



## **Enhancing sustainability in e-mobility for low carbon urban transport and an Extended Producer Responsibility (EPR) approach in batteries and vehicle components**

### **Part I: Project Information**

#### **Name of Parent Program**

**Global Programme to Support Countries with the Shift to Electric Mobility.**

#### **GEF ID**

**10286**

#### **Project Type**

MSP

#### **Type of Trust Fund**

GET

#### **CBIT/NGI**

☐ CBIT

☐ NGI

#### **Project Title**

Enhancing sustainability in e-mobility for low carbon urban transport and an Extended Producer Responsibility (EPR) approach in batteries and vehicle components

#### **Countries**

Peru

#### **Agency(ies)**

UNDP

#### **Other Executing Partner(s)**

Ministry of Environment

#### **Executing Partner Type**

Government

#### **GEF Focal Area**

Climate Change

**Taxonomy**

Influencing models, Demonstrate innovative approaches, Deploy innovative financial instruments, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Private Sector, Stakeholders, SMEs, Large corporations, Individuals/Entrepreneurs, Financial intermediaries and market facilitators, Type of Engagement, Information Dissemination, Consultation, Communications, Education, Awareness Raising, Public Campaigns, Beneficiaries, Civil Society, Non-Governmental Organization, Trade Unions and Workers Unions, Academia, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Gender results areas, Access to benefits and services, Capacity Development, Capacity, Knowledge and Research, Focal Areas, Sustainable Development Goals, Climate Change, Climate Change Mitigation, Sustainable Urban Systems and Transport, Energy Efficiency

**Rio Markers**

**Climate Change Mitigation**

Climate Change Mitigation 2

**Climate Change Adaptation**

Climate Change Adaptation 0

**Submission Date**

12/11/2020

**Expected Implementation Start**

7/1/2021

**Expected Completion Date**

12/31/2024

**Duration**

48In Months

**Agency Fee(\$)**

160,638.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCM-1-2	Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technology and electric mobility	GET	1,784,862.00	14,859,835.00
<b>Total Project Cost(\$)</b>			<b>1,784,862.00</b>	<b>14,859,835.00</b>

**B. Project description summary**

**Project Objective**

Reduce GHG emissions from urban transport by creating the conditions to accelerate market transformation of electric mobility in Peru

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 1: Institutionalization of low-carbon electric mobility	Technical Assistance	Outcome 1: Institutional, regulatory and fiscal frameworks established for the promotion of e-mobility, with the support of all key stakeholders, including potential EV providers and users	<p>Output 1.1: An intersectoral and multilevel e-mobility coordination space established, including all relevant governmental stakeholders</p> <p>Output 1.2: National e-mobility strategy submitted to the government and launched, including economic impacts (competitiveness, industrial development), geographical deployment (e.g. charging network) and environmental and social dimensions (gender-responsive).</p> <p>Output 1.3: Revised regulatory and fiscal framework for deployment of electric vehicles delivered for governmental approval.</p> <p>Output 1.4: Strengthened capacities and awareness of</p>	GET	407,100.00	1,286,993.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2: Short term barrier removal through low-carbon e-mobility demonstrations-mobility	Investment	Outcome 2  EV demonstrations in urban public transport systems provide evidence of technical, financial and environmental sustainability to scale-up e-mobility	Output 2.1: E-mobility pilots in public urban transport systems designed in Lima and Arequipa, integrating gender-responsive measures.  Output 2.2: EV pilot in Lima implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.  Output 2.3: EV pilot in Arequipa implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.  Output 2.4: Technical training delivered (including EV driving and maintenance).  Output 2.5: Evidence and best practices on EV pilot implementation communicated to key stakeholders and incorporated in	GET	795,802.00	10,830,651.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3: Preparing for scale-up and replication of low-carbon electric mobility	Technical Assistance	Outcome 3: Conditions established to support the inclusion of EVs in the vehicle market and to accelerate their deployment	Output 3.1: Assessment of e-mobility market potential in Peru carried out for the introduction of electric vehicles and electrification of road public transport systems.	GET	200,000.00	1,441,096.00
			Output 3.2: E-mobility network established in Peru, including manufacturers, importers, technology and service providers, as well as public transport operators and other final users.			
			Output 3.3: Detailed financial and business models for EV commercialization and operation designed.			
			Output 3.4: EV procurement guidelines for urban public transport operators and authorities developed.			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 4: Long-term environmental sustainability of low-carbon electric mobility	Technical Assistance	Outcome 4: Conditions created for a circular economy perspective in the electrification of mobility in Peru with EPR (Extended Producer Responsibility).	<p>Output 4.1: Comprehensive diagnosis on national end-of-life vehicle management completed</p> <p>Output 4.2: Proposal on end-of-life vehicle management regulation, based on the EPR approach, delivered to the government for approval</p> <p>Output 4.3: Cost-efficiency analysis and business models designed for implementation of an EPR approach to ELV management</p> <p>Output 4.4: Roadmap for EPR approach to end-of-life vehicle management submitted to the government for approval</p> <p>Output 4.5: Awareness-raising and capacity-building activities completed.</p>	GET	135,400.00	559,277.00



Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 5: Project monitoring and evaluation	Technical Assistance	Outcome 5:  The project monitoring and evaluation plan is implemented	Output 5.1: The project monitoring and evaluation plan and knowledge-management strategy are designed and implemented, providing regular reporting to the global programme  Output 5.2: Best practices and lessons learnt reports developed and shared with the global programme	GET	84,300.00	79,818.00
Sub Total (\$)					1,622,602.00	14,197,835.00
Project Management Cost (PMC)						
GET			162,260.00	662,000.00		
Sub Total(\$)			162,260.00	662,000.00		
Total Project Cost(\$)			1,784,862.00	14,859,835.00		

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

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Recipient Country Government	Ministerio del Ambiente	In-kind	Recurrent expenditures	379,818.00
Recipient Country Government	Ministerio de Energía y Minas	In-kind	Recurrent expenditures	2,000,000.00
Recipient Country Government	Municipalidad de Arequipa	Public Investment	Investment mobilized	2,670,623.00
Private Sector	Engie Energía Perú S.A.	In-kind	Recurrent expenditures	2,000,000.00
Private Sector	QEY Tech Perú SAC	Equity	Investment mobilized	1,500,000.00
Private Sector	Asociación de Emprendedores para el Desarrollo e impulso del vehículo Eléctrico en el Perú - AEDIVE	In-kind	Recurrent expenditures	1,400,000.00
Private Sector	Motores Diesel Andinos, S.A. - MODASA	Equity	Investment mobilized	700,000.00
Donor Agency	Agencia Francesa de Desarrollo - ADF	Grant	Recurrent expenditures	600,536.00
Private Sector	SINOMAQ	Equity	Investment mobilized	452,000.00
Other	Universidad de Ingeniería y Tecnología (UTEC)	In-kind	Recurrent expenditures	425,250.00
Private Sector	Integra Arequipa SAC	In-kind	Recurrent expenditures	388,000.00
Donor Agency	Oficina de Cooperación Suiza - COSUDE	Grant	Recurrent expenditures	349,097.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Private Sector	SENATI	In-kind	Recurrent expenditures	94,311.00
Private Sector	WUITO	In-kind	Recurrent expenditures	88,500.00
Private Sector	ABB	In-kind	Recurrent expenditures	77,000.00
Private Sector	CAVI Industrial SAC	Equity	Investment mobilized	62,000.00
Private Sector	DEUMAN	In-kind	Recurrent expenditures	41,900.00
Civil Society Organization	Fundaci?n Transitemos	In-kind	Recurrent expenditures	39,000.00
GEF Agency	UNDP	In-kind	Recurrent expenditures	200,000.00
Private Sector	Enel X Peru SAC	In-kind	Recurrent expenditures	382,000.00
Private Sector	CITE Energia	In-kind	Recurrent expenditures	949,800.00
Private Sector	Profonampe	In-kind	Recurrent expenditures	60,000.00
<b>Total Co-Financing(\$)</b>				<b>14,859,835.00</b>

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

In order to identify the investment mobilized, general presentations were made during the design workshops to clarify the concept of cofinancing and to identify the interested stakeholders in the public and private sectors, and bilateral meetings were held with those that expressed their willingness to participate. The investment mobilized presented in the table above correspond to the following activities, envisaged to be undertaken by the participants during the project timeline: ? Municipalidad Provincial de Arequipa. Studies and investment to implement new public transport infrastructure within its Intregated Transport System, (Sistema Integrado de Transporte, SIT). ? QEY Tech Per? SAC. Corporate activities and investments to

promote and deploy e-mobility in Peru. ? Asociaci?n de Emprendedores para el Desarrollo e impulso del veh?culo El?ctrico en el Per? ? AEDIVE. Network of companies and professionals promoting e-mobility. With its associates, the network will promote e-mobility through regulatory proposals, capacity building and the development of new business models. ? Motores Diesel Andinos, S.A. ? MODASA. Research and development activities on electric buses, aiming at manufacturing EVs in Peru. Business models linked to the e-bus segment. Professional training and capacity building on e-bus manufacturing, operation and maintenance. ? SINOMAQ, S.A. Public charging infrastructure to be installed in within the company's premises in Lima. New workshop for e-buses. Training and capacity building on operation and maintenance of EVs. Participation of company staff in promotion of e-mobility in Peru, networking and capacity-building activities. E-bus pilot project. ? CAVI Industrial SAC. Two pilots foreseen to manufacture and operate 3W taxis in Lima. Besides the co-financing letters summarized in the table above, the project has received supporting letters from Lima and Callao Public Transport Authority (Autoridad de Transporte Urbano para Lima y Callao, ATU) and the Ministry of Transport and Communications (Ministerio de Transportes y Comunicaciones, MTC).

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(\$)
UNDP	GET	Peru	Climate Change	CC STAR Allocation	1,784,862	160,638
Total Grant Resources(\$)					1,784,862.00	160,638.00

**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

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**PPG Amount (\$)**

50,000

**PPG Agency Fee (\$)**

4,500

Agenc y	Trust Fund	Country	Focal Area	Programmin g of Funds	Amount(\$)	Fee(\$)
UNDP	GET	Peru	Climat e Change	CC STAR Allocation	50,000	4,500
Total Project Costs(\$)					50,000.00	4,500.00

## 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	178460	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	0	236657	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)		178,460		
Expected metric tons of CO <sub>2</sub> e (indirect)		236,657		
Anticipated start year of accounting		2021		
Duration of accounting		16		

#### 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)		2,313,522,172		

#### 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)
<b>Female</b>		8,004		
<b>Male</b>		6,038		
<b>Total</b>	0	14042	0	0

## Part II. Project Justification

### 1a. Project Description

Changes in Alignment with the Project Design with the **Child Project**

The following changes have been made to the project design as contained in this document as compared to the child project concept note included in the programme framework document:

- ? **The project duration has been reduced from 48 months to 42 months. This duration is more consistent with the project budget and available resources as well as with the scope of the project activities.**
- ? The scope of the components 1 to 4 remain the same, however their titles and those of their respective outcomes have been modified in order to provide a more precise description of their scope, following the inputs received from stakeholders at the co-design and validation workshops.
- ? A new component 5 (Monitoring and Evaluation) has been added following recent GEF guidance. This component gathers together M&E activities previously contained in other components.
- ? The budget has been redistributed in accordance with the scope of the final project outputs, resulting in a small decrease (3.5%) in the demonstration, a 30% decrease in component 4 and a 19% increase in component 3. The budgets for component 1 and component 2 have slightly decreased, by 7% and 3% respectively. These changes follow the separation of M&E activities in the new component 5, a more accurate assessment of the activities to be undertaken by the project, and a more comprehensive assessment of the needs for scaling up and replication and of the contributions that can be expected from the project to develop an approach to EV and battery end-of-life management.
- ? The expected GHG emissions mitigated (direct and indirect) and beneficiaries disaggregated by gender have been estimated with more detail, based on the final scope of the demonstration and other project activities, and making use of the model and guidelines provided by UNEP to all child projects. The result is a decrease in the estimated direct and indirect GHG emission savings compared to the concept note, due to a more realistic estimate of the speed of expansion of electric buses and 3-wheelers within the country, and to the assumption that electrification will target only buses and 3W dedicated to urban transport. In accordance with current global trends, it is expected now that the expansion of buses will take place at a slower pace in the first years (inter alia due to the effect of the COVID pandemic and its associated economic slowdown), and it is also considered that electric buses will only replace urban buses of a certain size (9 m or more), and not all kind of buses as was considered in the child project. As a result, direct GHG emission savings decrease from 480,949 tons to 178,460 tons and indirect GHG emission savings decrease from 342,417 to 236,657 tons.

Total co-financing has slightly decreased compared to the child project concept note, from USD \$14,908,300 to USD \$14,859,835 (just 0.3 %), once the stakeholders were able to provide more

accurate figures covering the expected project lifetime. The distribution is now better balanced among the stakeholders, and also among the various workpackages, as in the child project cofinancing was concentrated in component 2 and more than 80% of it was provided by two partners.

Components at PIF	Components at CEO Endorsement	Comments / Rationale for changes
<p>C1: Electric mobility institutionalization</p> <p>PIF budget: USD 436,458</p> <p>PIF co-financing: USD 181,133</p>	<p>C. 1: Institutionalization of low-carbon electric mobility.</p> <p>Proposed budget: USD 407,100 (-6.7%)</p> <p>Co-financing: USD: 1,286,993</p>	<p>Harmonization with global programme and stakeholders? input at design workshops. The definition of outcome 1 has been completed and expanded; the description of outputs 1.1, 1.2, 1.3 provides now more details; output 1.4 now integrates former outputs 1.4 and 1.5, as they both were referring to capacity building.</p>
<p>C2: Demonstration of e-mobility in public transport systems</p> <p>PIF budget: USD: 824,591</p> <p>PIF co-financing: USD 14,387,833</p>	<p>C. 2: Short term barrier removal through low-carbon e-mobility demonstrations</p> <p>Proposed budget: USD 795,802 (-3.5%)</p> <p>Co-financing: USD 10,830,651</p>	<p>Harmonization with global programme and stakeholders? input at design workshops. The language in outcome 2 now stresses the expected results. Output 2.1 now integrates former outputs 2.1 and 2.2 (both referring to the design of demonstrations); outputs 2.2 and 2.3 now differentiate between the demonstrations in each city, training is delivered in output 2.4 and results are communicated in output 2.5) (these four outputs were merged in the child project in former output 2.3, making this output too big and difficult to manage).</p>
<p>C3: Investments in emobility</p> <p>PIF budget: USD 167,442</p> <p>PIF co-financing: USD 82,334</p>	<p>C. 3: Preparing for scale-up and replication of low-carbon electric mobility</p> <p>Proposed budget: USD 200,000 (19.4%)</p> <p>Co-financing: USD 1,441,096</p>	<p>Harmonization with global programme and stakeholders? input at design workshops. The component description now stresses upscaling and replication. Outcome 3 has been revised and now stresses the market-focus in this component. Two additional outputs (3.1. and 3.2) have been added to provide the necessary pre-conditions for upscaling (market analysis and a supporting network of stakeholders). Outputs 3.3 and 3.4 remain the same as former outputs 3.1 and 3.2 in the child project.</p>

Components at PIF	Components at CEO Endorsement	Comments / Rationale for changes
C4. Extended Producer Responsibility approach for electric vehicle batteries and other vehicle components PIF budget: 162,260 PIF co-financing: USD 75,000	C. 4: Long-term environmental sustainability of low-carbon electric mobility Proposed budget: USD 135,400 (-30.2%) Co-financing: USD 559,277	Harmonization with global programme and stakeholders' input at design workshops. Component 4 and outcome 4 have been slightly rephrased for the sake of clarity. All the outputs in this component remain the same, with only minor rephrasing.
M&E activities embedded in other components	C. 5: Project monitoring and evaluation  Proposed budget: USD 84,300 Co-financing: USD 79,818	New GEF/UNDP requirement to gather M&E activities in one component. A new outcome 5 is associated to this component. Two new outputs are included.
GHG emissions (direct): 480,949 t CO <sub>2e</sub>	GHG emissions (direct): 178,460 t CO <sub>2e</sub>	Estimate now based on UNEP e-mob model
GHG emissions (indirect): 342,417 t CO <sub>2e</sub>	GHG emissions (indir.): 236,657 t CO <sub>2e</sub>	Estimate now based on UNEP e-mob model
PIF co-financing: USD 14,908,300	Co-financing: USD 14,859,835	

Table 2: Changes in Alignment at Project Design with the Child Project

#### 1a. Project Description

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

###### Global environmental problem:

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[1]<sup>1</sup>; this is expected to grow 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, three out of five cars will be found in developing countries[2]<sup>2</sup>. This means that achieving global climate targets will require a shift to zero emissions mobility in all countries, including low- and middle-income ones.

In 2014, greenhouse gas (GHG) emissions in Peru reached 167,630 Gg CO<sub>2e</sub> (including LULUCF, 92,285 Gg CO<sub>2e</sub> without LULUCF), an increase of 48% compared to 2000 levels. However, Peru accounts for just 0.3% of global emissions, and its per capita emissions (excluding LULUCF, agriculture and waste) are relatively low compared to other countries in the LAC region (1.7 tons per

capita compared to an average of 3.1 tons[3]<sup>3</sup>). In accordance with BaU scenario retained in its Nationally Determined Contributions (NDC-2020)[4]<sup>4</sup>, GHG emissions are expected to grow, reaching 298,300 Gg by 2030 (including LULUCF) or 139,300 Gg, excluding LULUCF). The NDC-2020 envisages to reduce the 2030 emissions (including LULUCF) to 208,800 Gg, or to 179,000 Gg in case international cooperation materializes.

#### Root causes and barriers to the adoption of electric vehicles:

The development challenge can be described as follows: Policies to reduce GHG emissions in Peruvian cities and to improve air quality cannot make full use of the potential provided by e-mobility. There are four immediate causes of this development challenge: (i) insufficient policies and regulations on e-mobility, necessary to remove current barriers to sustainable mobility and innovation and to reduce uncertainties about emerging technologies and political priorities (for a clear vision about the future urban mobility); (ii) insufficient knowledge of the potential of e-mobility (including myths, misperceptions, and biased decisions by stakeholders); (iii) a vehicle market monopolized by conventional technologies, so that accessing electric vehicles (EV) or chargers becomes a difficult, long and expensive task; (iv) end of life vehicle management insufficiently developed, which raises concerns among environmental authorities and the public about the ability of the country to adequately manage its potentially hazardous and valuable vehicle components, particularly its lithium batteries.

The lack of comprehensive policies and regulations derives from several root causes: a fragmented institutional framework with e-mobility partially addressed from different ministries without unified leadership; lack of formalized coordination among the governmental units with competences linked to e-mobility; lack of an e-mobility strategy providing a shared vision guiding the governmental sectoral actions, and reliance on outdated regulations, poorly suited to deal with e-mobility. Furthermore, e-mobility is linked to a variety of regulated sectors, from energy to transport or urban planning, each of them with strong autonomy (technical, professional, entrepreneurial and regulatory cultures), which jeopardizes the development of a comprehensive approach to e-mobility as a game-changer.

The insufficient knowledge of the potential of e-mobility to tackle the challenges of urban mobility demand is due to several root causes: conservative urban policy trends in cities, favoring the expansion of high-emitting private cars within a business as usual approach; weak public transport systems without resources to invest in the potential of e-mobility solutions; most local stakeholders wrongly consider that there are high risks in transitioning to e-mobility solutions, due to their limited awareness of technical progress and success stories in other countries.

The difficulties of e-mobility solutions to reach the Peruvian market (particularly in what refers to public transport services) are due to a variety of root causes: high costs and limited information on EV options available; absence of some key market actors in the country (manufacturers, dealers, repairs?), business models poorly tailored (if at all) to the Peruvian context; financial schemes unable to meet the

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needs of public transport operators to transition towards e-mobility, public transport concession schemes discouraging the introduction of innovative technologies, such as EVs, and informal operators unfairly competing with formal concessions.

The insufficient development of end-of-life vehicle (ELV) management is due to insufficient awareness among regulators and stakeholders about the requirements for end-of-life management of EVs; also to the fact that the existing solid waste disposal system does not directly consider EV's batteries; furthermore, to the slow development of Extended Producer Responsibility (EPR) mechanisms in the country<sup>[5]</sup> (particularly in the automotive sector); and also to the gap in knowledge and awareness of the environmental risks associated to ELVs.

There are environmental, social and economic consequences of lagging behind in the deployment of e-mobility: (i) the growing negative environmental impact of urban mobility; (ii) insufficient quality of public transport services; (iii) the economic inefficiency of the urban transport sector. The environmental impacts of urban mobility are primarily reflected in terms of increasing GHG emissions from road transport in Peru: in 2012, road transportation accounted for 15.26 million tons CO<sub>2</sub>e, or 8.9% of total GHG emissions (up from 8.2% of emissions in 2005 and 5.3% of emissions in 2000)<sup>[6]</sup>. Lastly, electric vehicles (EV) entering the country may become a serious environmental hazard in the absence of adequate end-of-life management, due to the polluting potential of some of the components of the battery pack, such as cobalt, nickel and manganese.

E-mobility could contribute to improve the quality of urban public transport services in terms of noise reduction, comfort and technological reliability. E-mobility could bring up the use of cutting-edge technologies, that could serve as a catalyst to attract young talent and innovation to a sector in Peru that, in spite of governmental and local actions to improve regular public transport services, has been unable to increase its share of urban trips. For example, in Metropolitan Lima, regular public transport (metro and buses) provided 56% of motorized trips in 2018 <sup>[7]</sup>; although high, it has substantially decreased from a 70% share in 2007<sup>[8]</sup>. The share of private cars in motorized trips has increased from 10% in 2004 to 19% in 2009, consistent with the relatively low motorization rate in the country, 114 vehicles/1000 inhabitants. Nevertheless, the main reason for the reduction of the share of public transport is the increase of trips made by taxis and informal services, reaching 25% of all motorized trips, probably due to the poor quality of public transport. The availability of updated mobility data is also limited, although in Lima and other cities the authorities are working in developing plans based on reliable information.

Lacking access to e-mobility technologies, public transport in Peruvian cities cannot benefit from the reduced operating costs provided by e-mobility. In the absence of adequate enabling conditions, particularly in what refers to financial mechanisms for electrification and more specifically in urban public transport systems (a core issue to be addressed by the project's outputs), investors remain

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cautious about investing in the sector. The government finds it difficult to implement the intended regulatory reforms and informal transport thrives as an affordable alternative for vulnerable groups. Public transport suffered from excessive deregulation in the previous decades, resulting in a general loss of quality, poor working conditions and financial difficulties for operators. Regulatory reforms are being implemented at a slow pace; for example, in Metropolitan Lima, the number of small PT vehicles (minibuses with up to 33 seats and microbuses with up to 16 seats) is still high (4,827 and 7,492 units respectively), compared to only 1,537 full-size buses[9]<sup>9</sup>, in spite of the central and municipal governments' efforts to expand the latter through the creation of bus corridors with higher level of service[10]<sup>10</sup> (corredores complementarios), currently served by 669 buses[11]<sup>11</sup>.

## 2) Baseline scenario and any associated baseline projects

### Baseline scenario for the energy sector

In Peru, 74% of the energy demand is covered by fossil fuels (nationally produced natural gas and partly imported oil), 13% by biofuels (mostly imported) and waste and 10% by hydropower. Wind, solar and other renewable sources just cover 1%[12]<sup>12</sup> of the energy demand. The share of renewables in electricity generation is 45.8% (although just 2.4% from solar and wind), leading to a low emission factor of just 0.412 kg CO<sub>2</sub>/kWh. A National Energy Plan for 2014-2025 was prepared in 2014[13]<sup>13</sup>, but was not approved; therefore, there are no official targets for the expansion of wind and solar, although the government announced a 15% share target for 2030 in 2019, at COP-25.

### Baseline scenario for the transport sector

As it is the case for most countries, Peru faces increasing GHG emissions from the inland transport sector (60% growth between 2005 and 2014[14]<sup>14</sup>). The share of the road transport sector in GHG emissions (excluding LULUCF, agriculture and waste) has been slightly increasing over time: from 27.1% in 2000 to 28.6% in 2014. The BAU GHG emission scenario, retained in the revised NDC (2020), foresees that transport emissions will steadily grow in the absence of mitigation measures (see Figure 1 below), reaching 28,800 Gg in 2030. The mitigation measures foreseen in the NDC-2020 would reduce emissions by 6,937 Gg CO<sub>2e</sub> in 2030 (so that transport would provide 7.8% of the total emission reduction target)[15]<sup>15</sup>.

