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GEF-7 CHILD PROJECT CONCEPT

Child Project Title: Global project to support countries with the shift to electric mobility

GEF Agency: UN Environment
GEF Agencies: The Asian Development Bank

Total Project Cost: GEF Grant – USD 3,202,500; Cofinancing: USD 30,405,000 (inc. PPG for USD 50,000)

PROJECT DESCRIPTION

1. Country Context

Globally, a key environmental challenge comes from the transport sector. This sector is currently responsible for approximately one quarter of energy-related greenhouse gas (GHG) emissions. And this is set to grow to one-third by 2050. The transport sector also generates significant short-lived climate pollutants, such as NOx, SOx, PM and CO, and especially black carbon. The root cause of these environmental problems is the domination of fossil-fuel driven internal combustion engines in the transport section globally, as these engines emit greenhouse gases (GHGs) and short-lived climate pollutants. To address these environmental problems, the transport sector needs to be decarbonized.

Without interventions, this environmental challenge will increase in severity. In an IEA baseline scenario, the number of vehicles will double to 4.5 billion by 2060. Over 2 billion new vehicles will be introduced, primarily in non-OECD countries. Despite a significant shift to electric 2-3 wheelers, 80% of the other modes (light-duty vehicles, trucks and buses) will still be conventional internal combustion engine vehicles. This will lead to road transport energy use and CO₂ emissions growing by an estimated 50% between 2015 and 2060. Most of this growth is projected to come from low- and middle-income economies, where transport-related CO₂ emissions would double until 2060.

The strategic positioning of the global community to address this environmental challenge is clear. In 2018, the Intergovernmental Panel on Climate Change stated that to achieve a target of 1.5°C, all vehicles added to the global fleet would need to be electric from 2035 onwards. It further noted that the complete global fleet would need to be electric by 2050. In March 2019, the United Nations Environment Assembly adopted the first ever UN sustainable mobility resolution. This calls on all countries to switch to sustainable mobility, including electric mobility. Furthermore, at the UNFCCC COP21, a group of major countries adopted the Paris Declaration on Electro-mobility and Climate Change, which calls for 100 million electric cars and 400 million electric 2-3 wheelers by 2030.

In this context, it is important to note that the world has now started this shift to zero-emission electric mobility. A rapid development of technology and falling battery prices have seen the global fleet of electric vehicles double in size every 18 months. Countries such as China, the United States, Japan, Norway, Sweden, Finland, Germany and France, amongst others, have implemented policy frameworks to stimulate national transitions to electric mobility transport sectors. However, with most transport growth due to come from non-OECD countries, there is therefore an urgent need to put programs and policies in
place that will ensure that vehicle growth in these countries is through the use of zero-emission vehicles (combined with a shift from individual car use to active and public transport).

The implementation of such policies and measures in low- and medium-income countries, combined with increasing efforts in OECD countries, would facilitate and accelerate a global transformation to a zero-emission transport sector. Such efforts are needed if the global community is to achieve the goals of the Paris Agreement.

2. Project Overview and Approach

(a). Description of the geographical target(s), including details of systemic challenges, and the specific environmental threats and associated drivers that must be addressed;

Geographical target
The geographic target is low- and middle-income countries in Africa, Asia and Pacific and Latin America and the Caribbean.\(^1\) Participating countries are those which, inter alia, prioritize the decarbonization of their transport sector and have significant GHG emissions in this sector (see figure 1).

![Figure 1. Country coverage of the GEF Global electric mobility programme and the EC Solutions Plus Programme](image)

List of Child Projects: Antigua and Barbuda, Armenia, Burundi, Chile, Costa Rica, India, Ivory Coast, Jamaica, Madagascar, Maldives, Peru, Seychelles, Sierra Leone, St. Lucia, Togo, Ukraine and Uzbekistan

List of EC cities where demonstrations will take place: These 8 cities are Quito (Ecuador), Montevideo (Uruguay), Dar Es Salaam (Tanzania), Kigali (Rwanda), Kathmandu (Nepal), Pasig City (Philippines), Nanjing (China) and Madrid (Spain).

\(^1\) See the GEF-7 program framework document for a list of the countries.
Systemic challenges and specific environmental threats
As noted in the response to question one, the key systemic challenge that these countries face in their transport sectors is their high dependence on fossil fuels for the provision of energy. In this sector, the domination of internal combustion engine cars, trucks and buses, and their ever-increasing numbers, has led to significant and growing GHG, NOx and PM emissions. Such emissions are resulting in specific environmental threats to climate change (from GHG emissions) and air quality (from NOx and PM emissions, with the consequent impacts on public health).

Associated drivers
The key associated driver of the on-going reliance on internal combustion engine transport is the current inexistence of socially and economically viable alternatives to fossil fuel road transport. There are several barriers to the broad adoption of low-emission transport. The key barrier is the higher price of plug-in hybrid and electric vehicles compared to conventional vehicles, combined with a lack of investment in charging infrastructure. Additional barriers are:

- Lack of information/awareness. Consumers, policy-makers and vehicle manufacturers are not fully aware of the environmental and economic benefits related to electric mobility;
- Policy and planning challenges. Many low- and middle-income countries have no dedicated fiscal or regulatory policies in place to incentivize the uptake of electric vehicles;
- Limited institutional capacity. Decision-makers lack the capacity to develop national electric mobility projects and policies;
- Charging infrastructure and range anxiety. Range, combined with a lack of recharging infrastructure, are sometimes conceived as barriers to uptake.

(b) Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;

Baseline Investments

<table>
<thead>
<tr>
<th>Agency/initiative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Nations Environment Programme</td>
<td>Electric mobility programme which supports low- and middle-income countries with the introduction of electric mobility policies and pilots on electric 2-3 wheelers, buses, light-duty vehicles and normative activities.</td>
</tr>
<tr>
<td>International Energy Agency (IEA)</td>
<td>The Electric Vehicles Initiative, including the EV30@30 Campaign and the Global EV Pilot City Programme; the electric mobility and system integration workstream; and the Technology Collaboration Programmes.</td>
</tr>
<tr>
<td>EC SOLUTIONS Urban Electric Mobility Initiative (UEMI)</td>
<td>Focuses on sustainable urban development, energy, mobility, and equal access provision of urban basic services in Latin America, Asia and Africa.</td>
</tr>
<tr>
<td>Global Fuel Economy Initiative (GFEI)</td>
<td>Global programme to improve the fuel efficiency of the global vehicle fleet.</td>
</tr>
<tr>
<td>ADB</td>
<td>Sustainable Transport Initiative (STI) technical assistance to 18 countries in the region, and USD 2-3 billion transport-related investments.</td>
</tr>
<tr>
<td>EBRD</td>
<td>EBRD is active in promoting e-mobility investment projects in its countries of operation and has ongoing electric mobility projects in a number of its countries of operation (4 countries at present), with current business volumes in</td>
</tr>
</tbody>
</table>
the order of €50 million a year on electric vehicle related projects.

<table>
<thead>
<tr>
<th>UNDP</th>
<th>Supporting several GEF-supported electric vehicles projects in Bhutan, Malaysia, Philippines, Nepal, Mongolia, Lao, China, Peru and Uruguay.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEF</td>
<td>Transport-related projects in Nepal, Mongolia, Georgia, Vietnam, China and Peru.</td>
</tr>
</tbody>
</table>

**Stakeholder Engagement**
A wide range of stakeholders will be consulted in the project design and involved in project implementation. These include IEA EVI members and partners, GEF implementing agencies, and other leaders, partners and coordinators of initiatives on fuel efficiency improvements and electric mobility from the private sector, academia and civil society. The global programme will also engage fleet manufacturers and financiers in the development and design of business models that reduce the high upfront costs of EV fleets. In addition, development banks and other financiers will be engaged to support governments in scaling up the procurement of EV fleets.

