to the bus sector, Sun Motors Limited and PMC Auto Group, both members of Seychelles Motor Vehicle Dealers Association (SMVDA), have already started selling new EVs (LDVs) in Seychelles and therefore have started to acquire experience from selling and monitoring operation of EVs. During the scoping mission, representatives from Sun Motors and PMC Auto Group pledged their support for the project. Working through the SMVDA, they will help in supporting adequate EV policies to incentivise the uptake of the EV market.

The project will also engage with the private sector through the Enterprise Seychelles Agency. Start-ups working on in the EV ecosystem from vehicle sales, vehicle charging, software service etc. will be invited to all relevant events and will participate in the development process of adequate policies and regulations.

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<sup>[1]</sup> <http://www.nation.sc/articles/3547/2020-state-of-the-nation-address-by-president-danny-faure-on-february-20-2020>

## 5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Risk description	Main categories	Risk level rating	Risk Mitigation Strategy and Safeguards	By Whom / When?
The growing demand from electric vehicles destabilizes the power supply	Technical / Economic	Moderate	Introduction of e-mobility in the Seychelles starts with one electric bus which will be up-scaled to about 20 after project implementation. The impact of the charging of 20 electric buses is moderate. It will be part of the e-mobility strategy and component 4 on renewable power integration to align power supply and e-mobility market in the Seychelles	Minister for Agriculture, Climate Change and Environment, Ministry of Transport, Seychelles Energy Commission year 3-4
Leadership change: change in leadership and priorities in the government	Political / Institutional	Low	Seychelles has re-elected the President in and the members of the National Assembly in October 2020, who will be in power for a term of 5 years and a new cabinet has appointed end of October 2020.	Government of Seychelles, year 1-4
Conflicting interests making it impossible to find consensus or required compromises that render the strategy and action plan too vague.	Political / Institutional	Moderate	The national coordination body brings together all relevant ministries on a regular basis to discuss the e-mobility project and align interests. The project is led by Ministry of Transport (Department of Land Transport).	Government of Seychelles, year 1-3
SPTC does not have the capacity to implement the demonstration project	Capacity	Low	SPTC has proven capable of running public transportation in Mahe and Praslin and showed good economic performance over the last couple of years according to a recent audit.	SPTC Year 1-3

Higher upfront cost of electric vehicles and in particular buses may pose a barrier to implementation and scale up of activities	Economic	Moderate	The government of Seychelles is committed to scale-up electric buses and negotiations about a government to government development agreement between the Seychelles and China are underway,	E-bus manufacturers, Government of Seychelles, Government of China Year 2-4
Objection or low commitment from industry and lack of interest or participation from market players/private sector.	Political / Economic	Moderate	The Global Programme works together with e-bus manufacturers to create an understanding of the market size and requirements of electric buses in Africa. Negotiations about a government to government development agreement between the Seychelles and China are underway	E-bus manufacturers, Government of Seychelles, Government of China Year 2-4
Insufficient and incomparable systems for tracking results	Capacity / Technical	Low	The project is part of a Global Programme which has tracking systems in place and which provides technical support to build the necessary capacity in the country.	Government of Seychelles, SPTC, year 2-3
Time lag of results: Major results of the project may not be seen before the end of the project period.	Political	Substantial	The by far highest share of the GHG and energy use reductions will materialize after the project time-frame based on the policies, business models and financial concepts developed	Government of Seychelles, SPTC year 3-4 and post project
Lack of linkages with available funding/financing for EVs fleets.	Financial	Low	Multilateral financing institutions and development banks are closely involved through the Global Programme and a scale-up financing concept will be developed and submitted to a relevant financier. Negotiations about a government to government development agreement between the Seychelles and China are underway	Government of Seychelles, Government of China, Financing institutions, SPTC Year 2-4
Inadequacy of the exit strategy and lack of ownership of the program after the end of the GEF funded period	Political / Financial	Low	The project addresses upscaling and replication through the development of one scale-up concept for e-buses operated within SPTC. Negotiations	Government of Seychelles, SPTC year 3-4

end of the GEF funded activities and inability to source resources to continue the program's activities in the medium/long term			operated within SPIC. Negotiations about a government to government development agreement between the Seychelles and China are underway	
Higher electricity use might lead to higher emissions, e.g. from HFO powerplants	Environmental	Low	Power generation in the Seychelles is based on diesel gensets but plans to substantially scale-up renewable power integration exist. Even under the unlikely scenario of continued reliance on diesel genset for power generation, emission reductions will be achieved. The project considers the enabling capacity of e-mobility for renewable power integration in the Seychelles.	Minister for Agriculture, Climate Change and Environment, Ministry of Transport, Seychelles Energy Commission year 1-4
Materials from EVs (e.g. from batteries) might generate environmental pollution	Environmental	Substantial	Recycling and tracking of these materials will be integrated into the scheme to be developed as part of Output 4.1	Minister for Agriculture, Climate Change and Environment year 3-4

### Climate risk assessment

*(i) How will the project's objectives or outputs be affected by climate risks over the period 2020 to 2050, and have the impact of these risks been addressed adequately?*

The Republic of Seychelles is a small island developing state (SIDS) and is an archipelago of 115 islands on the Indian Ocean in Eastern Africa with a population of approximately 94,000. Three-quarters of the population lives on the main island of Mahé. Seychelles has the highest Gross Domestic Product (GDP) per capita in Africa (\$15,410 in 2016), but inequality is significant and increasingly the effects of climate change are placing its economy at risk

Categorized as a Small Island Developing State (SIDS) with a large dependency on tourism, the "Seychelles National Climate Change Strategy" states that Seychelles is economically, culturally and environmentally vulnerable to the potential effects of climate change and associated extreme events. Vulnerability characteristics such as concentration of development on narrow coastal zones, non-resilient populations and ecosystems make the Seychelles extremely sensitive to climate change and its associated impacts. The impact of climate change on coastal livelihoods as a result of sea level rise, storm and tidal surges, extreme sea-surface temperatures, and coastal flooding will have serious consequences for livelihoods in the Seychelles. The effects of climate change on

tourism in small islands are expected to be largely negative. Furthermore, recent studies suggest that changes in long-term rainfall patterns and temperature changes will also have adverse consequences for water, food and health"<sup>[1]</sup><sup>1</sup>. Climate risk assessment for the Seychelles in the context of the electric mobility project is as follows:

## 1. Hazards

### *Cyclones*

The main climate change threats facing Seychelles are similar to those threatening other small island developing states: changes in rainfall patterns leading to flooding, landslides on one hand and extended periods of drought on the other, increases in sea temperature, changes in acidity and damage to marine ecosystems, increases in storms, storm surges and cyclones, and sea level rise during the longer term

The Seychelles has a history of being affected by tropical cyclones, which form to the south of the Equator in the period November to mid-May, and more frequently from late December to mid-April. The islands most at risk are the southernmost of the Outer Islands, in particular, the groups of Aldabra and Farquhar. Cyclones bring strong winds and torrential rains.

The northernmost islands, including Mahé, being close to the Equator, are generally spared by cyclones, or they are affected marginally, but they can sometimes be more clearly affected, as happened in May 1990 with Tropical Storm Ikonjo, and in January 2013 with Cyclone Felleng, which caused considerable damage.

A 2013 cyclone caused flooding and landslides that led to damages and losses exceeding \$8.4 million, or .77% of the country's gross domestic product (GDP). Seychelles' infrastructure was the heaviest hit, with many roads completely washed away by the storm.

### *Sea level*

Sea level is already affecting Seychelles, such as in May 2007 when very high tides combined resulted in flooding up to 50m inland causing damage to roads, public infrastructure. Sea level rise may lead to coastal erosion impacting infrastructure especially tourism and roads. Sea level change may also increase salinity of the soil and aquifers impacting food and water supply.

### *Rainfall*

Extreme rainfall has caused significant agricultural losses to crops in the last decade. Heavy rainfall during 1997-98 El Nino and 1998-00 La Nina events caused widespread flooding with significant losses to the economy. The government reported that Fisheries alone accounted for 45% of the total losses followed by agriculture and tourism. Increases in rainfall intensity may also result in greater surface runoff and reduced water capture in existing storage facilities and could also pose health risks.

Short, intense rain events are known to trigger landslides such as in Jan 2013 when Pointe Au Sel in the southeast of the island reported 184mm of rain in a 24-hour period - nearly half the amount of rain expected in the entire month of January. Landslides and rock falls cause damage to transport infrastructure and houses and are expected to worsen

Regarding the project, there is a risk of high impact climatic events such as cyclones disrupting power generation and electricity diffusion, damaging electric vehicles and destroying road and power infrastructure. This would lead to a loss of income as hotels close and taxi and bus services are consequently reduced.<sup>2</sup>

The threats caused by climate change will have significant impacts on Seychelles in the short, medium and longer term on infrastructure, agriculture, fisheries, tourism, energy and water security, biodiversity, waste management and on human health and well-being. Although the exact impacts are not known, and more research is needed to better understand the implications of a change global climate on the islands, it is critical that Seychelles take measures to better understand the threats and begin longer-term planning for adaptation.<sup>3</sup>

## 2. Vulnerability and exposure

As a small island developing state, Seychelles is on the front line of vulnerability to climate change. Higher sea surface and atmospheric temperatures, a rise in sea level, inland flooding, drought and cyclones and storm surges have threatened the lives, property, and livelihoods of the Seychelles population. The project has therefore moderate vulnerability and exposure to climate change. The infrastructure locations chosen need to be chosen in a way that they are safe from recurring, regular and foreseeable bad weather impact.

## 3. Risk

The project has moderate risk. Impact from climate change may occur, but will be manageable. Financial, environmental and social failure is unlikely. The system has, to a certain extent, the capacity to manage climate shocks and transport and infrastructure is not identified as an area of high vulnerability in the Seychelles National Climate Strategy of 2009<sup>4</sup>. While the country has some propensity to experience increasing quantities of extreme weather events, the project's interventions have moderate exposure, as noted previously. The primary risks are that:

- Cyclones damage road, transport, electricity or charging infrastructure;
- Sea level rises or storm surges affect road or transport infrastructure operation.

## 4. Measures to manage risks

The project's overall objective is to promote low-carbon and *climate-resilient* public and private transportation systems in the Seychelles. Thus, it has a key and direct focus on building resilience. In particular the project will focus on building resilient electric public transportation systems, and by investigating the impact of electric vehicle to grid services it will evaluate the options of using EVs for back-up power after extreme weather events. These grid-interactive systems aim to ensure that in the event of a grid blackout, electric vehicles will still be able to provide power to run critical systems in domestic environments.

On plans and regulations, output 1.2 aims to develop a national strategy for low-carbon electric mobility. While, under 3.2 it will be ensured that developed regulations for the installation of electric vehicle charging infrastructure also incorporate resiliency.

*(ii) Has the sensitivity to climate change, and its impacts, been assessed?*

Seychelles has high sensitivity to climate change and its impacts. It experiences severe weather events annually due to cyclones. It is also susceptible to sea level rise. See additional information above under (2) vulnerability and exposure.

*(iii) Have resilience practices and measures to address projected climate risks and impacts been considered? How will these be dealt with?*

As noted in the response to (i), the project incorporates the aspect on building resilience.