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Urbanization trends in Peru are at the basis of the growth in transport emissions, so that policies tackling urban mobility provide a strong climate change mitigation potential: the percentage of Peruvians living in urban areas increased from 74.0% in 2010 to 76.4% in 2017 [16]<sup>16</sup>. The living conditions of this growing population are strongly influenced by the transport system, as it provides access to jobs and services; this is even more relevant for women and other vulnerable groups, which cannot often afford the most convenient transport means. Air quality is a critical public health problem in cities and it can be improved as an associated benefit by GHG mitigation measures in urban transport. The mitigation potential in urban mobility is higher than in other transport subsectors, and so is the potential to attain favorable gender, social and environmental impacts. Electrification of road transport (generally referred to as e-mobility) is one of the key game-changers, and developing countries are lagging behind in the adoption of the new technologies.

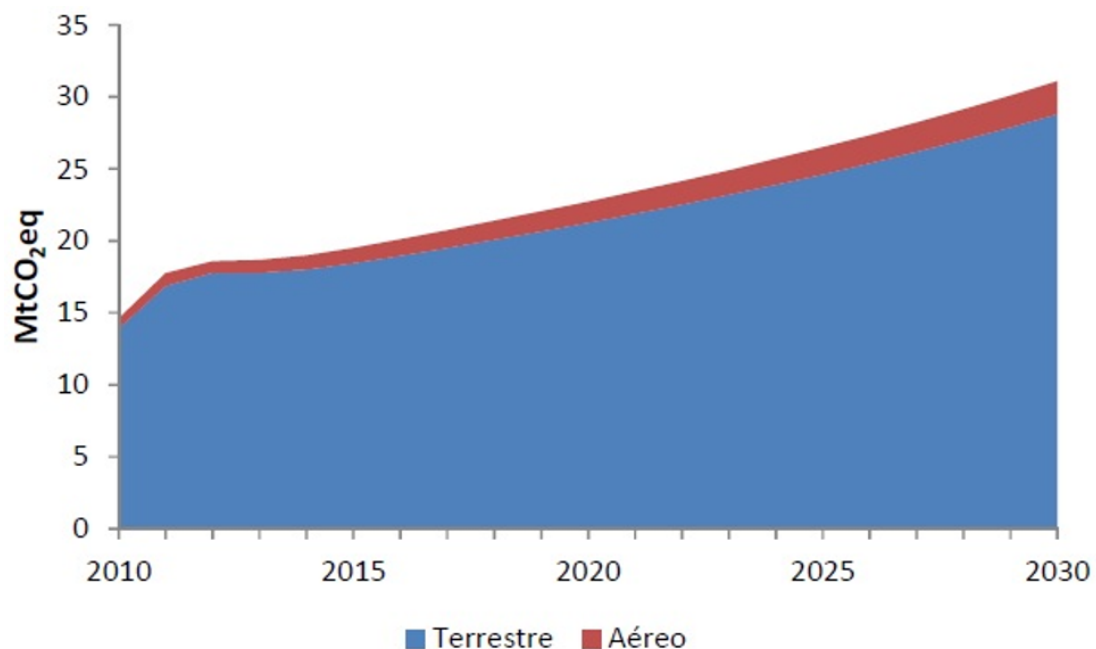


Figure 1: Emission baseline projection for transport (Gg CO<sub>2</sub>e)

(Source: Secretaría Técnica de la Comisión Multisectorial de la INDC ? RS N? 129-2015-PCM)

Low air quality in Peruvian cities is also largely due to transport emissions: The World Health Organization (WHO) estimates that annually, 4,239 deaths in Peru are correlated to air pollution, with ischemic heart disease as the most common cause. Furthermore, the cost of respiratory diseases caused by air pollution is estimated to be around 1,935 million USD per year. The estimated average of PM<sub>2.5</sub>



concentration in Lima is among the highest in the region (28.0 µg/m<sup>3</sup> in 2018, compared to the WHO recommended limit of 10 µg/m<sup>3</sup>)[17]<sup>17</sup>.

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#### Baseline scenario - policies and strategies

Peru completed its Third National Communication on Climate Change in 2016, reporting *inter alia* on mitigation measures on electricity generation and transportation. In 2018, the mitigation measures included in the NDC were developed by the various ministries involved within their respective areas of competence. Measures E15 (promotion of electric vehicles (EV) at the national level), and T09 (national programme on sustainable urban mobility) are particularly relevant for this project. The published 2020 update of the NDC does not provide such detailed information.

The NDC is being supported by the identification and implementation of Nationally Appropriate Mitigation Actions (NAMA) in various sectors. Among them, the Ministry of Energy and Mines is leading the implementation of four energy NAMAs, which include one NAMA on electric road transport. The energy NAMAs are being supported by the GEF/UNDP project 'Nationally Appropriate Mitigation Actions in the energy generation and final use sectors in Peru' (henceforth referred to as NAMA-Energy project), which started in 2015 and which will be completed in 2021.

The government is already developing new legislation to facilitate the deployment of EV in Peru[18]<sup>18</sup>. In the context of the measures following the COVID-19 economic downturn, the government introduced in May 2020 an advantageous accelerated depreciation scheme for companies procuring hybrid or electric vehicles[19]<sup>19</sup>. Previously, in 2018 the government had increased the special tax to conventional vehicles by 10 percentage points, while exonerating hybrid and electric vehicles[20]<sup>20</sup>; hybrid and electric vehicles are also exempted from paying import duties.

In the field of urban mobility, new legislation was passed in 2019 approving the National Policy on Urban Transport, a National Program on Sustainable Urban Transport (Promovilidad) and an urban transport authority for the metropolitan region of Lima and Callao. Similar urban transport authorities are operating or being implemented in other cities, including Arequipa, the second largest metropolitan area in Peru (Sistema Integrado de Transporte). In both cities, the urban transport authorities are expanding the infrastructure dedicated to public transport with BRT systems and regular bus lanes and are working with bus operators to introduce contactless ticketing systems and to provide more reliable and comfortable bus services through competitive concession contracts. They are also aiming at 3-wheeler taxi services, defining the areas where they can provide services and increase control and inspection to support authorized 3W drivers while enforcing regulations and fighting unfair (and often irregular) competition.

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The country has also made efforts in recent years to reduce GHG emissions in electricity generation, through the introduction of wind, solar, biomass and other sources of renewable energy. These sources were virtually absent in 2008, when the national government issued a new regulation with incentives to promote the investment in renewables[21]<sup>21</sup>; as a result, wind, solar, biomass and mini-hydro power plants reached a joint 7.2% share[22]<sup>22</sup> in electricity generation in 2018[23]<sup>23</sup>, with 1030 MW of installed power. The development plan for renewables prepared in 2012 by the Inter-American Development Bank[24]<sup>24</sup> establishes a target of 4,321 MW by 2040 (17.3% of the total), with an investment of USD 8,757 million. The expansion of renewables has been supported by the government through four public auctions, starting in 2009, with 69 projects being authorized, of which 43 were in operation in 2019. In the end of 2020 the UNEP lead proposal for IKI (International Climate Initiative) entitled Low Carbon Mobility Through Digitalization was approved. ATU (Urban Transport Authority) of Lima will be the beneficiary of this project which will search synergies with e-mobility GEF 7 project during design.

### 3) The proposed alternative scenario with a description of outcomes and components of the project

The project strategy addresses the four barriers identified above in full alignment with the approach of the UNEP proposal to GEF for a Global Programme to Support Countries with the Shift to Electric Mobility, and will contribute to its component on "regional support and investment platform". To be effective, the project objective of reducing GHG emissions by stimulating the deployment of electric vehicles has to build upon five action blocks: (i). institutions and regulations, in order to provide the overall policy vision at the national level and the necessary institutional and legal instruments and implementation capacities; (ii). demonstrations of EV implementation, in order to remove short-term barriers, such as the perception of a high technological risk due to the lack of knowledge about the performance of EVs on the field; (iii). market conditions, facilitating the new technology to reach the envisaged public transport systems; (iv). anticipated deployment of end-of-life vehicle management to avoid the environmental hazards raised by EVs; and (v). project monitoring, evaluation and knowledge management.

Firstly, e-mobility requires to be institutionalized, i.e., for the government to establish a national strategy for the expansion of EVs in the country and the adequate institutional framework to implement it. The project will build upon existing energy and transport plans and policies, and the pilots that have taken place in the past. It will build with the government a comprehensive long-term strategy and develop the capacities for its implementation by the relevant stakeholders, while building up wide support for this transition. The strategy provides the framework for the regulatory reforms and other actions to be implemented within and beyond the project.

In the second place, it is necessary to provide evidence of the feasibility and sustainability of e-mobility options in the country, putting the new technologies at the service of a consistent sustainable transport

vision, rather than the other way round. Consistent with the current transport policy in Peru, the project will advance the deployment of EVs in urban public transport systems, working with two pilot cities with bold sustainable mobility ambitions and a good performance record in the improvement of urban mobility: Arequipa and Lima. These cities are making consistent efforts to improve public transport and reduce private car use, and the project will provide insight on how EVs can further strengthen such sound policy practices[25]<sup>25</sup>.

In the third place, to be financially sustainable, the availability of EVs in Peru has to be guaranteed by a solid regulatory framework that -among other aspects- includes regular importation or manufacturing and maintenance support. EV manufacturers are concentrating their market strategies in countries with a sufficiently vehicle market and attractive incentives for potential EV users. These conditions will primarily target the urban public transport sector, but they will also benefit the deployment of EVs in other transport subsectors and other vehicle categories such as taxis, vans and private EVs.

Finally, to be environmentally sustainable the introduction of e-mobility needs to provide adequate measures to manage EVs at their end-of-life, preventing them from becoming an environmental hazard for Peru. At a time where these measures are still at their infancy globally, it is necessary to align Peru with the regulations and market conditions already successfully established elsewhere. This implies fostering the Extended Producer Responsibility for ensuring re-use of the batteries and its adequate disposal.

The expected result of the project is the provision of higher quality public transport (buses and 3-wheeler services) with the use of electric vehicles, providing substantial emission reductions of GHG and local air pollutants. The introduction of EVs in public transport will subsequently spread to other vehicle categories, providing additional GHG emission savings.

This result is expected to be a consequence of the achievement of a supporting legal and institutional framework, a wider support to the use of EVs in public transport and to the development of a strong EV market in Peru.

In the uncertain context created by the COVID pandemia, there is some evidence (McKinsey research[26]<sup>26</sup>) that E3Ws have surged in worldwide popularity since COVID-19 began to spread, partly because people are avoiding shared mobility solutions. Public transport systems have adapted to the new challenges, and UITP is providing evidence of the low risks of being infected by COVID in well managed public transport systems; to this, the electrification of bus fleets contribute to a healthier environment inside and outside the vehicles, further reducing the the risk of infection[27]<sup>27</sup>.

Several additional forces are driving electrification, such as environmentally-friendly regulations and incentives, falling battery prices and lower total costs of ownership, the availability of a ever wider variety of innovative go-to-market models, transport digitization and growing social connectivity. Manufacturers and other stakeholders are following these drivers through the design of modular,

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scalable platforms with open architectures; setting-up disruptive front-end sales channels; developing innovative business models; establishing alternative partnerships, and getting aligned with a consistent energy backbone strategy.

The project provides these conditions through four expected outcomes and a M&E outcome:

### **COMPONENT 1: Institutionalization of low-carbon electric mobility**

**Outcome 1:** Institutional, regulatory and fiscal frameworks established for the promotion of e-mobility with the support of all key stakeholders, including potential EV providers and users.

The risks identified under the Social and Environmental Screening Procedure (SESP) point to potential conflicts with social and environmental safeguards. Related to policy and market introduction of eMobility, specific mention is given to: (1) a human rights approach to ensure inclusiveness and equitable access to the benefits of the Project, both short- and long-term; (2) incorporation of gender-oriented elements in policies and action plans, as to avoid any discriminatory effects; moreover, and (3) Potential environmental hazards associated with waste generated during manufacture of electric vehicle batteries as well as handling batteries that have reached their end-of-life. UNDP and the IP will ensure that safeguards are monitored by applying a Strategic Social and Environmental Assessment (SESA) throughout Component 1. The SESA will include FPIC as determined appropriate and necessary for SES compliance in the course of that assessment.

This outcome requires the consolidation of an internal space of coordination, the formulation of a widely-supported strategy supporting the deployment of EVs in Peru, the identification and implementation of required changes in the existing regulatory framework in order to make it compatible with the new strategy, and the involvement of a growing number of stakeholders in support of such policy. To achieve these, this outcome is based on four outputs that will provide the institutional structure, policies, regulations and capacities. It also includes the liaison with the Global E-mob Programme.

**Output 1.1:** An intersectoral and multilevel e-mobility coordination space established, including all relevant governmental stakeholders. The need for such coordination space has also been indicated within the legislative proposal for the promotion of electric transport<sup>[28]</sup><sup>28</sup> published by the Ministry of Energy and Mines<sup>[29]</sup><sup>29</sup>. This space will primarily include national and subnational governmental institutions, and may also extend participation to the private sector, academia and civil society (which are expected to coordinate more closely under the e-mobility network established through Output 3.1). Thus, this coordination space will enable convergence among the various ministries and public institutions involved in e-mobility, replacing the current non-binding discussion platforms established by each ministry related to e-mobility, which are convened by different public authorities with rigid sector divisions and which focus on partial issues: vehicle technical approval, tariffs, charging

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standards, fiscal incentives, among others. The coordination space will facilitate the approval of strategies, policies and regulations, and will also serve as an entry point for partnerships with non-governmental stakeholders. Two stages are envisaged: initially, the key stakeholders will be convened with support from the project to establish and agree upon a mandate and working plan for the coordination space. Once finalized, the joint working plan will be delivered to the various governmental institutions involved in the official ratification of the space, establishing the adequate structure within the government.

Activity 1.1.1: Convene and carry out periodic meetings with all key stakeholders identified, while the interim coordination space is being structured, as well as when it has been established as a new official e-mobility coordination space or within an operating official government initiative.

Activity 1.1.2: Provide technical assistance to participating governmental stakeholders for the preparation and delivery of a draft document, which will include the mandate, structure, governance and working plan for the continuation of the coordination space. This document will include procedures for the screening and involvement of interested parties and the subsequent strategic assessment of policies, plans and regulations during its deliberation within the coordination space. This activity also includes the coordination of the liaison with the Global E-mob Programme, in particular in what refers to the participation in the various working groups and LAC regional platform activities, and the travel expenses required<sup>[30]</sup>.

**Output 1.2:** National e-mobility strategy submitted to the government and launched, including economic impacts (competitiveness, industrial development), geographical deployment (e.g. charging network) and environmental and social dimensions (gender-responsive).

The comprehensive national e-mobility strategy addresses three key areas: (i) the expansion of EVs within the vehicle fleet in Peru; (ii) the deployment of the charging network; and (iii) the electrification of public transport. Economic impacts, geographical deployment and environmental and social dimensions that are key for the development of these three intervention areas will be considered and integrated into the strategy. To this end, the national e-mobility strategy will provide guidelines on technological and industrial development, legal and regulatory framework reforms needed, and a strategy to raise awareness and build capacities in support of e-mobility implementation. A gender analysis and action plan will be included in the strategy to ensure EV deployment in Peru is gender-responsive and contributes to gender-equality in the energy and transport sectors.

This output will include the following activities:

Activity 1.2.1: Study of electrification options for public transport by road, with a focus on urban buses and 3-wheelers. This study will provide a screening of electric bus and 3-wheelers manufacturers and models, and their availability and fitness for current and future public transport conditions in Peru<sup>[31]</sup>. This study will benefit from the contributions of the Working Group (WG) on HDV and e-

buses, the WG on 2&3 wheelers and the regional (LAC) marketplace events of the Global E-mob Programme.

Activity 1.2.2: Study of electrification options for light vehicles, with a focus on public and private fleets. This deliverable provides a screening of light EV manufacturers and models, and their availability and fitness for current and future mobility conditions in Peru<sup>[32]</sup><sup>32</sup>. This study will benefit from the contributions of the WG on LDV and the regional (LAC) marketplace events of the Global E-mob Programme.

Activity 1.2.3: Study of the charging network necessary to expand electric routes in the cities of Lima and Arequipa. This activity will identify the most suitable locations and characteristics of public charging points to provide opportunity charging to e-buses and 3-wheelers. This activity contributes to the implementation of the regulation of charging points developed by the NAMA-energy project. In order to properly manage any environmental, social or economic impacts, within the study a Strategic Environmental and Social Assessment (SESA) approach will be applied, to ensure compliance with the SES. The study will avoid any places in which any environmental, social or economic impacts may arise, and for doing so it will (1) identify a sufficient number of alternative locations for each charging point; (2) undertake an assessment of potential traffic generation created by the envisaged infrastructure; (3) identify the eventual needs for changes in the electricity distribution grid; (4) mitigation measures, in case concerns are raised from any of the relevant local stakeholders. This study will benefit from the contributions of the WG on batteries and charging infrastructure and the regional (LAC) marketplace events of the Global E-mob Programme.

Activity 1.2.4: Capacity needs assessment and elaboration of a capacity-building and communications plan. This deliverable builds upon the materials provided by the NAMA-Energy project and its activities to promote substantial electrification of the fleet in the 2030 horizon .

Activity 1.2.5: Development of a gender analysis and action plan to address gender gaps in the energy and transport sectors related to e-mobility deployment in Peru, including the analysis of gender-based violence and harassment, in order to include appropriate gender-responsive measures in the e-mobility strategy.

Activity 1.2.6. Prepare an e-mobility strategy through participatory and multistakeholder consultations, including its strategic environment and social assessment for identifying interested parties (and avoided the exclusion of marginalized actors), the potential environmental and social impact of the strategy, and a monitoring and evaluation mechanism for its implementation. The preparation of the strategy will adopt a Strategic Environmental and Social Assessment (SESA) approach, to ensure compliance with the SES. The strategy will also provide charging infrastructure location criteria, to avoid any places in which any environmental, social or economic impacts may arise, including guidelines to (1) identify a sufficient number of alternative locations for each charging point; (2) undertake an assessment of potential traffic generation created by the envisaged infrastructure; (3) identify the eventual needs for changes in the electricity distribution grid; (4) define mitigation measures, in case that concerns are raised from any of the relevant local stakeholders.

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Activity 1.2.7. Submission of final e-mobility strategy to the government for adoption. The project provides the necessary technical support to get the strategy endorsed by the e-mobility coordination space and submitted to the government.

***Output 1.3:*** Revised regulatory and fiscal framework for deployment of electric vehicles delivered for governmental approval.

The envisaged framework is expected to combine the deployment of EVs in the various categories (with a focus on public transport) with the phasing out of high-carbon vehicles (through vehicle scrapping with incentives for acquisitions for EV, VAT exemptions/reductions, incentives for EV in public bids for routes, etc), and the protection of the Peruvian market against the import of outdated technologies and outdated second-hand vehicles . This output will include the following activities:

Activity 1.3.1: Submission to the government of national regulations reforms on vehicle approval, including EVs, building upon current government initiatives on vehicle labeling and energy efficiency; this document will include a strategic assessment of the potential social and environmental impacts of this regulation, through SESA to ensure compliance with the SES.

Activity 1.3.2. Design of national regulations and standards to install public and private charging infrastructure, including installation guidelines addressing professional installers and consumers. These will be based on the regulations and standards developed by the electric transport standardization technical committee and other projects; this document will include a strategic assessment of the potential social and environmental impacts of this regulation, as well as requirements on professional training to prevent health risks associated to battery banks and EV repairs to ensure compliance with the SES.

Activity 1.3.3. Reform proposals for vehicle taxes, to incentivize EV and discourage the purchase of high-carbon vehicles. Reforms have been identified within the NAMA-Energy project, dismissing the introduction of tax incentives; the project will provide support for their implementation, and for the consideration of additional incentives; this document will include a strategic assessment of the potential social and environmental impacts of this regulation to ensure compliance with the SES.

***Output 1.4:*** Strengthened capacities and awareness of public and private decision-makers, technical professionals and consumers regarding e-mobility policy design and implementation, highlighting the social and environmental benefits of EV deployment.

As the lack of updated information jeopardizes deliberation and slows-down the deployment of e-mobility options, the project will disseminate information strategically tailored to the specific needs of three target groups: the general public, private and public decision-makers and transport and energy professionals. The capacity building and awareness activities included under this output will be based on the capacity needs assessment and related capacity-building and communications strategy developed through the Activity 1.2.4.

This output includes the following activities:

Activity 1.4.1: Implementation of the communications strategy, specifically addressing educational centers and the public to foster the use of EVs. Whereas current initiatives are focusing on the communication of regulations and benefits, the project will expand these actions to also support professionals in the educational and social media sectors.

Activity 1.4.2: Implementation of training activities on e-mobility policies, targeting public and private decision-makers and other professionals, which will include the design and use of capacity-building materials. They will include training in health risks associated to battery banks and EV repairs to ensure compliance with the SES. The contents of the training activities will integrate the materials and methodologies developed by the Global E-mob Programme and by the capacitation sessions on vehicles and charging infrastructure of the regional platform.

Activity 1.4.3: Design of technical training modules for PT technical staff (drivers and operators) and transport and electricity professionals on EV and charging infrastructure maintenance and assembly. Awareness towards gender-based violence and harassment and measures to address these risks will also be addressed to ensure compliance with the SES. The contents of the training activities will integrate the materials and methodologies developed by the Global E-mob Programme and by the capacitation sessions on vehicles and charging infrastructure of the regional platform.

## **COMPONENT 2: Short term barrier removal through low-carbon e-mobility demonstrations**

**Outcome 2:** EV demonstrations in urban public transport systems provide evidence of technical, financial and environmental sustainability to scale-up e-mobility

A few short-term pilots have been completed thus far in Peru, giving bus and 3-wheelers operators the opportunity to make use of one EV for a few weeks<sup>[33]</sup>, providing them with direct contact with the technology. Yet, they have not engaged operators in managing the EV as an asset and rethinking their operational plans based on the strengths of this new technology. The project builds upon this evidence and upon consistent national and local plans to promote sustainable mobility options in cities, and focuses on bus services, and a few short pilots demonstrating the technical, financial and environmental sustainability of electric buses and 3-wheelers for subsequent up-scaling.

The project's challenge is to demonstrate that electric buses and 3-wheelers can be consistent with current efforts to improve public transport quality in Peruvian cities, that they can provide additional advantages compared to ICE vehicles, and that their current higher upfront costs can be compensated through adequate financial and non-financial schemes without requiring additional public resources, at least in the mid-term, as battery costs continue to decrease. Furthermore, it will be necessary to make financially-weak bus and 3-wheelers operators confident in EVs reliability and operational costs, and to identify reforms in the urban transport systems that could expand the use of EVs (such as appropriate routes and operational conditions, fares and public subsidies, schedules and circulation permits). Furthermore, the demonstrations will provide evidence to incentivize public transport authorities in the

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two pilot cities to include EVs as a part of their public transport network planning activities, and to review concession and authorization rules accordingly to make the most of the opportunities associated to e-mobility. In addition to testing electric vehicles, data will be collected for the evaluation of the pilots to generate evidence and recommendations on best practices for replicability. Operators participating in the demonstration are requested to prepare and implement a gender policy, to be monitored during the project lifespan, according to SES.

In order to facilitate the procurement and operation of the EV in the demonstrations, the Executing Agency (EA) will establish a competitive procedure and sign with the selected contractors contract of services in which the contractor is requested to operate an e-bus on a regular urban line (or 3W taxis) for a minimum period of time and a minimum of km travelled. The EA is regularly paying the contractor with an amount according to the verified km travelled. The details of such contracts are described in Annex 15 of the Prodoc.

The financial compensation to the PT operators is described in detail in Annex 15 of the ProDoc, in which a justification of the budget initially estimated for the demonstration is also provided. The selection of operators is made through a competitive Request for Proposals (RFP) for the provision of the EV demonstration services envisaged in activities 2.2.1 and 2.3.1, in which offerors will include the compensation they are requested per km travelled during the demonstrations, and the selection of the most advantageous proposal for the project. Market competition will therefore provide a mechanism for checks and balances. There is a cap in the total compensation, so that only the km established in the ProDoc as necessary for a successful demonstration will be entitled to be subsidized. The preparation of the RFP requirements and the subsequent review and assessment of the proposals received will include a third-party expert (the contractor selected for activity 2.1.2: Elaboration of a design proposal for the pilots in Lima and Arequipa), to verify that the subsidy does not exceed the incremental costs of the EVs compared to conventional vehicles of similar performance.