**Gender**
Gender-sensitive policy design and implementation is essential for the successful transition to a low-emission transport sector. The programme will explore options to integrate gender considerations into mobility and work with policy-makers in designing gender-responsive policies and solutions for electric mobility. Gender Action Plans will be developed as part of the child projects to ensure that the development of EV policies considers the mobility needs and characteristics of women and men, as well as boys and girls. The plans will also evaluate the role of electric mobility in supporting women’s empowerment and girl’s education by providing access to safe, affordable and reliable transport. The global project will seek to collaborate with the IEA Clean Energy Education and Empowerment Technology Collaboration Programme.

**c) Describe how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits;**

This Global Child project will support the rapid introduction of electric mobility in GEF recipient countries. It will undertake activities at the global, regional building on a solid basis of knowledge and outreach capacity developed by the leading electric mobility programmes of the International Energy Agency and the United Nations Environment Programme (with partners).

The overall objective of the project is to contribute to the implementation of the Paris Climate Agreement by contributing to the levels of electric mobility necessary to achieve emission reductions from the transport sector, in child project and other countries of the electric mobility programme.

The global child project will generate best practice and guidance from countries that have advanced e mobility market uptake and disseminate this knowledge to three support and investment platform. The platforms will host country dialogue, training and other related events with child project and other countries to promote demonstration, policy best practice, build in-country capacity and institutions and promote investment in the e mobility market place.

Experiences generated from the programme will help to refine guidance and training materials and help to generate interest in neighbouring countries in more actively promoting e mobility uptake at home.
Interest of the private sector to provide electric mobility solutions in non-OECD countries has been limited up to now. However, the market on non-OECD countries is changing rapidly because of several reasons: growing vehicle fleets in non-OECD countries; increasing concerns about air quality and climate problems; increasing availability of locally produced renewable electricity (versus expensive imported foreign oil); and local initiatives for manufacturing and/or assembling electric vehicles (especially 2& 3 wheelers).

The global child project aims to create markets – where demand from countries and cities to introduce, or upscale, electric mobility is met with supply from manufacturers and financing. They will be involved in the global working groups to develop solutions for the introduction and upscaling of electric mobility in non-OECD countries. At regional level the support and investment platforms will involve the private sector and will provide them with a market place bringing together cities and countries in a (sub)region. The project will facilitate the connection between child projects and suppliers. Finally, the project will support local manufacture and assembly of electric vehicles, to create green jobs within the project countries and regions. The following are examples of the involvement of the private sector in this global child project.

### Africa
- **Ampersand**: This is a startup company in Rwanda that is developing electric motorcycles for use as taxi motorcycles in East Africa. They are now testing prototypes in Kigali.
- **EkoRent/Nopia**: EkoRent is a Finnish startup with presence in Kenya that is providing electric vehicle rental and ride sharing services. Electric taxis are charged off of solar power. They are planning wide roll out of electric taxi fleets in different African countries.
- **Solar E-Cycles Kenya Limited**: A start-up based in Kenya, with also operations in Madagascar and Morocco, and working closely with the Strathmore University Business School Energy Research Center to produce solar electric 3 wheel cargo tri-cycles.

### Asia & Pacific
- **Honda**: is supporting an electric two-wheeler project in Vietnam and has donated a fleet of electric scooters. Are interested to support further demonstration projects in South East Asia.
- **Build your Dreams (BYD)**: signed an MOU with UNEP and are in contact with several countries and cities for the introduction of electric busses. They will join the programme.
- **TailG**: is one of the largest electric motorcycles producers (Chinese). They are offering to donate e-motorcycles to various projects in Asia and Africa, are keen to join the programme, and recently signed an MOU with UNEP.

### Latin America & Caribbean
- **Chile**: has the largest electric bus fleet outside of China. BYD, Yutong and Hyundai delivered electric busses to Chile and are part of a programme to fully electrify public transport by 2040.
- **EnelX and Engie**: are electricity providers that are keen to be part of the GEF7 electric mobility programme in Peru.
- **GrupoICE**: in Costa Rica have committed to install 17 charging stations (USD 850,000) as part of the “Leapfrogging to E-busses in Costa Rica” project.

The IEA is working closely with a large group of private sector partners in the Electric Vehicles Initiative (EVI). UNEP works with many local and global manufacturers in the electric mobility projects it is already involved in. And the EC Solutions plus programme will include a large set of European companies. The private sector partners in all three these initiatives will be involved in, and integrated in, the activities of...
the GEF7 programme. Already many of them have expressed a keen interest to join the programme in some or all of its components.

**d) Describe the project’s incremental reasoning for GEF financing under the program, including the results framework and components.**

The Global Child project’s overall objective is to contribute to reaching the levels of electric mobility necessary to significantly reduce emissions in the transport sector in GEF recipient and other countries while minimizing adverse effects for the sustainability of transport and energy systems.

The Global child project will provide an integrated approach to child project and other countries to help them develop electric mobility policies, institutions, capacity, early experiences and promote investment in the sector. Global Child project knowledge product will target deployment barriers such as high vehicle price and low range, and the lack of relevant infrastructure will be targeted. A central platform to generate and refine knowledge products and regional platform for engage countries in the use of these knowledge products will maximise economies-of-scale, is cost effective and will help to avoid duplication and will allow for more comprehensive learning experiences and generation of good practices.

There complementary components are proposed to achieve the project’s objective:

1. **Global thematic working groups**: Four thematic working groups: Light-duty vehicles (two and three wheelers and cars); Heavy-duty vehicles (buses and trucks); Charging infrastructure, grid, system and power market integration; and Batteries, will gather information from a mix of stakeholders to develop knowledge products and policy materials support child project and other countries.

   The thematic working groups will meet twice per year. Members will include representatives from international organisations, academia, independent experts, the private sector, civil society, and governments. While country and city projects of the GEF and EC Solution Plus will also be invited to participate in the thematic working groups (where relevant), the actual dissemination of the products of the working groups to the country and city projects will take place through technical support, capacity building and training activities that will be organised by the Support and Investment Platforms.

   A selection of interested child project countries will be asked to join the thematic working groups to contribute their experiences and help shape the guidance materials to ensure they are relevant for recipient countries. They will also be able to benefit from peer to peer exchange with other countries in a similar or more advanced state of e mobility transformation than themselves. For this the program will ask them to finance their travel and DSA from their own child project. We estimate the costs of this will amount to a little more than USD 120,000.

2. **Regional Support and Investment Platforms**: will support market expansion and investment in electric mobility in Africa (led by UN Environment); Asia & the Pacific (led by Asian Development Bank); and Latin America & Caribbean (led by the Marion Molina Center). The platforms have the following main functions:
   - Technical support – support the development and implementation of the GEF & EC Solutions Plus country and city projects;
   - Networks and communities of practice – build networks and communities of practice to promote electric mobility and share experiences;
   - Investment marketplace – bring together demand from countries and cities with supply from the private sector/ suppliers and financiers, at regional and sub-regional levels;
• Training and capacity building, including helpdesk – organise training sessions around specific electric mobility modes and technologies at regional and sub-regional levels;
• Information dissemination from global working groups – disseminate the knowledge and tools developed by the four thematic global working groups to the city and country projects in the region;
• Replication – promote replication of lessons learned in the GEF and EC Solutions Plus projects to other countries and cities in the regions to promote wider impacts of the GEF and EC programs.

The Platforms will provide the support to approximately 30 in-country projects between GEF (STAR) and projects supported by the EC Solutions Plus project. In addition, the platforms will be open for the participation by other countries and cities with an interest in introducing and scaling-up electric mobility. Such countries and cities could participate in training, networking and replication activities of the platforms at their own expense. The Platforms would also invite projects under the GEF Sustainable Cities Impact Programme, which incorporate components on electric mobility, to join in the work of the Platforms, including training, capacity building and communities of practice.