*(iv) What technical and institutional capacity, and information, will be needed to address climate risks and resilience enhancement measures?*

The technical design of the e-bus demonstration including the charging installations will need to be in accordance with the latest building codes, to ensure resilience to extreme weather events (primarily extreme wind speeds, see discussion above). Regulations for charging stations (output 3.2) will also need to be in accordance with such codes. Information on extreme weather events and wind speeds is currently available and will not need to be obtained through the project. Operators of and institutions operating charging installations will need capacity to understand how to operate the grid interactive systems during and after extreme weather events, especially in the event of grid blackouts.

### **COVID-19 Risk and Opportunity analysis**

The COVID-19 pandemic presents several challenges but also highlights the valuable benefits of electric mobility, in particular in the field of public health, and therefore the Seychelles Electric Mobility Child Project has an opportunity for larger impact by starting now. According to today's knowledge, long-term exposure to particulates could be linked to up to 15% of global COVID-19 deaths. Other studies suggest that besides, particulates (e.g. PM2.5, PM10), N2O from both mobile (e.g. trucks and cars) and stationary emission sources can be a multiplier of COVID-19 impact. Since electric mobility has the potential to significantly contribute to improving urban air quality, this project is a timely move in the Seychelles' efforts to respond to the COVID-19 pandemic. Similarly, a shift to electric mobility will significantly reduce the dependency of Seychelles on petroleum fuel imports. It therefore increases resilience against restrictions or oil price spikes resulting from international crisis. Furthermore, in terms of green recovery, clean mobility is expected to play a key role in getting the country's economy back on track.

#### **Risks:**

The COVID-19 pandemic has the potential to affect the project in the following ways:

*Reduced bus operations / load factors.* The responses to COVID-19, ranging from social distancing, teleworking to lockdowns have significant implications for the continuity of transport services in Seychelles both from the demand and supply perspectives. Firstly, users will have to modify their mobility needs either for concern on reducing the physical moves but also because users will less likely afford them. Secondly, public transport operators could suffer a reduction in income through lower ridership numbers and imposed reductions of passengers, and hence adopting new technologies such as electric vehicles might not be their priority. This would negatively impact the effective execution of the project's outputs, potentially leading to slower adoption of electric buses in the Seychelles.

*Lockdowns and movement restrictions.* Mobility restrictions and the need for social distancing would make it difficult to organise physical events that have traditionally benefited from in-person interactions, such as workshops, meetings, training, and consultations.

*Changes in government priorities.* With the national focus on addressing the pandemic and its impact on the national economy, commitment to electric mobility might be impacted. Financial incentives such as favourable import taxes or exemptions for EVs and charging equipment might not gain enough political support.

#### **Mitigation measures:**

*Reduced taxi and minibus operations.* If the pandemic continues to hamper the implementation of the project activities, especially Component 2 which is scheduled to take place in 2021 and 2022 with lockdowns and travel restrictions continue to impact the country, the PMU will re-evaluate the project work plan to reschedule field activities until the second or the third year (2022-2023). Additional health and safety protocols will need to be put in place to minimize the risks of

spread. Where possible, the capacity development components of the project, also in collaboration with the Ministry of Transport, could be used to support the development of pandemic response protocols/roadmaps for transport operators.

*Lockdowns and movement restrictions.* In the event of travel and mobility restrictions and social distancing, events will be rescheduled or held online. The project stakeholders in Seychelles have used teleconferencing and therefore are already familiar with required arrangements.

*Changes in government priorities.* Project activities requiring the government's endorsement of laws and decrees are to take place primarily for the project's second and third year when it is estimated that action on the pandemic will be in place and less of a requirement for legislative authorities. If the pandemic continues to be requiring the attention of decision-makers, such project activities will be rescheduled for the project's third year.

#### Opportunities:

*Increased awareness about cleaner urban air:* As the GEF project directly contributes to improving urban air quality through a reduction of air pollutants coming from internal combustion engine vehicles, the project can take advantage of this growing global voice demanding cleaner urban air. What needs to be ensured is that this leads to not only better awareness in the public and among decision-makers but also to concrete actions.

*Budget savings and reallocation:* It is likely many of the project's events at least in the first year of implementation would have to be held virtually. Budget savings made from the unused traveling and venue costs could be reallocated to more substantive activities, which would be decided depending on project needs.

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[1] Seychelles National Climate Change Strategy November 2009, the Seychelles National Climate Change Committee



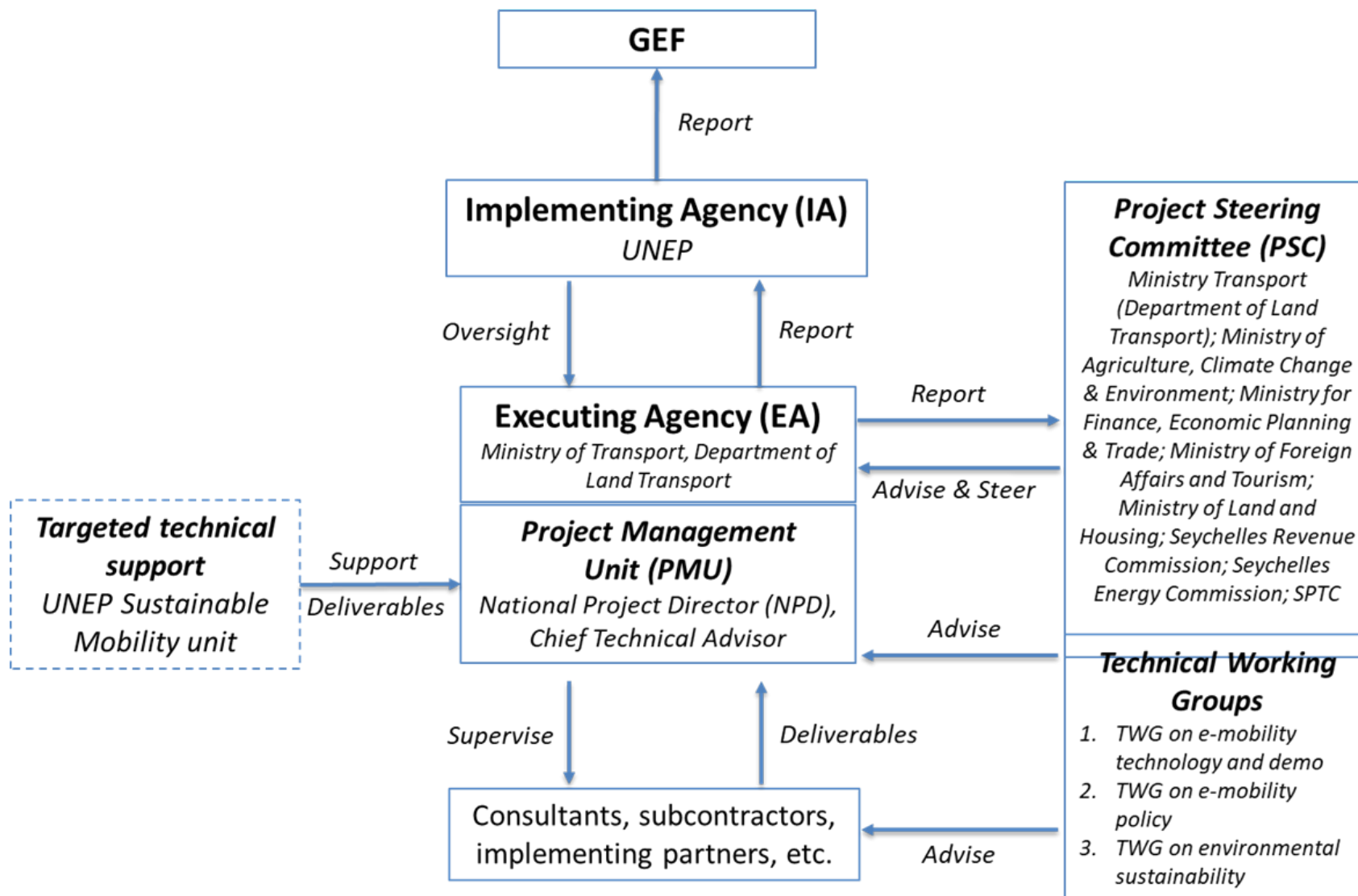
## 6. Institutional Arrangement and Coordination

**Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.**

### Institutional arrangements:

This project is funded by the GEF and co-funded by the Ministry of Transport (Department of Land Transport), the Ministry of Agriculture, Climate Change & Environment and UNEP. UNEP, through its Climate Mitigation Unit, will be acting as the GEF Implementing Agency and the Ministry of Transport (Department of Land Transport) will be the project's Executing Agency. Refer to Annex K for further details on the roles and responsibilities of the Implementing and Executing Agencies.

The main project bodies are the following (refer to Annex K for more details):



A **Project Steering Committee (PSC)** will be established to provide overall guidance and oversee the progress and performance of the project as well as to enhance and optimize the coordination and contribution with various project partners. The PSC will be chaired by the National Project Director (NPD) and will convene at least three times per year. The PSC will eventually transform into the National Intersectoral E-Mobility Coordination Body at the end of year 3 of the project, through a formal notification from the Seychelles government.

A **Project Management Unit (PMU)** will also be established within Ministry of Transport (Department of Land Transport) to manage day-to-day operation of the project. The PMU will be headed by the National Project Director (NPD) and will include the Chief Technical Advisor (CTA).

The Ministry of Transport and Seychelles' GEF OFP have requested for **targeted technical support**<sup>[1]</sup> to be provided by the UNEP Sustainable Mobility Unit (UNEP SMU), which is also the Lead Executing Agency of the Global E-mobility child project. The GEF OFP's letter request for the support may be found in Annex N-2 of the CEO Endorsement and the details of the support to be provided by UNEP SMU are outlined in the Project Implementation Arrangements (Annex K) and in the Terms of References (Annex H).

Below is a summary of the UNEP SMU budget, which can also be found in the detailed budget (Annex I-1):

Project Outputs the UNEP SMU will be supporting:	Budget Category	Amount (US \$)
Output 1.2: A gender sensitive National Electric Mobility Strategy that includes electrification of Seychelles Public Transport Corporation is developed and formally proposed.	Staff & Personnel	1,750
	Travel	2,200
Output 2.2. One demonstration bus and charging equipment are procured, staff trained, demonstration project on different routes is implemented, monitored and data collected, analysed and disseminated.	Staff & Personnel	3,500
Output 3.2: Fiscal policies, and regulatory measures to incentivize the uptake of electric mobility are developed and formally proposed.	Staff & Personnel	3,500
	Travel	2,200
Output 3.3. One e-bus up-scaling financing concept is developed and submitted to a financier	Staff & Personnel	1,750
Output 4.1: A sustainable e-mobility study including a brief technical assessment of the usability of an Extended Producer Responsibility (EPR) scheme for the collection of used EV batteries, an evaluation of the potential to charge EVs with renewable power and the impact of EVs on the integration of renewable is developed with the support of the Global Programme	Staff & Personnel	3,500
<b>Total</b>		<b>18,400</b>

Ad-hoc **Technical Working Groups (TWG)** will be formed to facilitate the implementation of the project components. The TWG will meet regularly during project implementation to work inter alia on the following topics:

- TWG on e-mobility technology and demonstration: including SPTC, SEC, the EC SOLUTIONSplus industry partner, Department of Land Transport, Public Utility Corporation, among others.
- TWG on e-mobility policy: Formulation of e-mobility policy and technology - Department of Land Transport Ministry of Finance, Trade Investment and Economic Planning, Seychelles Revenue Commission, Ministry of Land and Housing, Ministry of Foreign Affairs and Tourism; Ministry of Agriculture, Climate Change &

Environment, Seychelles Motor Vehicle Dealers Association (SMVDA), and government agencies responsible for business support such as the Enterprise Seychelles Agency, among others.