Payments to the selected PT operators will be calculated based the actual km driven by the EVs during the demonstration, for which they will be required to provide detailed justification (with a GPS system accessible to the PM) of the actual EV mileage driven.

***Output 2.1:*** E-mobility pilots in public urban transport systems designed in Lima and Arequipa, integrating gender-responsive measures.

The project will collect information on successful implementation of electric buses and 3 wheelers in other countries, in order to identify best practices that facilitate the selection of the vehicles? and charging points? manufacturers and models, the identification of a suitable service route and service conditions, and the selection of the operator. Once the best practices guidelines for pilot design are developed they will be applied to the design of the pilots in Lima and Arequipa.

Activity 2.1.1: Development of best practice guidelines and design recommendations for e-mobility public transportation pilots, which shall include guidelines on gender-responsive design based on participatory analyses. These guidelines will build upon previous experiences in the cities from the

private sector, the NAMA-Energy project and others<sup>[34]</sup><sup>34</sup>, and will be consistent with the strategies of the public transport authorities in the pilot cities (Lima and Arequipa). They will include recommendations for public transport reforms, if needed, to allow the operation of the electric vehicles, and will support the design of comparable and scalable pilots nationwide. The guidelines will include recommendations for safe ridership under COVID-19 pandemic conditions. For the preparation of the guidelines, it is expected to get continued support from the Assistance Service provided by the LAC Regional Platform of the Global E-mob Programme in what refers to the identification and integration in the guidelines of best international and regional practice.

Activity 2.1.2: Elaboration of a design proposal for the pilots in Lima and Arequipa, following the guidelines for e-mobility pilot design. The design will include the assessment and identification of best routes for the implementation of electric buses and three-wheelers for the pilot, considering potential for scale-up, technical, and financial feasibility, and social and environmental sustainability principles as described in the safeguards screening, in particular the affordability of fares and awareness towards gender-based bias in bus design and operations. To address these risks, the project will undertake a livelihood analysis of the potential impact electrification may have on the living and working conditions of 3-wheeler owners and drivers, in conformity with UNDP SES standard 5 requirements<sup>[35]</sup><sup>35</sup>. The pilot design proposal will be developed in close coordination with the city government and the local public transport authority.

Activity 2.1.3: Design and implementation of multi-media campaigns against gender-based harassment, discrimination and violence, including against other vulnerable groups (children, elderly, persons with disabilities, LGBTQIA people).

**Output 2.2:** EV pilot in Lima implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.

Within this output, the selection of the relevant pilot partners (EV and charger provider, public transport operator) will be undertaken in Lima as the first pilot city. Subject to the results of activity 2.1.2, it is expected that an open call for proposals will be made for interested vehicle manufacturers and public transport operators, in order to choose the most appropriate vehicles and partners to conduct the pilot.

Activity 2.2.1: Selection of EV operators for e-buses in Lima in compliance with selection criteria established based on best practice guidelines and technical support provided by the Global Program and LAC Platform , including gender considerations for gender-responsive design and selection of drivers.

Activity 2.2.2: Integration and operation of at least 2 e-buses and 10 electric 3-wheelers in operator's fleet in Lima along one selected route (through incremental cost support for vehicle purchase or long-term leasing). The 3-wheelers will be operated as mototaxi services.

Activity 2.2.3: Identification and systematization of results, best practices and lessons learned for the route where the pilot was implemented, including the assessment of social and environmental impacts and recommendations regarding how to escalate to other routes. This will be integrated and fed into MINAM's knowledge management processes and systems. This activity will benefit of assistance support from the regional (LAC) platform and present and discuss results at the LAC regional platform group and at the WG on HDV and e-buses of the Global E-mob Programme.

Monitoring and evaluation of this demonstration is undertaken within the M&E Component.

**Output 2.3:** EV pilot in Arequipa implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.

Within this output, the selection of the relevant pilot partners (EV and charger provider, public transport operator) will be undertaken in the second pilot city. Subject to the results of the activity 2.1.2, it is expected that an open call for proposals will be made for interested vehicle manufacturers and public transport operators, in order to choose the most appropriate vehicles and partners to conduct the pilot.

Activity 2.3.1: Selection of EV operators for e-buses in Arequipa in compliance with selection criteria established based on best practice guidelines, including gender considerations for a gender-responsive design and selection of drivers.

Activity 2.3.2: Integration and operation of at least 2 e-buses and 10 electric 3-wheelers in operator's fleet in Arequipa along one selected route (through vehicle incremental cost support for vehicle purchase or long-term leasing). The 3-wheelers will be operated as mototaxi services.

Activity 2.3.3: Identification and systematization of results, best practices and lessons learned for the route where the pilot was implemented, including the assessment of social and environmental impacts and recommendations regarding how to escalate to other routes. This will be integrated and fed into MINAM's knowledge management processes and systems. This activity will benefit of assistance support from the regional (LAC) platform and present and discuss results at the LAC regional platform group and at the WG on 2&3 wheelers of the Global E-mob Programme.

Monitoring and evaluation of this demonstration is undertaken within the M&E Component.

**Output 2.4:** Technical training delivered (focused on EV driving and maintenance)

In line with the objectives of output 1.4 with regards to the strengthening of capacities of technical professionals, (in particular activity 1.4.2), the project will carry out technical training activities on EV driving and maintenance specifically targeted at those who will be directly involved with the operation of the pilots, including drivers, maintenance technicians, transport inspectors and/or others. Additional participants not directly involved in the operation of the pilot may be included to strengthen capacities for scalability and replicability. Female participants will be sought and encouraged to promote gender equality in the access to jobs generated by the operation of EVs in public transport. Participants involved in the operation of e-buses will also receive training in gender-responsive measures.

Activity 2.4.1: Implementation of technical training activities on EV driving and maintenance, that also address gender issues and gender-responsive measures in public transportation. They will include training in health risks associated to battery banks and EV repairs. Awareness towards gender-based violence and harassment and measures to address these risks will also be addressed. Training activities are targeting professionals involved in the operation and maintenance of the pilots, although they can include additional participants. Participation of women will be prioritized.

Although focusing on facilitating the implementation of the pilots, these training activities on EV driving will be open to future trainers from institutions interested in providing such educational services in the future, such as the academia and technical institutes participating in the project, which will be authorized to make use of the activity's training materials. Linkages with E-mujer (energy school for woman structured by the GEF6 Energy NAMAs project) will be sought, to guarantee woman can also be multipliers and beneficiaries of such trainings.

***Output 2.5:*** Evidence and best practices on EV pilot implementation communicated to key stakeholders and incorporated in e-mobility guidelines for replicability.

Communications materials will be developed and activities will be carried out to disseminate the pilot results, so that national and local decision-makers and stakeholders, as well as the general public, can have detailed knowledge of the contents and conclusions of the demonstrations. It is expected that this activity will address possible misperceptions, biases and/or myths regarding the viability of using EVs in public transport, so as to build the necessary support from the various stakeholders ? including public transport users ? for replicability and scaling-up. The communications materials and activities will be based on the systematized best practices and lessons learned of the pilots, which fall under activities 2.2.3 and 2.3.3. Lastly, to strengthen the potential for replicability of the pilots, these best practices and lessons learned will be further integrated into the e-mobility guidelines developed under activity 2.1.1.

This output will include the following activities:

Activity.2.5.1: Dissemination of project pilot results through communication materials and initiatives (ie. articles, infographics, videos, social media, etc.).

Activity 2.5.2: Incorporation of best practices and lessons learned in e-mobility best practice guidelines. The preparation of the guidelines will benefit of assistance support from the regional (LAC) platform and present and discuss results at the LAC regional platform group, at the WG on HDV and e-buses and at the WG on 2&3 wheelers of the Global E-mob Programme.

### **COMPONENT 3: Preparing for scale-up and replication of low-carbon electric mobility.**

**Outcome 3:** Conditions established to support the inclusion of EVs in the vehicle market and to accelerate their deployment

This outcome bridges the gap between institutionalization and demonstration on the one side and the market on the other side. It will support the consolidation of a market for EVs, primarily in the vehicle categories included in the pilots (buses and 3-wheelers) and subsequently in other categories (mainly light duty vehicles for passengers (cars) and freight (vans)). The NAMA-Energy project and the Interamerican Development Bank-COFIDE initiative are expected to provide some alternative business and financing models for fleet electrification in Peru, covering inter alia vehicle loans and leasing (see ProDoc Annex 15 for a description of the financing of the demonstrations, which will provide guidance for the development of such schemes); this project will focus on updating them based on Component #2 results and supporting the implementation of such models, taking into consideration relevant changes during the project life (e.g. a significant reduction in EV prices due to technological progress).

**Output 3.1:** Assessment of e-mobility market potential in Peru carried out for the introduction of electric vehicles and electrification of road public transport systems.

Based on the analysis of current demand and supply trends in the vehicle market, forecasts of EV demand for the different vehicle categories will be developed, as well as an in-depth analysis of the demand potential for urban public transport fleets. This will consider the results from the NAMA-Energy project demonstrations, paying particular attention to how the interaction with national and local governments and other key stakeholders was developed during the demonstrations. In this way, it is expected that these activities will expand the market analysis to be provided by the Ministry of Energy and Mines in order to make it consistent with the Global Programme requests to facilitate comparison among participating countries.

Activity 3.1.1: Study of scenarios on the potential of the electric vehicle market in Peru. This deliverable will cover all vehicle categories, building upon the experience of previous initiatives such as the NAMA-Energy project activities (e.g. taxis) and other actions (private fleets, delivery vans).

Activity 3.1.2: Study of the electrification potential of road public transport systems in Lima and Arequipa. It will cover all public transport road services (including the last-mile link), in line with the global programme's guidelines, and with the emerging best-practice following the COVID-19 pandemic.

**Output 3.2:** E-mobility network established in Peru, including manufacturers, importers, technology and service providers, as well as public transport operators and other final users.

A variety of private stakeholders are already participating in the private network AEDIVE-Per? (Asociaci?n de Emprendedores para el Desarrollo e Impulso del Veh?culo El?ctrico- Per?), as well as in a dedicated Committee within the AAP (Asociaci?n Automotriz de Per?). However, these spaces do not include the academia, NGOs and civil society organizations. Therefore, it is expected that a space where all non-state actors can engage and integrate their different approaches to support the advancement of an e-mobility agenda. The project will act as a contact and networking point, facilitating regular interactions among the e-mobility coordination space (output 1.1), AEDIVE, local public transport authorities and public transport operators, and the engagement of civil society stakeholders.

Activity 3.2.1: E-mobility network engagement with the project, providing regular contacts among e-mobility stakeholders, the government and civil society.

Activity 3.2.2: Elaboration of the network action plan (information platform and website, quarterly workshops, quarterly position papers) to accelerate the deployment of e-mobility. The action plan defines the network activities to be implemented until project conclusion and beyond.

**Output 3.3:** Detailed financial and business models for EV commercialization and operation designed.

The main objective of this output is to overcome the financial barriers involved in the purchase of electric vehicles by creating and strengthening strategies to finance the initial capital cost requirements, enabling the participation and investment of the private sector. Whereas fiscal incentives are identified within component 1, this output will analyze the existing vehicle trading chain, will take stock of the business models developed in various initiatives such as the NAMA-Energy project and the studies made by COFIDE (Peruvian Public Development Bank) with the support of IADB, and will foster their implementation.

Although building upon the pilots conducted in Component 2, and focusing on urban public transport services, this output will also provide business models for other categories, including cars in public fleets, taxis, 3-wheelers and private fleets and vans for urban delivery.

Building upon the results of the NAMA project, the design of business models and financial schemes includes considerations on regulations (e.g. for the application of accelerated depreciation to electrified vehicles in corporate fleets), fiscal incentives (e.g. temporary exemption from VAT on the sale of electrified vehicles and their spare parts; exemption from Ad-Valorem for the importation of electrified vehicles), public contracts (e.g. duration of transportation concessions aligned with the lifespan of the vehicles), or scrap bonds for the purchase of electrified vehicles.

The design of financial schemes will consider different leasing and vehicle loans options, based on international experience. In particular, it will build upon previous studies made by COFIDE with IADB on the feasibility of a program of low-interest private loans, also benefiting from lessons learned with the COFIGAS facility and the Vehicle Gas Bond of the Social Energy Inclusion Fund.

The financial schemes will be developed primarily with COFIDE, although these activities will be open to the participation of the private financial sectors, and will be tailored to the particular needs (terms of lending, concessionality level) of different economic sectors, with a focus on public transport operators and large corporate fleets.

Additionally to vehicle loans, leasing schemes could provide an attractive alternative to vehicle procurement, provided some changes are made in the regulation of concession contracts. Linked to the expansion of EVs, leasing schemes concerning vehicles and batteries, and alternative payment options including energy supply have been proposed and, in some cases, implemented by some fleet managers around the world. The advantages of leasing options are strongly linked to their taxing regime and to the development and competition within the local financial sector. It will also consider the design of

financial strategies for those who are not part of a fleet; all these conditions will be included in the development of innovative business models for EVs:

Activity 3.3.1: Development of alternative business models for the electrification of urban public transport (buses and 3 wheelers). Building on and collaborating with COFIDE's experience in financing bus fleet renewal (COFIGAS and the future COFIELECTRICO facility). The preparation of the business models will benefit from the exchanges and materials developed by the marketplace of the LAC regional platform. Business models will be disseminated to the financial sector and other interested stakeholders through the communication activities of the e-mobility platform (activity 3.2.2).

Activity 3.3.2: Development of alternative business models for the electrification of public and private corporate fleets (with focus on 3-wheeler and taxi fleets). The preparation of the business models will benefit from the exchanges and materials developed by the marketplace of the LAC regional platform. Business models will be disseminated to the financial sector and other interested stakeholders through the communication activities of the e-mobility platform (activity 3.2.2).

Activity 3.3.3: Submission to the government of alternative concession schemes to facilitate financing of EV in public transport. Addressed to public transport authorities, in order to incentivize within their concession agreements the use of e-buses by operators. These may include, among other specifications, minimum fleet ownership conditions, differentiated public service compensations for different bus technologies and performance.

**Output 3.4:** EV procurement guidelines for urban public transport operators and authorities developed.

The consideration of EVs as a feasible option in fleets providing public services requires careful consideration of their differences with ICE vehicles while defining contract specifications. This includes a comprehensive consideration of the vehicle lifespan, total energy consumption and emissions, maintenance obligations, etc. The guidelines will take into consideration the existing national regulatory framework and its likely changes in the future (integrating the changes proposed by the project in Component 1 and those under consideration by the national government), showing their impact on the above-mentioned parameters and the comparative advantage EVs offer to urban public transport operators and authorities under the most likely regulatory scenarios. In 2020, the NAMA-Energy project is expected to provide guidelines to support public authorities in making this transition; the project will provide support for the implementation of these procurement recommendations to interested PT authorities and operators in Peruvian cities beyond Arequipa and Lima, as a way to scale-up the project results. Furthermore, the project will incorporate in these guidelines recommendations for the adoption of gender-responsive measures in EV procurement, recruitment and training strategies of urban public transport operators.

Activity 3.4.1: Provision of tailored support and development of guidelines for operators of public transport services (buses and 3-wheelers) for the procurement of EVs for their fleets. The project will provide customized technical support for up to 4 operators interested in including EV in their fleets. This support will build on previous experiences and work the details of financing EVs. It will bring the strategy from concept to implementation.

Activity 3.4.2: Provision of tailored support to interested public authorities for promoting EVs in their own fleets and in those associated to public service concessions. The project will provide customized technical support for up to 4 public transport authorities in Peruvian cities interested in including EV in their systems. It will bring the strategy from concept to implementation.

#### **COMPONENT 4: Long-term environmental sustainability of low-carbon electric mobility**

**Outcome 4:** Conditions created for a circular economy perspective in the electrification of mobility in Peru with EPR.

There is limited documented information on current end-of-life vehicle ELV management practices in Peru (no information on the rate of vehicles that are properly disposed or on the vehicle withdrawal rate); as ELV management generates valuable products, it usually is organized on a B2B basis, however without the intervention of producers; this can generate environmental hazards due to inadequate (or lack of treatment) of particular components (e.g. tires, lead batteries or lubricants). As identified at the Social and Environmental Screening, the future management for EVs at their end-of-life raises therefore two challenges in Peru: on the one hand, the need to strengthen current waste management chains for ELV, or at least for some components (where an EPR approach could eventually play a role); on the other hand, the need to introduce an adequate management approach for the EV battery. The first electric bicycles and motorbikes imported in Peru a few years ago are already reaching its lifespan, and the project will consider the management of their batteries as a first case study.

Although still at its infancy, EV battery management is likely to be organized around the use of batteries for energy storage (second life), rather than recycling. It is unclear whether the original EV (or battery) producer should be held responsible for the second-life use of its batteries, or whether this can be left to market forces, due to the relatively high value of used batteries. There is however a case to implement an EPR approach, in order to extend the lifespan of batteries as much as possible, as the production of a Lithium battery can emit between 39 kg CO<sub>2</sub>e/kWh and 196 kg CO<sub>2</sub>e/kWh: finding a new use for EV batteries when they are no longer fit for their original purpose is a smart way to reduce their carbon footprint, before recycling. Finally, battery recycling would need to include some kind of credit system so that manufacturers using recycled materials could claim the associated emissions reduction.

In order to address all these issues comprehensively, while focusing on the promotion of second-life battery use, this component will provide the following outputs:

**Output 4.1:** Comprehensive diagnosis on national end-of-life vehicle management completed.

Currently, there are no reliable data available on ELV management, which jeopardizes any attempts to introduce an EPR approach to any vehicle components. The following deliverables will serve to provide a national ELV diagnosis:



Activity 4.1.1. Study on the description and analysis of local management conditions of ELVs and their components. This should consider the lifecycle of the components as well as value chains involved throughout their lifespan, and provide a comprehensive stakeholder mapping, identifying their interests and potential roles within ELV management. It should also provide off- and on-site research of the waste generation regarding vehicle components at the end-of-life, and the identification of ELVs components management and disposal.

Activity 4.1.2. Estimate of projected ELVs components generation, considering internal combustion and electric vehicles.

**Output 4.2:** Proposal on end-of-life vehicle management regulation, based on the EPR approach, delivered to the government for approval.

Framework regulation for EPR implementation has been issued in Peru in the last couple of years, but it needs to be complemented with specific regulation and norms for each particular waste stream to which EPR is intended to be applied. This output will provide the following deliverables:

Activity 4.2.1: Research and systematization for international and regional regulation on EPR-based ELV management, with a focus on EV components and battery. This activity will exchange information with the WG on batteries and charging infrastructure of the Global E-mob Programme.

Activity 4.2.2: Comprehensive review of existing and planned international regulations on second-life battery use.

Activity 4.2.3: Formulation of proposals for regulation in line with national priorities and in close coordination with the identified relevant private stakeholders.

**Output 4.3:** Cost-efficiency analysis and business models designed for implementation of an EPR approach to ELV management.

The assessment of business models for EPR implementation will ease the decision to invest for the private sector; the following deliverables will be provided by the project:

Activity 4.3.1: Research and systematization of successful financial and business models on ELV components and second-life battery use, based on the EPR concept. This activity will exchange information with the WG on batteries and charging infrastructure of the Global E-mob Programme and with the marketplace of the LAC regional platform.

Activity 4.3.2: Development of commercially viable EPR business models for ELV components and EV batteries, including cost benefit analysis estimating investment needs and financing schemes.

**Output 4.4:** Roadmap for EPR approach to end-of-life vehicle management submitted to the government for approval.

The Road Map for implementation of EPR in ELV management will consider ELVs components, with a focus on EVs and their batteries, including the promotion of second-life use. The project will provide

this road map, with short, medium and long term visions for country action in the field, through the following deliverables:

Activity 4.4.1: Development of a road map for EPR with ELVs components, built through a participatory process and in close coordination with the Ministry of Environment.

Activity 4.4.2: Advocacy and promotional activities to secure timely approval and enforcement of the roadmap as a planning instrument.

**Output 4.5**: Awareness-raising and capacity-building activities completed, targeting government, consumers and private sector stakeholders on end-of-life vehicle management.

The following project activities are vital to ensure the engagement of private and public stakeholders as implementers, as well as the civil society as consumers and generators of ELVs components:

Activity 4.5.1: Design and delivery of a training programme for policymakers, to be implemented by local academia (trained beforehand if necessary), and to be later available for wider dissemination. It will include training in health risks associated to manipulation of batteries and other EV components at their end of life. **This activity will exchange materials and methodologies with the capacitation activities of the LAC regional platform.**

Activity 4.5.2: Provision of technical and managerial support to producers and importers. With a focus on the local industry (particularly 2-3 wheeled vehicle manufacturers) in order to strengthen their roles within the new ELV management framework.

Activity 4.5.3: Support to the government, industry and research sector in the design of a national campaign to raise awareness amongst consumers regarding the benefits of EPR for ELVs components, and the importance of second life battery use.

## **COMPONENT 5: Project monitoring and evaluation**

**Outcome 5**: The project monitoring and evaluation plan is implemented

Under this component, all the project's monitoring and evaluation activities are undertaken.

Results from monitoring and evaluation activities will be regularly shared with the E-mobility Global Programme in order to facilitate global monitoring, and to support knowledge management activities at the global and regional levels.

**Output 5.1**: The project monitoring and evaluation plan and knowledge-management strategy are designed and implemented, providing regular reporting to the global programme

The project monitoring and evaluation plan is outlined in Annex 3, and the monitoring and evaluation budget is presented in Section VI. This plan will be revised and updated during the inception workshop

and will ensure the regular reporting on the project's indicators established in the PRF. The GEF/UNDP NAMA Project has structured a robust MRV system for road transport emissions, including EVs, that will provide the adequate framework for the MRV plans in Arequipa and Lima.

The project knowledge management (KM) strategy is outlined in section 8 of this Part II, including a liaison with the Global Programme. This strategy will be revised and updated during the inception workshop and will ensure the regular exploitation and dissemination of the materials developed under the other project components, including training and dissemination materials, policy and technical recommendations and technical tools.

Activity 5.1.1: Updating and implementation of project monitoring and evaluation plan.

Activity 5.1.2: Development and implementation of monitoring, reporting and verification (MRV) plan for the demonstration in Lima, including passenger satisfaction surveys to assess service quality of e-buses under a gender approach.

Activity 5.1.3: Development and implementation of monitoring, reporting and verification (MRV) plan for the demonstration in Arequipa, including passenger satisfaction surveys to assess service quality of e-buses under a gender approach.

**Output 5.2:** Best practices and lessons learnt reports developed and shared with the global programme

The Terminal Evaluation will be undertaken after the completion of all main project activities, as described in Section VI of the ProDoc.

Activity 5.2.1: Terminal evaluation

Activity 5.2.2: Final best practices and lessons learnt report prepared and shared with the Global Programme its Regional Platform.

#### 4) Alignment with GEF focal area and/or impact program strategies

The Global Programme, that supports countries with the Shift to Electric Mobility, and all its national child projects are aligned with Objective 1 of the Climate Change Focal Area which is to 'Promote innovation and technology transfer for sustainable energy break-throughs', and more specifically with CCM1-2, to 'Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility'.

Whereas the global programme will provide tools, policy best practices, training materials and strategies to foster large-scale market introduction of electric mobility, the child project in Peru will put in place enabling conditions for this transformation. In particular, through their working groups, the global programme is expected to provide updated information on progress in EV technologies, that the child project can consider during the design of its demonstrations (component 2), and scaling-up actions (component 3); likewise, it can facilitate access to international progress in the management of

EV and components at their end of life (as they affect global manufacturing chains rather than local ones), so that the project (component 4) can focus on the integration of Peru in such value chains. The section on barriers provide more information on the enabling conditions this project will need to strengthen.

By creating a favorable institutional and regulatory framework for EVs, the project in Peru will contribute to point 112 of the GEF-7 Programming Directions to accelerate 'the speed and scale of sustainable energy investment in developing countries'; by establishing adequate business models for a stronger EV market, the project will contribute to point 113, developing 'innovative business models that go beyond business as usual'.

In addition, the demonstrations on EV operations are expected to accelerate the transition to low-emission urban mobility. They directly address the root cause of weak public transport systems, which are unable to afford the introduction of EV solutions and therefore cannot provide the higher quality mobility services associated to attract car users. They also address the root cause of the high risks perceived by public transport managers of making use of innovative electric technologies. Besides addressing the short-term barriers linked to these root causes, the project provides long-term sustainability for the adoption of EVs, providing adequate market conditions and management of potential environmental hazards generated by them.