As an initial estimate, the regional platforms will host two events annually and invite three participants from each child project country. Each country will be asked to cover their travel and living costs for all events from their own child project. These costs are estimated at around USD 740,000. Other countries will also be welcome to join the events from EC solutions plus, and countries engaged with the regional platform hosts on electric mobility through their regular business.

3. **Tracking progress and facilitating replication:** Projects and electric mobility markets will be tracked, and key developments, best practices and other lessons learned shared, to promote wider uptake of electric mobility.

*Monitoring:* The component will develop a monitoring, reporting and verification framework against which the outcomes of the programme will be measured, during implementation and afterwards, enabling the quantification of greenhouse gas and air pollutant emission reductions and resultant benefits stemming from the electrification of various modes of motorized transport.

*Awareness raising:* Under this component UNEP and IEA will track key developments, outcomes and project progress of GEF child projects and distribute these through a global programme website, flyers, presentations, webinars and through global meetings to national governments, industry stakeholders and beyond. The website will be maintained after the life of the project as distinct GEF products either on the IEA or UN Environment website. The component builds on monitoring and tracking work the IEA is already undertaking through their EVI project and through the analysis developed every year in the Global EV Outlook publication series. This component will support an extension of the Global EV Outlook to target countries in the GEF and EC Solutions Plus programmes, beyond the current scope of the publication.

Global Programme Launch and closure meetings: This meeting will involve all GEF and EC Solutions Plus in-country projects and all major partners involved in the two programs, including civil society and private sector partners. A second global meeting will be organised at the end of the project where results are presented and replication and sustainability (i.e. continuation after projects have ended) will be discussed. Both meetings will also present the global programme (and in the second meeting: its results) to the outside, including to the media.
Child project countries will be expected to finance the costs to track their own progress and report annually to the IEA; capture lessons learned and experiences with project materials and e mobility uptake. As part of this they will be expected to track emissions reductions from their projects and conduct country assessments on their e mobility markets to establish a baseline and track market uptake. These costs have been estimated at USD 370,000.

3. Engagement with the Global / Regional Framework

Describe how the project will align with the global / regional framework for the program to foster knowledge sharing, learning, and synthesis of experiences. How will the proposed approach scale-up from the local and national level to maximize engagement by all relevant stakeholders and/or actors?

The project will reduce 7.5 million tonnes in indirect CO₂ emissions in pursuit of CCM 1-2 Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. These emissions will be generated from the EC Solutions plus project, since all GEF country child projects already account for their own emissions reductions.

The knowledge and policy materials generated by the global thematic working groups will be disseminated to the child projects and beyond through dedicated training events and direct technical support by the Support and Investment Platforms. These trainings will take place at least twice over the course of the programme in each region. Further workshops and trainings may also be organized upon request of the child projects. Two global conferences are proposed to be organized to bring together all stakeholders of the programme, including the country child projects, in collaboration with the EC Solutions Plus project.

Furthermore, the regional Support and Investment Platforms will collect best practices and tools and disseminate these among the countries in the regions. Building communities of practice at regional and sub-regional levels will encourage cities and countries to share their experiences, practices and approaches. These platforms will also facilitate the transfer of knowledge generated in the thematic working groups to the country level.

The knowledge products leveraged through the global thematic working groups will also be made accessible through a digital platform. This platform will be continuously fed with content created from the various activities and knowledge products and from the experiences gathered through the Support and Investment Platforms. Finally, child-project countries will have continuous remote access to experts – through helpdesks to be set up in each regional Platform –, and peers, so that they can access informal and targeted support to progress their electric mobility projects.

The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the programme and will ensure the effective use of funds, both at the country as well as at the global level.
Antigua and Barbuda

Child Project Title: Antigua and Barbuda Sustainable Low- Emissions Island Mobility Project

GEF Agency: UN Environment
Total Project Cost: USD 3,245,000; CoFinancing: USD 9,735,000 (Inc. PPG USD 20,000)

PROJECT DESCRIPTION

1. Country Context

One of Antigua and Barbuda’s key environmental challenges is related to its high dependence on fossil fuels in the transport sector. The country is almost entirely dependent on imported fossil fuels for energy supply, with close to 98% of the country’s energy demand being met by petroleum fuel. The transport sector accounted for around 30% (USD $49 million) of these total imports. Power generation is dependent on the operation of diesel generators which result in expensive and high carbon grid power (1kgCO2 per kWh) and electricity. 2018 electricity prices were as high as USD $0.40 per kWh.

The transport sector’s dependence on fossil fuels has led to a key environmental challenge from transport-derived greenhouse gas (GHG) emissions and air pollution. These consequently impact negatively on public health. Road transport represents 29% of energy-related GHG emissions. Private vehicles dominate the fleet (72%) and the country is experiencing rapid motorization with an estimated 50,000 more cars by 2030. The public bus fleet accounts for almost a quarter of transport GHG emissions and over half of NOx and particulate matter emissions (PM), despite making up only 4% of the vehicle fleet.

Antigua and Barbuda’s strategic positioning to address this environmental challenge and facilitate a systemic transformation to a low-carbon and climate-resilient transport system is initiated from the highest level of governmental policy. In the Copenhagen Accord, the country pledged to reduce its GHG emissions by 25% in 2020 based on 1990 emissions levels. As part of its nationally determined contribution (NDC), it signaled that transportation is a key area in which it will reduce its GHG emissions. In its NDC the government also designated the establishment by 2020 of efficiency standards for the importation of all vehicles and appliances. Furthermore, the government has established the Renewable Energy Act of 2015 and an NDC conditional mitigation target of an energy matrix with 50 megawatts (MW) of renewable capacity by 2030. These lay the ground and regulatory steps toward diversifying the country’s energy supply through investment in renewables. Antigua and Barbuda is rich in renewable sources of energy. A recent study estimated that up to 400 MW of wind power could be deployed on the islands. So far, 3.8 MW of solar capacity have already been deployed, with plans to expand to 10 MW.
In the transport sector, the government has eliminated all duties on electric vehicles (EVs) and has developed a Low Emissions Development Strategy for the Transport Sector which prioritizes the introduction of EVs. However, the old age of the vehicle fleet is in part driven by the lack of vehicle efficiency standards and enforcement of standards for imported vehicles. Bringing all the above together, the country’s strategic positioning is aligned with an approach that will foster impactful outcomes with global environmental benefits. Through the above policies and targets, the country will accelerate its transformation to a low-carbon and climate-resilient transport and energy system. This will serve as an important example for other small-island developing states.

2. Project Overview and Approach

Geographical Target
Antigua and Barbuda are a twin-island state located in the eastern arc of the Leeward Islands of the Lesser Antilles. The demonstration project will take place on the island of Antigua.

Systemic challenges and specific environmental threats
As noted in the response to question 1, the key systemic challenge that the country faces is its high dependence on fossil fuels for the provision of energy, including transport. In the transport sector, the domination of internal combustion engine cars, trucks and buses, and the ever-increasing numbers of such vehicles (50,000 more cars by 2030), has led to significant and growing transport-derived GHG, NOx and PM emissions. Such emissions are resulting in specific environmental threats to climate change (from GHG emissions) and air contamination (with its consequent impacts on the levels of public health).

Associated drivers
The key driver of the on-going reliance on internal combustion engine transport is the current inexistence of socially and economically viable alternatives to fossil fuel road transport. There are several barriers to the broad adoption of low-emission and climate resilient transport. The key barrier is the higher price of plug-in hybrid and electric vehicles compared to conventional vehicles. Furthermore, additional barriers are:

- The lack of a coordinating framework at different levels of government;
• The lack of an adequate policy framework for electric vehicles, electric vehicle supply equipment and renewable power integration;
• The lack of public charging infrastructure;
• The lack of experience, and technical and operational skills for responding to future requirements of clean transport and power generation;
• A knowledge gap on the benefits of electric vehicles and misconceptions on the total cost of ownership;
• The limited number of available EV classes on the market;
• The lack of adequate finance schemes and business models.