- TWG on e-mobility and sustainability, Ministry of Agriculture, Climate Change & Environment, SEC, Public Utility Corporation, among others.

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#### Coordination with other initiatives:

The project will be coordinated with:

- Government of Seychelles plans to acquire 22 new electric buses for the Seychelles Public Transport Corporation (SPTC) through a government to government agreement between the Republic of Seychelles and China. Discussions have been advanced under the old government and are currently revived by the new government elected November 2020. The demonstration project works towards the specification of technical, operation and financial parameter of the e-bus upscaling part of abovementioned agreement. Coordination takes place on all levels, especially with regards to technical parameters of the buses and implementation plan. The donated buses shall not be received before end of the year 2023.
- The renewable power projects identified in the baseline scenario. More specifically, the project will coordinate on a technical level and in particular with the Ile de Romainville Solar PV project, since this project is already integration energy storage as means to better integrate variable renewables in the island power grid. Input to and expertise generated under Component 4 will be received and shared with the respective partners. Information exchange with all renewable power projects is envisaged for the development of the e-mobility strategy, particularly with regards to annual power generation, generation profiles and plans to feed power to the Seychelles grid.

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[1] The UNEP SMU does not intend to hire a consultant to provide the targeted technical support requested by Seychelles, but rather it will draw upon time and travel of its team members, which have broad bandwidth of competencies and expertise on various aspects of e-mobility, from national strategy development, policy development, feasibility assessment, demonstrations, renewable energy integration, to battery life cycle management, etc. Indeed, no single consultant has the expertise to cover all these areas of work alone. In addition, the SMU team members that will be supporting this project will work together with the Ministry of Transport (the Executing Agency) to help build its capacity, in particular with regards to e-mobility policy and to the procurement of e-vehicles.

## 7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

### 1. Minamata Initial Assessment (MIA) under Minamata Convention

The Republic of Seychelles Minamata Initial Assessment Report of 2016 established that the mercury production and release to air from transportation and domestic LPG usage was negligible, accounting for 0.0014 kilograms/year against a total calculated release of mercury of 55kg for Seychelles in 2015.

### 2. National Communications (NC) under UNFCCC

The Republic of Seychelles' Second National Communication Under the United Nations Framework Convention on Climate Change December 2011 established that the total emission for electricity production was around 64% while from the transport sector (road, aviation & navigation) it was around 25%. Consequently, the report recognizes the need for reduction of consumption of gasoline and gasoil from the transport sector to see to the reductions of GHG emission.

### 3. United Nations Strategic Partnership Agreement (UNSPA)

The Republic of Seychelles and United Nations Strategic Partnership Agreement 2018 – 2022 under Section 3 (Resources and Resource Mobilization Strategy) calls for UN system agencies to provide support to the development and implementation of activities within the Agreement which *may include technical support, cash assistance, supplies, commodities and equipment, procurement services, **transport**, funds for advocacy, research and studies, consultancies, programme development, monitoring and evaluation, training activities and staff support. Part of the UN system agencies' support may be provided to Non-Governmental [and Civil Society] organizations as agreed within the framework of the individual work plans (WPs) and project documents.*

### 4. Sustainable Development Goals (SDGs)

· The project contributes to SDG:

Goal	Goals and targets
SDG 3 – Ensure healthy lives and promote well-being for all at all ages	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
SDG 13 – Take urgent action to combat climate change and its impacts	13.2 Integrate climate change measures into national policies, strategies and planning

## 5. Nationally Determined Contributions (NDC)

Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change (UNFCCC) in September 2015 commits to see to absolute economy-wide emission reductions covering public electricity, land transport and solid waste management. Specifically, the NDC calls for more efficient fuel-based land transport and more use of electric vehicles charged with renewable energy technology

## 8. Knowledge Management

**Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.**

The project is part of the global GEF-UNEP Programme on Electric Mobility. It will actively participate in the global programme's global and regional activities through its component 1, for example by participating and contributing to the knowledge exchange in the regional knowledge and investment platforms and the relevant global working groups, as well as by providing insights and knowledge.

The Department of Land Transport will ensure that all knowledge products developed under the project will be shared with the Global Programme and in particular the IEA (for the global data repository) and UNEP (for dissemination through the Africa Support and Investment Platform). Furthermore, the CTA will collect and maintain all project reports and make sure that they are publicly accessible.

Results of the Seychelles Project will be accessible through the Global E-Mobility Programme Online Toolbox. The Global Programme Website will showcase the Seychelles Project and report on progress. The Global Programme will also disseminate results of the Seychelles Project through social media.

Key deliverables contributing to knowledge management are

### Component 1

- D 1.1.4 Report compiling all the best practices and lessons learned based on studies / reports produced as part of the e-mobility project in Seychelles (to be shared with the Global E-mobility Programme)
- D 1.2.4 Gender-sensitive national e-mobility strategy finalized and presented to National Inter-Sectorial Electric Mobility Steering Committee

### Component 2

- D 2.1.3 Feasibility assessment for demonstration of 1 electric bus as part of the SPTC fleet in Mahé, including technical specifications of the demonstration bus and charger, and selection of routes (at least 3) and charger locations carried out;
- D 2.1.4 Implementation plan for e-bus operation (including operation on three different routes and possibly within different depots), charging and maintenance, data collection, reporting and analysis framework developed
- D 2.2.5 Final report on the demonstration results, technical assessments and data analysis is presented to the national inter-sectorial electric mobility steering committee (Output 1.1) and shared with the Global E-Mobility Programme

### Component 3

- D 3.1.2 Technical specifications for e-buses for scaling-up as well as the necessary chargers are developed
- D 3.1.3 A detailed implementation plan for the operation and maintenance of a scale-up fleet of about 20 electric buses is developed
- D 3.2.2 Based on currently available regulation in other countries, EV and EV charging technical standards are adapted and drafted for the Seychelles.
- D 3.2.3 A vehicle import tax scheme based on CO<sub>2</sub> emissions is proposed.
- D 3.2.4 An alternative scheme to subsidize SPTC and to remove subsidies on diesel is proposed.

### Component 4

- D 4.1.3 A brief technical assessment on the usability of an EPR scheme for used EV battery collection is prepared and recommendations for an initial scheme for battery EOL issues are developed
- D 4.1.4 A study focusing on the integration of renewable power for electric vehicle charging and the impact of EVs on renewable power integration in the Seychelles is developed and disseminated

The total GEF budget dedicated to the production of knowledge products is estimates at around USD 150,000. The development of the knowledge products is envisaged to take place over the entire duration of the project. For detailed information on the timeline of delivery of each of the knowledge products listed above, please refer to the project's Workplan in Annex L of the CEO Endorsement Document.



## 9. Monitoring and Evaluation

### Describe the budgeted M and E plan

Monitoring and Evaluation (M&E) activities and related costs are presented in the costed M&E Plan (Annex J) and are fully integrated in the overall project budget.

The project will comply with UNEP standard monitoring, reporting and evaluation procedures. Reporting requirements and templates are an integral part of the legal instrument to be signed by the Executing Agency and the Implementing Agency

The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Annex A includes SMART indicators for each expected outcome as well as end-of-project targets. These indicators along with the key deliverables and benchmarks included in Annex L will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification to track the indicators are summarized in Annex A.

The M&E plan will be reviewed and revised as necessary during the project Inception Workshop (IW) to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be re-tuned at the inception workshop. General project monitoring is the responsibility of the Project Management Unit (PMU) but other project partners could have responsibilities in collecting specific information to track the indicators. It is the responsibility of the Chief Technical Advisor to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

The project Steering Committee (PSC) will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E Plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility of the UNEP Task Manager. The UNEP Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

Project supervision will take an adaptive management approach. The UNEP Task Manager will develop a project Supervision Plan at the inception of the project, which will be communicated to the Project Management Unit and the project partners during the Inception Workshop. The emphasis of the Task Manager's supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring.

Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by the Project Management Unit, the project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The PIR will be completed by the Chief Technical Advisor and ratings will be provided by UNEP's Task Manager. The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. UNEP's Task Manager will have the responsibility of verifying the PIR and submitting it to the GEF. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

Since this is a Medium-Size Project (MSP) of less than 4 years of duration, no Mid-Term Evaluation (MTE) will be undertaken. However, if the project is rated as being at risk or if deemed needed by the Task Manager, he/she may decide to conduct an optional Mid-Term Review (MTR). This review will include all parameters recommended by the GEF Evaluation Office for Terminal Evaluations (TE) and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see section 2 above). Members of the project Steering Committee could be interviewed as part of the MTR process and

the Chief Technical Advisor will develop a management response to the review recommendations along with an implementation plan. Results of the MTR will be presented to the Project Steering Committee. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

In-line with the with UNEP Evaluation Policy and the GEF Evaluation requirements, the project will be subject to an independent Terminal Evaluation. The Evaluation Oce will be responsible for the Terminal Evaluation (TE) and will liaise with the project manager throughout the process.

The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. The project performance will be assessed against standard evaluation criteria using a six-point rating scheme. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP staff and implementing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE will typically be initiated after the project's operational completion. If a follow-on phase of the project is envisaged, the timing of the evaluation will be discussed with the Evaluation Oce to feed into the submission of the follow-on proposal.

The draft TE report will be sent by the Evaluation Oce to project stakeholders for comment. Formal comments on the report will be shared by the Evaluation Oce in an open and transparent manner. The final determination of project ratings will be made by the Evaluation Oce when the report is finalised.

The evaluation report will be publicly disclosed and will be followed by a recommendation compliance process. The evaluation recommendations will be entered into a Recommendations Implementation Plan template by the Evaluation Oce. Formal submission of the completed Recommendations Implementation Plan by the project manager is required within one month of its delivery to the project team. The Evaluation Oce will monitor compliance with this plan every six months for a total period of 12 months from the finalisation of the Recommendations Implementation Plan.

The GEF Core Indicator Worksheet is attached as Annex F. It will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above, the optional MTR and TE will verify the information of the tracking tool.

The direct costs of reviews and evaluations will be charged against the project evaluation budget. A summary of M&E activities envisaged is provided in Annex J. The GEF contribution for this project's M&E activities (including evaluations) is US\$ 30,000.

## 10. Benefits

**Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?**

By transitioning from a mobility model based on imported fossil fuels to one based on renewable energy powered electric mobility, Seychelles stands to reap the following socio-economic benefits:

- Improved public health from reduced local air and noise pollution and a commensurate reduction in air pollution associated healthcare costs
- Development of new policy frameworks to underpin electric mobility is a key opportunity to improve road safety through ensuring better enforcement of existing policies as well as development of new ones to seal road safety regulation gaps
- The evaluation and development of strategies to ensure non-discriminatory access to opportunities created by electric mobility will go a long way in bridging the gender disparity in mobility from employment, investment and access of services.
- Reduced exposure to oil price volatility & reduced oil imports (Improved energy security)
- By reducing consumers gasoline expenditures, more money will stay local and boost the local economy. This will result in new business/investment opportunities for entrepreneurs, local investors etc.
- Potential to reduce poverty and inequality by providing clean and affordable transport options
- Reduced congestion leading to better quality of life with less time spent in traffic and better accessibility to jobs, health care services by low-income groups.

## 11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

**Overall Project/Program Risk Classification\***

PIF	CEO Endorsement/Approval	MTR	TE
Low			

**Measures to address identified risks and impacts**

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

This is likely a low risk project. However, the components 2 and 3 would require vigilant attention on potential safeguard issues and project's potential impact to the marginalized and vulnerable people.