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

Electric mobility is making quick progress in those countries and regions offering some key enabling conditions: dynamic vehicle and battery manufacturing industries, strong research and innovation ecosystems in these fields, financial and political support from the public sector, users' financial capacity and interest in innovation and public and private commitment with GHG emission mitigation targets. These enabling conditions are supported by consistent strategies, providing a long-term vision, and inspiring the legislative and institutional reforms to encourage the development and implementation of innovations.

After more than two decades of efforts, technological innovation is successfully decreasing EV prices, delivering higher performances in terms of range and lifespan, and new models, increasingly adapted to particular niche markets such as urban delivery or public transport<sup>[36]</sup><sup>36</sup>. New legislation is being deployed on vehicle approval, roadworthiness and end-of-life management, as well as on the use of EVs for the provision of public services, and innovative financing schemes are being proposed.

In the absence of the enabling conditions mentioned above, developing countries risk to lag behind in the transition towards low-carbon mobility. EVs are being designed to meet the needs of those developed markets with higher actual or potential demand, while the other markets seem prone to become the dumping sites for old fashion technologies, as it has been the case in the past (and even

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today, as outdated technologies such as EURO III diesel buses remain being the standard for public transport concessions in some cities). EV manufacturers are unlikely to push forward on their own, as they carefully choose the most promising markets for development, to limit costs and risks.

GEF-7 is in a unique position to support a step change, by contributing to supporting governments in developing countries to establish the required legislation, so that producers and consumers become more confident about the robustness of the local EV market, to channel EV introduction towards the public transport sector first, so that it benefits a larger population, and to get global players (from EV manufacturers or battery managers to financial institutions and global regulators) interested in the needs and priorities EVs can meet in developing countries.

The potential size of the Peruvian EV market, the sustained effort of national and local governments to improve urban public transport services and the rapid fleet growth in the last 5 years (particularly of the 10 and 12 m long bus segment, due to the implementation of new concession contracts requiring larger buses) provides an excellent environment for GEF-7 action. The benefits of current public transport enhancement actions can be expanded through the integration of considerations included in this project, such as fleet electrification, women empowerment (as users and workers) in this sector, and widening the options for concession contracts, in order to speed up quality service improvements and the adoption of environmentally-friendly technological developments. In terms of GHG emissions, the project may accelerate the transition towards EVs in public transport by 5 to 10 years, with a potential for spill over effects in other types of vehicles. In the absence of action on EV promotion, the bus fleet growth over the next years will largely rely on conventional technologies, which will remain on the roads for decades, slowing down the introduction of electric technologies.

The GEF support provides the resources and political leadership necessary to undertake a comprehensive approach, addressing the necessary coordination among institutions and political capital for regulatory changes enabling a transition towards electric mobility. In the absence of GEF support, it is unlikely that local stakeholders interested could move beyond current small demonstrations unable to be expanded due to an unsupportive regulatory framework and the political and human capital resources needed to reform it.

In addition, the project is supported by the global e-mob programme, and this programmatic approach seeks to bundle demand in the region and thus reduce the incremental costs of electric technologies in a cost-effective way:

- ? Generic tools are expected to be produced at the global level, disseminated through regional support and investment platforms and adapted to the needs in Peru at the country level; in this way, return on investment for development of tools and methodologies is maximized.
- ? Bundling demand for e-vehicles for demonstration in a certain region can lead to lower vehicle prices, reducing investment risk.
- ? Through adequate training of vehicle operators and exchange between numerous projects, the industry is less likely to face misuse of technology.

Last but not least, Peru requires GEF support to accelerate the preparation of adequate national strategic planning on transport electrification and to engage public transport authorities and private and public stakeholders in the transport community in the transition towards e-mobility through capacity building and practical evidence of the operation of these new technologies in Peruvian cities.

#### 6) Global environmental benefits (GEFTF)

GHG emission mitigation has been estimated by the UNEP Air Quality and Mobility (AQM) Unit using its GHG emission reduction calculation model. Full details are provided in Annex M. Based on official gross domestic product (GDP) and population statistics (available at the time of completing the model until 2017 and 2018 respectively), an approximate hypothesis has been established for future annual GDP and population growth.

The model estimates bus and 3-wheeler sales based on GDP per capita, with an elasticity of 0.7 until GDP per capita reaches USD 20,000 (which is expected to happen in 2027) and 0.5 afterwards. In the baseline model, alternative technologies to ICE are not considered to enter the country until 2031 for buses and 3-wheelers. The electric mobility scenario considers that the introduction of electric vehicles will start with one e-bus in 2021 and the 4 project's e-buses in 2022, followed by 16 e-buses in 2023, 60 buses (4% of the annual sales) in 2024 and 76 buses in 2025; then increasing its sales share by 0.5 percentage points each year until 2030 and 1.3 percentage points afterwards. Concerning 3-wheelers, their introduction in Peru will start with the 20 EVs provided by the project in 2022, followed by 80 additional ones in 2023 and 127 (2% share of the 3W annual sales) in 2024, then increasing its sales share by 1 percentage point per year. Direct GHG emission reductions are considered only for the lifespan (15 years for buses and 5 years for 3-wheelers) of the vehicles provided by the project.

The average fuel consumption is estimated at 52.0 liters diesel/100 km for buses (the average value obtained from public operators in Lima) and 6 liters gasoline/100 km for 3-wheelers (CO<sub>2</sub> GEF Manual). The average annual mileage is estimated at 54,000 km for buses (average value for the targeted bus lines in Lima) and 14,000 km for 3-wheelers.

An average consumption of 75 kWh/100 km for e-buses and 8.7 kWh/100 km for electric 3W has been considered. The average emission factor for electricity generation in Peru (0.412 kg CO<sub>2</sub>/kWh until 2029, and steadily decreasing afterwards as a result of the increased expansion of renewables undertaken by the government<sup>[37]</sup>) has been included.

The emissions avoided by the new EVs, additional to the ones implemented by the project, are used for computing the total benefits. These additional emission reductions are estimated for a 15-year period after the beginning of the project. A causality factor of 80% is used to quantify the amount of the benefits obtained as a result of the project execution and its influences. Of them, 30% are considered as direct project benefits and 70% as indirect project benefits. The project GHG emission reductions and energy saving impacts are summarized in the table below.

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GHG reductions and energy savings estimation for Peru	
<b>Project information</b>	
? Project duration: 3.5 years. Starting in 2021 and ending in 2024	
? Time frame for indirect effects: 15 years. Starting in 2021 and ending in 2035 (Effects produced by the introduction of electric buses electric 3 wheelers in the public transport fleet in Peruvian cities)	
? Causality factor: 80%	
<b>Total project emissions reductions, t CO<sub>2</sub></b>	<b>415,117</b>
<b>Total direct emission mitigation from demonstration projects, t CO<sub>2</sub></b>	<b>178,460</b>
Primary direct emission mitigation	4,836
3-wheelers (considering end of life of vehicle as 5 years)	195
Buses (considering end of life of vehicle as 15 years)	4,640
Secondary direct emission mitigation (policy measures)	173,624
3-wheelers (considering end of life of vehicle as 5 years)	247
Buses (considering end of life of vehicle as 15 years)	173,378
<b>Total indirect emission mitigation, t CO<sub>2</sub></b>	<b>236,657</b>
<b>Total direct emission mitigation at the time of measurement, t CO<sub>2</sub></b>	
At end of month 24 (mid-term)	348
At end of month 42 (project termination)	871
<b>Total project energy savings, MJ</b>	<b>5,381,596,677</b>
<b>Total direct energy savings from demonstration projects, MJ</b>	<b>2,313,522,172</b>
Primary direct energy savings	62,331,465
3-wheelers (considering end of life of vehicle as 5 years)	2,153,373
Buses (considering end of life of vehicle as 15 years)	60,178,093
Secondary direct energy savings (policy measures)	2,251,190,707
3-wheelers (considering end of life of vehicle as 5 years)	2,721,007
Buses (considering end of life of vehicle as 15 years)	2,248,469,700
<b>Total indirect energy savings, MJ</b>	<b>3,068,074,505</b>

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

The technological **innovativeness** of the project is very high, as the deployment of EVs is still low in most countries, and the characteristics of the EVs available in the market have been developed attending to contexts in other countries, not necessarily similar to the mobility conditions in Peruvian cities. Although a few EVs have been recently tested in Peru, the project will be innovative in engaging in permanent use, integrating the new EVs within the existing fleets of some operators. As the project is partnering with vehicle manufacturers, there is also the potential to innovate in vehicle design aspects that can better tailor the service provided to the preferences of Peruvian users.

Another relevant innovation is the EPR approach to the management of EVs and its components at their end of life. Peru has still limited experience in the practical implementation of the EPR concept, and EVs offer an excellent ecosystem for implementation, considering the reduced number of stakeholders initially involved. Furthermore, action at the international level is expanding in order to establish global recycling chains, at least for batteries, and regional legislation is being drafted (e.g. in

the European Union). The project will facilitate access to the innovations associated to these recycling chains and their adaptation to national conditions.

The innovative potential of the project also includes financial schemes to facilitate the operators' access to EV, in spite of their higher upfront costs. The project will explore and propose incentive packages for early adopters, as well as alternative schemes to vehicle purchase, with the engagement of project partners from the financial and electricity sectors.

**Replication and scaling up** is included in the project design at three levels: i. within the pilot cities, through the support to public transport operators participating in the demonstrations to expand their EV fleets based on their first-hand experience gained from the project; ii. at the broader level of cities in Peru, through the dissemination of demonstration results and the preparation of EV procurement guidelines addressed to public transport authorities and operators; and iii. at the country level, through the adoption of regulatory recommendations creating a levelled playing field for e-mobility, the project will facilitate the deployment of other EV categories, such as cars or cargo vans. It is expected that thanks to these activities the project will be able to leverage on the pilots and have an impact beyond the vehicles acquired by the project:

Besides the 4 electric buses in the project demonstration, operational in 2022, it is expected that additional electric buses will be added to the fleet as a result of project activities, so that 5% of the new bus sales are electric by 2025 (reaching that year a total fleet of 233 e-buses). Since then, the percentage of electric buses in new sales would grow reaching 10% of total bus sales in 2032, 15% in 2036 and 20% in 2040.

Besides the 20 electric 3W in the project demonstration, operational in 2022, it is expected that additional electric 3W will be added to the fleet as a result of project activities, so that 2.5% of the new 3W sales are electric by 2025 (reaching that year a total fleet of 484 3W). Since then, the percentage of electric vehicles in 3W new sales would grow 0.5 percentage points per year, reaching 5% in 2030, and at a quicker path since then, reaching 9.5% in 2036 and 13% in 2040.

Moreover, the project will facilitate the efforts to accelerate the shift towards EVs globally, through the cooperation channels envisaged by the e-mob programme it participates in.

**Sustainability.** The project sustainability and exit strategy will mainly rely on the government and some of the project partners, based on their empowerment through the project activities and deliverables, and the institutional and informal networks established. Through its deliverables, the project is expected to support the implementation of a sound regulatory framework for the deployment of EVs, to implement business models and financing schemes (including incentives as required) for potential users, and to create a robust network of stakeholders interested in e-mobility. Furthermore, awareness-raising and training activities will provide the necessary know-how within the national and local governments, and in the transport sector at large. This friendly environment is expected to facilitate action from key stakeholders:

Financial institutions will have access to the necessary factual evidence on EV performance to design adequate financial schemes, without unfair conditions compared to ICE vehicles.



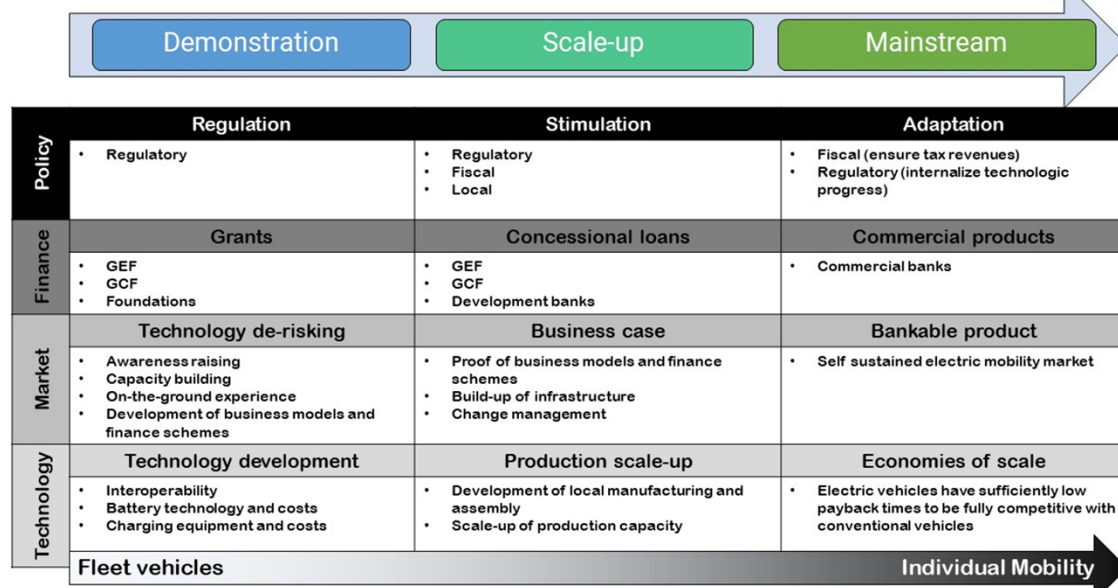
EV manufacturers will find a consistent legal framework in Peru as a growing market, in a time that bus fleets in cities are quickly growing and authorized 3-wheeler operators need to rely on more efficient technologies to reduce their operating costs and improve quality of service (noise, pollutants?).

Managers of public transport and other fleets will find electric alternatives to their vehicle needs with reliable information and wide local expertise.

The project aligns its sustainability and exit strategy with the EV market transition design provided by the e-mob programme (figure below). It is a first step towards mainstreaming of EVs making them competitive in all market segments, while embedding the effort within the national and local governments priorities to improve and expand the public transport system.

The e-mobility network sustained by the project is a key instrument for the project's exit and sustainability strategy, as it has brought together all market actors behind a shared plan of action. This network (and the government) will be able to monitor future progress in the electrification of road transport mobility in Peru based on the project's results and the continuation of the operation of the MRV platform used by the project and initially provided by the NAMA energy project.

## EV market transition in low and middle income countries



**Figure 2: EV market transition**

(Source: UNEP, E-Mobility Program Framework Document)

Figure 2: EV market transition

(Source: UNEP, E-Mobility Program Framework Document)

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- [1] CO2 Emissions from Fuel Combustion Highlights (2019 edition), IEA 2019.
- [2] IEA Mobility Model, 2017.
- [3] <https://data.worldbank.org>
- [4] Approved in December 2020. See final report at <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Peru%20First/Reporte%20de%20Actualizacio%CC%81n%20de%20las%20NDC%20del%20Peru%CC%81.pdf>
- [5] There is basic legislation on EPR, but only one scheme has been implemented thus far, addressing waste from electrical and electronic equipment (DECRETO LEGISLATIVO N°1278, que aprueba la Ley de gesti?n integral de residuos s?lidos).
- [6] Ministerio del Ambiente (2020). Inventario Nacional de Gases de Efecto Invernadero (INGEI 2014).
- [7] Fundaci?n Transitamos (2018). Informe de Observancia situaci?n del transporte urbano en Lima y Callao.
- [8] JICA (2007). Estudio de Factibilidad de Transporte Urbano para el ?rea Metropolitana de Lima y Callao.
- [9] In accordance with the WB?s Urban Bus Toolkit (<https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/UrbanBusToolkit/assets/1/1c/1c7.html>), the ratio of buses per 1,000 population would be expected to be between 0.5 and 1.2. In the case of the metropolitan area of Lima-Callao, this ratio was 1.5 (2018 data), confirming the need to reduce the fleet by replacing smaller units by bigger ones.
- [10] <https://www.uitp.org/buses-high-level-service-final-report>.
- [11] Fundaci?n Transitamos (2018). Informe de Observancia situaci?n del transporte urbano en Lima y Callao.
- [12] MINEM (2019). Balance Nacional de Energ?a 2018 and [www.iea.org/countries/peru](http://www.iea.org/countries/peru)
- [13] MINEM (2014). Plan Energ?tico Nacional 2014-2025. Documento de Trabajo.
- [14] Ministerio del Ambiente (2020). Inventario de emisiones de gases de efecto invernadero (INGEI 2014).
- [15] MINAM (2018). Informe Final del Grupo de Trabajo Multisectorial de naturaleza temporal encargado de generar informaci?n t?cnica para orientar la implementaci?n de las Contribuciones

Nacionalmente Determinadas (GTM-NDC). Available at:  
[http://www.minam.gob.pe/cambioclimatico/wpcontent/uploads/sites/127/2018/12/Informe-final-GTM-NDC\\_v17dic18.pdf](http://www.minam.gob.pe/cambioclimatico/wpcontent/uploads/sites/127/2018/12/Informe-final-GTM-NDC_v17dic18.pdf)

[16] Instituto Nacional de Estadística e Informática.

[17] IQ Air (2019). World Air Quality Report 2018.

[18] Including the recently issued (22 August 2020) Decreto Supremo N° 022-2020-EM, with regulations regarding charging infrastructure for EVs.

[19] Decreto Legislativo N° 1488.

[20] Decreto Supremo N° 091-2018-EF. This special tax (Impuesto Selectivo al Consumo) was subsequently raised in 2019 for all second-hand vehicles, including hybrid and electric ones.

[21] DECRETO LEGISLATIVO N° 1002 de promoción de la inversión para la generación de electricidad con el uso de energías renovables. Approved in 2008 and revised in 2010.

[22] 2.9% for wind and 1.5% for solar plants in 2018.

[23] Osinergmin (2019). Energías renovables: experiencia y perspectivas.

[24] IADB (2012). Elaboración de la nueva matriz energética sostenible y evaluación ambiental estratégica, como instrumentos de planificación.

[25] Arequipa is implementing its Integrated Public Transport System (Sistema Integrado de Transporte, SIT) with the support of different International Financial Institutions. A metropolitan Public Transport Authority (Autoridad de Transporte Urbano) has been established for Lima and Callao, and a Master Plan for the public transport system (Plan Maestro de Lima 2050) is under preparation.

[26] <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/global-emergence-of-electrified-small-format-mobility>

[27] <https://www.uitp.org/news/public-transport-is-covid-safe/>

[28] Resolución Ministerial N° 250-2019-DM publicando el proyecto del Decreto Supremo (DS) que declara de interés nacional y necesidad pública la promoción de vehículos eléctricos e híbridos, y facilita las condiciones para el desarrollo de la infraestructura para su abastecimiento de energía.

[29] Acciones Nacionales Adecuadas de Mitigación (NAMA) en sector de generación de energía y su uso final en el Perú.

[30] The travel budget (USD 50,000) includes 12 international trips to participate (one participant each) at 3 meetings of each of the four Working Groups @ USD 1,900, 18 regional trips to participate (2 participants each) at: the kick-off meeting, 3 regional group meetings, 2 capacitation workshops, 2

market place events and 1 replication event, @USD 1,400 and USD 2,000 for travel contingencies. All travel is subject to COVID restrictions.

[31] This activity builds upon the proposal on regulatory changes and enabling conditions delivered by the NAMA-Energy project.

[32] In particular, the Diagnostic on Clean Transport (July 2017), the Estimate of the energy efficiency of the bus fleet in Lima (2019), and the Pilot to operate an electric bus in Lima (Javier Prado corridor).

[33] Although jointly covering different seasons, so that performance in summer and winter can be compared.

[34] Such as the results on the small demonstration carried out with one e-bus in Lima, operated for some months on the ?Javier Prado? and ?Panamericano? corridors. 30 electric cars are also envisaged to be used for taxi services in Lima, within the NAMA-Energy project.

[35] UNDP Social and Environmental Standard 5, N? 2: Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions ? even in the absence of physical relocation)?

[36]

[https://www.transportenvironment.org/sites/te/files/publications/2019\\_07\\_TE\\_electric\\_cars\\_report\\_final.pdf](https://www.transportenvironment.org/sites/te/files/publications/2019_07_TE_electric_cars_report_final.pdf)

[37] Osinergmin (2019). Energías renovables: experiencia y perspectivas.

## **1b. Project Map and Coordinates**

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

Geospatial coordinates Lima: 12°03'00.0"S 77°03'00.0"W

Geospatial coordinates Arequipa: 16°24'00.0"S 77°32'00.0"W

Geospatial coordinates Arequipa: 16°24'00.0"S 77°32'00.0"W



Figure 3: Location of project sites

### 1c. Child Project?

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

The current project is hosted under the "Global Programme to Support Countries with the Shift to Electric Mobility", led by UNEP.

The Global Programme is based on the following four 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			
<div></div> Global level monitoring		<div></div> 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 up take 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.
<b>Indicator 1.1</b> # of knowledge products developed by the four thematic working groups and used by the Support and Investment platforms in their training and outreach activities	<b>Indicator 2.1</b> % of countries using services and knowledge products offered by the Support and Investment Platform	<b>Indicator 3.1</b> % of countries with an improved institutional framework and a strategy to promote the uptake of low-carbon electric mobility	<b>Indicator 4.1</b> % of countries generating and sharing best practices and other lessons learned on low-carbon electric mobility with the global programme
	<b>Indicator 2.2</b> # of e-mobility scale-up and / or replication concepts facilitated as a result of the match-making	<b>Indicator 3.2</b> % of countries with nationally generated evidence of the technical, financial and/or environmental benefits of low-carbon electric mobility	<b>Indicator 4.2</b> # of e-mobility knowledge products refined based on evidence coming from the country projects
	<b>Indicator 2.3</b> # of financial institutions / development banks (national/regional) that have been engaged through the Global Programme and are actively supporting e-mobility projects	<b>Indicator 3.3</b> % of countries that have improved preparedness to accelerate market transformation towards low-carbon electric mobility	<b>Indicator 4.3</b> # of non-e-mobility programme countries committing to actively promote the uptake of low-carbon e-mobility
	<b>Indicator 2.4</b> # of US\$ leveraged to scale-up low-carbon electric mobility through the support and investment platforms	<b>Indicator 3.4</b> % of countries with measures in place to ensure the long-term environmental sustainability of low-carbon electric mobility	

Global E-mobility Programme Monitoring Framework			
<div></div> Global level monitoring		<div></div> 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 up take 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.
<b>Indicator 1.1</b> # of knowledge products developed by the four thematic working groups and used by the Support and Investment platforms in their training and outreach activities	<b>Indicator 2.1</b> % of countries using services and knowledge products offered by the Support and Investment Platform	<b>Indicator 3.1</b> % of countries with an improved institutional framework and a strategy to promote the uptake of low-carbon electric mobility	<b>Indicator 4.1</b> % of countries generating and sharing best practices and other lessons learned on low-carbon electric mobility with the global programme
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	<b>Indicator 2.3</b> # of financial institutions / development banks (national/regional) that have been engaged through the Global Programme and are actively supporting e-mobility projects	<b>Indicator 3.3</b> % of countries that have improved preparedness to accelerate market transformation towards low-carbon electric mobility	<b>Indicator 4.3</b> # of non-e-mobility programme countries committing to actively promote the uptake of low-carbon e-mobility
	<b>Indicator 2.4</b> # of US\$ leveraged to scale-up low-carbon electric mobility through the support and investment platforms	<b>Indicator 3.4</b> % of countries with measures in place to ensure the long-term environmental sustainability of low-carbon electric mobility	

Figure 4: Indicators in the Global Programme

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 [Executing Agency name] will be requested to report against the indicators of the country Project Results Framework (Annex A) on an annual basis, during the PIR process, in addition to the usual GEF Core Indicators (mentioned at the top of the table above).

At the global level, a steering committee led by 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.