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Current institutional framework**
The Department of Environment of the Ministry of Health and the Environment is the national focal point for all multilateral environmental conventions. This centralized coordination role promotes synergies with other GEF-financed initiatives. The Antigua and Barbuda Transport Board is responsible for registering and evaluating the suitability of vehicles for all public roads. The Antigua Public Utilities Authority is the national provider of power, water and telecommunications services.

**Baseline Investments**

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Agency</th>
<th>Description</th>
<th>Period</th>
<th>Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Pathways – Protected Areas and Renewable Energy</td>
<td>UNEP</td>
<td>Enhances financing and management of protected areas. Establishes the environmental management window of the SIRF Fund.</td>
<td>2015–ongoing</td>
<td>2,639,726</td>
</tr>
<tr>
<td>Sustainable Energy Facility</td>
<td>Inter-American Development Bank</td>
<td>Aims to reduces the dependency on fossil fuels by implementing energy efficiency measures, renewable energy pilot demonstration projects and Smart Grid solutions.</td>
<td>2016–ongoing</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Electric School</td>
<td>Department of</td>
<td>Tests an electric school bus</td>
<td>2017–</td>
<td>625,000</td>
</tr>
</tbody>
</table>
Bus Pilot in Antigua
Environment to determine the feasibility of converting the government transportation fleet to Evs.
ongoing

Stakeholder Engagement

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>How will be engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Environment</td>
<td>Lead partner for development and detailed design of the project.</td>
</tr>
<tr>
<td>Antigua and Barbuda Transport Board</td>
<td>Will approve, implement, monitor and enforce the related transportation policies.</td>
</tr>
<tr>
<td>Antigua Public Utilities Authority (APUA) and independent power producers</td>
<td>To be engaged in the project with two independent power who have contracts to sell power to APUA.</td>
</tr>
<tr>
<td>Ministry of Finance</td>
<td>Provide information on fiscal impacts from the incentives programme, tax structures and public investment in e-mobility.</td>
</tr>
<tr>
<td>Antigua and Barbuda Investment Authority</td>
<td>Provide guidance on work plan for EV bus operators.</td>
</tr>
<tr>
<td>Civil society, including gender-specific constituents</td>
<td>Support consumer surveys, consultations and focus group discussions with women and social groups.</td>
</tr>
<tr>
<td>Academia, e.g. College of Science and Technology, Royal Thimphu College</td>
<td>Provide advice and support on local context-specific policy studies, technology and routing assessments</td>
</tr>
<tr>
<td>Bus Association and independent private bus operators</td>
<td>The project will involve the many small bus operators who own and operate their own buses and provide mass transit services.</td>
</tr>
<tr>
<td>Development/multilateral partners</td>
<td>Coordinate on survey and assessment results, support capacity development activities and identify potential collaboration on activities planned.</td>
</tr>
<tr>
<td>Development Control Authority</td>
<td>Provide support in planning of future EV charging stations and other infrastructure.</td>
</tr>
<tr>
<td>Ministry of Works</td>
<td>Responsible for the maintenance of government vehicles. Will participate in training in maintenance of EVs.</td>
</tr>
</tbody>
</table>

Gender

The project will incorporate gender considerations on mobility. The project will disaggregate data collection to capture gender-based differences in the modes of transport used, trip patterns and destinations travelled. This will be undertaken to ensure services and infrastructure planned respond to the specific needs of women, men and children. Vehicles demonstrated will be designed in way to respect privacy and increase comfort of women.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits;

The child project responds to and reflects the global programme’s theory of change as its components mirror those of the global programme but in a way which is adjusted to national context. It will develop supportive policies, incentives and strategies to incentivize the uptake of electric mobility. It will
demonstrate electric buses for public transport usage in combination with the generation of renewable power for recharging. It will also prepare for the large-scale introduction of electric mobility and low-carbon power charging through the development of context-specific finance schemes and business models. The demonstration of electric vehicles with integrated renewable power recharging aims at establishing public-private community partnerships which can become independent power producers.

**Incremental reasoning for GEF financing under the program, including the results framework and components.**

The project aims to promote low-emission public and private transportation systems in Antigua and Barbuda that are resilient to the projected impacts of climate change. The grant funds provided by the GEF and complemented by co-funding aim at de-risking electric vehicles and associated supply equipment technology. They also aim to support the integration of low-emission transportation systems with renewable power generation and attract non-grant funding from financial institutions for scaling up.

The GEF-financing’s incremental effects will assist Antigua and Barbuda to overcome the higher initial costs of fuel efficient and low emissions options. The enabling policy environment created will strengthen institutional capacity and increase public awareness and participation, elements that are instrumental in encouraging the shift towards sustainable low-emission public transport systems as a preferred choice for mobility. Coupled with the use of renewable energy, the project will contribute to improving energy efficiency and reducing CO2 emissions, air pollution and energy dependence in the country. GEF7 grant funds will be employed to:

**Component 1:** Strengthen the enabling environment for electric mobility through the development for adoption of policies, strategies and plans to accelerate low-emission and climate resilient island transportation systems

**Component 2:** Demonstrate affordable grid-interactive energy for electric transport and power wheeling to support Antigua and Barbuda with transforming its power sector.

**Component 3:** Raise the interest of the private sector to invest in low-carbon electric mobility through the demonstration of low-carbon electric mobility in the public transport sector and development of innovative finance models.

**Component 4:** Raise national and regional awareness and build capacity for the innovative financing of low-emission electric mobility.

3. **Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 256,170 (metric tons of CO2e) greenhouse gas emissions, of which 127,619 are direct and 127,551 are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage with the Charging Infrastructure and Grid Integration Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on *Supporting the Shift to Global Electric Mobility* and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Antigua and Barbuda will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region and small island developing states, supporting them to benefit from the know-how
generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
**Armenia**

**Child Project Title: Transition Towards Electric Mobility in Armenia**

*GEF Agency: UN Environment*

*Total Project Cost: USD 592,202 ; CoFinancing: USD 5,875,000 (Inc. PPG USD 50,000)*

**PROJECT DESCRIPTION**

1. Country Context

In Armenia, the energy sector accounts for around 70.3% of the country’s total emissions, of which 25% is from transport. In 2013, the transport sector consumed 522 ktoe and was the second largest consumer after the residential sector (IEC, 2017). Armenia’s transport CO₂ emissions are expected to increase by 160% by 2020, as a result of its aging fleet and inefficient urban transport systems (ADB, 2011). A large share of vehicles in Armenia use compressed natural gas (CNG) instead of gasoline and diesel. Armenia imports all its oil and gas (largely from Russia), with gas accounting for 63% of Armenia’s primary energy (IEC, 2017).

Armenia’s high dependence on fossil fuels in the transport sector has a significant impact on the levels of air pollution and hence public health in its’ cities. To mitigate the effects of growing pollutants and greenhouse gas emissions (GHG), Armenia has set itself the objective of promoting the efficient use of energy. The government has set an ambitious goal in its Intended Nationally Determined Contribution (INDC, 2015) to achieve ecosystem neutral GHG emissions by 2050 (2.07 tons/per capita annual, 633 million tCO₂e at an aggregate level by 2050). Energy (including renewable energy and energy efficiency) and transport (including development of electrical transport) are among the main sectors included in the mitigation contribution.

Further, in its 2014-2025 Development Strategy, Armenia articulates the need to reform its countries energy sector, by replacing old power plants and diversifying its energy supply by investing in renewables. The current generation capacity is unable to meet forecasted electricity demand and the state-owned power companies are in financial distress, in part due to increases in the import of gas prices (World Bank, 2014). Armenia is developing a tariff policy to create favorable conditions for developing renewable energies and attracting investment.