UNEP ESSF guiding principles-- resilience and sustainability; human rights, gender equality and women empowerment, accountability and leave no one behind--are still applicable for low risk projects. Project level grievance mechanism (if the government does not have such venue) should be established for any complaints to be handled swiftly at the project level.

**Supporting Documents**

Upload available ESS supporting documents.

Title	Module	Submitted
EM Seychelles_SRIF_2021.03.31	CEO Endorsement ESS	

## 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).

Project Objective	Objective level Indicators	Baseline	Mid-Point Target (if applicable)	End of project Target	Means of Verification	Assumptions & Risks	UNEP MTS reference
Mitigate GHG emissions by accelerating the introduction of electric mobility in Seychelles through demonstration in public transportation, capacity building, and preparation of upscaling and replication through development of adequate electric mobility policies and financing concepts.	Indicator A: Direct and Indirect Greenhouse Gas Emissions Mitigated (metric tons of CO <sub>2</sub> e) over the period 2021-2036	Baseline A: 0	Mid-point target A: N/A	End-of-project target A: Direct: 23,117 tCO <sub>2</sub> Indirect: 86,901 tCO <sub>2</sub> (by year 2036)	Calculation based on UNEP Emob calculator	Assumption: Adoption of policies and introduction of financial mechanism by the Government of Seychelles  - Objection or low commitment from industry and lack of interest or participation from market players/private sector. - Higher upfront cost of EVs pose a barrier to implementation and scale up - Leadership change: change in leadership and priorities in the government - Time lag of results: Major results of the project may not be seen before the end of the project period.	UNEP MTS 2018-2021  Climate Change Objective: Countries increasingly transition to low-emission economic development and enhance their adaptation and resilience to climate change
	Indicator B: Number of direct beneficiaries of the project, disaggregated by gender	Baseline B: 0	Mid-point target B: N/A	End-of-project target B: Women: 387 Men: 604 Total: 991	- Attendance sheets from the child project and the Global Electric Mobility Programme - Monitoring (the number of unique passengers serviced by the demonstration bus)		
Project Outcomes	Outcome level Indicators	Baseline	Mid-Point Target (if applicable)	End of project Target	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
Outcome 1: The government has established a coordinated institutional framework and adopts a gender sensitive strategy for the promotion of low-carbon electric mobility in Seychelles	Indicator 1.1: A National Inter-Sectoral Electric Mobility Steering Committee to support and promote the uptake of low-carbon e-mobility is established and endorses a national strategy to promote low-carbon electric mobility	Baseline 1.1: No	Mid-point target 1.1: The Project Steering Committee is established and includes all key institutions.	End-of-project target 1.1: Yes The National Inter-Sectoral Electric Mobility Steering Committee: - is officially created by the government - remains operational and has agreed on post-project plan to promote e-mobility. - has at least 30% female members.	- Reports of the steering committee's quarterly meetings - Gender-disaggregated participation lists - Government notification of the National Inter-Sectoral Electric Mobility Steering Committee's creation - Written agreement of cooperation and post-project action plan	Assumption: There is a political climate to expand ongoing national initiatives for the increase of energy efficiency in transport to e-mobility.  - Objection or low commitment from industry and lack of interest or participation from market players/private sector. - Leadership change: change in leadership and priorities in the government	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies
	Indicator 1.2: The government of the Seychelles endorses a gender sensitive National Electric Mobility Strategy to promote low-carbon electric mobility	Baseline 1.2: No	Mid-point target 1.2: The respective Ministries are discussing the draft strategy.	End-of-project target 1.2: Yes	- Public announcements by the government and/or respective Ministries - Public availability of the National Electric Mobility Strategy - The strategy contains a chapter / section on gender mainstreaming - Government gazette and other publications	Assumption: There is a political climate to expand ongoing national initiatives for the increase of energy efficiency in transport to e-mobility.  - Conflicting interests making it impossible to find consensus or required compromises that render the strategy and action plan too vague. - Objection or low commitment from industry and lack of interest or participation from market players/private sector. - Leadership change: change in leadership and priorities in the government	
	Indicator 1.3: # of reports on best practices and lessons learned on low carbon electric mobility in the Seychelles shared with the global programme	Baseline 1.3: 0	Mid-point target 1.3: N/A	End-of-project target 1.3: 1	- Lessons learned and best practices report produced by the CTA and the National Inter-Sectoral Electric Mobility Steering Committee (deliverable 1.1.4)	Assumption: The project properly disseminates and communicates the results of the demo project  - Time lag of results: Major results of the project may not be seen before the end of the project period.	
Outcome 2: The e-bus demonstration provides evidence of technical, financial, and environmental sustainability enabling SPTC to plan for scale-up of Seychelles' e-bus fleet.	Indicator 2.1: # of electric buses committed to be introduced with SPTC based on the evidence generated by the 1-bus demonstration project	Baseline 2.1: 0	Mid-point target 2.1: N/A	End-of-project target 2.1: At least 20	- SPTC commitment letter - Donation / funding agreement with potential donor / investor	Assumption: The project properly disseminates and communicates the results of the demo project  - Lack of linkages with available funding/financing for EVs fleets. - SPTC does not have the capacity to implement the demonstration project - Objection or low commitment from industry and lack of interest or participation from market players/private sector. - Higher upfront cost of EVs pose a barrier to implementation & scale up - Inadequacy of the exit strategy and lack of ownership of the program after the end of the GEF funded activities and inability to source resources to continue the program's activities in the medium/long term	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies
Outcome 3: The government creates conditions for removing existing barriers by developing plans and financing concepts, and by submitting policies and regulations for adoption to accelerate the introduction of EVs in Seychelles	Indicator 3.2: # of policies to incentivize the uptake of low-carbon electric mobility submitted for adoption by the government of Seychelles	Baseline 3.1: 0	Mid-point target 3.1: N/A	End-of-project target 3.1: at least 2	- Government gazette and other publications - Policy package document including: + EV and EV charging technical standards + Vehicle import tax scheme + Alternative scheme to subsidize SPTC and to remove subsidies on diesel	Assumption: There is a political climate to expand ongoing national initiatives for the increase of energy efficiency in transport to e-mobility.  - Conflicting interests making it impossible to find consensus or required compromises that render the strategy and action plan too vague. - Leadership change: change in leadership and priorities in the government	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies
	Indicator 3.2: # of financing concepts for e-mobility replication and / or upscaling in Seychelles submitted to financial institutions	Baseline 3.2: 0	Mid-point target 3.2: N/A	End-of-project target 3.2: 1	- E-mobility concept note - Approval letter / document of the submitted concept note received from the financial institution	Assumption: The project properly disseminates and communicates the results of the demo project  - Lack of linkages with available funding/financing for EVs fleets. - Objection or low commitment from industry and lack of interest or participation from market players/private sector.	
Outcome 4: Measures are developed by the government to ensure the long-term environmental sustainability of low-carbon electric mobility	Indicator 4.1: # of recommendations reports / schemes developed to ensure the long term sustainability of electric mobility in Seychelles (including the issue of EV batteries EOL and the integration of low-carbon power for charging)	Baseline 4.1: 0	Mid-point target 4.1: 0	End-of-project target 4.1: 2 recommendation reports / schemes	- Technical assessment on the usability of an EPR scheme for used EV battery collection including recommendations for an initial scheme for battery EOL - Study report focusing on the integration of renewable power for electric vehicle charging	Assumption: The project properly disseminates and communicates the results of the demo project  - Higher electricity use might lead to higher emissions, e.g. from HFO powerplants - The growing demand from electric vehicles destabilizes the power supply - Materials from EVs (e.g. from batteries) might generate environmental pollution	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies

## ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Please refer to the separate pdf files which include all responses to the GEF's reviews:

Annex B.1 – Responses to GEF Sec reviews (on the PFD)

Annex B.2 – Responses to GEF Sec reviews (on the PFD addendum)

Annex B.3 – Responses to STAP comments

Annex B.4 – Responses to Council comments

Responses to STAP comments may be found below:

UNEP replies to STAP screening:

<b>Part I: Project Information</b>	
<b>GEF ID</b>	10114
<b>Project Title</b>	Global Program to Assist Countries with Shift to Electric Mobility
<b>Date of Screening</b>	27-May-19
<b>STAP member Screener</b>	Saleem H. Ali
<b>STAP secretariat screener</b>	Sunday Leonard
<b>STAP Overall Assessment</b>	Concur

STAP comments	UNEP replies
The e-mobility program has been developed based on a set of 17 child projects, as well as synergies with the EC Solutions Plus program. Partnership with the International Energy Agency gives the proposal a high level of rigor in terms of metrics of energy costing and efficiency measurement criteria. The proposal is also supported by relevant studies from applicable development agencies.	



The public-private partnership aspect of the project is convincing and likely to deliver the overall desired impact - if well- implemented.

Comment 1: Key barriers to the scaling of e-mobility have been recognized in the child projects. However, there are also some system factors around e-mobility that deserve attention, and which should be highlighted as barriers to upscaling. The material needs of e-mobility infrastructure in terms of the availability of battery storage technology, and the link between the price of key metal components needs to be specified more clearly. The project has set up a “batteries working group” to assure a reliable supply of batteries through recycling and criticality assessments, but how such a working group would ensure supply is not clearly articulated. The proposal notes a connection with the Global Battery Alliance of the World Economic Forum which will help to avoid redundancies and build a wide private sector alliance. The project proponents should also monitor the Roland Berger “E-Mobility” Index in terms of key lessons from countries that have achieved high rankings in this index. The Australian government has also set up a new Cooperative Research Centre on Batteries which could be an important resource.

Comment 2: Clearly the E-mobility program has positive interactions with the Sustainable Cities Impact Program because much of the high-den

Reply 1: The project recognizes the issues around provision of raw materials for battery production. Nonetheless, it is not the focus of the project to ensure availability of these materials and subsequent battery supply. It seems to be understood that availability of resources such as lithium, cobalt, nickel and copper and their transformation into reserves (classification based on IEA Global Electric Vehicle Outlook [GEVO] 2019) is not constrained by the natural resource base but rather by the pace of investment to un-tap these resources (see IEA GEVO 2019). The project seeks for acceleration of EV demand, and therefore acceleration of demand for batteries. It is believed that such an accelerated demand will lead to the necessary investment in battery production capacity and hence the provision of raw materials.

Nonetheless, the project will put focus on the development of regulation and schemes for collection of used EV batteries for re-use, recycling and safe disposal, mainly through the International Energy Agency (IEA) led Global Thematic Working Group on “Charging infrastructure, grid integration, low-carbon power supply and batteries”. The project aims at facilitating re-use and recycling of used EV batteries through “design for recyclability” of EV batteries to ensure that a trajectory leading to some sort of circular economy can be taken in the future. Development of adequate policies will play a major role in the stipulation of high recycling rates to ease pressure on raw material demand and to increase sustainability of e-mobility as a whole. This also includes the development of guidelines and agreements with regards to the social and environmental standards for the sourcing of these materials. Private sector alliances such as the mentioned Global Battery Alliance of the World Economic Forum can help with the facilitation of such agreements and will be included in the design of the relevant operational parts of the Global Child Project. Similarly, literature and indices such as the mentioned Roland Berger “E-Mobility” Index will be included to the extent possible within the work of the relevant Working Groups. It needs to be noted that the Basel and Stockholm Convention Regional Centre for the Asia and Pacific Region in China (BCRC-SCRC China, hosted by the School of Environment of Tsinghua University) will be part of the GEF Global E-Mobility Programme. The Basel Convention regulates the international trade of waste, which might play a key role in the area of used EV battery recycling since large scale battery recycling is likely to depend on international shipping of used EV batteries and / or battery components.