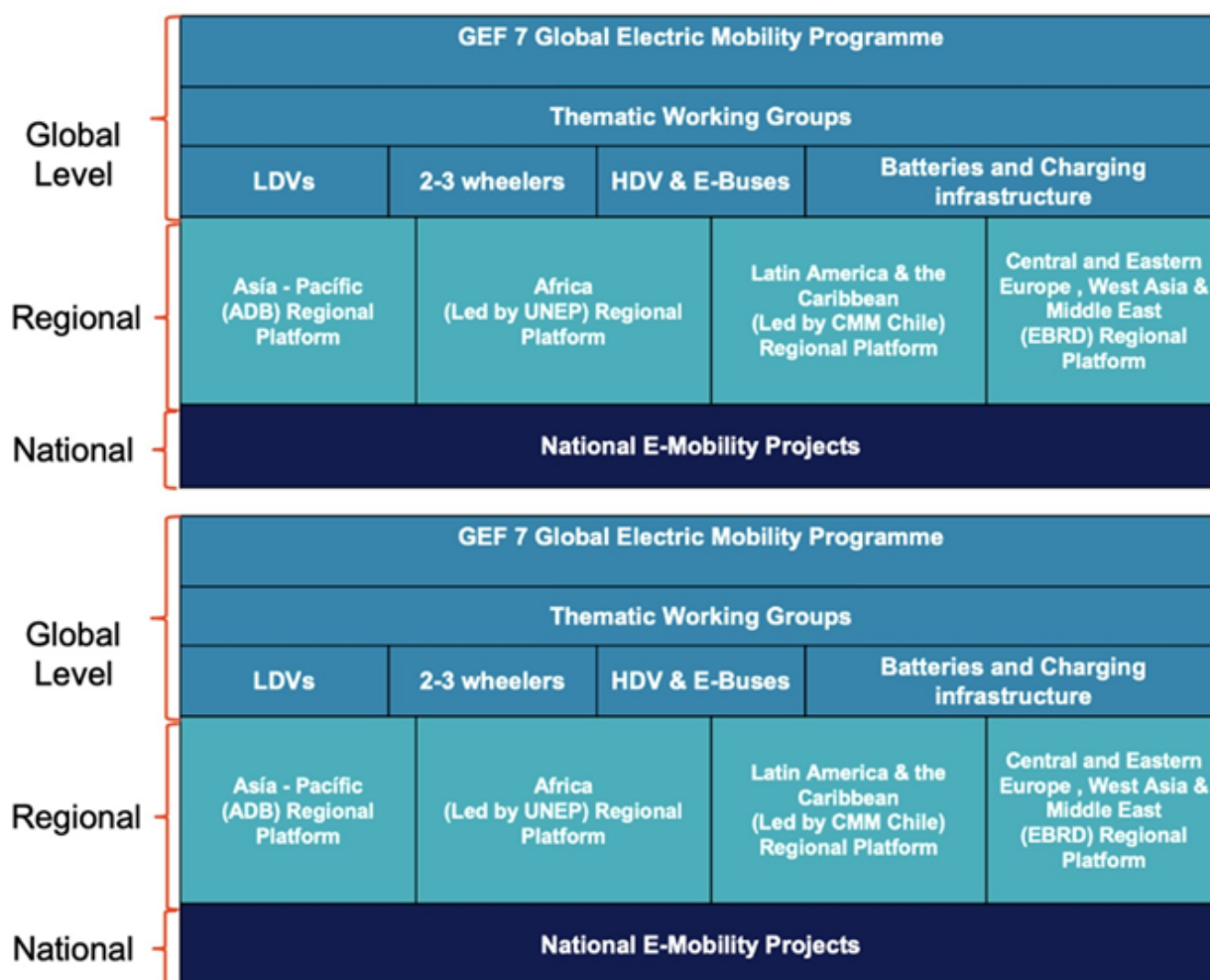


Figure 5: Governance Structure of the Global Programme

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 4 Support and Investment Platforms 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 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.

The project will exchange information and best practices with the four working groups set up by the Global Programme:

? Working group on Light Duty Vehicles (LDV). Although the project pilots do not include LDVs, the scope of the national e-mobility strategy (component 1), and the up-scaling activities to promote electrification (component 3) also cover LDVs, with a focus on large corporate and institutional fleets. The information to be exchanged refers to regulations, manufacturers' commercial strategies, vehicle performance and maintenance and driving training materials.

? Working group on Heavy Duty Vehicles (HDV) and e-buses. The information to be exchanged focuses on e-buses in urban areas, and refers to results and performance from pilots and comparison across participating countries, reaching out to PT operators and authorities, regulations, manufacturers' commercial strategies, vehicle performance and maintenance and driving training materials.

? Working group on 2&3 wheelers. The information to be exchanged focuses on 3 wheelers providing urban public transport services, and refers to results and performance from pilots and comparison across participating countries, reaching out to 3W operators and authorities, regulations, manufacturers' commercial strategies (including manufacturing opportunities in Peru), vehicle performance and maintenance and driving training materials.

? Working group on batteries and charging stations. The information to be exchanged refers to the guidance on the deployment of the charging network in Peru included in the national e-mobility strategy (component 1), and the regulation and performance of charging infrastructure, based on the pilots' results. Furthermore, the project will also exchange information with this WG on regulations on second-life battery use, and management at their end of life.

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The project plans to exchange information and interact with the regional support and investment platform in the Latin America and Caribbean (LAC) region through the following channels:

? The LAC regional platform group or community of practice, in which representatives from Peru provide general project information and will get engaged in the various working teams, with a focus on those on 3W and e-buses.

? The LAC regional platform marketplace, from which the project expects to gain understanding on global market trends and to exchange experiences on the development and implementation of financial models.

? The LAC regional platform capacitation activities, in which the project expects to exchange materials, know-how, tools and learning methodologies regarding training of decision makers (policies), transport professionals (fleet management) and staff (driving and maintenance).

? The project demonstrations (component 2) will seek support from the on-line technical support services provided by the LAC regional platform in the design, implementation, operation and evaluation of the project pilots with e-buses and 3W.

## 2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The Stakeholder Engagement Plan is included in the Project Document as Annex 8. The plan includes all relevant stakeholders: national and local government services, public transport authorities, electricity utilities, transport operators, EV providers, academia and civil society, as well as vulnerable groups. Project's stakeholders contacted during the project design and means of engagement during project preparation and project implementation are summarized in the Table below.

Stakeholder name	Stakeholder group	Means of engagement
MINAM, MINEM, MEF, MTC, PRODUCE, MVCS, FONAM,	National government	Exchange of correspondence, meetings, training courses
Municipalidad Metropolitana de Lima Municipalidad de Arequipa	Local Government	Exchange of correspondence, meetings, training courses, demonstration design supervision.
Sistema Integrado de Transporte Arequipa (SIT) Autoridad de Transporte Urbano para Lima y Callao (ATU)	Public Transport Authorities	Exchange of correspondence, meetings, training courses, demonstration design supervision.  Data collection templates and procedures
Transportes Cruz del Sur, Per? Masivo, Lima V?as Express, Transvial Lima, Per? Bus Internacional, Allin Group, Consorcio Transporte Arequipa, Consorcio Nueva Alternativa, Expreso Pr?ceres Internacional, Consorcio Empresarial Futuro Express, Consorcio Santa Catalina, COTRANSCAR, Transporte Ecol?gico Vial,	Bus operators	Exchange of correspondence, meetings, training courses, demonstration design supervision.  Data collection templates and procedures

Stakeholder name	Stakeholder group	Means of engagement
Confederaci?n Nacional de Mototaxis del Per?	3-wheeler taxi associations	Exchange of correspondence, meetings, training courses, demonstration design supervision.  Data collection templates and procedures
COFIDE, IADB, CAF,	Financial sector	Exchange of correspondence, meetings
SENATI, BYD, SINOMAQ, Modasa, DEUMAN, Mitsubishi, ABB, Laboratorio Diesel Senatinos, Euromotors, Samcorp,  	EV & charging infrastructure manufacturers, car dealers	Exchange of correspondence, meetings
Engie, CITE Energ?a, Enel, Enel X, Enel LATAM,	Electricity utilities	Exchange of correspondence, meetings
CAVI, APVEA, AEDIVE, EPEI, C?mara Peruana de Energ?as Renovables, Global Sustainable Electricity Partnership	Sectoral associations and groups	Exchange of correspondence, meetings, training activities
UTEC, Pontificia Universidad Cat?lica del Per?, Universidad Nacional de Ingenier?a,	Academia	Exchange of correspondence, meetings, training activities
Fundaci?n Transitemos, Lima C?mo Vamos, CIDATT, Global Green Growth Institute, Sustainable Earth,  Agencia Francesa de Desarrollo  Swisscontact  Agencia Suiza para la Cooperaci?n (COSUDE)  GiZ  	NGOs and civil society associations	Exchange of correspondence, meetings, training activities.
QEV Technologies, Eco Energy, Green Energy, WSP,	Consultancy firms	Exchange of correspondence, meetings, training activities

Table 3: Project's stakeholders and means of engagement

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.

The Stakeholder Engagement Plan (SEP) builds upon the interviews and workshops conducted during project preparation. All the workshops and most of the interviews took place during the two missions (November 2019 and February 2020) carried out by the international consultant. The national consultant participated in all these activities and carried out additional interviews with those stakeholders that were not available during the missions.

Meetings during the mission in November 2019 included the national government (MINAM, MINEM, MTC, MVCSS, PRODUCE, Osinergmin), the industrial sector (MODAS, QEV Tech, AEDIVE, BYD, Asociaci3n Automotriz), the Municipality of Lima, the Public Transport Authority of Lima (ATU), the electricity utilities (Engie, Enel X), and one of the bus operators in Lima (ALLIN Group). The mission included a co-design workshop focusing on the project's components and another workshop on social, environmental and gender issues.

Meetings during the mission in November 2020 focused on the national government stakeholders. Two final validation workshops were held, one focusing on social, environmental and gender safeguards and on the final validation of the project.

Outside the two missions' dates, the national consultant held bilateral meetings with financial institutions (IADB, CAF, COFIDE), and with the local stakeholders in Arequipa (municipality, public transport authority (SIT) and bus operators).

All the meetings followed a similar methodology: the MINAM representative provided an overview of the project and its consistency with the national government's policy and priorities. This was followed by a detailed presentation of those aspects of the project closer to the interests of the participants. A discussion followed, aiming at identifying co-financing opportunities and to assess the consistency of the project's approach and the prospects for the involvement of the participants.

The workshops followed UNDP's general guidance of social and environmental safeguards, including presentation of other projects in the same area and their social, environmental and gender impacts, detailed discussion on potential project's impacts and risks and discussion on mitigation measures, if relevant. Workshop participants also considered how to better integrate the results of the discussion within the project's structure and contents. The project's Social and Environmental Screening Process (SESP) was distributed among participants to validate its contents.

During the general validation workshops, the participants were distributed in different groups addressing their main shared interests and discussing those project components more relevant for them.

This was followed by a general discussion. A summary of the draft project document was distributed in advance among the participants, to facilitate the discussion.

During its implementation, the project is expected to maintain a fluid two-way dialogue with the relevant national and local government institutions and agencies, the private sector, and civil society in the country, as well as with international institutions and the countries participating in the UNEP/GEF e-mobility global programme. The SEP (Stakeholder engagement Plan) provides the framework to make it possible.

The identification of the stakeholders potentially interested in the project built upon activities in previous and on-going projects, and the knowledge of the various ministries involved in their respective areas of competence.

The engagement plan focuses on initial consultations with stakeholders since the first months and during implementation, information disclosure through public reports, website and publications, as required, and periodic reporting. Engagement activities aim at increasing the involvement of key partners (national and local government, public transport stakeholders, electricity sector) during all project activities, and particularly during the demonstrations. They also aim at providing a collaborative space for the preparation of regulatory proposals. Finally, the engagement plan will also aim at identifying vulnerable public transport users affected by the services provided by EVs, and at integrating their mobility needs during the demonstrations, and in the scaling-up and replication plans after project conclusion.

The engagement tools are based on different meetings: regular (quarterly) meetings for project implementation and *ad hoc* meetings with particular stakeholders, as project activities are deployed. The project includes training activities and awareness-raising workshops that will also facilitate the engagement of stakeholders.

Resources for stakeholder engagement activities are included within design and awareness-raising activities, as well as within the project management budget.

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

**Consulted only;**

**Member of Advisory Body; Contractor; Yes**

**Co-financier; Yes**

**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.**

The Gender Analysis and Action Plan is included in the Project Document as Annex 9. The project follows the guidance of the government's climate change policy, as established in the Gender and Climate Change Action Plan (Plan de Acci?n en G?nero y Cambio Clim?tico[1]), to integrate the gender perspective in the design and implementation of GHG emission reduction projects and programmes in the energy and transport sectors. It aims at facilitating the access of women to the know-how and job opportunities associated to EV technologies, with a focus on urban public transport services. Additionally, it aims at properly identifying differences between women and men in their urban mobility requirements (e.g. in terms of vehicle design, quality of services, security?) and integrate the lessons learned within the demonstrations, and subsequently within the guidelines for procurement of EV of urban transport.

The project activities in this area include EV training activities, in which women will be given priority for enrollment, and where gender-equality challenges will be considered in the selection of topics and trainers. They also include the design and monitoring of demonstrations, in which gender-sensitive information (EV operation and use, relevance of the assessment criteria for women and men) will be embedded.

On top of the internal governmental assessment procedures, the project will provide an assessment on how each proposed regulation improves women's access to services, create opportunities to women and promote equitable treatment. The project will also assess how the proposed regulation will increase the participation of women in the transport sector, and how it will engage women directly in decision-making.

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[1] Ministerio del Ambiente, Ministerio de la Mujer y Poblaciones Vulnerables (2016). Plan de Acci?n en G?nero y Cambio Clim?tico. Disponible en <http://www.minam.gob.pe/cambioclimatico/wp-content/uploads/sites/11/2015/12/PLAN-G%C3%A9nero-y-CC-16-de-JunioMINAM+MIMP.pdf>.

#### **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 or women Yes**

### **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**

The project is engaging the private sector in a variety of ways:

? As project beneficiary: project's activities are expected to increase demand for EV in Peru, to the benefit of vehicle manufacturers, dealers and importers interested in trading and providing maintenance services to EV. Furthermore, these stakeholders will benefit from additional supporting actions from the project, such as the development of business and financial schemes, which should be instrumental for developing their own market strategies.

? Owners of public transport fleets will benefit from the project's demonstration and other supporting actions to transition towards the progressive introduction of EVs in their own fleets.

Some private stakeholders will be particularly active as project partners providing co-financing to some project-related activities:

? Engie Energía Perú is contributing through the provision of urban and 3-wheel vehicles it plans to introduce in Peruvian cities, and which can be associated to the project pilots.

? QEY Tech Perú SAC is undertaking corporate activities and investments to promote and deploy e-mobility in Peru.

? Asociación de Emprendedores para el Desarrollo e impulso del vehículo Eléctrico en el Perú (AEDIVE). This national network of private companies and professionals interested in the promotion of e-mobility will partner with the project, further promoting e-mobility through regulations, capacity building and business models.

? National vehicle manufacturers and importers (SINOMAQ, MODASA, SENATI, WUITO, CAVI Industrial, Deuman) are actively involved in the introduction of EV in Peru, and interested in exploring the prospects for manufacturing them.

? CITE energía is engaged in the development of various technological innovations on e-mobility, as well as the related awareness raising activities, technical performance assessment, business model developments and end-of-life management.

? Private financial institutions did not participate in project preparation, as in the initial contacts undertaken with them they expressed not to be considering the development of financial instruments focusing on electro mobility in the short term. However, they expressed their interest in getting information about the project progress, particularly in what referred to the possible financial

instruments and models that the project could develop with COFIDE. Accordingly, they will be approached at a later stage during project implementation.

The private sector is also targeted by most of the capacity-building activities included in the project:

? Capacity building activities within component 1 are targeting decision makers and professionals in the public and private sector, and will focus on the technical advantages of EVs, and their growth prospects.

? Capacity building activities within component 2 will serve to increase the number of drivers and maintenance specialists in the country familiar with EV technologies. This will serve as a strong support for those private companies interested in using EVs.

? Networking activities within component 3 will provide support to the private sector in the development and sharing of business models and financial schemes.

? Capacity building activities within component 4 will facilitate the involvement of private companies in the management of EVs at their end of life, opening up new business opportunities in this sector.

Finally, the involvement of the private sector in EV policy decision making will be supported by the project:

- The private sector is expected to participate in the new E-mobility coordinating space as well as in the design of the e-mobility strategy.
- The project will support and encourage active private sector stakeholders to network in order to foster the deployment of e-mobility through its component 3.

## 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):**

The potential risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, are presented in the table below, with the proposed mitigation measures to address them at the time of project implementation. This includes environmental, social, financial, operational, political, regulatory and strategic risks. Of them, the political risk is critical, as the project intends to achieve changes in the institutional and regulatory framework that will require political will and action in a highly polarized context. Among the main risks, it is also worth pointing out the social risk associated to the achievement of the project's ambitions in facilitating access to e-mobility jobs to women and to mobilize the financial resources required by operators to get access to EVs.

The mitigation measures for the risks mentioned above (and others) build upon the already substantial experience of the Peruvian government in climate change mitigation policies in the transport area

(including the on-going NAMAS for the energy sector), the national sectoral plans on transport and energy and local plans on sustainable urban mobility. These policies are being successful in building and widening social and political consensus on sustainable mobility, with a similar approach to this project.

Furthermore, the project is including activities addressing these risks: for example, the project will prioritize women in professional training activities, and will provide financial incentives to operators interested in using EVs during the demonstrations, in cooperation with COFIDE and other financial institutions.

It is important to highlight that the project will have to face a high level of informality in the transport sector, both in buses and 3W taxis. This can lead to disloyal competition, difficulties with getting permits (both in legal and social terms) and other complex social issues.

The project risk associated to the COVID-19 pandemic has been included. The eventual implementation of lockdown and social distancing measures is expected to have a low impact on the project, as its activities can be undertaken under mobility-restricted conditions. In fact, the deterioration of economic and social conditions due to the pandemic has highlighted the critical importance of urban mobility and increased the attention of governments and key stakeholders to safe mobility. Urban mobility demand has decreased, and non-collective transport modes (walking, cycling and private transport) have been perceived as safer by many users[1]. Public transport authorities and operators have reacted by establishing safety protocols, and the critical importance for cities of safe urban public transport systems has become even more relevant, and pre-COVID PT ridership levels have recovered in many cities around the way, although not in Peru yet. The project provides additional arguments for the use of PT, as EVs reduce air pollution (also inside the vehicle) and provide a positive contribution for a safe ride, and the demonstrations are expected to include innovative protocols for a safe trip by the EVs participating in the project, but its ability to reach the expected number of beneficiaries will largely rely on the success of public transport authorities and operators to regain the trust of their customers.

Climate risk screening.

- i. Climate hazards. In accordance with the Third National Communication to UNFCCC (2016), Peru is a country with ecosystems particularly vulnerable to climate change: coastal areas, arid and semiarid areas, areas prone to drought or flooding, fragile montanious ecosystems, disaster-exposed areas and urban areas with high air pollution levels. The key climate hazards include an increase in average temperature and precipitations, and an increase in extreme weather events. Based on the 2015 National Strategy on Climate Change, Peru has developed climate scenarios and is currently completing its National Adaptation Plan.
- ii. Vulnerability and exposure. The project's vulnerability to climate change is related to the disruption in the operation of EVs due to their inability to be recharged. This vulnerability may come from (a) disruption in electricity supply or (b) lack of access or disruption of the charging infrastructure. The Third National Communication acknowledges the rise in the economic costs of climate-related electricity disruption events in Peru[2], and the potential decrease in hydro-generated electricity due to changes in climate (between 3.3% and 5% of GDP); the national energy policy is reducing this vulnerability through the expansion of renewables and distributed

generation, as well as with improvements in the integrated distribution grid[3]; the future availability of charging infrastructure relies on the adequate deployment of the network, for which the project will contribute through the preparation of the e-mobility strategy. The exposure of the project to changes in climate is low, due to the fact that the electricity network in Peru is already highly integrated, the availability of charging infrastructure is already growing, and the primary charging points for the fleets targeted by the project (3W taxis and PT buses) will be located in depots, with lower exposure to the effects of climate events.

- iii. The probability of occurrence of climate events can be rated as moderate, considering the vulnerability of Peru, and the impact of such events on the project can be rated as low, considering the likelihood of major electricity disruptions in Lima and Arequipa, the expected location of the charging stations, the availability of alternative charging ports in both cities, and the quick response capacity, through the installation of alternative charging points. This risk is accordingly rated as low.
- iv. The adaptation measures considering in the project include the preparation of the national e-mobility strategy and the study of the charging networks in Lima and Arequipa, in which the resilience of the system will be integrated; during the preparation of the pilots, contingency plans will be prepared to make it possible to recharge the EVs in case of disruption or failure of the project's charging points and to provide quick recovery of these points.

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
1	Inability to properly manage EVs (especially batteries) at their end-of-life due to weak ELV management control and insufficient regulations; aggravated if Peru allows import of 2-hand EVs with low remaining battery life.	Environmental Moderate P = 4 I = 2	Probability: High, as ELV management is not well developed, and developed countries are starting to export 2-hand EVs with low battery capacity. Impact: Low environmental hazard, as the number of EV in Peru still very low and at the beginning of their lifespan, even if some EV are imported.	New regulations developed by the project. Responsibility required from producers and importers of EVs used in the project demonstrations	MINAM

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
2	Traditional gender barriers in the transport sector remain, and women are marginalized in accessing new e-mobility jobs.	Social Substantial P = 3 I = 4	Probability: Medium: women share in transport jobs is very low, but their involvement in innovative technologies, like EVs is higher. Impact: Very high, as gender objectives might not materialize and EV technologies are likely to dominate future road transport.	Specific professional training activities are envisaged within the project, targeting women.	MTC/ MIMP
3	Higher public transport fares due to additional EV costs, jeopardizing mobility of low-income groups.	Social Substantial P = 2 I = 5	Probability: Low, as EV costs are rapidly decreasing compared to ICE vehicles Impact: Very high, as current fares are already hardly affordable to some social groups; social opposition to EVs would be likely to follow.	The project includes development of financial and fiscal measures to reduce EV costs and their impact on fares	MTC/ MIMP/Local transport authorities
4	PT operators buying EVs cannot access financing with the same conditions than for ICE vehicles	Financial Substantial P = 4 I = 4	Probability: High, as EV are more expensive and there is not much experience in the country on their lifespan. Impact: Very high, as most PT operators have low financial capacity; EVs would not be introduced very slowly in Peru.	The project develops incentives to reduce financial needs, and awareness raising activities on EV technology; financial partners are included in the project.	MEF/MEM/MINAM

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
5	Electric buses and 3-wheelers unable to cope with current operational requirements (range)	Operational Low P = 1 I = 4	Probability: Low, as EV autonomy is rapidly increasing and EV are intended to be used in the most appropriate routes and services. Impact: High, as this would reinforce prevention against EV deployment. The project would fail to demonstrate the technical feasibility of EVs.	The project is selecting well-proven EV models through a public RfQ. Project partnership include all relevant technical stakeholders.	ATU/ Local authorities
6	Charging infrastructure coverage insufficient for convenient EV rechaging	Operational Moderate P = 2 I = 4	Probability: low, as the project focuses on fleets that will recharge at depots (buses) or at owners? households (3-wheelers) with low technical requirements for charging. Impact: High, as EV would provide a more limited service. The project would fail to fully demonstrate the technical feasibility of EVs.	The project will address this within the E-mobility strategy and action plan. Electricity providers are included as partners.	MEM
7	Political instability in Peru jeopardizes the continuity of policies and the approval of regulations and policies.	Political High P = 4 I = 5	Probability: very high, as recent developments in Peru have increased political polarization. Impact: critical, as the sustainability of project results would be compromised. Adoption an implementation of regulations would fail.	The project establishes a coordination space and a national network to institutionalize and to facilitate wide political and social consensus on e-mobility	MINAM

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
8	Current concession and authorization regimes for PT and 3-wheeler taxis jeopardizes the use of more costly EVs (e.g. leasing options not accepted).	Regulatory Substantial P = 2 I = 5	Probability: Low, as PT authorities are already aware and try to encourage the use of better vehicles. Impact: Very high, as operators would be unable to use EVs. The project demonstrations would not materialize and business models could not be implemented.	The project is building upon the experience of previous pilots; PT authorities are project partners.	MTC/ATU/ Local government
9	Cheaper so-called 'clean' technologies? like CNG promoted by the government, in spite of their negative impact on GHG emissions	Strategic Moderate P = 2 I = 4	Probability: Low; although CNG (and LPG) technologies have been widely promoted in Peru, the NAMA Energy project has provided evidence on their high emissions, costs compared to benefits. Impact: High, as most stakeholders and consumers would not support a more expensive technology if CNG is presented as a 'green' option. Introduction of EVs in public transport would not materialize.	The project includes extensive activities on networking and awareness-raising. The e-mobility strategy is expected to address this challenge, establishing an adequate transitioning period.	MINAM

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
10	The deployment of clean electric 3-wheelers jeopardizes policies to replace them by conventional public transport	Strategic Moderate P = 2 I = 3	Probability: Low, as the advantages (safety, comfort) of buses are overwhelming. Impact: Low, as there are no consistent plans for replacement of 3-wheeler taxi services by regular bus services. The project would not receive support from governments to work on 3-wheelers.	The project will develop guidelines at the end of demonstrations, with PT authorities. Electric 3-wheelers will be considered as a transitional option until safer PT modes can be deployed in those districts.	MTC
11	The competition to regular public transportation by informal operators put concessions at risk of financial failure	Regulatory Low P = 3 I = 1	Probability: Medium, as regulations are not being sufficiently enforced by public authorities. Impact: Low, as the introduction of electric buses with project support is not increasing the financial burden on formal operators.	The project will monitor the pilot corridors making use of e-buses and monitor informal supply and demand, so that authorities can establish an enforcement plan.	Project team. ATU (Lima). SIT (Arequipa)



#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
12	Climate risk: More frequent extreme weather events due to climate change lead to disruptions in the electricity system and to difficulties to charge EVs; therefore, reliance on the electric grid increases the vulnerability of urban transport systems to climate change	Environmental Low P = 2 I = 1	Probability: Low, as Peru is already planning and implementing the adaptation of the electric grid to climate change (NDC, 2016). Impact: Low, as the resiliency of the electricity grid to changes in climate is similar to that of the fuel distribution system. Also, the effects of mobility constraints can be to a good extent reduced by alternative transport means or mobility demand measures, such as teleworking and teleservices.	MINAM will integrate electrification trends within its adaptation planning process for the transportation system in Peru. The project team will identify alternative charging options in case of electricity disruption in the usual charging points used by the project's EVs.	MINAM

#	Description	Risk Category	Impact & Probability	Risk Treatment / Management Measures	Risk Owner
13	The COVID pandemic affects project implementation due to lockdown and social distancing measures, and to economic downturn.	Economic/ Health Moderate P = 3 I = 3	Probability: Medium, Peru was severely hit by the pandemic in Spring 2019 and the government is actively improving its capacity of response towards new crisis. Mobility has recovered since then, although public transport ridership has not reached pre-COVID levels yet. Impact: Medium. Project activities can easily be undertaken under lockdown or social-distancing conditions; public transport authorities and operators are committed in recovering pre-COVID ridership levels, but they need to implement additional measures to provide a safe trip and regain the trust of their customers	The pandemic impact in Peru has been high until September 2020. COVID prevention policies include mobility as a key area for action, and the project will include COVID lessons learned in other countries. The following mitigation measures will be implemented If the pandemic results in continued application of lockdown and social distancing measures: Components 1, 3 and 4: Physical meetings will be replaced by virtual meetings. Online tools (such as clouds for document preparation) will be used to facilitate the development of draft policies and regulations. Travel to activities of the global programme will be held through means of ?virtual missions? if travel restrictions are established. Component 2: Instructions will be provided for the operation of the vehicles used in the pilot actions, in line with those issued by public transport authorities	Project team by end Y1

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[1] <https://www.limacomovamos.org/noticias/informe-de-encuesta-los-efectos-del-covid19-en-la-movilidad-de-lima-y-callao/>

[2] From USD 32 million in 1982-83 to USD 165 million in 1997-98 (Third National Communication, p. 171).