The National Energy Efficiency Action Plan (NEEAP) of 2011 defined several measures aimed at reducing energy consumption in the transport sector:

- Development of legislative background on fuel efficiency and emission norms
- Dissemination of information on technologies and energy saving
- Continuous replacement of minibuses by larger passenger buses and route optimization
- Expansion and modernization of electrified public transport

Electric vehicles have the potential to reduce energy use, mitigate GHG and air pollutant emissions, reduce cost (i.e. due to reduced fuel imports) and create opportunities to increase the local content of vehicle manufacturing. As the economy is recovering after the financial crisis, the major cities, notably Yerevan, which has become one of the most densely populated cities in the region and is witnessing increasing motorization rates, have started to embrace electric mobility.
2. Project Overview and Approach

The objective of this project is to mitigate GHG emissions, promote energy security, and improve air quality through the promotion of electric mobility in Armenia. This objective will be achieved by a combination of technical assistance and investment into a small electric vehicle demonstration project of up to 12 electric passenger cars in a captured fleet.

The grant funds provided by the GEF and complemented by co-funding aim at de-risking the EVs and EV supply equipment technology to attract non-grant funding for upscaling of the demonstration projects from financial institutions such as development banks and funds (i.e. Green Climate Fund). It thus significantly contributes to accelerating the introduction of electric mobility in Armenia.

Geographical Target

The project will be piloted in Yerevan, the capital city of Armenia.

Systemic challenges, environmental threats and drivers

While EVs have the potential of bringing significant carbon mitigation benefits, such benefits will only materialize to the extent that the carbon intensity of electricity is reduced. In 2013, Armenia’s electricity
generation capacity was comprised of thermal (2433MW – 60%), hydro (1182 MW) and nuclear (815MW) with a small amount of other renewables (IEC,2017).

Although the total cost of ownership of electric vehicles for use in fleets are already competitive compared to conventional cars, several barriers exist preventing the rapid uptake of EV sales in Armenia:

**Policy and Regulatory Barrier:**
- Absence of a national strategy for the shift to sustainable and low carbon transport;
- Lack of a coordinating framework at different levels of governments;
- Insufficient regulatory and fiscal framework to incentivise the uptake of e-mobility;
- Lack of established charging standards;
- Lack of regulation for battery re-use, recycling and disposal;

**Infrastructure and Technical Barrier**
- Lack of charging infrastructure
- Range anxiety among potential EV buyers;

**Investment and Market Barrier**
- Higher upfront cost of EVs in combination with absence of financial models to support EV purchase;
- Limited offer of EVs;

**Awareness and Outreach Barrier:**
- Knowledge gap on sustainable transport pathways;
- Uncertainty regarding the cost/benefit ratio of electric vehicles and their residual value.

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline Investments**
In 2018, light EV's were exempt from custom duties and in January 2019 the Armenian Government approved a legislative initiative to exempt the imports of EV’s from value added tax (VAT). Yerevan has instituted an exemption of parking fees for EV’s and has deployed some recharging infrastructure.

Several projects in the energy sector have been implemented or committed to in order to improve energy transmission networks, given that a reliable, stable and affordable energy supply is a key condition for attracting investment into Armenia. Increasing efficiency in electricity production and distribution also contributes to reducing GHG emissions and environmental pollution. Investment in renewables is also taking off. In 2019, 23 charging stations will be installed through a GEF-6 funded Small Grant Programs implemented and led by UNDP.
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Implementation Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Bank: Electricity Transmission Network Improvement Project</td>
<td>To improve the reliability of the power transmission network and system management.</td>
<td>2015-2019</td>
<td>USD 64.86 million</td>
</tr>
<tr>
<td>ERBD – Modernization of Distribution Network</td>
<td>Investment programme for the modernisation of the distribution network including the introduction of smart metering across Armenia.</td>
<td>2017-2020</td>
<td>USD 80 million</td>
</tr>
<tr>
<td>KFW/ EIB/ EU NIF - Caucasus Electricity Transmission Network</td>
<td>The aim of the program is to a) provide grid infrastructure for promotion of net integration of hydropower plants (HPPs); b) Increase transmission capacities, including cross-border trade; c) improve security of energy supply of Georgia. Stage one includes the construction of the HVDC substation in Ayrum and the 500 kV/220 kV line construction on the Georgian and Armenian side. In a second stage the substation will be extended to connect the new 400 kV line to the existing thermal power plant in Hrazdan.</td>
<td>2014-2021</td>
<td>EUR 225.36 Million</td>
</tr>
<tr>
<td>ADB- Power Transmission Rehabilitation Project</td>
<td>Investment to increase the efficient electricity supply to urban and rural consumers to support inclusive and sustainable economic development.</td>
<td>2015-2020</td>
<td>USD 37 Million</td>
</tr>
<tr>
<td>ADB- Sustainable Urban Development Investment Program</td>
<td>The project aims to improve urban transport in Yerevan aligned with the urban master plan of Yerevan city.</td>
<td>2011-2020</td>
<td>USD 48.6 Million</td>
</tr>
<tr>
<td>World Bank- EBRD-SREP Masrik-1 solar power plant</td>
<td>The first large-scale solar power plant in the country with a capacity of 55MW which will be located in Masrik, Gegharkunik province, eastern Armenia. This is the first competitively tendered IPP in the Armenian power sector.</td>
<td>2018-2020</td>
<td>USD 120 Million</td>
</tr>
</tbody>
</table>

**Stakeholder Engagement**

The successful implementation of this project relies on the leadership of the Ministry of Nature Protection. The Ministry of Nature Protection will be the executing agency of the project. Identified key stakeholders will be involved from the beginning of the implementation with established roles. The project will also engage with various private sector actors, industry associations and academia.
Institutional Framework
The below table outlines the institutional framework.

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Nature Protection</td>
<td>The Ministry will act as an executing agency and will play an advisory role and provide expert advice on aspects related to climate change mitigation.</td>
</tr>
<tr>
<td>Ministry of Energy Infrastructures and Natural Resources (MENR)</td>
<td>The ministry will be involved in discussion on power demand from e-mobility and on the business relationship between distributors and charging companies.</td>
</tr>
<tr>
<td>The State Urban Development Committee</td>
<td>The ministry will support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Ministry of Finance</td>
<td>The Ministry will play an advisory role and provide expert advice on aspects related to policy formulation and legal / regulatory measures related to public and private sector charging infrastructure providers.</td>
</tr>
<tr>
<td>City Council and Local Government Authorities</td>
<td>The ministry will provide project technical inputs and information on the demo planning, design, integrated inventory data collection, as well as policy inputs to the Project Document.</td>
</tr>
<tr>
<td>Municipal Government Support in the design and implementation of demo projects and co-financing investments.</td>
<td></td>
</tr>
<tr>
<td>Electricity Distribution Companies</td>
<td>Electricity distribution companies will have to upgrade its infrastructure to support charging infrastructure. EDCs will be consulted on developing regulations and steps for providing connectivity for charging stations. Some of the EDCs are also interested in investing in the charging infrastructure.</td>
</tr>
</tbody>
</table>

Gender

In Armenia women are both underrepresented in decision-making and face an increasingly large gender wage gap (20%), thus have less disposable income for fuel and make shorter and more frequent trips often with children. The project will consider the specific needs of women, elderly and the disabled through the design and provision of adequately equipped vehicles that prioritize comfort, dignity and safety. A shift to EV’s can addresses the disparity of women’s employment in the transport sector by providing opportunities for women in new businesses and business models and as drivers (more affordable to maintain and run), charging solution providers, fleet operators etc. EVs will also contribute to reducing the negative public health implications from vehicles for women and children.