Reply 2: For countries that have both an e-mobility and a Sustainable Cities project (i.e. India, etc.), close coordination will be undertaken during project implementation to ensure synergies. Whenever the sustainable cities projects organize events/workshops on urban mobility, the e-mobility project team / proponents will be invited to participate.

sity implementation and climate benefits of e-mobility would be realized in an urban context. There needs to be good coordination between the two programs.

Comment 3: A core challenge will be to ensure that the source of electricity for the e-mobility platform is low carbon to maximize the GHG reduction benefit. All calculations for GHG emissions (cars, buses versus trains etc.) need to be evaluated in terms of life-cycle analysis methodologies to ensure full systems-wide GHG benefits and ensure that impacts are internalized.

Reply 3: GHG emission saving potentials for all Country Child Projects are evaluated based on 1.) the current local carbon footprint of grid electricity; and 2.) prospects to reduce the average carbon footprint of grid electricity based on commitments and pledges to mitigate climate change. Many of the low and middle-income countries included in the Global E-Mobility Programme already have power mixes based on high shares of low carbon electricity such as hydro, wind, solar PV and nuclear power. This is true for many of the Country Child Projects in Latin America, Africa, Eastern Europe and West Asia. For Country Child Projects with relatively high grid emission factors such as India, most of the SIDS, Indonesia, South Africa, etc. projects have been designed in a way to ensure that sufficient amount of low carbon power will be integrated in the electricity mix used to power the demonstration vehicles to yield net climate benefits. As a general "rule of thumb" a carbon footprint threshold for grid electricity of around 800 to 900 gCO<sub>2</sub>/kWh is assumed to mark the line above which additional measures are necessary to reach net reductions of greenhouse gas emissions. Compared to alternative, technology based transport GHG mitigation measures such as the large scale use of biofuels as well as the use of potentially low carbon fuels such as hydrogen and synthetic fuels, it is believed that the direct use of electricity constitutes the most efficient means of decarbonizing transportation, alongside implementation of "avoid" (avoid transport demand) and "shift" measures (shift transport demand to more efficient means of mass transport as well as non-motorized transport). It is therefore necessary to introduce e-mobility now, in order to be prepared for upscaling once mitigation targets in the relatively low-abatement cost power sector have been achieved.

STAP comments	UNEP replies
<p><u>Comment 4:</u> The program will generate both climate mitigation and air pollution reduction benefits. If possible, the expected health benefits from air pollution reduction (for example, premature death prevention and Disability-Adjusted Life Years - DALYs) should be estimated during project development. This will provide a more detailed information on the environmental</p>	<p><u>Reply 4:</u> The air pollution reduction and associated expected health benefits will not be measured/quantified by the projects through GEF funding. However, if the countries wish to undertake these estimates, they will be welcome to do it through co-finance contributions.</p>



and socio-economic benefits from the GEF's investment.

Comment 5: There is detailed evidence of multi-stakeholder engagement, particularly for training programs, and other activities which connect with the OECD's multi-stakeholder engagement processes. It would be helpful to acknowledge that e-mobility has implications for "energy justice", because growth of this sector has largely been in high-income markets, especially for electric cars.

Comment 6: STAP recommends that project proponents review the following study: Sovacool, B. K., Kester, J., Noel, L. & de Rubens, G. Z. Energy Injustice and Nordic Electric Mobility: Inequality, Elitism, and Externalities in the Electrification of Vehicle-to-Grid (V2G) Transport. Ecological Economics 157, 205–217 (2019).

Comment 7: E-vehicle technology is rapidly evolving; it will be important therefore to keep track of and incorporate innovations in the field. University partners in academia would be recommended in this regard. A few key academic partners are noted such as University of California Davis and Technical

Reply 5: E-mobility has the potential to increase energy justice and to support the development of local value chains. While petroleum-based fuels are imported in most of the Country Child Projects, electricity is generated locally, with the potential to include high shares of locally generated renewable power. Introduction and up-scaling of e-mobility has therefore the potential to increase energy security and to hedge against the price volatility of the global petroleum fuel market. In many of the Country Child Projects, consumer prices of petroleum fuels are regulated by government and price spikes in the global supply chain has immediate effects on countries budgets. Total cost of ownership of electric vehicles, in particular when used in fleets such as public transportation fleets (buses, taxis, 2&3 wheeler taxis) are already lower than for conventional vehicles today in many of the Child Country Projects. The large-scale introduction of EVs in such fleets can therefore lead to better economics of public transport services, which in turn can lead to better service and lower cost of transportation for the end consumer. In addition, the provision of e-mobility applications such as electric 2&3 wheelers in least developed countries can un-tap synergies with rural electrification based on renewable micro and mini-grids (e.g, based on solar PV & electricity storage). Last but not least, the relatively less complex nature of electric vehicles can lead to the creation of green jobs in the local assembly and manufacturing of EVs, notably electric 2&3wheelers.

Reply 6: We take note of this recommendation. This will be shared with project proponents and the global thematic working groups.

Reply 7: The GEF Global E-Mobility Programme will be implemented in close collaboration with the European Commission funded Solutions Plus project. The Solutions Plus project, which started implementation in January 2020, and which has a total budget of about 18 million EUR, is targeting e-mobility demonstration projects in 9 low and middle-income cities world-wide, and includes replication activities of these dem

University of Denmark. These institutions and others should be involved in the M&E program.

demonstration projects in a number of additional cities and countries. UNEP is responsible for the development of replication projects in 8 cities worldwide. It has been agreed that EC Solution Plus funds will be included in 5 GEF Country Child Projects (around 60k to 80k USD per replication project) to procure charging equipment and to provide targeted support to local innovators with the installation and operation of this equipment. Similar to UNEP, DTU is a consortium member of the EC Solution Plus project and is mainly responsible for impact assessment and data collection and analysis of the project. UNEP will make sure that impact assessment and data collection and analysis will be closely coordinated between the GEF E-mobility Programme and the EC Solution Plus project and that all tools and materials as well as project outcomes and lessons learnt will be shared between both projects. In fact, the GEF and the EC Solutions Plus project target the joint and complementary development of tools, training materials, and events.

Comment 8: A recent study which may be helpful in considering some of the pitfalls of e-mobility is also referenced below: Onat, N. C., Kucukvar, M., Aboushaqrah, N. N. M. & Jabbar, R. How sustainable is electric mobility? A comprehensive sustainability assessment approach for the case of Qatar. Applied Energy 250, 461–477 (2019).

Academic partners may also include the University of California, Davis, which is a long-standing partner in UNEP's Global Fuel Economy Initiative (GFEI) through the Sustainable Transportation Energy Pathways Program directed by Lew Fulton.

Reply 8: We take note of this recommendation. This will be shared with project proponents and the global thematic working groups.

Part I: Project Information	What STAP looks for	Response	UNEP replies
<b>B. Indicative Project Description Summary</b>			
Project Objective	Is the objective clearly defined, and consistently related to the problem diagnosis?	Yes – the program has a very clearly defined objective of electric mobility.	-
Project components	A brief description of the planned activities. Do these support the project's objectives?	Yes, the outcomes support the objectives.	-
Outcomes	A description of the expected short-term and medium-term effects of an intervention.	These are defined in detail and referenced through a theory of change. Global environmental benefits of carbon mitigation are noted with key as	-

		assumptions about the source of energy.	
	Do the planned outcomes encompass important global environmental benefits/adaptation benefits?		
	Are the global environmental benefits/adaptation benefits likely to be generated?		
Outputs	A description of the products and services which are expected to result from the project. Is the sum of the outputs likely to contribute to the outcomes?	Yes, there is a clear linkage between outputs and outcomes made through the theory of change materials provided.	
Part II: Project justification	A simple narrative explaining the project's logic, i.e. a theory of change.		
<b>1. Project description. Briefly describe:</b>			
1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)	Is the problem statement well-defined?	Yes – detailed review of the material from the perspective of development agencies provided. However, academic literature review is not provided.	
	Are the barriers and threats well described, and substantiated by data and references?		
	For multiple focal area projects: does the problem statement and analysis identify the drivers of environmental degradation which need to be addressed through multiple focal areas; and is the objective well-defined, and can it only be supported by integrating two, or more focal areas objectives or programs?		
2) the baseline scenario	Is the baseline identified clearly?	Yes. baseline of current programs for countries	

or any associated baseline projects		provided as well as the relationship with EC Solutions plus program.	
	Does it provide a feasible basis for quantifying the project's benefits?		
	Is the baseline sufficiently robust to support the incremental (additional cost) reasoning for the project?		
	For multiple focal area projects:		
	are the multiple baseline analyses presented (supported by data and references), and the multiple benefits specified, including the proposed indicators;		
	are the lessons learned from similar or related past GEF and non-GEF interventions described; and how did these lessons inform the design of this project?		
3) the proposed alternative scenario with a brief description of expected outcomes and components of the project	What is the theory of change?	Good presentation of theory of change material in Figure 6.	
	What is the sequence of events (required or expected) that will lead to the desired outcomes?		
	What is the set of linked activities, outputs, and outcomes to address the project's objectives?		
	Are the mechanisms of change plausible, and is there a well-informed identification of the underlying assumptions?		
	Is there a recognition of what a		

	Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes?		
5) incremental/additional cost reasoning and expected contributions from the baseline, the GEF trust fund, LDCF, SCCF, and co-financing	GEF trust fund: will the proposed incremental activities lead to the delivery of global environmental benefits?	Yes – very detailed cost reasoning and partnerships provided.	
	LDCF/SCCF: will the proposed incremental activities lead to adaptation which reduces vulnerability, builds adaptive capacity, and increases resilience to climate change?		
6) global environmental benefits (GEF trust fund) and/or adaptation benefits (LDCF/SCCF)	Are the benefits truly global environmental benefits, and are they measurable?	Yes – electric mobility if implemented with low carbon energy source has clear global environmental benefits.	
	Is the scale of projected benefits both plausible and compelling in relation to the proposed investment?		
	Are the global environmental benefits explicitly defined?		
	Are indicators, or methodologies, provided to demonstrate how the global environmental benefits will be measured and monitored during project implementation?		
	What activities will be implemented to increase the project's resilience to climate change?		
7) innovative, sustainability and potential for scaling-up	Is the project innovative, for example, in its design, method of financing, technology, business model, policy, monitoring and evaluation?	The PFD has a short section on innovation (Section 7 on page 68) which largely focuses on the inherent innovation of e-mobility infrastructure as a new technology. Perhaps the most	

	tion, or learning?	significant innovations in the GEF program itself would be the financing arrangements that are being proposed through a variety of public-private partnerships that are being proposed, building on the vast experience of the International Energy Agency. Regarding STAP's guidelines on innovation in projects, the wide range of examples provided of innovative start-ups that emanate from the EC's Solutions Plus program are also appropriate. These should be further analysed to ascertain the level of actual success they are having (refer to section starting on page 36 and the table which starts on page 37).	
	Is there a clearly-articulated vision of how the innovation will be scaled-up, for example, over time, across geographies, among institutional actors?		
	Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability?		
1b. Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place.			
2. Stakeholders. Select the stakeholders that have participated in consultations during the project identification phase: Indigenous people and local communities; Civil society organizations; Private sector entities. If none of the above, please explain why. In addition provide in	Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers?	The energy justice aspect of this program should be closely monitored as e-mobility uptake continues to favor higher income households	Please refer to our response to the energy justice comment in the 1 <sup>st</sup> section above (reply 5).