[3] Osinergmin (2019). Energías renovables: experiencia y perspectivas.

## **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.**

a) Roles and responsibilities of the project's governance mechanism

### Implementing Partner:

The Implementing Partner for this project is Ministry of the Environment (MINAM).

The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document.

The Implementing Partner is responsible for executing this project. Specific tasks include:

Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes and is aligned with national systems so that the data used and generated by the project supports national systems.

Risk management as outlined in this Project Document;

Procurement of goods and services, including human resources;

Financial management, including overseeing financial expenditures against project budgets;

Approving and signing the multiyear work plan;

Approving and signing the combined delivery report at the end of the year; and,

Signing the financial report or the funding authorization and certificate of expenditures.

#### Responsible Parties:

The Ministry of Environment has requested execution support services from a third party. MINAM has opened a call for proposals during PPG to select a responsible party to support in administrative and fiduciary activities during the execution period. PROFONAMPE was the responsible party selected through a procurement process undertaken by the same IP (according to its regulations and policies).

The Peruvian Trust Fund for National Parks and Protected Areas (PROFONANPE), a private sector environment fund not for profit, has been selected to provide execution support. PROFONANPE will develop support activities in the execution of the project, providing operational assistance including administrative and procurement functions for the entire project.

PROFONANPE is the most important environmental management fund at the national level, and as such it will participate in the technical committees of the project in order to identify possibilities to accelerate processes or mobilize additional co-financing resources - particularly from the private sector - that could enhance project interventions.

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#### Project stakeholders and target groups:

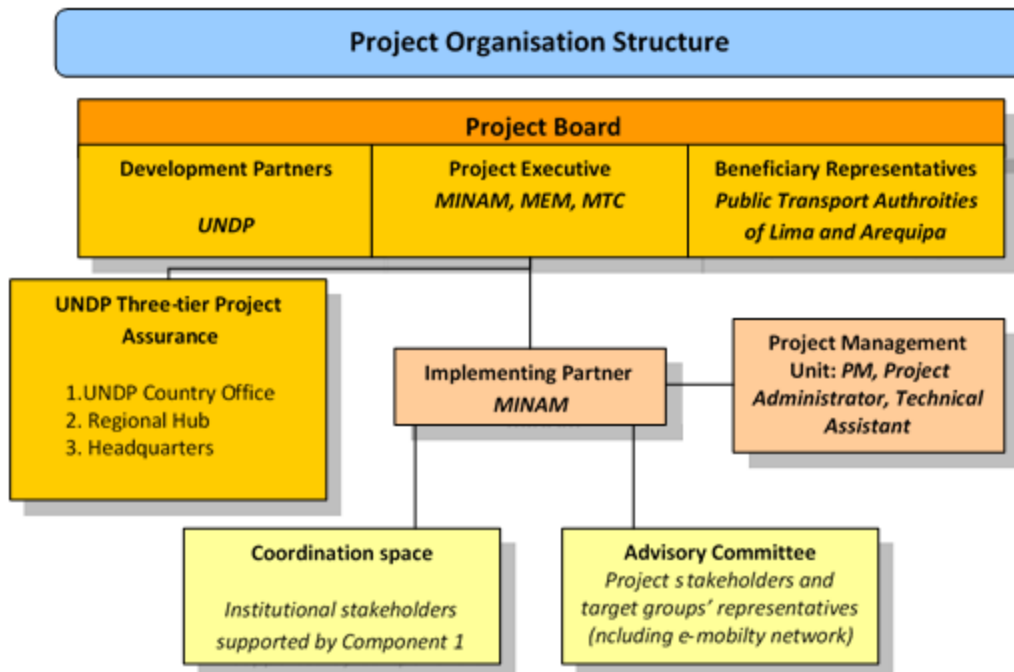
All national stakeholders will be represented and actively participate in the implementation and supervision of the project activities, and will be entitled to provide guidance to the project through their participation at the Advisory Committee. Key project stakeholders will be engaged in the project decision making processes through their participation as full members or observers in the Project Board (PB). Project consultants will be required to identify and involve the target groups and stakeholders relevant to their activity throughout their technical consultancy services. The screening of stakeholders and the engagement channels are detailed in the Stakeholder Engagement Plan (Annex 8 of ProDoc).

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#### UNDP:

UNDP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is also responsible for the Project Assurance role of the Project Board/Steering Committee.

#### b) Project organisation structure



**Project Board.** The Project Board (also called Project Steering Committee) is responsible for taking corrective action as needed to ensure the project achieves the desired results. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition.

In case consensus cannot be reached within the Board, the UNDP Resident Representative (or their designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

The Project Board will consist of representatives of the Ministry of Environment, the Ministry of Energy and Mines, the Ministry of Transport and Communications, Local transport authorities from Lima and Arequipa, and UNDP.

Specific responsibilities of the Project Board include:

- ? Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- ? Address project issues as raised by the project manager;
- ? Provide guidance on new project risks, and agree on possible mitigation and management actions to address specific risks;

- ? Advise on major and minor amendments to the project within the parameters set by UNDP-GEF;
- ? Ensure coordination between various donor and government-funded projects and programmes;
- ? Ensure coordination with various government agencies and their participation in project activities;
- ? Track and monitor co-financing for this project;
- ? Review the project progress, assess performance, and appraise the Annual Work Plan for the following year;
- ? Appraise the annual project implementation report, including the quality assessment rating report;
- ? Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;
- ? Review combined delivery reports prior to certification by the implementing partner;
- ? Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- ? Address project-level grievances;
- ? Approve the project Inception Report, Mid-term Review and Terminal Evaluation reports and corresponding management responses;
- ? Review the final project report package during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.
- ? Ensure highest levels of transparency and take all measures to avoid any real or perceived conflicts of interest.

The composition of the Project Board must include the following roles:

- a. Project Executive: Is an individual who represents ownership of the project and chairs the Project Board. The Executive is normally the national counterpart for nationally implemented projects. The Project Executive is the Director General of Environmental Quality (*Director General de Calidad Ambiental, MINAM*).
- b. Beneficiary Representative(s): Individuals or groups representing the interests of those who will ultimately benefit from the project. Their primary function within the board is to ensure the realization of project results from the perspective of project beneficiaries. The Beneficiary representatives are the Public Transport Authorities of Arequipa and Lima.
- c. Development Partner(s): Individuals or groups representing the interests of the parties concerned that provide funding and/or technical expertise to the project. The Development Partner is the UNDP Resident Representative.

- d. **Project Assurance:** UNDP performs the quality assurance and supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed, and conflict of interest issues are monitored and addressed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. UNDP provides a three ? tier oversight services involving the UNDP Country Offices and UNDP at regional and headquarters levels. Project assurance is totally independent of project execution.

**Advisory committee.** If considered necessary by the PB, the project will also be advised by stakeholders and representatives from the civil society organizations related to electro-mobility in Peru, a previous screening of suitable institutions for integrating the advisory committee has been made when requesting the co-financing support for this project. This Advisory committee should not be confused with the e-mobility network the project will support under component 3, although it can be expected that the most active members of the network will participate in the Advisory committee. While the former is intended to play a role in the governance of the project, the latter is a flexible network to facilitate the interaction among any stakeholders in Peru interested in the promotion of e-mobility. **PROFONAMPE will take part of the technical discussions in the advisory committee.**

**Coordination space.** It will primarily include national and subnational governmental institutions, and may also extend participation to the private sector, academia and civil society (which are expected to coordinate more closely under the e-mobility network established through Output 3.1). This coordination space will constitute a meeting point for the various ministries and public institutions involved in e-mobility, replacing the current non-binding discussion platforms established by each ministry related to e-mobility, which are convened by different public authorities with rigid sector divisions and which focus on partial issues: vehicle technical approval, tariffs, charging standards, fiscal incentives, among others. The coordination space will facilitate the approval of strategies, policies and regulations, and will also serve as an entry point for partnerships with non-governmental stakeholders. Two stages are envisaged: initially, the key stakeholders will be convened with support from the project to establish and agree upon a mandate and working plan for the coordination space. Once finalized, the joint working plan will be delivered to the various governmental institutions involved in the official ratification of the space, establishing the adequate structure within the government.

**Project extensions:** The UNDP Resident Representative and the UNDP-GEF Executive Coordinator must approve all project extension requests. Note that all extensions incur costs and the GEF project budget cannot be increased. A single extension may be granted on an exceptional basis and only if the following conditions are met: one extension only for a project for a maximum of six months; the project management costs during the extension period must remain within the originally approved amount, and any increase in PMC costs will be covered by non-GEF resources; the UNDP Country Office oversight costs in excess of the CO's Agency fee specified in the DOA during the extension period must be covered by non-GEF resources.

c) Coordination with other projects

The project intends to build upon the activities already initiated in Peru to promote e-mobility. Partnerships with these projects and stakeholders will allow the project to focus on implementation, bridging the gap between the on-going initiatives and the ambition to create the conditions for full-fledged deployment of EV in the Peruvian market, particularly in public transport. The following projects are currently active in the field of e-mobility in Peru, and this project has already established links with most of them during its design stage. Stakeholders participating in these projects will be invited to the inception workshop and to the e-mobility network to be set up in component 3:

? GEF/UNDP NAMA-Energy project. The project ?Peru: Nationally Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors? is expected to conclude in April 2021 and will provide relevant recommendations on regulatory changes and acceleration of EV deployment in Peru. Building upon these deliverables, the project will take the demonstrations to a new stage (EVs owned as an asset of the operators participating in Component #2) and will take forward those recommendations to government?s approval and to implementation by relevant stakeholders. Furthermore, this project will provide the adequate platform for the MRV system of the demonstrations in Arequipa and Lima. The MRV Platform developed by the NAMA project provides MRV protocols for its 12 mitigation measures, included those on electric mobility, in one centralized, integrated and automated online system[1]. This platform helps to ensure a transparent, traceable, understandable, and automated MRV process.

? COFIDE is currently working with BID in the preparation of a USD 20 million financial facility to support the electrification of bus fleets. If this facility is established, it would significantly expand the number of electric buses operating in the country during the project?s lifespan, offering an opportunity to establish a shared monitoring and evaluation system and to multiply the impact of the demonstration activities of the project. COFIDE will also contribute with its past experience in financing bus fleet renewal (COFIGAS).

? In addition, the GEF/UNEP global e-mobility programme will support the project through participation in the global working groups and networking with the other projects in the Latin America and Caribbean region (Antigua and Barbuda, Chile, Costa Rica, Grenada, Jamaica, Saint Lucia) through a regional platform. This is expected to maximize the impact of the incremental financing provided by GEFTF, through the optimization of capacity building and knowledge management activities, bundling of EV procurement, provision of generic tools for business and financial modelling, etc.

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[1] <http://sismrv.minem.gob.pe>. See also:

[https://undpgefpmis.org/attachments/4679/213487/1737554/1760682/Annex\\_12\\_Diagnostic\\_Study\\_NAMA\\_Electric\\_Transport.pdf](https://undpgefpmis.org/attachments/4679/213487/1737554/1760682/Annex_12_Diagnostic_Study_NAMA_Electric_Transport.pdf)

[https://undpgefpmis.org/attachments/4679/213487/1737554/1760682/Annex\\_22a\\_Plataforma\\_MRV\\_NAMAs.pdf](https://undpgefpmis.org/attachments/4679/213487/1737554/1760682/Annex_22a_Plataforma_MRV_NAMAs.pdf)

## **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.

Addressing the project challenges described above is consistent with national priorities as stated in the following documents:

? General national priorities are identified in the long-term planning document: Strategic Plan for National Development (Plan Estratégico de Desarrollo Nacional, PEDN), published in 2010 and with a 2021 horizon. It refers to urban mobility in relation with the improvement of air quality in cities (100% compliance with PM10 limits), and the reduction of road accidents.

? The National Environmental Policy (Política Nacional del Ambiente, 2009) includes a general call for the use of appropriate technologies for climate change mitigation, the promotion of clean technologies and the promotion of energy efficiency.

? Climate change mitigation priorities are identified in the National Climate Change Strategy (Estrategia Nacional ante el Cambio Climático, ENCC, 2015) and in the Nationally Determined Contributions (NDC), submitted by Peru to the United Nations Framework Convention on Climate Change (UNFCCC) and approved in December 2020. It envisages a reduction of emissions equivalent to 30% in relation to the projected Business as Usual scenario (BaU) in 2030, based inter alia, on electric vehicles reaching a 5% share of the total fleet by 2030 (NDC measure T8, promotion of electric vehicles (EV) at the national level), and on a national programme on sustainable urban mobility (measure T6)[1].

? The National Energy Policy (Política Energética Nacional 2010-2040) includes the development of e-mobility as one of the required actions to improve energy efficiency. This approach is also followed in the National Energy Plan (Plan Energético Nacional, 2014-2025), the Sectoral Strategic Multiannual Plan (Plan Estratégico Sectorial Multianual (PESEM) 2016-2021), and the Efficient Energy Use Master Plan (Plan Referencial del Uso Eficiente de la Energía 2009-2018): the government is developing new legislation to promote electric vehicles ( in accordance with all these plans).

? The National Plan for Competitiveness and Productivity (DS N° 237-2019-EF, Plan Nacional de Competitividad y Productividad), approved in 2019, promotes the electrification of the transport sector as a means to diversify the electricity matrix.

? The Sectoral Strategic Multiannual Plan (Plan Estratégico Multianual Sectorial (PESEM) 2018-2020) of the Ministry of Transport and Communications (MTC) includes references to government's investments in the Metro system in Lima and Callao, in the Public Transport Master Plan for the metropolitan area as well as public transport systems in other cities and traffic management systems. PESEM includes guidelines that are closely linked to the project contents, such as 'increasing the quality of the transport system' and developing 'environmentally sustainable transport systems', as well as a commitment for the promotion of clean energy in all transport modes.

? With the support of British and German cooperation, MTC has also developed the TRANSPer?-NAMA project on sustainable urban transport. Key actions included in this NAMA have subsequently been implemented, such as the legislation passed in 2019 approving the National Policy on Urban Transport [2], a National Program on Sustainable Urban Transport (Promovilidad) and an urban transport authority for the metropolitan region of Lima and Callao [3]. Similar urban transport authorities are operating or being implemented in other cities, including Arequipa, the second largest metropolitan area in Peru (Sistema Integrado de Transporte). As stated in the National Policy on Urban Transport, all these actions, aim at 'providing safe, reliable, high-quality, institutionally coordinated and socially, economically and environmentally sustainable urban transport systems', including the key areas addressed by this project (public transport, implementation of technological innovations, and institutional coordination).

The promotion of e-mobility is linked in these documents to other national priorities, such as the favourable framework provided by the very low carbon intensity of Peruvian's electricity grid[4], the industrial and economic development opportunities linked to the significant Peruvian lithium reserves, and the potential of EV manufacturing by the national industry, at least in the segments of buses and 3-wheelers. To these, it is worth adding the interest of various global players (such as BYD, ENEL and ENGIE) to introduce e-mobility in Peru, with some short pilots conducted in the last years[5].

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[1] Perú (2020). Contribuciones determinadas a nivel nacional del Perú. Reporte de actualización período 2021-2030. Available at <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Peru%20First/Reporte%20de%20Actualizaci%CC%81n%20de%20las%20NDC%20del%20Peru%CC%81.pdf>

[2] Decreto Supremo N° 012-2019-MTC, que aprueba la política nacional de transporte urbano.

[3] Programa Nacional de Transporte Urbano Sostenible (Promovilidad) established by Decreto Supremo N°027-2019-MTC. Autoridad de Transporte Urbano para Lima y Callao (ATU) established in December 2018 by Law N°30900.

[4] 412 gCO<sub>2</sub>/kWh in 2016, as calculated by MINEM.

[5] Such as the e-bus operating in Arequipa in the context of the Mining Convention (Convención Minera, septiembre 2019), the e-bus in San isidro, Lima (October-December 2018) and the on-going operation of one e-bus in Javier Prado corridor in Lima (2020).

## 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.**

Knowledge management includes all the methods, processes, and systems in the project to support the storage, analysis, and access to the knowledge created during the project. Knowledge management

activities are integrated within the project logical framework to collect and share experiences, lessons and results in a structured and user-friendly manner. It also facilitates the relations between the Peruvian child project and the global e-mob programme.

The project team will ensure extraction and dissemination of lessons learned and good practices to enable adaptive management and upscaling or replication at local and global scales. Results will be disseminated to targeted audiences through relevant information sharing platforms and networks. The project will contribute to scientific, policy-based and/or any other networks as appropriate (e.g. by providing content, and/or enabling participation of stakeholders/beneficiaries). The project will apply an open data policy, providing full access to the project's databases and reports to those interested, through the project's website whenever possible.

The knowledge management approach, integrated into the project and outlined in this section, will contribute to its overall impact, making special emphasis on lessons learned and good practices. The knowledge management activities will ensure that the knowledge generated is aligned and integrated into MINAM's, and UNDP's knowledge management systems. The capacities of some project stakeholders (particularly AEDIVE and Profonanpe) will also contribute to the knowledge management and dissemination effort.

In the case of MINAM, its contribution will be critical to facilitate replicability and up-scaling of the overall project activities. This is in accordance with the RM 349-2019-MINAM (Plan de Modernizaci?n Institucional del Ministerio del Ambiente 2020 ? 2022) and MINAM's Institutional Strategic Plan, which dictates the implementation of its Knowledge management system. Every knowledge product generated by the project will be incorporated into MINAM's knowledge management system.

The project will actively participate in the global e-mob programme's activities at the regional and global levels, channelled through its component 1. Peru will actively participate and contribute to the knowledge exchange in the regional knowledge and investment (marketplace) platform and in all the global working groups, as well as by providing insights and knowledge (monitored through indicator 5.1). A budget is reserved within component 1 for travel necessary for participation in these international activities.

The project's knowledge management approach builds upon previous UNDP projects in the GHG mitigation sector, and particularly from the recently completed project to support the implementation of NAMA in the energy sector. The approach considers four steps in the knowledge management of project's activities:

? Identification and collection of project's reports, results, lessons learnt and other experience. The focal point at the PMU for this task is the Project Technical Assistant, which participates in all the project activities with a potential to generate such materials and will actively engage with project participants to get them involved in this effort.

? Analysis and formatting of the collected material, to be integrated in the knowledge management system. The Project Technical Assistant will prepare the relevant templates at the beginning of the project and complete them for each relevant output on a quarterly basis.

? Accessibility and dissemination of knowledge materials. This is mainly provided through the project website and the project's e-mobility network (output 3.2). Some stakeholders with networking experience and capacity to reach out to a wider audience (e.g. AEDIVE, Profonanpe) are expected to actively contribute to the dissemination of the project's knowledge materials.

? Experiences in adaptive management during the implementation of the project are also targeted within project management. This includes the materials produced and lessons learned during the various participatory, deliberating and training activities envisaged in the project, as well as in along the internal administrative procedures. The Project Manager, with the support of the project administration team provided by Profonanpe, will act as focal point for this.

A summary of the knowledge management activities, timeline and budget is presented in the table below.

Activity	Timeline	Budget	Deliverables
Project Technical Assistant (PTA) collection of knowledge materials from outputs 1.1, 1.3, 1.4 and liaise with the global programme KM system	Quarterly, from M6 to M34	8,300	Content management system (templates for storing information and tracking tools for changes).
Project Technical Assistant (PTA) collection of knowledge materials from outputs 2.1, 2.2, 2.3, 2.4, 2.5	Quarterly, from M7 to M28	9,200	Databases. Analytical tools. Video or virtual conferencing. Content management system (templates for storing information and tracking tools for changes). Storytelling.
Project Technical Assistant (PTA) collection of knowledge materials from outputs 3.1, 3.2, 3.3, 3.4	Quarterly, from M18 to M29	9,000	Knowledge platform. Video or virtual conferencing.
Project Technical Assistant (PTA) collection of knowledge materials from outputs 4.1, 4.2, 4.3, 4.4	Quarterly, from M19 to M33	7,500	Content management system (templates for storing information and tracking tools for changes).
Project Technical Assistant (PTA) monitoring of KM (outputs 5.1, 5.2)	Quarterly, from M6 to M36	2,000	Database. Knowledge platform.
Profonanpe (project administration team)	Quarterly, from M6 to M42	10,500	Content management system (templates for storing information and tracking tools for changes).

Activity	Timeline	Budget	Deliverables
Management of publications and website (outputs 1.4, 2.5, 3.2)	Ongoing, from M6 until project closure	20,400	Knowledge platform. Content management system (templates for storing information and tracking tools for changes).
	<b>Total</b>	<b>66,900</b>	

**Table 4: Knowledge Management Plan**

## 9. Monitoring and Evaluation

### Describe the budgeted M and E plan

#### a) Describe the budgeted M & E plan

The project results, corresponding indicators and mid-term and end-of-project targets in the project results framework will be monitored annually and evaluated periodically during project implementation. If baseline data for some of the results indicators is not yet available, it will be collected during the first year of project implementation. The Monitoring Plan included in Annex J details the roles, responsibilities, and frequency of monitoring project results.

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. The UNDP Country Office is responsible for ensuring full compliance with all UNDP project monitoring, quality assurance, risk management, and evaluation requirements.

Additional mandatory GEF-specific M&E requirements will be undertaken in accordance with the GEF Monitoring Policy and the GEF Evaluation Policy and other relevant GEF policies. The costed M&E plan included below, and the Monitoring plan in Annex J, will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report.