The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and develop a gender mainstreaming and action plan for project design, implementation, and monitoring. Further, the project will ensure women are included in all awareness raising activities, decision making and capacity building so that all services, vehicles and infrastructure planned for and invested into necessitate that women reap the equal socio-economic and health benefits of shifting to cleaner technology as do men. The project will align with the goals of Armenia’s Gender Equity Strategy 2017-2021.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the sys-
temic challenges, and to achieve the desired transformation with multiple global environmental benefits; and

The proposed project significantly contributes to accelerating electric mobility in the countries participating in the Global Programme. The project addresses the current barriers to wider adoption of electric mobility through adapting the regulatory framework as well as building capacity of key stakeholders, conducting demonstrations and enabling replications in the region. Through development of business models and finance schemes for EVs for use in fleets it works towards the creation of conditions for up-scaling and replication supported through the regional support and investment platforms. Further, an e-mobility coordination body will be established which will be the focal point to share data, lessons learnt and policy best practice under the Global Programme. It thus significantly contributes to accelerating the adoption of e-mobility in the countries participating in the Global Programme.

Incremental reasoning for GEF financing under the program, including the results framework and components.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the transport system in Armenia. The project aims to demonstrate up to 12 light duty vehicles in a government fleet in Yerevan. The promotion of electric vehicles coupled with the use of renewable energy will contribute to improving energy efficiency and further reducing CO₂ emissions, air pollution and energy dependence in Armenia.

The objective of the project: Is to accelerate the introduction of electric mobility in Armenia through capacity building and demonstration of EVs and preparation of upscaling and replication through development of adequate electric mobility policies, and development of business models and finance schemes.

Component 1: Institutionalization of electric mobility: Political and technical consensus and institutional mandate for e-mobility in Armenia among key stakeholders is built.
Component 2 – Electric vehicle demonstration: Demonstrations provide evidence of technical, financial and environmental sustainability to plan for scale-up of e-mobility.
Component 3. Preparation of scale-up and replication of electric mobility: Conditions are created to accelerate the shift towards e-mobility in Armenia.
Component 4: Promotion of long-term sustainability of electric mobility: Measures are developed to ensure the long-term sustainability of e-mobility

3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 404,575 (metric tons of C02e) greenhouse gas emissions, of which 330,864 are direct and 73,711 are indirect.

The project will take part in the Asia & the Pacific Support and Investment Platform led by The Asian Development Bank and engage with the Light Duty Vehicle global thematic working group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Armenia and will join the regional meetings and thematic working groups organized by
the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Burundi

Child Project Title: Support the Shift to Electric Mobility in Burundi

GEF Agency: UN Environment
Total Project Cost: USD 775,688 ; CoFinancing: USD 3,125,100 (Inc. PPG USD 50,000)

PROJECT DESCRIPTION

1. Country Context

Burundi is a landlocked country at the heart of Africa’s Great Lakes Region. With a population of 11 million people, Burundi is one of the poorest countries in the world. In 2017, the World Bank placed the country’s Gross Domestic Product at US$3.172 billion. Years of conflict has resulted in rapid migration of the population from rural areas to urban centers, as a result, it is estimated that Burundi has one of the fastest urbanization rates in the world - around 6%.

Burundi’s transport sector is not well developed and is considered a great hindrance to the country’s economic development. Clean and sustainable transport remains a challenge for the country. The vehicle population is rapidly increasing and is estimated to have doubled between 2005 and 2015. In 2015, the country was estimated to have 63,000 vehicles. Over 90% of the country’s vehicle fleet is imported as used vehicles, with the national average vehicle age estimated at 20 years. Public transport is mainly by minibuses and motorcycles. These are not reliable and are highly polluting due to poor vehicle standards. Even though most of the motorcycles are imported new, they are mainly two stroke, hence highly polluting.

Figure 1: Burundi’s motor vehicle registered from 2005 to 2015

In 2007, the number of vehicles per 1,000 people was one of the lowest in the world – at 6 vehicles per 1,000 people. Despite this, in 2005, a greenhouse gas emissions inventory attributed 62.62% of the total
emissions of the energy sector to transport. Transportation therefore remains significant in climate change mitigation. The low motorization rate is also an opportunity to promote cleaner electric mobility and address air pollution and increasing GHG emissions.

In addition, Burundi does not have any oil reserves. All its fuel requirement is imported through Kenya and Tanzania. The Government of Burundi recognizes that reducing dependence on fossil fuels for the transport sector through low carbon transport strategies is not only desirable to reduce air pollution and GHG emissions, but also sustainable. This project will help Burundi towards a low carbon transport pathway, with the demonstration project providing the much-needed experience with electric mobility and renewable energy integration. The Government of Burundi is already planning to expand its hydro-electric power generation, which when coupled with solar energy potential could result in a shift from conventional to electric mobility.

2. Project Overview and Approach

Geographical targets

The project will be piloted in Bujumbura. Bujumbura is the economic capital and until recently remained also as the political capital. The bulk of the vehicles are thus to be found in Bujumbura. In 2018, the composition of the national vehicle fleet comprised 80% light duty vehicles, 10% heavy duty vehicles and 10% motorcycles. The project will thus focus on the uptake of electric light duty vehicles and motorcycles, while also developing strategies for uptake of electric urban buses.

Systemic challenges, environmental threats and drivers

Burundi has a limited national installed electricity production capacity of 45 MW only, which satisfies 79% of the country’s demand. This capacity is in 8 hydropower and 2 thermal power plants. The country therefore imports electricity to meet the national deficit. Estimates show that 73% of electricity production is from hydro power, 14 % from fossil fuels and other renewable energy sources account for 14% (2017). Hydro-electric power resource potential is estimated to be 1,700 MW, with government planning to increase production through construction of three hydroelectric power plants. In addition, Burundi enjoys a significant solar potential estimated at 5 kWh / m² / day in Bujumbura and 4 kWh / m² / day for the highlands (National Strategy and Action Plan on Climate Change Burundi 2013).
Transport remains the largest and fastest growing contributor to energy related GHG emissions. The country aims to reduce its GHG emissions by 20% by 2030 compared to a Business as Usual (BAU) scenario (2015, UNFCCC). Low emission urban transit was identified by the government in their NDC as a mitigation strategy to lower GHG emissions. The project is also in line with Burundi’s Vision 2025 to focus on improvement and the development of the infrastructures of transport, communication and energy.

![Mitigation objectives for 2030](image)

**Figure 3: Mitigation objectives for 2030**

*Policy and Planning Barrier:*
Even though the Government of Burundi has policies, strategies and planned investments that align with the scope of this project such as improvement of renewable energy production and improvement of road transport, the country lacks comprehensive policies on sustainable low carbon transport. There are no policies to ensure that vehicles imported to the country are cleaner or having zero emissions (fully electric).

*Institutional Capacity Barrier:*
There is lack of capacity within various institutions in Burundi to assess vehicle imports in terms of cleaner technologies options. This means that the country also lacks capacity to develop policies to promote low emission vehicles including electric vehicles into the country.

*Investment and Market Barrier:*
This barrier manifests the limited opportunities to access finance or create enabling partnerships for investment. There is a lack of preparedness due to limited capacity to access new sources of financing or to liberate private sector investment through enabling finance and partnerships. Fiscal policies and public financing mechanisms have no provision for prioritizing low emission options or in reflecting lifecycle costs.