<p>...ing. In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.</p>			
	<p>What are the stakeholders' roles, and how will their combined roles contribute to robust project design, to achieving global environmental outcomes, and to lessons learned and knowledge?</p>		
<p>3. Gender Equality and Women's Empowerment. Please briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis). Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes/no/ tbd. If possible, indicate in which results area(s) the project is expected to contribute to gender equality: access to and control over resources; participation and decision-making; and/or economic benefits or services. Will the project's results framework or logical framework include gender-sensitive indicators? yes/no /tbd</p>	<p>Have gender differentiated risks and opportunities been identified, and were preliminary response measures described that would address these differences?</p>	<p>Gender sensitivity analysis and action plans built into program. The uptake of electric motor cycles disproportionately by men for cultural reasons is noted as a useful example.</p>	<p>All country child projects as well as the global child project include a gender analysis and a gender action plan (in PART II section 3. Gender Equality and Women's Empowerment of the CEO Endorsement Document) to mainstream gender during project implementation.</p>
	<p>Do gender considerations hinder f</p>		

	ull participation of an important stakeholder group (or groups)? If so, how will these obstacles be addressed?		
5. Risks. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design	Are the identified risks valid and comprehensive? Are the risks specifically for things outside the project's control?	A wide variety of risks have been identified especially with reference to critical supply chains.	
	Are there social and environmental risks which could affect the project?		
	For climate risk, and climate resilience measures:		
	How will the project's objectives or outputs be affected by climate risks over the period 2020 to 2050, and have the impact of these risks been addressed adequately?		
	Has the sensitivity to climate change, and its impacts, been assessed?		
	Have resilience practices and measures to address projected climate risks and impacts been considered?  How will these be dealt with?		
	What technical and institutional capacity, and information, will		



	be needed to address climate risks and resilience enhancement measures?		
6. Coordination. Outline the coordination with other relevant GEF-funded and other related initiatives	Are the project proponents tapping into relevant knowledge and learning generated by other projects, including GEF projects?	Figure 9 presents a good organizational framework for coordinating the project across multiple agencies and private partners.	
	Is there adequate recognition of previous projects and the learning derived from them?		
	Have specific lessons learned from previous projects been cited?		
	How have these lessons informed the project's formulation?		
	Is there an adequate mechanism to feed the lessons learned from earlier projects into this project, and to share lessons learned from it into future projects?		
8. Knowledge management. Outline the "Knowledge Management Approach" for the project, and how it will contribute to the project's overall impact, including plans to learn from relevant projects, initiatives and evaluations.	What overall approach will be taken, and what knowledge management indicators and metrics will be used?	University partnerships could be better leveraged for knowledge management. Clearer role delineation of university and research partners would be a positive development.	Please refer to our response in relation to UCD and DTU in the 1 <sup>st</sup> section above (reply 7).
	What plans are proposed for sharing, disseminating and scaling-up results, lessons and experience?		
STAP advisory response	Brief explanation of advisory response and action		

	proposed		
1. Concur	STAP acknowledges that on scientific or technical grounds the concept has merit. The proponent is invited to approach STAP for advice at any time during the development of the project brief prior to submission for CEO endorsement.		
	* In cases where the STAP acknowledges the project has merit on scientific and technical grounds, the STAP will recognize this in the screen by stating that "STAP is satisfied with the scientific and technical quality of the proposal and encourages the proponent to develop it with same rigor. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design."		
2. Minor issues to be considered during project design	STAP has identified specific scientific/technical suggestions or opportunities that should be discussed with the project proponent as early as possible during development of the project brief. The proponent may wish to:		
	(i) Open a dialogue with STAP regarding the technical and/or scientific issues raised;		
	(ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review.		

	The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.		
3. Major issues to be considered during project design	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to:		
	(i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.		

Responses to Council comments may be found below:

-  
**UNEP responses to GEF Council comments on the  
Global Programme to Support Countries with the Shift to Electric Mobility (GEFID 10114)**

**v Comment by Yoshiko Motoyama, GEF Alternate Council Member, Japan, Deputy Director Global Environment Division, International Cooperation Bureau, Ministry of Foreign Affairs of Japan, Council, Japan made on 6/1/2020**

The below comments from Japan were provided prior to the Council meeting. An initial agency response was provided and can be found in the list of documents specific to the project in the GEF Portal.

On single-country projects, especially with large stated co-finance ratios, and cyclical-industry-related projects, such as Project 10564 (Environmentally Sustainable Development of the Iron and Steel Industry) and Project 10544 (electric mobility addendum):

· We anticipate that participants of these projects may be severely impacted by the COVID-19 crisis. How realistic are the published co-financing arrangements to be met, and for the industry to meet the higher operating costs - without de facto subsidization from the GEF?

Response:

The current health crisis related to COVID-19 poses some difficult challenges for the automotive sector, but also, looking more specifically at the electric vehicles segment, it offers some opportunities.

Challenges include delays related to the finalization of the design of some of the national child projects, due for instance to international travel restrictions for the specialists involved in the design and the relative consultations. Broader challenges also include depression of demand for cars, at least in the short term, and potential shift in government priorities to focus limited national budget and workforce to more pressing health-crisis related issues. At this point it is difficult to make assumptions regarding the extent to which this will affect government priorities with regards to the allocation of budget and work force. What can be said is that there is a clear case to be made for mobility to be as a key pillar for sustainable and clean transportation investments in the context of economic recovery plans.

Opportunities: According to today's knowledge, there seems to be a correlation between air quality and COVID-19, whereby COVID-19 incidence and mortality are significantly higher in areas that have high levels of local air pollution. This includes particulate matters (e.g. PM2.5, PM10)[1] as well as N<sub>2</sub>O from both mobile (e.g. trucks and cars) and stationary (e.g. coal power stations) emission sources[2]. Since electric mobility has the potential to significantly contribute to improved urban air quality, we assume that it will play an important role in countries' strategies to respond to the COVID-19 pandemic.

Similarly, a shift to electric mobility will significantly reduce the dependency of countries to import petroleum petrol fuels. It therefore increases resilience against restrictions or price spikes resulting from international crisis.

While during COVID-19 vehicles sales have plummeted by half or more, electric vehicles sales have been relatively less affected. Analysts from Bloomberg New Energy Finance have estimated that the electric segment of car sales will continue to outperform in terms of growth the traditional cars one as we move past the crisis, even though oil prices at a historic low will create some negative headwinds. However, orders of buses are likely to suffer delays if public perception of mass transit as unsafe does persist.

Furthermore, in terms of green recovery, clean mobility is expected to play a key role in getting the global economy back on track. Continued social distancing measures will have an impact on how we use transportation services, and in particular public transportation, but certain modes of public transport are expected to grow, in particular in low and middle-income countries. These modes include 2&3 wheeler taxis, or usual taxis and ride-hailing providers using

passenger cars, to reduce close contact with higher numbers of riders. For many of these modes good electric alternatives are available.

Based on current trends and signals it is expected that after COVID-19 the shift to electric mobility would continue, if not increase. Many city governments around the world are looking at opportunities to take advantage of the significant reduction in urban congestion linked to the COVID-19 mobility restrictions to introduce permanent limitations to the use of private vehicles, especially if internal combustion engines. Such measures will not only reduce local air pollutants (such as particulates PM2.5 and PM10, but also N<sub>2</sub>O) and carbon emissions but can also increase resilience of transport systems against the current - and any potential future - health crises. The contribution of low-carbon mobility, including electric mobility, to a more resilient economy will be further integrated in the Programme and highlighted throughout the training components to be delivered to participating countries.

- What happens to the funds/projects if some participants cease to become going concerns (=i.e. bankruptcy)?

Response:

The information presented in the project documentation (PIFs and PFDs) represents the best available information available at the time of the submission to Council, following the technical review from the GEFSEC. Some level of change in the project design and in the availability of the amount of co-financing estimated ex-ante is possible and sometimes even desirable, considering the additional in depth design analysis conducted during the project preparation phase, including through the PPG-funded activities, between the submission of PIFs/PFDs and the submission of the relative CEO ER. Co-financing arrangements and amounts specified in PIFs/PFDs are best-case estimations that GEF Implementing Agencies and National Executing entities or participating actors provide for the formulation of the project proposals. These up-front estimates are assessed as part of the GEFSEC review process in terms of their relevance and adequacy vis-à-vis the scope and objective of the proposed Project/Program activities.

Once the PIF/PFD is approved by Council, as part of the detailed design process, Agencies and actors listed as other providers of co-financing amounts are asked to reassess and formally confirm that the co-financing volumes which had been included in the PIF/PFD have been approved by the competent authority within each specific organization. This is formalized through the submission of co-financing confirmation letters. In case a specific entity is no longer able to provide the previously stated co-financing amount, either in full or in part, generally Implementing Agency and GEFSEC would work together to assess if the stated co-financing is essential to achieve the project/program's objective. If so, GEFSEC and Agency assess if the expected amount of co-financing that is no longer available can be replaced by existing or additional co-financing from other actors. In case the co-financing is deemed essential, and there is no possibility to source such funds that are considered necessary to achieve the stated objectives, GEFSEC and Agency would consider whether to revise the approved project/program, and if not possible/advisable the project/program would not receive CEO Endorsement.

Given that the development phase will take around 12 months, and that the COVID crisis might trigger some government support to accelerate the further uptake of electric vehicles, as we have seen in France, for example (see quote below) , we hope that the co-financing might not be such an issue in a year from now, when the CEO endorsement documents will be due for submission. In any case, if planned investments and/or co-financing becomes an issue, agencies will work with the project developers to identify other sources of co-financing that can substitute the initial set of co-financiers, while keeping the project scope. If this is not possible, the developers will try to re-adjust the scope to respond to available co-financing that is still aligned with the project objectives. If this fails as well, then the developers might wish to either postpone the project or discuss with the country if the project should/can go ahead.

We raised at the last council our interest in verifying the ability of GEF and its accredited agencies to conduct independent audits of such contributions, including verifying and assessing the abilities of the involved parties to meet the co-financing obligations of this project. We recognize that this process --- along with many other due diligence procedures --- could be increasingly impaired by the latest COVID-19 crisis. Detailed explanations on how the Secretariat plans to handle these types of issues would be appreciated (preferably in writing to be posted on the GEF website, as it is not clear from the existing material and guidelines on the website)

Response:

In addition to the explanation provided above on the dynamics of co-financing, co-financing is reported on a yearly basis, based on progresses related to the sourcing and use of co-financing amounts. In the case of the e-mobility Programme, the Lead Implementing Agency is UNEP. For each project implemented by UNEP, the Project Manager has responsibility to seek signed co-financing reports from each co-financier of that given project. While the co-financiers are not audited, their signed (by the authorized authority in each entity providing co-financing) co-financing reports are available for the mid-term and terminal evaluators, so that the evaluation process can assess if that given GEF project reached or not the co-financing amounts which had been estimated up-front.