<b>Monitoring and Evaluation Plan and Budget:</b>		
This M&E plan and budget provides a breakdown of costs for M&E activities to be led by the Project Management Unit during project implementation. These costs are included in Component 5 of the Results Framework and TBWP. For ease of reporting M&E costs, please include all costs reported in the M&E plan under the one technical component. The oversight and participation of the UNDP Country Office/Regional technical advisors/HQ Units are not included as these are covered by the GEF Fee.		
GEF M&E requirements	Indicative costs (US\$)	Time frame

<b>Monitoring and Evaluation Plan and Budget:</b> This M&E plan and budget provides a breakdown of costs for M&E activities to be led by the Project Management Unit during project implementation. These costs are included in Component 5 of the Results Framework and TBWP. For ease of reporting M&E costs, please include all costs reported in the M&E plan under the one technical component. The oversight and participation of the UNDP Country Office/Regional technical advisors/HQ Units are not included as these are covered by the GEF Fee.		
<b>GEF M&amp;E requirements</b>	<b>Indicative costs (US\$)</b>	<b>Time frame</b>
<b>Inception Workshop</b>	3,500	Within 60 days of CEO endorsement of this project.
<b>Inception Report</b>	None	Within 90 days of CEO endorsement of this project.
<b>Project monitoring platform development &amp; compilation of KM products</b>	20,000	Annually and at mid-point and closure.
<b>GEF Project Implementation Report (PIR)</b>	None	Annually typically between June-August
<b>Supervision missions</b>	None	Annually
<b>Monitoring of social and environmental safeguards management measures, stakeholder engagement activities and gender action plan</b>	30,800	Annually
<b>Independent Terminal Evaluation (TE)</b>	30,000	31/03/2024
<b>TOTAL indicative COST</b>	84,300	

Table 5: M&E Plan and Budget

b) Additional GEF monitoring and reporting requirements:

Inception Workshop and Report: A project inception workshop will be held within 60 days of project CEO endorsement, with the aim to:

- Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.
- Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.
- Review the results framework and monitoring plan.
- Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP and other stakeholders in project-level M&E.

- e. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.
- f. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.
- g. Plan and schedule Project Board meetings and finalize the first-year annual work plan.
- h. Formally launch the Project.

#### GEF Project Implementation Report (PIR):

The annual GEF PIR covering the reporting period July (previous year) to June (current year) will be completed for each year of project implementation. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR submitted to the GEF will be shared with the Project Board. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR.

#### GEF Core Indicators:

The GEF Core indicators included as Annex will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with TE consultants prior to required evaluation missions, so these can be used for subsequent groundtruthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF website.

#### Terminal Evaluation (TE):

An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance for GEF-financed projects available on the UNDP Evaluation Resource Center.

The evaluation will be "independent, impartial and rigorous". The evaluators that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project being evaluated.

The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the BPPS/GEF Directorate.

The final TE report and TE TOR will be publicly available in English and posted on the UNDP ERC by 31 March 2024. A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report's completion.

## Final Report:

The project's terminal GEF PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

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Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information: To accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP, Government of Peru and MINAM logos on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy and the GEF policy on public involvement.

## **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)?**

The number of direct project beneficiaries is estimated at 8,004 women and 6,038 men. These are the estimated passengers that will make use of the electric buses and 3W taxis involved in the demonstrations. Indirect project beneficiaries are estimated at 26,500 women and 26,500 men, based on the population living within the area of influence of the bus corridors which will be served by the electric buses and the population living in the districts where the 3W taxis are expected to be deployed, and considering that 5% of such population follow the itineraries provided by the project vehicles.

In terms of benefits for the local population, through the introduction and scale-up of electric vehicles in public transport over the medium- to long-term, the project will contribute to reducing air contamination due to transport related emissions and thus improving air quality for those living in Lima and Arequipa and, through scaling up, in other urban areas in the country. This has the co-benefit of improving the health of the citizens and reducing associated health care costs and possibility mortality rates, which has become even more relevant with the COVID-19 pandemic. The World Health Organization (WHO) estimates that annually, 4,239 deaths in Peru are correlated to air pollution, with ischemic heart disease as the most common cause. Furthermore, the cost of respiratory diseases caused by air pollution is estimated to be around 1,935 million USD per year. The estimated average of PM<sub>2.5</sub> concentration in Lima is among the highest in the region (28.0 µg/m<sup>3</sup> in 2018, compared to the WHO recommended limit of 10 µg/m<sup>3</sup>)[1]. Although the vehicles initially introduced by the project will be unable to impact significantly on noise abatement, the scaling up of project results has a strong potential to reduce noise pollution. Facilitating the



introduction of EVs into the public transport system may improve the quality of the service in terms of comfort by reducing noise and vibrations. It may consequently promote a modal shift from the use of private transport to the public transport system.

In terms of economic benefits, Peru is rich in renewable resources to produce electricity. The deployment of EVs in the country will reduce the needs to import oil, and will further stimulate the electricity market, and the appetite of investors in renewables, in accordance with the country's policy, as investment uncertainties are reduced in face of a growing and steady electricity demand.

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[1] IQ Air (2019). World Air Quality Report 2018.

## 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
Medium/Moderate			

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.

## Project Information

<i>Project Information</i>	
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1. Project Title	Enhancing sustainability in Electric mobility for low carbon urban transport and an Extended Producer Responsibility approach in batteries and vehicle components
2. Project Number	6384
3. Location (Global/Region/Country)	Peru

## Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
<b><i>Briefly describe in the space below how the Project mainstreams the human-rights based approach</i></b>
<p>The project accelerates the adoption of electric vehicles and the improvement of public transport services in Peru, reducing greenhouse gas emissions and improving the quality of life of citizens through better mobility conditions, air quality and a more liveable urban environment.</p> <p>The project enhances the availability, and quality of transport services for citizens, particularly for those more dependent on public transport, such as women, low-income households, children and teenagers, and the elderly. The project will facilitate authorities to implement and enforce transparent and accountable contracts for the provision of public transport services, with decision-making processes for contract awarding, which encourage the participation of civil society and the active involvement of marginalized groups in those decisions affecting them, such as public transport service provision with electric vehicles.</p> <p>Participation and inclusion of all stakeholders, including marginalized groups is embedded in project design. Implementation and monitoring are being facilitated through a co-creation approach during project design and through awareness-raising and capacity-building activities during project implementation. The project will also strengthen stakeholders' and the public's involvement in monitoring and evaluation through the provision of enhanced information and mobility data, as well as information on the actual environmental performance of the passenger transport sector and its different modes.</p>
<b><i>Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment</i></b>
<p>The project will contribute to improving the quality of life for all urban dwellers in the long-run through improved air quality as well as through provision of a safer, quieter and more affordable transportation option. A significant proportion of urban women rely on public transportation, namely buses and motorcycle taxis. The project will address issues of sexual harassment in public transportation, which is a pressing issue for women that rely on this to commute in cities. Opportunities to include and prioritize women in accessing financing for technology shift will be also explored. In addition, opportunities for women empowerment will be identified, especially in form of increased participation of women in the provision of the currently male-dominated transportation services.</p>
<b><i>Briefly describe in the space below how the Project mainstreams environmental sustainability</i></b>

Environmental sustainability is at the heart of project, that is geared towards promoting and supporting electric vehicles for the satisfactory achievement of the energy and clean air environment and development agenda in Peru. The reduction of GHG emissions nationally and air pollution especially in urban areas is a key element to mainstream environmental sustainability in Peru and in the LAC region.

The proposed project is aligned to Peru's Nationally Determined Contributions (NDC): It will contribute to enhance the ambition of the NDC measure E15 (promotion of electric vehicles, EV) at the national level, and T09 (national programme on sustainable urban mobility). The NDC is being supported by the identification of Nationally Appropriate Mitigation Actions (NAMA), including one on clean transport through the GEF/UNDP NAMA project for the Energy Sector (started in 2015 and expected to be completed in 2020). The project will help to reach the NDC objective of a 7% of share of electric vehicles in the Peruvian fleet, while supporting the sustainability of urban transport and backing the achievement of Sustainable Development Goals in cities.

The proposed initiative will contribute to a longstanding environmental sustainability impact from transport, especially significant in larger cities, such as Arequipa and Lima: Air quality, which is a problem plaguing major cities in Peru.

**Part B. Identifying and Managing Social and Environmental Risks**

<p><b>QUESTION 2: What are the Potential Social and Environmental Risks?</b></p> <p><i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 ? Risk Screening Checklist (based on any ?Yes? responses). If no risks have been identified in Attachment 1 then note ?No Risks Identified? and skip to Question 4 and Select ?Low Risk?. Questions 5 and 6 not required for Low Risk Projects.</i></p>	<p><b>QUESTION 3: What is the level of significance of the potential social and environmental risks?</b></p> <p><i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i></p>			<p><b>QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?</b></p>
<p><b>Risk Description</b></p>	<p><b>Impact and Probability (1-5)</b></p>	<p><b>Significance (Low, Moderate, High)</b></p>	<p><b>Comments</b></p>	<p><b>Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.</b></p>

<p>Risk 1: The project intends to work with 3-wheeler technology conversion in city demonstrations. 3-wheeler (3W) owners and drivers may have difficulties to understand the advantages of electrification. The sector plays a secondary role in urban mobility and could be marginalized by institutional stakeholders during project consultations and decision-making, so that the project's outcomes could negatively impact in the living conditions of 3-wheeler workers.</p>	<p>I = 3 P = 2</p>	<p>Moderate</p>	<p>3-wheeler taxis are well regulated in Peru, and provide an alternative for cheap and efficient transportation in some urban areas, and fares are approved by local authorities. The project intends to facilitate access to electrification for 3-wheeler operators, providing information, capacity building and factual evidence with 20 electric vehicles. The sector has a long tradition of dialog with local authorities to improve working conditions and fight informality.</p>	<p>The ProDoc provides a stakeholder engagement plan, in which 3-wheeler taxi representatives are included in key consultations for projects investments and activities. In order to guarantee transparency and isonomy in the financial support for technology shift, the project will guarantee a public and open call for interests for the selection of demonstrations within this category. At the project design stage, participants at the design and validation workshops suggested that 3-wheeler taxi operators participating in the pilot will decrease their operating costs, and enjoy better working conditions (less noise, no emissions, less vibrations), but this will not reduce the economic activity of the operators not adopting electric 3W, as the demand for these services will remain high. In order to prevent any unexpected impacts, a livelihood analysis will be undertaken during the project activity to design the pilots (D.2.1.2), as the concrete geographical areas in which the electric 3W will be operating are established and the operators in the demonstration area are fully identified.</p>
<p>Principle 1, No 4: Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?</p>			<p>The deployment of electrification could make fuel-based 3-wheelers less attractive to users, with a negative impact on their owners. However, this effect is likely to be very limited, as the demand for 3W services is high and the lifespan of these vehicles is short (5 years), and vehicle owners can change to the new technology when renewing their vehicles.</p>	<p>An IPP (Indigenous people plan) and FPIC (Free, prior and informed consent) are not required for the demo sites but that will be re-confirmed during the planned assessments. The SESA will include FPIC as determined appropriate and necessary for SES compliance in the course of that assessment.</p>
<p>Principle 6, no 2: Are indigenous peoples present in the Project area (including Project area of influence)?</p>			<p>The matter of indigenous people for this project is related to the principle 1 - excluding vulnerable groups in upstream activities. This</p>	
<p>Standard 5, No.2: Would the Project possibly result in economic displacement (e.g. ...)</p>				

<p>Risk 2: Potential limited participation of women in public transportation sector, as well as gender-based harassment, discrimination and violence.</p> <p>Principle 1, No.8: Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?</p> <p>Principle 2, No.2: Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?</p>	<p>I = 3</p> <p>P = 2</p>	<p>Moderate</p>	<p>The target of the proposed project is the public transportation sector which is predominantly male dominated. There is a risk that this trend might continue even after the project is implemented. Sexual harassment is also a key element for woman in the public transportation in LAC.</p>	<p>The project has developed a gender analysis and action plan to mitigate the risks of limited participation and access to opportunities. The project activities include EV training activities for drivers and others (2.4.1), where gender-equality challenges will be considered in the selection of topics and trainers and gender harassment, discrimination and violence will be addressed. The latter will also be analyzed and addressed through campaigns (2.1.3). Gender-sensitive information is embedded in the monitoring of demonstrations (EV operation and use, accessibility for women and men (2.1.2)). One of the project activities (1.2.5) is dedicated to provide an assessment on how each proposed regulation improves women's access to services, will create opportunities to women and will promote equitable treatment of women; furthermore, this activity will also assess how the proposed regulations will increase the participation of women in the transport sector, and how they will engage women directly in decision-making. Project output 3.4 provides guidelines for PT operators and authorities including recommendations for the adoption of gender-responsive measures in EV procurement, recruitment and training strategies of urban public transport operators. A budget of USD 129,000 has been allocated for gender-related actions.</p>
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<p>Risk 3: Potential environmental hazards associated with waste generated during manufacture of electric vehicle batteries as well as handling batteries that have reached their end-of-life.</p> <p>Standard 3, No.3.2: Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?</p> <p>Standard 7, No.7.2: Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?</p>	<p>I = 3</p> <p>P = 3</p>	<p>Moderate</p>	<p>Electric vehicle batteries are produced from rare earth metals some of which are not environmentally friendly. Therefore, the disposal of unrecyclable material from battery manufacturers must be handled properly.</p> <p>As GHG emissions during battery production are substantial, there is a need to extend the battery life through other uses (e.g. energy storage) once they are no longer fit to be used in vehicles.</p> <p>In addition, when batteries have reached their end-of-life, they also need proper disposal to minimize environmental impact and exposure to the society.</p>	<p>The potential environmental hazards of EV have been analyzed in the Problem Tree and Theory of Changed, at the beginning of the project design stage (and benefited from the analysis made by the global E-mob programme on this topic), identifying the need to establish adequate regulations for end-of-life battery management. These topics were discussed during the validation workshops, and resulted in the definition of 12 activities in component 4 of the project, based on the application of the Extended Producer Responsibility (EPR) principle to the management of batteries and vehicle components at their end-of-life; additionally, these activities aim at strengthening current waste management chains for electric vehicles. Regulation and guidance for second- and third-life use of batteries are also considered, so that batteries exhaust their whole lifespan before being sent to recycling processes. Component 4 also provides a strategic framework for mid and long term management of potential environmental hazards.</p> <p>The project will develop policy guidelines/regulations for re-use, collection, safe disposal/waste management and recycling of the batteries. The project will develop market mechanisms and business plans suitable to develop cooperation between vehicle importers (within an EPR approach) and third parties interested in battery reuse and recycling, while addressing the informality still present in the end-of-life vehicle (ELV) management sector.</p>
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<p>Risk 4: Potential occupational health and safety risks associated with electric vehicle repair and decommissioning of battery banks and/or vehicle.</p> <p>Standard 3, No. 3.7: Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?</p>	<p>I = 3</p> <p>P = 3</p>	<p>Moderate</p>	<p>Battery Electric Vehicles (BEVs) operate at 3-phase high voltage. Consequently, they must be maintained by properly trained technicians. As expected, most of the existing crop of vehicle repair technicians were trained at a time when electric vehicles were unheard of. Therefore, retraining will be required for the technicians involved in electric vehicle repair or decommissioning.</p>	<p>In accordance with the global e-mob programme, the problem tree and the theory of change, there is a need to provide adequate training to all the staff involved in the maintenance, repairs and decommissioning of EVs and their batteries. These topics were discussed during the validation workshops, and resulted in the definition of 3 activities in output 4.5, to provide training, technical support and an awareness raising campaign. Training activities will build the capacity of technicians to handle the repair and decommissioning of electric vehicles, and public awareness-raising campaigns will be useful to impress on the general public, who will own electric vehicles, the need for taking them to repair shops that have the appropriate equipment and training to handle such vehicles. The implementation of the Extended Producer Responsibility will provide the necessary mandates to electric vehicle dealers to take full responsibility of the EV they will commercialize, including thorough end-user awareness to avoid accidental injury due to electric shock.</p> <p>Potential risks associated to EVs will also be included within the different training activities envisaged in the project (1.4.2; 2.4.1) and in the future standards (1.3.2).</p>
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<p>Risk 5: the introduction of EVs (with higher upfront costs for operators purchasing them) could result in an increase in public transport fares, reducing the mobility of vulnerable groups or forcing them to use informal transport services. This also applies to fares of 3-wheeler taxi services.</p> <p>Standard 5, No.2: Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions ? even in the absence of physical relocation)?</p>	<p>I = 4</p> <p>P = 2</p>	<p>Moderate</p>	<p>As PT fares are already relatively high compared with purchasing power in Peru, any further raise of fares could eventually result in some low-income users looking for alternative places to live and work.</p> <p>The literature shows that e-buses? higher upfront costs are compensated with lower operational costs, and the same occurs for 3-wheelers. Furthermore, the purchase cost of electric buses and 3-wheelers is steadily decreasing worldwide.</p> <p>Public authorities? requests for fleet renewals in the past have raised similar concerns, and they have negotiated with the operators transitional conditions to attain the technological improvements without increasing fares.</p> <p>These transitional conditions need to be properly identified as a result of the project.</p>	<p>Public transport authorities have been established in most Peruvian cities to integrate PT systems and provide affordable fares. As a result of the demonstrations and through its component 2, the project will design mechanisms to compensate electric bus operators for the additional costs (which are expected to decrease in time, due to the quick global progress in battery technology) due to the new vehicles.</p> <p>Through its component 3, the project intends to develop financial models in order to facilitate the operators? access to electric buses and 3-wheelers, balancing their higher procurement costs and their lower operating costs.</p> <p>These issues have been addressed at project design, establishing a project compensation to the operators participating in the pilot to avoid a need to raise fares; the conditions will be fine-tuned in the design of the demonstrations (activity 2.1.2) and the options for upscaling will be defined during the monitoring and assessment of project demonstrations in activities 2.2.3 and 2.3.3.</p>
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	I = 4 P = 2	Moderate	<p>During the project, charging stations will be located within the premises (depots) of bus and 3-wheelers operators or at key high-accessibility places in the demonstration cities, in highly-urbanized areas.</p> <p>Charging stations are very compact in size, not requiring any significant occupation of land.</p> <p>Some EV chargers or the electricity distribution grid feeding them can be vulnerable to changes in climate. Best international practice is to identify a critical network with higher resilience to the impact of extreme weather events and other changes in climate.</p>	<p>During project design, the stakeholders discussed this risk and considered that current national legislation on environment, habitat protection and indigenous population provide the adequate framework to avert this risk. Accordingly, the project will apply a Strategic Environmental and Social Assessment (SESA) approach; as e-mobility is a new issue and the location of charging infrastructure is highly flexible, the following location criteria will be integrated: (1) identify a sufficient number of alternative locations for each charging point; (2) undertake an assessment of potential traffic generation created by the envisaged infrastructure; (3) identify the eventual needs for changes in the electricity distribution grid; (4) define mitigation measures, in case that concerns are raised from any of the relevant local stakeholders.</p> <p>Accordingly, project activities 1.2.3 (design of the future charging network in Arequipa and Lima), 1.2.6 (design of e-mobility strategy) and 1.3.2 (design of national regulations and standards to install charging infrastructure) are expected to adopt a SESA approach. As for the implementation of the charging stations for project demonstrations (activities 2.2.2 and 2.3.2) in Lima and Arequipa, they will be installed in the operators' premises, pointing out to a very low probability of impact in indigenous peoples territory and cultural heritage. FPIC are not required for the demo sites but that will be re-confirmed during the planned assessments to align to SESA requirements..</p> <p>The exposure of the project's outputs to changes in climate have been assessed during project design (see risk 1.2 in</p>
<p>Risk 6: Location of charging stations in the demonstration work, and also in the design of the networks in Lima and Arequipa, has not been decided yet and could therefore have negative impacts on habitats if not selected appropriately.</p>				
<p>Standard 1.1: Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?</p>				
<p>Standard 2.2: Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?</p>				

<p>Risk 7: Unintended (social and/or environmental) impacts of national e-mobility strategy, regulations and standards.</p> <p>Principle 1, No 4: Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?</p> <p>Principle 2, No.2: Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?</p> <p>Principle 3, Standard 1, Question 1.1: Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?</p> <p>Standard 5, No.2: Would the Project possibly result in economic</p>	<p>I = 2</p> <p>P = 2</p>	<p>Moderate</p>	<p>Policies, regulations and strategies related to e-mobility may have unintended social and environmental impacts, beyond the risks identified above. Existing legislation in Peru requires undertaking a Strategic Environmental Assessment of relevant plans, policies and regulations to prevent such unintended impacts.</p> <p>Policies, regulations and strategies are developed in project Component 1. The unintended risks screened at project design refer to (1) the new coordination space (output 1.1) not advancing the participation of affected stakeholders in policy decision-making or even establishing additional barriers to such participation; (2) the national e-mobility strategy (activity 1.2.6) and regulatory reforms (output 1.3) and the subsequent expansion of EVs not improving mobility (and associated livelihood) conditions or creating unintended impacts on habitats</p>	<p>At the design stage, the project activities that may have such unintended impacts and the interested parties have been screened during design workshops; this has resulted in the integration within several activities in component 1 of mechanisms for stakeholders? involvement, scoping processes to identify unintended impacts and evaluation and monitoring processes to be included in the design of the expected policies, strategies and regulations. These are described in the activities related to the new deliberation body (output 1.1, coordination space, activity 1.1.2), the design of the national e-mobility strategy (activity 1.2.6) and the regulatory reforms on vehicle approval, charging infrastructure and vehicle taxes (output 1.3, activities 1.3.1, 1.3.2 and 1.3.3).</p>
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	<b>QUESTION 4: What is the overall Project risk categorization?</b>			
	Select one (see <a href="#">SESP</a> for guidance)			Comments
	<i>Low Risk</i>	?		
	<i>Moderate Risk</i>	?		The Project is considered to be low-range Moderate risk as the mitigation strategies were inserted at the project design stage. The risk considered to be more substantial ? hazardous waste- is being addressed as a core component with specific budget, results and indicators embedded in project logframe.
	<i>High Risk</i>	?		
	<b>QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?</b>			
	Check all that apply			Comments
	<i>Principle 1: Human Rights</i>	?		Comprehensive Stakeholder Engagement Plan
	<i>Principle 2: Gender Equality and Women's Empowerment</i>	?		Gender Analysis and Action Plan
	<i>1. Biodiversity Conservation and Natural Resource Management</i>	?		
	<i>2. Climate Change Mitigation and Adaptation</i>	?		
	<i>3. Community Health, Safety and Working Conditions</i>	?		Extended Producer Responsibility (EPR) approach included as a component of the project.
	<i>4. Cultural Heritage</i>	?		
	<i>5. Displacement and Resettlement</i>	?		

	<b>6. Indigenous Peoples</b>	?	An IPP and FPIC are not required for the demo sites but that will be re-confirmed during the planned assessments. The SESA will include FPIC as determined appropriate and necessary for SES compliance in the course of that assessment.
	<b>7. Pollution Prevention and Resource Efficiency</b>	?	Extended Producer Responsibility (EPR) approach included as a component of the project.