*Awareness and Outreach Barrier:*
There is no effective system to monitor, gather, analyze and disseminate information on low emissions development. There is low level of awareness among planners and decision makers on the linkages and potential common interventions to address climate change from the transport sector.
Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;

Baseline investments

Even though the Government of Burundi annually provides for a budget of $28,000 as part of the "Urban Transport Development Project", this is not adequate to support cleaner mobility in Burundi. In its "National Strategy for Transport Management and Planning, Action Plan 2018-2027", a strategic axis for the development of sustainable transport is planned. At the same time, in the context of renewable energy, the Ministry has initiated an "Energy Efficiency Project" to promote cleaner energy. This project will complement the two government activities by linking electric mobility to renewable energy options. It will support the development of an adequate institutional framework to foster the uptake of electric mobility in Burundi.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Funded/Run by</th>
<th>Period</th>
<th>Amount/ Available Budget US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban transport development project</td>
<td></td>
<td>Govt</td>
<td>2017-2022</td>
<td>28,000 US$</td>
</tr>
</tbody>
</table>

Indicative Renewable Energy projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Funded/Run by</th>
<th>Period</th>
<th>Amount/ Available Budget US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mpanda Hydro-Electric Plant</td>
<td>10.4MW</td>
<td>Govt</td>
<td>2018/20</td>
<td>55 Million US$</td>
</tr>
<tr>
<td>Kabu 16 Hydro-Electric Plant</td>
<td>20MW</td>
<td>Govt</td>
<td>2018</td>
<td>12 Million US$</td>
</tr>
<tr>
<td>Jiji and Murembwe Hydro-Electric Plant</td>
<td>49MW</td>
<td>Govt</td>
<td>2023</td>
<td>145 Million US$</td>
</tr>
<tr>
<td>Rusumo falls Hydro-Electric Plant</td>
<td>80 MW</td>
<td>Govt</td>
<td>2020</td>
<td>470 Million US$</td>
</tr>
<tr>
<td>Kagu Project</td>
<td>8MW</td>
<td>Govt</td>
<td>2022</td>
<td>60 Million US$</td>
</tr>
<tr>
<td>Ruvyironza Hydro-Electric Plant</td>
<td>22.5MW</td>
<td>Govt</td>
<td>2024</td>
<td>70 Million US$</td>
</tr>
<tr>
<td>Kirasa-Karonge Hydro-Electric Plant rehabilitation</td>
<td>- 16 MW</td>
<td>Govt</td>
<td>2022</td>
<td>56.72 Million US$</td>
</tr>
</tbody>
</table>
**Institutional framework and stakeholders**

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Transport, Public Works and Infrastructure</td>
<td>Is responsible for developing and regulating transport systems. It also runs OTRACO which provides a public transport service. Will provide the overall coordination of the project including implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Ministry of Energy and Mines (MEM);</td>
<td>Is responsible for energy policy development and implementation. Will provide technical support for on energy demand and supply and link to renewable energy.</td>
</tr>
<tr>
<td>Ministry of Environment (Burundian Office for Environmental Protection)</td>
<td>Will provide technical support for the promotion of low emission transport policies GHG emissions assessments.</td>
</tr>
<tr>
<td>Ministry of Finance (Burundian Revenue Agency)</td>
<td>Will provide baseline vehicle information and facilitate development of fiscal policies and incentives for import of electric vehicles.</td>
</tr>
<tr>
<td>Municipal of Bujumbura</td>
<td>Will facilitate piloting of the demonstration project and support infrastructure development for sustain urban mobility.</td>
</tr>
<tr>
<td>University of Burundi</td>
<td>Support analysis of the vehicle import baseline inventory, GHG emissions assessments and the design of demo projects.</td>
</tr>
</tbody>
</table>

The Ministry of Transport, Public Works, Equipment and Land Use Planning will execute the project. Identified key stakeholders will be involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project. The project will engage with private sector in order to increase the market share of electric vehicles in Burundi during all stages of the project, and in particular during the demonstration phase. High-impact fleets (e.g. taxi, delivery and government fleets) will be selected for the demonstration of the cost-benefits and business opportunities of e-vehicles.

**Gender**

In Burundi women account for the higher share of motorcycle taxi ridership, as motorcycle taxis are an affordable and flexible mode in accessing their daily needs and responsibilities. The project will consider the specific needs of women through the design and provision of adequately equipped motorcycles that prioritize women’s comfort, dignity and safety. Increasingly, women have expressed an interest in becoming operators themselves, however they often lack access to capital for purchasing motorcycles. A shift to electric motorcycles can addresses the disparity of women’s employment in the transport sector by providing opportunities for women as drivers, charging solution providers, fleet operators etc. E-motorcycles will also contribute to reducing the negative public health implications for women and children from transport related air pollution.

The project will include an assessment of the impact of the current transport system in women, children, and the elderly, including impacts on health and safety. The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and make an appropriate analysis on gender and transport issues in the country.
Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits

The project components fully align with the program’s TOC in as it addresses the key drivers of environmental issues and to reduce the barriers and constraints to the wider adoption of electric mobility. This project aims at accelerating the introduction of electric mobility through capacity building and demonstration of electric vehicles, and preparation of upscaling and replication through development of appropriate electric mobility policies, and development of business models and financing schemes.

Incremental reasoning for GEF financing under the program, including the results framework and components.

GEF funding will remove institutional, regulatory and technology barriers in Burundi to promote market transformation of electric 2 and 3 wheelers. This will be underpinned by a number of baseline investments to bolster power supply in the country and increase the percentage of renewable energy power generation from hydro and solar power sources.

The objective of the project is to promote low-emissions mobility to reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector. The project is structured across four components:

• **Component 1**: Develop legal, regulatory and institutional framework to support electric mobility uptake in Togo
• **Component 2**: Demonstration of electric motorcycles and cars and establishment of measurement, reporting & verification (MRV) framework
• **Component 3**: Preparation of scale-up and replication of electric mobility
• **Component 4**: Promotion of long-term sustainability of electric mobility

GEF resources will only cover the incremental cost between the electric vehicle including the charger and the respective conventional vehicle. The contribution of the vehicle owner to the purchase costs is accounted as co-funding to the project. The promotion of electric vehicles coupled with the use of solar power will contribute to further reducing CO2 emissions and air pollution in Burundi.

3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 240,978 (metric tons of C02e) greenhouse gas emissions, of which 157,232 are direct and 83,746 are indirect.

The project will take part in the Africa Support and Investment Platform led by UN Environment and will engage with the Light-Duty Vehicles Working Group on 2& 3 wheelers.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on **Supporting the Shift to Global Electric Mobility** and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Burundi will join the regional meetings and thematic working groups organized by the
Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Chile

Child Project Title: Accelerating the Adoption of Electric Mobility in Chile

GEF Agency: UN Environment
Total Project Cost: USD 1,784,862 ; CoFinancing: USD 12,403,539 (Inc. PPG USD 50,000)

PROJECT DESCRIPTION

1. Country Context

One of Chile’s key environmental challenges is related to its high dependence on fossil fuels in the transport sector. The transport sector accounts for 35% of final energy consumption, and 98% of this corresponds to oil derivatives. Such dependence results in about 20% of the country’s total greenhouse gas (GHG) emissions. It also has a significant impact on the levels of air pollution from short-lived pollutants, resulting in significant and well-documented public health challenges in Chilean cities. Every year in Chile, air pollution costs the health sector at least $670 million and is the root cause of the 127,000 emergency health consultations and more than 4,000 premature deaths (Ministry of Environment, 2012).

Chile’s strategic positioning to address this environmental challenge and facilitate a systemic transformation to a low-carbon and climate-resilient transport system is initiated from the highest level of governmental policy. In its nationally determined contribution (NDC), Chile has set a conditional target of reducing its CO2 emissions per capita by 35-45% with respect to 2007 levels. It also notes that one of its priority sectors for mitigation is the energy sector, including transportation.

Specifically, on transport, the government has also committed a full shift to electric mobility across the country for public transport by 2040 and a 10% in private fleets by 2022. Furthermore, in December 2017, the Ministry of Energy, together with the Ministry of Environment and the Ministry of Transport and Telecommunications, launched the ‘National Electromobility Strategy’, which sets a long-term target of electrifying 100% of public transport together with 40% of private vehicles by the year 2050. Chile is the regional leader in terms of electric mobility development in Latin America. Chile’s transition to electric mobility is a step towards low-emission development as already today, the share of low-carbon power in the Chilean electricity grid is above the global average. In 2016, about 25% was based on hydropower, 8% on biofuels and waste, and 3% each on wind and solar. This equated to a carbon intensity of around 0.45kg CO2/kWh.