We would also like to stress the need for transparency and balanced involvement of private sector providers in any of these corporate projects (particularly highly cyclical sector projects such as the ones included in this work program in the steel and automobiles sectors), especially amid the COVID crisis, given that all such industry participants indiscriminately face severe business conditions. Projects should be carefully constructed and communicated, so that they are not deemed to infringe upon rules against subsidization of particular entities, thereby "reinforcing the market power of some targeted companies at the expense of others" (as per the rules). For example, "to de-risk investments in ...." in the project description/ objectives implies the potential of subsidization, highlighting the need for transparency in their construction and execution, so that they are visibly in line with GEF rules and regulations and the Private Sector Engagement Strategy to be adopted at this Council session. This type of crystal-clear communication/ governance insurance measure is essential for the GEF to credibly raise funding for private sector-driven projects in a tough financial environment.

Response:

We certainly acknowledge the importance of the point being raised here: all projects must be careful to run clear, fair and transparent procurement policies, which Agencies have in place for GEF projects. The recently adopted MINIMUM FIDUCIARY STANDARDS FOR GEF PARTNER AGENCIES Policy (GA/PL/02, of Dec 19, 2019), which covers both the Agency's internal procurement policies and procurement by recipients of funds, provides that:

*Specific GEF Partner Agency policies and guidelines promote economy, efficiency, transparency and fairness in procurement through written standards and procedures that specify procurement requirements, accountability, and authority to take procurement actions. As a minimum, these policies and guidelines provide for:*

- o Open competition and define the situations in which other less competitive methods can be used; and*
- o Wide participation through publication of business opportunities; descriptive bid/ proposal documents that disclose the evaluation criteria to be used; neutral and broad specifications; non-discriminatory participation and selection principles; and sufficient time to submit bids or proposals.*

UNEP is the GEF agency leading the global e-mobility programme and will take on this guidance in the development of the global project and its own child projects and will also pass it along to all other Implementing Agencies (UNDP, UNIDO, DBSA and EBRD). Of course, the participation of private sector partners and entities is key for the e-mobility programme and UNEP and the other Implementation Agencies will continue to seek their support and participation in the

program. The Program objective is to promote a shift towards electric mobility and away from Internal Combustion Engines, and as such all projects will be working with private sector partners that are actively working in this space.

In this context, it may also be useful to refer to the GEF-7 Programming Directions, para 121, as they refer to the Climate Change Focal Area:

*121. To take advantage of the GEF's comparative advantage, programming under this objective does not prioritize direct support for large-scale deployment and diffusion of mitigation options with GEF nancing only. Rather, GEF-7 resources should be utilized to reduce risks and enhance enabling environments in order to facilitate additional investments and support by other international nancing institutions, the private sector, and/or domestic sources to replicate and scale up in a timely manner.*

The global e-mobility program is responding to the GEF's grant role to support innovation and technology transfer at key early and middle stages of development, focusing on the demonstration and early deployment of innovative technologies to deliver sustainable energy solutions that control, reduce, or prevent GHG emissions.

**v Comment by Kordula Mehlhart, GEF Council Member, Head of Division on Climate Finance, BMZ, Council, Germany made on 6/18/2020**

Germany approves the following PIFs in the work program but asks that the following comments are taken into account:

Germany approves the addendum to the global programme that contributes to the adoption of e-mobility by strengthening the technical and nancial capacities of countries and taking into account different local prerequisites and requirements.

Suggestions for improvements to be made during the drafting of the nal pr oject proposal:

- The introduction of e-busses to local public transportation eets differs from other e-mobility forms, e.g. from heavy duty long-distance trucks, when it comes to technical aspects, charging infrastructure and the role of public / private investments. Given the unique involvement of public stakeholders in the purchase and operation of e-busses as well as the significant effect e-busses can have in terms of GHG-emission reductions in urban centres, this subject deserves a great amount of attention. Germany therefore proposes, that the significance of the acceleration of ebus adoption be reected in the program structure, by creating an additional working group focused on e-busses in public transportation.

#### Response:

Many countries have prioritized the introduction of electric busses in their country projects. Often as part of their efforts to introduce mass transit/ bus rapid transit systems. There will be a key interest in developing tools about the introduction of e-busses in developing country operating environments. There are also many lessons learned and examples (good and bad) in all regions that need sharing (for example the Chile and South Africa pilots). On the other hand, no country projects have prioritized electric trucks in their projects. Generally, this sector is seen as the last sector to switch, after busses, 2&3 wheelers and light duty vehicles (with the exception of the smaller delivery trucks like vans and so). Therefore, our thinking is to focus the HDV working group on busses. With possibly (probably) a smaller sub-group focusing on electric trucks. So rather than having a busses sub-group, we want to focus the HDV working group on busses and have a sub-group on trucks.

· Germany welcomes that information exchange and knowledge management are a substantial part of the programme. We suggest establishing a close working relationship to the new TUMI (Transformative Urban Mobility Initiative) E-Bus mission. The “TUMI E-Bus Mission” follows a similar logic and approach in supporting cities in the uptake of e-busses. As the e-bus implementation in public transport is largely dependent on an involvement of city level decisionmakers, the TUMI E-Bus Mission can contribute to the proposed programme by feeding in local perspectives and requirements.

Response:

UNEP already has existing working relations with the Transformative Urban Mobility Initiative. Coordination with and involvement of the TUMI initiative in the global e-mobility programme will be added to the project document (especially through the activities implemented as part of the Regional Support and Investment Platforms).

**v Comment by Anar Mamdani, Director, Environment Division (MSS), Global Issues and Development Branch (MFM), Global Affairs Canada, Council, Canada made on 6/26/2020**

· We recommend that there be some consideration to mitigating the environmental impacts of electric vehicles, particularly where facilities for managing batteries don't exist.

Response:

Component 1 of the global e-mobility project includes a Global Thematic Working Group on “Electric vehicle charging, grid integration, renewable power supply and battery re-use, recycling and safe disposal”. This Working Group’s main objective will be to develop and make available knowledge materials that support governments in their ambitions for advancing a sustainable roll out of electric mobility, including policy instruments to ensure the sustainability of the battery supply chain and the end-of-life treatment of batteries. It also aims at the facilitation of discussions between regulators, recyclers and battery / vehicle manufacturers to better understand and enhance battery design to improve recyclability of batteries, especially with regards to economic viability.

In addition, Component 4 of the country child projects is usually focused on the long-term environmental sustainability of low-carbon electric mobility, which include outputs/activities to ensure/promote the environmentally sound management of used batteries (i.e. collection, re-use, recycling and disposal).

**v Comment by Elizabeth Nichols, U.S. Department of State | Bureau of Oceans, International Environmental and Scientific Affairs (OES), Office of Environmental Equality and Transboundary Issues (EQT), Council, United States made on 7/2/2020**

· Within Bangladesh, we recommend additionally coordinating with the State Minister for Power, Energy, and Mineral Resources, and the Dhaka North City Corporation Mayor.

Response:

Comment taken and shared with UNDP project proponents in charge of the Bangladesh child project. This recommendation will be considered during the proposal development phase of the Bangladesh e-mobility project.



- Within Sri Lanka, there was very minimal reference to the project's stakeholders. We look forward to seeing much more clearly defined information on stakeholders and their engagement in the next stage of proposal development.

Response:

Comment taken and shared with UNEP project proponents in charge of the Sri Lanka child project. Engagement of project stakeholders will be further elaborated during the proposal development phase of the Sri Lanka e-mobility project.

**v Comment by Dr Katharina Stepping, Deputy Head of Unit Climate Finance, Federal Ministry for Economic Cooperation and Development (BMZ), Council, Germany made on 6/28/2019**

Germany welcomes the proposal aiming to support countries to design and implement electric mobility programs as part of an overall shift to sustainable, low carbon transport sector. Germany welcomes the proposal as the first global inter-agency electric mobility programme and appreciates that the project clearly aims at supporting the rapid introduction of electric mobility in GEF recipient countries, thereby making a contribution to the low carbon transition in the transport sector. At the same time, Germany has the following comments that it suggests be addressed in the next phase of finalizing the project proposal:

Suggestions for improvements to be made during the drafting of the final project proposal:

- Germany welcomes that the project foresees a clear role for the private sector as a supplier for electric mobility technologies. However, given that private sector investments in electric mobility will be key, Germany would welcome the inclusion of activities that specifically directed at spurring private investments in electric mobility (from the demand side). For instance, some firms have switched parts of their operations to electric fleets. These types of opportunities could be considered within the PIF.

Response:

Almost all of the Country Child Projects are geared towards the introduction of electric 2&3 wheelers (and sometimes e-passenger cars) as well as e-buses into private or government owned public transportation fleets through: 1) Awareness raising, capacity building and institutionalization of e-mobility; 2) Short term barrier removal through demonstration of e-mobility; 3.) Scale-up and replication through development of e-mobility policies, business models and financial mechanisms; and 4.) Support of environmental sustainability through battery re-use / end-of-life considerations and integration of renewable power for vehicle charging. The Country Child Projects therefore target to spur e-mobility demand in the project countries.

The Regional Support and Investment Platforms under the Global Programme will create market-place events whereby the current as well as potential new projects meet with financiers (development banks, venture capital, green funds) and e-mobility manufacturers. The idea is to bundle demand for EVs and EV supply equipment and to raise interest from manufacturers in regions of the world, which are not yet in the focus of manufacturers, but have a great market potential.

The Global Working Groups and the Regional Supply and Investment Platforms are a means of private sector participation, and invites all major EV and EV supply equipment manufacturers to participate in events, tasks groups, etc. This also includes bringing together multinational EV and EVSE manufacturers with the vibrant mobility service provider start-up scene in low and middle-income countries.

Many Country Child Project also include work streams to incentivize the local assembly and manufacturing of e-vehicles, such as e-motorcycles and e-3wheelers.

Germany welcomes the comprehensive and overall well-structured project design. To further facilitate an overview of the project's intended activities, Germany welcomes the inclusion of quantitative indications in the description of component 3 on how many pilot projects, regulatory measures etc are planned.

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Response:

Each country child project includes a project results framework with quantitative indicators and end-of-project targets to measure the number of pilot projects, regulatory measures, etc., achieved/developed within the framework of the GEF project. However, at the time of submission of the Global Child Project, not all Country Child Projects (and in particular those 10 Country Child Projects submitted as part of the second round) have been finalized, and thus the exact amount of policies planned, business models envisaged and financial mechanisms to be set-up cannot be provided.

While the proposal provides a comprehensive overview of highly relevant initiatives and programmes, Germany welcomes including existent initiatives such as the Transformative Urban Mobility Initiative and the C40 Cities Finance Facility as well as upcoming initiatives such as TUMIVolt to enable exchange of experiences as well as potentials for future collaboration. This is especially relevant considering the planned future expansion of the proposed project to countries like Nigeria and Mexico which are partner countries to above mentioned initiatives.

Response:

UNEP has working relations with both TUMI as well as C40 (in particular through the "Zero Emission Bus Rapid-deployment Accelerator" (ZEBRA) initiative), and coordination with and involvement of both initiatives in the global e-mobility programme, especially through the activities implemented as part of the Regional Support and Investment Platforms, will be added to the project document.

Germany welcomes the proposal's reliance on IEA scenarios to lay out the project approach. To even further increase the proposal's line of argument, Germany would welcome a very brief explanation on why the proposal focuses on the IEA's B2DS and not on the 2DS scenario when describing the programme's focus. This could for example be provided on page 26 in the next paragraph.

Response:

Work funded by the GEF working towards Climate Change Mitigation is related to the UNFCCC and the Climate Agreements achieved as part of the Conference of the Parties (COP). The Paris Agreement's central aim is "to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius". The IEA Beyond 2 Degree Scenario (B2DS) reflects this. Language can be added as suggested.