### Final Sign Off

<i>Signature</i>	<i>Date</i>	<i>Description</i>
QA Assessor		UNDP staff member responsible for the Project, typically a UNDP Programme Officer. Final signature confirms they have 'checked' to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have 'cleared' the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

<b>Checklist Potential Social and Environmental <u>Risks</u></b>	
<b>Principles 1: Human Rights</b>	<b>Answer (Yes/No)</b>
1. Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2. Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [1]	No
3. Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4. Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	Yes
5. Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6. Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7. Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8. Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	Yes
<b>Principle 2: Gender Equality and Women's Empowerment</b>	
1. Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2. Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	Yes
3. Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	Yes
4. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?  <i>For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being</i>	No

<b>Principle 3: Environmental Sustainability:</b> Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below	
<b>Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management</b>	
<p>1.1 Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?</p> <p><i>For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes</i></p>	Yes
<p>1.2 Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?</p>	No
<p>1.3 Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)</p>	No
<p>1.4 Would Project activities pose risks to endangered species?</p>	No
<p>1.5 Would the Project pose a risk of introducing invasive alien species?</p>	No
<p>1.6 Does the Project involve harvesting of natural forests, plantation development, or reforestation?</p>	No
<p>1.7 Does the Project involve the production and/or harvesting of fish populations or other aquatic species?</p>	No
<p>1.8 Does the Project involve significant extraction, diversion or containment of surface or ground water?</p> <p><i>For example, construction of dams, reservoirs, river basin developments, groundwater extraction</i></p>	No
<p>1.9 Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)</p>	No
<p>1.10 Would the Project generate potential adverse transboundary or global environmental concerns?</p>	No
<p>1.11 Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area?</p> <p><i>For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.</i></p>	No
<b>Standard 2: Climate Change Mitigation and Adaptation</b>	

2.1	Will the proposed Project result in significant[2] greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	Yes
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? <i>For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding</i>	No
<b>Standard 3: Community Health, Safety and Working Conditions</b>		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	Yes
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	Yes
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
<b>Standard 4: Cultural Heritage</b>		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
<b>Standard 5: Displacement and Resettlement</b>		



5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions ? even in the absence of physical relocation)?	Yes
5.3	Is there a risk that the Project would lead to forced evictions?[3]	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
<b>Standard 6: Indigenous Peoples</b>		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	Yes
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	<p>Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)?</p> <p><i>If the answer to the screening question 6.3 is ?yes? the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.</i></p>	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
<b>Standard 7: Pollution Prevention and Resource Efficiency</b>		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No

7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	Yes
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? <i>For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol</i>	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

[1] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

[2] In regards to CO<sub>2</sub>, "significant emissions" corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

[3] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

#### Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
<b>PIMS 6384 PPG Stage SES_Dec7 final</b>	<b>CEO Endorsement ESS</b>	

**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).

The Project Results Framework can be found on page 30 of the Project Document.

<b>This project will contribute to the following Sustainable Development Goal (s): 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure), 11 (Sustainable Cities and Communities) and 13 (Climate Action).</b>				
<b>This project will contribute to the following country outcome (UNDAF/CPD, RPD, GPD): CPD Outcome 1 (Inclusive and sustainable growth and development) and Outcome 3 (Institutions and transparency)</b>				
	<b>Objective and Outcome Indicators</b>	<b>Baseline</b>	<b>Mid-term Target</b>	<b>End of Project Target</b>
<b>Project Objective:</b> <i>Reduce GHG emissions from urban transport by creating the conditions to accelerate market transformation of electric mobility in Peru</i>	<b>Mandatory Indicator 1:</b> # direct project beneficiaries disaggregated by gender (individual people)	0	1,300 women and 1000 men (1.17 million trips/year)	8,000 women and 6,000 men (7 million trips during the project)
	<b>Mandatory Indicator 2:</b> # indirect project beneficiaries disaggregated by gender (individual people)	0	26,500 women and 26,500 men beneficiaries	26,500 women and 26,500 men beneficiaries
	<b>Mandatory GEF Core Indicators 6.2:</b> Expected metric tons of CO <sub>2</sub> e avoided (at the time of measurement)	0	35,692 t CO <sub>2</sub> e	178,460 t (direct) end of life of project's vehicles 236,657 t (indirect) end of life of project's vehicles
<b>Component 1</b>	<b>Institutionalization of low-carbon electric mobility</b>			
<b>Outcome 1</b> <i>Institutional, regulatory and fiscal frameworks established for the promotion of e-mobility, with the support of all key stakeholders, including potential EV</i>	Indicator 1.1: A national coordination space to promote the uptake of low-carbon e-mobility is established and operational	No coordination space	Coordination space established	4 meetings/year
	Indicator 1.2: National e-mobility strategy launched by the government	No e-mobility strategy	Draft e-mobility strategy delivered to government, including gender analysis and action plan	E-mobility strategy launched

<i>providers and users</i>	Indicator 1.3: Regulatory and fiscal schemes to incentivize the uptake of e-mobility (technical approval of vehicles, public transport operations, electricity fares and charging stations) approved by the government	Reduced excise on some taxes	At least one draft regulatory scheme (on PT vehicles, car fleets or 3-wheelers) delivered by the project.  At least one draft fiscal scheme delivered by the project	At least one regulatory or one fiscal scheme tabled for approval by the government
	Indicator 1.4: Number of public and private decision-makers trained on legal and fiscal issues of e-mobility	0 trainees	5 women, 15 men trained	25 women, 25 men trained
<b>Outputs to achieve Outcome 1</b>	<p>Output 1.1: An intersectoral and multilevel e-mobility coordination space established, including all relevant governmental stakeholders</p> <p>Output 1.2: National e-mobility strategy submitted to the government and launched, including economic impacts (competitiveness, industrial development), geographical deployment (e.g. charging network) and environmental and social dimensions (gender-responsive).</p> <p>Output 1.3: Revised regulatory and fiscal framework for deployment of electric vehicles delivered for governmental approval.</p> <p>Output 1.4: Strengthened capacities and awareness of public and private decision-makers, technical professionals and consumers regarding e-mobility policy design and implementation, highlighting the social and environmental benefits of EV deployment).</p>			
<b>Component 2</b>	<b>Short term barrier removal through low-carbon e-mobility demonstrations</b>			
<b>Project Outcome 2</b> <i>EV demonstrations in urban public transport systems provide evidence of technical, financial and environmental sustainability to scale-up e-mobility</i>	Indicator 2.1: Number of kilometers served by the project's 4 electric buses and 20 3-wheelers per city (Lima and Arequipa)	0	Buses: 108,000 in each city at end of year 2 3W: 140,000 km in each city at end of year 2	Buses: 216,000 in each city at end of year 3 3W: 280,000 km in each city at end of year 3
	Indicator 2.2: Number of women and men receiving professional training	0	15 women and 15 men	30 women and 30 men
	Indicator 2.3: Number of EV purchases approved by PT operators in Lima and Arequipa	No purchase orders	At least 1 purchase order submitted to one operator's Board in one city	At least 1 purchase order approved in one city

<b>Outputs to achieve Outcome 2</b>	<p><b>Output 2.1:</b> E-mobility pilots in public urban transport systems designed in Lima and Arequipa, integrating gender-responsive measures</p> <p><b>Output 2.2:</b> EV pilot in Lima implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.</p> <p><b>Output 2.3:</b> EV pilot in Arequipa implemented, monitored and evaluated: two electric buses and ten 3-wheelers (indicatively) in public transport lines.</p> <p><b>Output 2.4:</b> Technical training delivered (including EV driving and maintenance)</p> <p><b>Output 2.5:</b> Evidence and best practices on EV pilot implementation communicated to key stakeholders and incorporated in e-mobility guidelines for replicability.</p>			
<b>Component 3</b>	<b>Preparing for scale-up and replication of low-carbon electric mobility</b>			
<b>Outcome 3</b> <i>Conditions established to support the inclusion of EVs in the vehicle market and to accelerate their deployment</i>	Indicator 3.1: Procurement guidelines on EV for PT	No guidelines	Draft guidelines delivered, including guidance on women's PT quality priorities	Guidelines endorsed by PT authorities and government
	Indicator 3.2: At least one financial mechanism to facilitate the scaling-up of e-mobility in public transport fleets	No financial mechanism available	Financial mechanism proposed	Financial mechanism established
	Indicator 3.3: Number of new EV registered in Peru in (public transport) fleets	1	5 buses and 20 3-wheelers	21 buses and 100 3-wheelers
<b>Outputs to achieve Outcome 3</b>	<p>Output 3.1: Assessment of e-mobility market potential in Peru carried out for the introduction of electric vehicles and electrification of road public transport systems.</p> <p>Output 3.2: E-mobility network established in Peru, including manufacturers, importers, technology and service providers, as well as public transport operators and other final users</p> <p>Output 3.3: Detailed financial and business models for EV commercialization and operation designed</p> <p>Output 3.4: EV procurement guidelines for urban public transport operators and authorities developed.</p>			
<b>Component 4</b>	<b>Long-term environmental sustainability of low-carbon electric mobility</b>			
<b>Outcome 4</b> <i>Conditions created for a circular economy perspective in the electrification of mobility in Peru with EPR</i>	Indicator 4.1: EPR-based roadmap for collection, reuse and disposal of used EV batteries	No roadmap in place	Diagnostic on ELV management completed	Roadmap endorsed by government
	Indicator 4.2: Number of women and men professionally trained on end-of-life EV management	Baseline 4.3: 0	Mid-point target 4.3: 6 women, 4 men	25 women, 15 men

<b>Outputs to achieve Outcome 4</b>	Output 4.1: Comprehensive diagnosis on national end-of-life vehicle management completed Output 4.2: Proposal on end-of-life vehicle management regulation, based on the EPR approach, delivered to the government for approval Output 4.3: Cost-efficiency analysis and business models designed for implementation of an EPR approach to ELV management Output 4.4: Roadmap for EPR approach to end-of-life vehicle management submitted to the government for approval Output 4.5: Awareness-raising and capacity-building activities completed, targeting government, consumers and private sector stakeholders on end-of-life vehicle management			
<b>Project component 5</b>	<b>Project monitoring and evaluation</b>			
<b>Outcome 5</b> <i>The project monitoring and evaluation plan is implemented</i>	Indicator 5.1: Number of reports on best practices and lessons learned on the Peru project shared by the national coordination space with the global programme	Baseline 5.1: 0	Mid-point target 5.1: 0	4 reports (corresponding to activities 2.2.3, 2.3.3, 2.5.2 and 4.3.1)
<b>Outputs to achieve Outcome 5</b>	Output 5.1: The project monitoring and evaluation plan and knowledge-management strategy are designed and implemented, providing regular reporting to the global programme Output 5.2: Best practices and lessons learnt reports developed and shared with the global programme			

#### PRF target notes:

Mandatory indicator 1: See Annex 13. Mid-term target based on the expected number of passenger trips provided in the first year of project demonstration. Final target based on a replication factor of 4 achieved through component 3 activities.

Mandatory indicator 2: See Annex 13. Final target is based on the assumption that the routes served by the vehicles in the project demonstrations could be convenient to at least 5% of the residents in the area of influence of such services. No replication factor is considered, as the additional EV resulting from component 3 activities are likely to be placed in the same areas. Therefore, the mid-term and the final targets are the same.

Mandatory indicator 3. See Annex 13. Mid-term targets assumed all demonstration EVs start operations at the beginning of year 2. Final targets assume operations continue until the end of the project and include a replication factor of 4 since year 3.

Indicator 1.1. As the coordination space brings together mainly governmental bodies, regular meetings provide effective monitoring of its activity. It is assumed that the coordination space is established by mid-term, with at least quarterly meetings. This indicator corresponds to one of the indicators necessary to report to the global programme.

Indicator 1.2. This indicator corresponds to one of the indicators necessary to report to the global programme.

Indicator 1.3. This indicator corresponds to one of the indicators necessary to report to the global programme.

Indicator 2.1. This indicator corresponds to one of the indicators necessary to report to the global programme. It assumes 54,000 km per bus and year and 14,000 km per 3W and year (see Annex 13).

Indicator 2.2. The number of women and men receiving professional training is linked to the number of electric buses and 3W expected to be operational by mid-term (demonstrations) and by the end of the project.

Indicator 3.1. This indicator corresponds to one of the indicators necessary to report to the global programme.

Indicator 3.2. This indicator corresponds to one of the indicators necessary to report to the global programme. It refers to the design and availability of financial instruments offered by financial institutions for the procurement of EVs.

Indicator 3.3. At the time of project design, there was already one e-bus providing occasional services. My mid-term, the project is expected to make 4 e-buses and 20 electric 3W operational for the demonstrations. By the end of the project, it is expected that component 3 activities will foster the procurement of 16 additional buses and 80 additional electric 3W.

Indicator 4.2. This indicator corresponds to one of the indicators necessary to report to the global programme

Indicator 5.1. This indicator corresponds to one of the indicators necessary to report to the global programme.

**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).**

Review Comments	Response
<p><b>Part I. Project information. Focal area elements.</b></p> <ul style="list-style-type: none"> <li>- Under taxonomy, please include climate change mitigation and sustainable urban systems and transport</li> <li>- The Rio Marker for Climate Change Mitigation should be 2</li> <li>- Implementation start date, end date and duration: We note that the project duration is 48 months, yet in the project reference is made to three years or 3.5 years. Further, the expected completion date is for 42 months in the future (as opposed to 48 months). Please clarify. Unfortunately, the expected implementation start date has already passed and must account for the finalization of the review process, including circulation to Council. Please change to 1 June 2021. Please address these comments and fix the dates/duration accordingly.</li> </ul>	<p>Taxonomy has been revised as requested.</p> <p>The project duration changed from 48 to 42 months during the project preparation, and it is now justified in the section presenting the changes compared to the child project as follows.: "The project duration has been reduced from 48 months to 42 months. This duration is more consistent with the project budget and available resources as well as with the scope of the project activities".</p> <p>Starting date changed to 1 July 2021. Closing date 31 Dec 2024.</p>
<p><b>Part I. Project description summary</b></p> <ul style="list-style-type: none"> <li>- Consider changing component 2's financing type to investment as this component will be focused on the demonstration pilots.</li> <li>- There is no proportionality between the co-financing allocated to PMC (1.2% of subtotal co-financing) and the GEF resources for PMC (10% of subtotal GEF grant). Please address per GEF guidelines.</li> </ul>	<p>The Component 2 financing type has been changed to "investment".</p> <p>Co-financing has been revised, in accordance with the letters? contents and checks with the partners. As a result, part of MINAM and MINEM contributions are dedicated to PMC. Additional co-financing from the new partner Profonanpe is also dedicated to PMC.</p>
<p><b>Part I. Co-financing</b></p> <ul style="list-style-type: none"> <li>- Please clarify why the co-financing from ADF and SDC was classified as in-kind when the letters identify them as grants. Please provide the exchange rate and date for the amounts listed in Table C compared to the amounts listed in the letters.</li> <li>- Please also provide the exchange rate and date for the co-financing amount from SENATI.</li> <li>- We note that the letter from WUITO lists \$88,500 in co-financing while Table C only listed \$88,000</li> </ul>	<p>ADF and SDC co-financing now identified as Grants. Exchange rates have been updated (resulting in changes in the amounts) to 20 April 2021 and are added as footnotes.</p> <p>The amount in the letter from SENATI refers to USD; the mistake in Table C has been corrected: USD 94,311 instead of USD 34,311.</p> <p>Co-financing of WUITO corrected.</p> <p>Section under table C now includes only the total investment mobilized.</p> <p>New in-kind contribution from Profomasa included.</p>



<p><b>Part I. Table E. Core indicators</b></p> <ul style="list-style-type: none"> <li>- Please fix data entry under Core Indicator 6. The amount of GHG mitigated is currently filled in under Sub-indicator 6.1 and 6.2, when it should only be under 6.2. This is causing the total at the top to appear as double the amount targeted.</li> <li>- Below the Core Indicators table, please provide a summary explanation for how the targets for GHG emissions mitigated and number of direct beneficiaries were calculated.</li> </ul>	<p>The table in the document only provides figures under the total (core indicator 6) and under indicator 6.2. It will be corrected in the system.</p> <p>Summary explanation has been added in section F (full explanation in Annex M).</p>
<p><b>Part II. Project justification. Alternative scenario</b></p>	<p>References to the Global Programme and its thematic working groups and regional platforms added in activities 1.1.2, 2.1.1, 2.2.3, 2.3.3, 2.5.2, 3.3.1, 3.3.2, 4.2.1, 4.3.1 and 4.5.1.</p> <p>Component 1. Travel budget: clarified in activity 1.1.2: "This activity also includes the coordination of the liaison with the Global E-mob Programme, in particular in what refers to the participation in the various working groups and LAC regional platform activities, and the travel expenses required". Detailed travel estimates included as a note to activity 1.1.2 description and to the budget: "The travel budget (USD 50,000) includes 12 international trips to participate (one participant each) at 3 meetings of each of the four Working Groups @ USD 1,900, 18 regional trips to participate (2 participants each) at the kick-off meeting, 3 regional group meetings, 2 capacitation workshops, 2 market place events and 1 replication event, @USD 1,400 and USD 2,000 for travel contingencies".</p> <p>Component 3. Dissemination of output 3.2 business models also targets the financial sector. This is now stated in the description of activities 3.3.1 and 3.3.2.</p> <p>Output 3.4: New text added to describe linkages with component 1: "The guidelines will take into consideration the existing national regulatory framework and its likely changes in the future (integrating the changes proposed by the project in Component 1 and those under consideration by the national government), showing their impact on the above-mentioned parameters and the comparative advantage EVs offer to urban public transport operators and authorities under the most likely regulatory scenarios". Geographic scope: the text now makes it clear that this output intends to reach all interested cities in Peru, beyond Lima and Arequipa.</p>

<p><b>Child project</b> Please add information as to the specific global thematic working groups this project will exchange information and best practices with and to the potential benefits it will get from the regional support and investment platforms.</p>	<p>Explanatory text added at the end of section 1.c. Child project.</p>
<p><b>Stakeholders</b> - As Fundacion Transitamos has been identified in Table C (co-financing) as a CSO, perhaps the selection for "Co-financier" under "role civil society will play" should also be chosen (in addition to member of advisory body; contractor). - Please include a table that outlines the key stakeholders and means of engagement, providing the specific names. We noted that the Stakeholder Engagement Plan did not provide a summary of the consultations that took place during PPG nor did it provide any specific references to stakeholders. Please clarify.</p>	<p>?Cofinancier" selection added.  Table of stakeholders and means of engagement has been included in section 2.  Summary of the consultations during PPG have been included in section 2 of the document.</p>
<p><b>Private sector engagement</b> This section clearly elaborates on key private sector stakeholders and engagement with the project. The only role that we found missing was that of financial institutions. Please add.</p>	<p>Text added: "Private financial institutions did not participate in project preparation, as in the initial contacts undertaken with them they expressed not to be considering the development of financial instruments focusing on electro mobility in the short term. However, they expressed their interest in getting information about the project progress, particularly in what referred to the possible financial instruments and models that the project could develop with COFIDE. Accordingly, they will be approached at a later stage during project implementation".</p>
<p><b>Coordination</b> Please update this section with the findings on the chosen third-party that will support the country with execution (as explained in the checklist).</p>	<p>Text added: "PROFONANPE, at the request of the executing agency - MINAM-, will develop support activities in the execution of the project, providing technical assistance and operational purchasing and procurement functions for the entire project. PROFONANPE is the most important environmental management fund at the national level, and as such it will participate in the technical committees of the project in order to identify possibilities to accelerate processes or mobilise additional co-financing resources, particularly from the private sector, that could enhance project interventions".</p>
<p><b>Consistency with national priorities</b> The project is aligned with relevant climate change, energy and transport strategies and plans. Please correct reference to latest NDC for Peru which was submitted December 2020.</p>	<p>References to NDC have been updated in the document. The information provided in the previous document was already based on the 2018 report of the group of experts which served as the basis for NDC-2020 and therefore remains valid. This is now clarified in the document.</p>
<p><b>Knowledge management</b> Please provide a more detailed KM plan including timeline, set of deliverables and associated budget.</p>	<p>The section on KM has been expanded, including a table with activities, timelines and budget.</p>

<b>Monitoring and evaluation</b> Please copy in this section the table with the M&E budget (p. 37 in ProDoc).	Table added
<b>Council comments</b> Please add relevant Council comments on the PFD and responses to this section on the Portal (check with Global Program).	There are no relevant Council comments on the PFD referring to the child project in Peru.

### **ANNEX C: Status of Utilization of Project Preparation Grant (PPG).**

**(Provide detailed funding amount of the PPG activities financing status in the table below:**

<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
<b>Project preparation grant to finalize the UNDP-GEF project document for project <i>Enhancing sustainability in e-mobility for low carbon urban transport and an Extended Producer Responsibility (EPR) approach in batteries and vehicle components</i></b>	50,000	20,503.70	29,496.30
<b>Total</b>	<b>50,000</b>	<b>20,503.70</b>	<b>29,496.30</b>

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

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

Geospatial coordinates Lima: 12°03'00.0"S 77°03'00.0"W

Geospatial coordinates Arequipa: 16°24'00.0"S 77°32'00.0"W



**ANNEX E: Project Budget Table**

Please attach a project budget table.

Expenditu	Detailed	Component (USDeq.)	Total	Responsi
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re Category	Description	Compon ent 1	Compon ent 2	Compon ent 3	Compon ent 4	Sub- Total	M& E	PMC	(USDe q.)	ble Entity
		Outcom e 1	Outcom e 2	Outcom e 3	Outcom e 4					
<b>Goods</b>	Furniture	0	0	0	0	0	0	6960	6960	MINAM
<b>Goods</b>	Publications on institutionaliz ation of e- mobility	7000	0	0	0	7000	0	0	7000	MINAM
<b>Goods</b>	Publications on project pilots	0	2250	0	0	2250	0	0	2250	MINAM
<b>Goods</b>	Publications on end-of-life vehicle management	0	0	0	1000	1000	0	0	1000	MINAM
<b>Goods</b>	Computers	0	0	0	0	0	0	5000	5000	MINAM
<b>Contractu al Services ? Company</b>	Draft e- mobility strategy, including economic, social, space and gender impacts, and gender plan	60000	0	0	0	60000	0	0	60000	MINAM
<b>Contractu al Services ? Company</b>	Design, implementatio n, monitoring and evaluation of demonstration s	0	20000	0	0	20000	200 00	0	40000	MINAM
<b>Contractu al Services ? Company</b>	Consultancy services on technical, legal and fiscal regulations of vehicles (including technical guidelines)	110000	0	0	0	11000 0	0	0	110000	MINAM
<b>Contractu al Services ? Company</b>	EV market analysis, scenario building, business models and financial schemes	0	0	130000	0	13000 0	0	0	130000	MINAM

<b>Contractual Services ? Company</b>	Organization of meetings and workshops (inception workshop)	0	0	0	0	0	3500	0	3500	MINAM
<b>Contractual Services ? Company</b>	Communication activities (knowledge management, communication plan, website management and publication of materials)	10000	20902	20000	0	50902	0	0	50902	MINAM
<b>Contractual Services ? Company</b>	Design and implementation of multimedia campaigns on harassment, discrimination and violence	0	10000	0	0	10000	0	0	10000	MINAM
<b>Contractual Services ? Company</b>	Provision of services with 2 e-buses in each city	0	578000	0	0	578000	0	0	578000	MINAM
<b>Contractual Services ? Company</b>	Provision of services with 10 electric 3-wheeler taxis in each city	0	100000	0	0	100000	0	0	100000	MINAM
<b>Contractual Services ? Company</b>	Design and implementation of a EPR approach to ELV regulations (including batteries)	0	0	0	90000	90000	0	0	90000	MINAM
<b>Contractual Services ? Company</b>	Communication and capacity building plan	20000	0	0	0	20000	0	0	20000	MINAM
<b>Contractual Services ? Company</b>	Independent financial audits	0	0	0	0	0	0	8000	8000	MINAM
<b>International Consultants</b>	Terminal evaluation	0	0	0	0	0	30000	0	30000	MINAM

<b>Salary and benefits / Staff costs</b>	Project Manager	46000	20000	32000	20400	11840 0	268 00	2280 0	168000	MINAM
<b>Salary and benefits / Staff costs</b>	Project Administrator	0	0	0	0	0	0	9500 0	95000	MINAM
<b>Salary and benefits / Staff costs</b>	Technical assistant	16600	18400	18000	15000	68000	400 0	0	72000	MINAM
<b>Trainings, Workshops, Meetings</b>	Organization of meetings and workshops	24500	0	0	0	24500	0	0	24500	MINAM
<b>Trainings, Workshops, Meetings</b>	Workshops and training in e-mobility	63000	0	0	0	63000	0	0	63000	MINAM
<b>Trainings, Workshops, Meetings</b>	Professional and technical training on electric vehicles	0	20250	0	0	20250	0	0	20250	MINAM
<b>Trainings, Workshops, Meetings</b>	Professional training on ELV management of EVs and their batteries	0	0	0	9000	9000	0	0	9000	MINAM
<b>Travel</b>	Travel to attend working groups and workshops of the global e-mob programme	50000	0	0	0	50000	0	0	50000	MINAM
<b>Travel</b>	Travel for meetings in Lima	0	3000	0	0	3000	0	0	3000	MINAM
<b>Travel</b>	Travel for meetings in Arequipa	0	3000	0	0	3000	0	0	3000	MINAM
<b>Office Supplies</b>	Office supplies	0	0	0	0	0	0	8750	8750	MINAM
<b>Other Operating Costs</b>	Office operations	0	0	0	0	0	0	1575 0	15750	MINAM
<b>Grand Total</b>		<b>407100</b>	<b>795802</b>	<b>200000</b>	<b>135400</b>	<b>15383 02</b>	<b>843 00</b>	<b>1622 60</b>	<b>178486 2</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.

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

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (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 reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**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 reflows. 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).