**v Comment by James Woodsome, International Economist, Office of International Development Policy, International Affairs, U.S. Department of the Treasury, Council, United States made on 7/3/2019**

Feasibility. The core of this proposal for Armenia deserves further scrutiny. The claim of 5,000 electric vehicles does not tally with other statistics, for example press reports citing the Minister of Nature Protection as saying that 30 electric vehicles were imported into Armenia in 2018. While there may have been a several-fold increase in electric vehicle imports in Armenia since 2016, those imports would have started from extremely low levels. That Armenia would manufacture electric vehicles does not track with the fact there is no real manufacturing industry even for traditional petroleum fuel vehicles at present. Due to the ratcheting duties caused by incremental adoption of the Eurasian Economic Union (EAEU) common external tariff, Armenia will face steadily increasing prices for imports of cars from outside the EAEU, complicating the adoption of such technology. We encourage more background investigation before its basic feasibility can be established.

Response:

Regarding the question on Armenia, unfortunately there is a mistake with the short description of the Armenia child project baseline in Table 2 of the PFD. This will be corrected during the Child Project development and a note will be attached to the PFD to that effect. The 5,000 EVs mentioned and the local manufacturing actually belong to Ukraine. The US Council comment is right and Armenia imported about 30 EVs in 2018 ([https://energyagency.am/en/page\\_pdf/tsragri-anvanoum](https://energyagency.am/en/page_pdf/tsragri-anvanoum)). The project feasibility in Armenia will be further analyzed during development, but the government has prioritized the promotion of electric vehicles as one of the transport measures in their NDC. Armenia recently waived the VAT on EVs to stimulate the EV market (<https://energyagency.am/en/category/noroutyouanner-ev-mijocaroumner/elektromobilneri-nermoutsoumy-kazatvi-aah>). In general, high import duties for vehicles can be an opportunity rather than a barrier for EV import. In case these duties are waived or reduced for EVs (to some extent that is already the case with the VAT exemption for EVs in Armenia), it provides a meaningful monetary incentive for customers to buy electric vehicles. EV market uptake in Norway is largely due to import and registration tax exemptions for EVs, while import of conventional cars is subject to high taxes. Yerevan has instituted an exemption of parking fees for EVs and has deployed some recharging infrastructure. Armenia already has a low emissions factor of about 0.4 tons of CO2/MWh and the introduction of EVs in Armenia would be able to reduce emissions with such a grid profile, and Armenia has introduced several policies to incentivize renewable power generation investments. For example, projects have been implemented or have been committed to improve energy transmission efficiency and reliability, and investment in renewables is taking off. This GEF project aims to demonstrate light duty vehicles in a government fleet in Yerevan, and in 2019, 23 charging stations will be installed through a GEF-6 funded Small Grant Programs implemented and led by UNDP. Promoting electric vehicles together with renewable energy will improve energy efficiency and further reduce CO2 emissions, air pollution and energy dependence in Armenia. This will be in full alignment with the countries' NDC and its strong commitment to the introduction of clean and sustainable energies.

**v Comment by Lauren Céline Naville Gisnås, NORAD, Department for Climate, Energy and Environment, Council, Norway made on 6/29/2019** □

- We put great emphasis on cutting GHG emissions through electrification of the transport sector. We are of the opinion that if all take concerted action, it will drive down costs because of scale production.
- Every country has to choose their own path. However, an important lesson so far is that one needs to tax emissions. You need carrots and sticks. In line with general GEF principles of an enabling policy framework, one should pay attention to relevant tax policies when designing GEF programs, including policies for reducing fossil fuel subsidies.

Response:

The Child Country Projects all include work on the development of adequate policy frameworks to support the uptake of e-mobility – including regulatory, fiscal and other local measures. For example, some of the country projects include outputs on fiscal reforms in order to base registration and / or import taxation for vehicles on CO2 emissions or fuel consumption. In some of the countries (i.e. in some of the SIDS), work will be brought forward to liberalize the power market and to allow the supply of power by independent power producers, which facilitates the introduction of renewable power generation and breaks the monopoly of subsidized petroleum fuel powered electricity generation.

[1] Harvard University: “COVID-19 PM2.5, A national study on long-term exposure to air pollution and COVID-19 mortality in the United States”, available at: <https://projects.iq.harvard.edu/covid-pm>

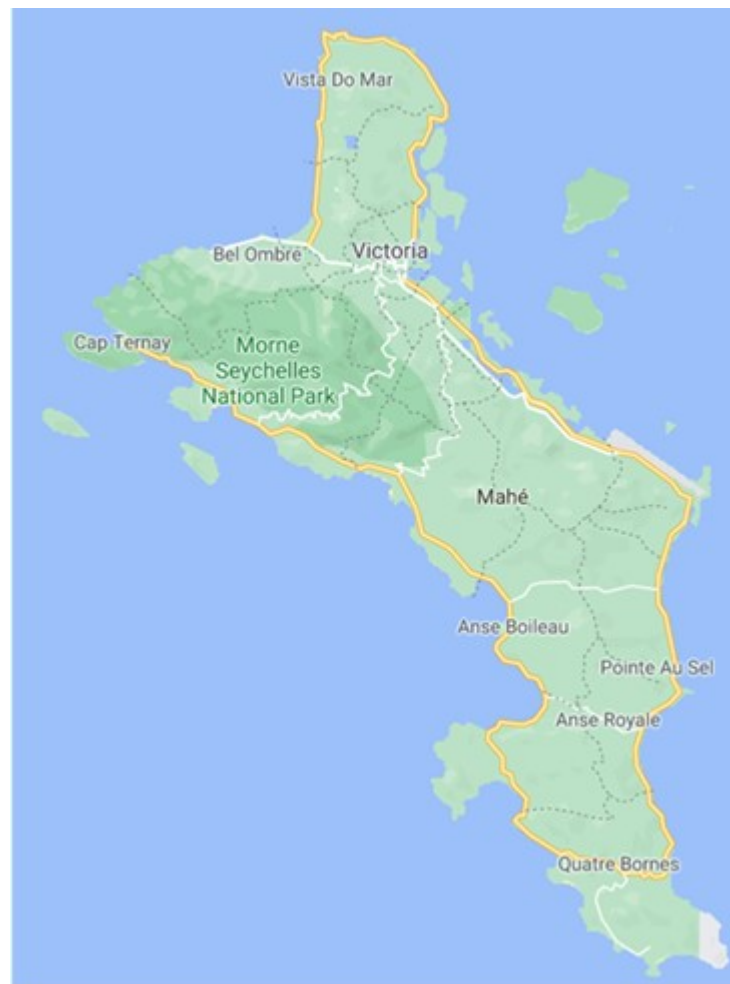
[2] Yaron Ogen, 2020, “Assessing nitrogen dioxide (NO2) levels as a contributing factor to coronavirus (COVID-19) fatality”, Science of The Total Environment, available at: <https://www.sciencedirect.com/science/article/pii/S0048969720321215>

**ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:**

PPG Grant Approved at PIF: US\$ 35,000			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (US\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent to date</i>	<i>Amount Committed</i>
GEF project consultant	6,000.00	4,000.00	2,000.00
UNEP Sustainable Mobility Unit personnel	24,240.00	24,183.02	0
UNEP Sustainable Mobility Unit travel	4,760.00	3,631.60	1,185.38
<b>Total</b>	<b>35,000.00</b>	<b>31,814.62</b>	<b>3,185.38</b>

## ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.



Demonstration sites	Latitude	Longitude
Mahé, Seychelles	-4.666664	55.4666648

## ANNEX E: Project Budget Table

Please attach a project budget table.

Expenditure category & detailed description	Component 1	Component 2	Component 3	Component 4	Sub-total	M&E	PMC	Total	Responsible entity
<b>Goods</b>	<b>0</b>	<b>80,000</b>	<b>0</b>	<b>0</b>	<b>80,000</b>	<b>0</b>	<b>0</b>	<b>80,000</b>	
GEF investment support for one e-bus	0	80,000	0	0	80,000	0	0	80,000	DoLT
<b>Contractual Services – Company</b>	<b>3,600</b>	<b>6,300</b>	<b>5,400</b>	<b>1,800</b>	<b>17,100</b>	<b>30,000</b>	<b>6,000</b>	<b>53,100</b>	
Venue and catering services for workshops and events	3,600	6,300	5,400	1,800	17,100	0	0	17,100	DoLT
Mid-Term Review (optional)	0	0	0	0	0	10,000	0	10,000	UNEP Evaluation Office
Terminal Evaluation	0	0	0	0	0	20,000	0	20,000	UNEP Evaluation Office
Independent financial audits	0	0	0	0	0	0	6,000	6,000	DoLT
<b>International Consultants</b>	<b>23,750</b>	<b>42,000</b>	<b>43,750</b>	<b>37,875</b>	<b>147,375</b>	<b>0</b>	<b>0</b>	<b>147,375</b>	
International Policy, Business and Strategy expert	22,000	0	27,500	0	49,500	0	0	49,500	DoLT
International E-mobility Technical Support (UNEP SM Unit)	1,750	3,500	5,250	3,500	14,000	0	0	14,000	UNEP SMU
International E-Mobility Technology expert	0	38,500	11,000	0	49,500	0	0	49,500	DoLT
International Battery Technology, Charging & Renewable Energy integration expert	0	0	0	34,375	34,375	0	0	34,375	DoLT
<b>Local Consultants</b>	<b>0</b>	<b>19,500</b>	<b>4,500</b>	<b>2,250</b>	<b>26,250</b>	<b>0</b>	<b>0</b>	<b>26,250</b>	
National E-Mobility & Power Market Expert	0	19,500	4,500	2,250	26,250	0	0	26,250	DoLT
<b>Salary and benefits / Staff costs</b>	<b>16,875</b>	<b>13,125</b>	<b>5,625</b>	<b>1,875</b>	<b>37,500</b>	<b>0</b>	<b>31,250</b>	<b>68,750</b>	
Chief Technical Advisor	16,875	13,125	5,625	1,875	37,500	0	31,250	68,750	DoLT
<b>Travel</b>	<b>32,600</b>	<b>6,600</b>	<b>6,600</b>	<b>2,200</b>	<b>48,000</b>	<b>0</b>	<b>0</b>	<b>48,000</b>	
Travel for the International Policy, Business and Strategy expert	2,200	0	2,200	0	4,400	0	0	4,400	DoLT
Travel for the International E-mobility Technical Support (UNEP SM Unit)	2,200	0	2,200	0	4,400	0	0	4,400	UNEP SMU
Travel to attend Africa Support & Investment Platform events	26,400	0	0	0	26,400	0	0	26,400	DoLT
Travel to attend E-Mobility Global Programme events (DSA only)	1,800	0	0	0	1,800	0	0	1,800	DoLT
Travel for the International E-Mobility Technology expert	0	6,600	2,200	0	8,800	0	0	8,800	DoLT
Travel for the International Battery Technology, Charging & Renewable Energy integration expert	0	0	0	2,200	2,200	0	0	2,200	DoLT
<b>Other operating costs</b>	<b>241</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>241</b>	<b>0</b>	<b>0</b>	<b>241</b>	
Information materials	241	0	0	0	241	0	0	241	DoLT
<b>Grand Total</b>	<b>77,066</b>	<b>167,525</b>	<b>65,875</b>	<b>46,000</b>	<b>356,466</b>	<b>30,000</b>	<b>37,250</b>	<b>423,716</b>	

## ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

Not applicable.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reow schedules.

Not applicable.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).

Not applicable.