Bringing all the above together, the country’s strategic positioning is aligned with an approach that will foster impactful outcomes with global environmental benefits. Through the above policies and targets, the country will accelerate its transformation to a low-carbon and climate-resilient transport system. This will serve as an important example for other countries in the region.
2. Project Overview and Approach

Geographic target
The project focuses on Chilean regions outside of the Metropolitan Region of Santiago. These regions have significant air pollution and GHG emissions, yet few transport-related interventions are currently being undertaken to address this issue (in contrast to the plethora of electric mobility activities in the capital). Furthermore, public transport systems and socio-economic conditions are significantly different to the capital.

Systemic challenges and environmental threats
The key systemic challenge that Chile faces is how to achieve a clean, effective and efficient public transport system outside of the Metropolitan Region of Santiago. Santiago has gained experience with electric mobility demonstration projects, leading to the introduction of 200 electric buses by the end of 2019. Nonetheless, this electric mobility readiness has not translated to the rest of the country. This results in a significant environment threat. In the transport sector, the domination of internal combustion engine vehicle and their ever-increasing numbers has led to important and growing transport-derived GHG, NOx and PM emissions. Such emissions are resulting in specific environmental threats to climate change (from GHG emissions) and air contamination (with its consequent impacts on levels of public health).
**Associated drivers**

The key driver of the on-going reliance on internal combustion engine transport is the current inexistence of socially and economically viable alternatives to fossil-fuel road transport in the regions. There are several barriers to the existence of alternatives. The key barrier is the higher price of electric vehicles compared to conventional ones. Another is the difficult in transferring lessons learnt in Santiago to other regions, since technical, operational and financial conditions are different. Additional barriers (drivers of the environmental threat) in the regions are:

- The dispersed public transport market, with multiple small companies operating small numbers of buses or taxis;
- Lack of a coordinating framework at different government levels;
- Lack of an adequate national policy framework for electric vehicles, supply equipment and renewable power integration;
- Lack of public charging infrastructure;
- Lack of experience, and technical and operational skills for clean transport and power generation;
- Lack of understanding of the benefits of electric vehicles and misconceptions on the total cost of ownership;
- Lack of adequate finance schemes and business models.

**Description of the existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline scenario**

It is estimated that the fleet of fixed-route taxis will grow from about 42,000 at present to more than 51,000 by 2030. The fleet of medium-sized city buses will grow from 23,000 to 27,000. It is projected that the electrification of the national fleet will be slow. By 2030, only 3% of new taxis will be electric. However, an estimated 30% of new taxis will be hybrid. The slow uptake of electric vehicles results in a fleet share of less than 10% by 2050.

**Current institutional framework and existing and planned baseline investments**

The Ministry of Energy, the Ministry of Environment and the Ministry of Transport and Telecommunications are co-executing the ‘National Electromobility Strategy’ launched in 2018. The strategy aims to electrify 100% of public transport and 40% of private vehicles by 2050. Furthermore, the Ministry of Transport and Telecommunications plans to incorporate more than 500 new electric buses in Santiago in tendering processes in 2019-2020. In 2018, the three ministries also launched a new public-private agreement which brings together 38 companies and institutions to boost electric mobility (Ministry of Environment, 2018).
**Stakeholder engagement**

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Form of engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Energy</td>
<td>Lead partners for the development, detailed design and implementation of the project. Will approve, implement, monitor and enforce the related transportation policies. Will support the design and monitor the implementation of associated power infrastructure and business models.</td>
</tr>
<tr>
<td>Ministry of Transport and Telecommunications</td>
<td></td>
</tr>
<tr>
<td>Ministry of Environment</td>
<td></td>
</tr>
<tr>
<td>Electricity and Fuels Superintendence</td>
<td></td>
</tr>
<tr>
<td>National Energy Commission</td>
<td></td>
</tr>
<tr>
<td>Production Development Corporation (CORFO)</td>
<td></td>
</tr>
<tr>
<td>Energy providers (e.g. Engie, Enel, SAESA)</td>
<td>Will support the design and implementation of associated power infrastructure and business models.</td>
</tr>
<tr>
<td>Financial sector</td>
<td>Will support the development of context-specific financial instruments for fleet acquisition and operation.</td>
</tr>
<tr>
<td>Private investors</td>
<td>Will provide equity investments to taxi and bus operators for fleet acquisition and operation. While private investment has mostly been concentrated in Santiago, many companies are considering expanding into other regions.</td>
</tr>
<tr>
<td>Academia</td>
<td>Will provide advice and support on local context-specific policy studies, technology and routing assessments</td>
</tr>
<tr>
<td>Fleet owners and drivers</td>
<td>Will be consulted on the design of the electric mobility interventions and selection of routes</td>
</tr>
<tr>
<td>Civil society</td>
<td>Will be consulted on the environmental, social and economic viability of electric fixed-route taxis and medium-sized buses in different Chilean regions</td>
</tr>
</tbody>
</table>
**Gender**

The Ministry of Transport and Telecommunications reports that 65.5% of trips made by women relate to care activities in Chile while 62.8% of male trips relate to work. This distribution highlights the importance of recognizing the gender dimensions of mobility in Chile. The project will disaggregate data collection to capture gender-based differences in the modes of transport used, trip patterns and destinations travelled. This will ensure that electric mobility policies, services and infrastructure are designed, planned and implemented to respond to the needs of women, disabled and the elderly. This will build on the 'Energy and Gender' agenda that the Ministry of Energy launched in 2017.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

This project responds to and reflects the global programme’s theory of change, as its components mirror those of the global programme in a way which is adjusted to the national context. It will develop supportive policies, incentives and strategies to promote the uptake of electric mobility. It will demonstrate fixed-route taxis and electric buses for public transport in combination with the generation of renewable power for recharging. It will also prepare for the large-scale introduction of electric mobility and low-carbon power charging through the development of context-specific finance schemes and business models.

**Incremental reasoning for GEF financing under the program, including the results framework and components**

This project aims to promote innovation and technology transfer for sustainable energy breakthroughs in electric mobility in Chile. The GEF grant funds and co-financing will play a key role in promoting investment in electric mobility in regions outside of Santiago. To date these regions have received little private investment in these technologies. Thus, GEF financing will serve to kickstart investment in these areas, building upon the success stories prevalent in the country’s capital.

The project is structured around a national electric mobility coordination platform and knowledge platform. These will collect experiences, good practices, lessons learned and data on electric mobility with the aim of informing key stakeholders outside the Santiago Metropolitan Region. The knowledge platform will be informed by the demonstration of approximately 60 medium-sized electric city buses and 130 electric fixed-route taxis in Chilean regions. This pilot will provide a proof of concept for public electric mobility business models adapted to the conditions outside Santiago de Chile.

Building on the demonstration, the project will facilitate the building of enabling conditions for the uptake and broad diffusion of public electric mobility throughout Chile. This will include support for the development of policies, regulations, and incentives for electric mobility. Specifically, GEF7 grant funds will be employed to:

- **Component 1**: Strengthen the enabling environment for electric mobility through capacity building, institutional readiness and awareness raising, to accelerate the uptake of electric mobility systems in Chile.
- **Component 2**: Demonstrate electric vehicles and the related recharging equipment in public transport captive fleets in Chilean regions outside of Santiago de Chile.
Component 3: Support actions that promote and facilitate the scale-up and replication of electric mobility, including by developing policies and other actions based on lessons learned from the demonstrations.

3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 396,491 (metric tons of CO2e) greenhouse gas emissions, of which 307,573 are direct and 88,918 are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage with the Heavy-Duty Vehicle Working Group.

The project will draw upon the materials and trainings provided by the GEF global programme on Supporting the Shift to Global Electric Mobility. In return, it will provide feedback on the experiences, good practices, lessons learned, and policies developed at the national level to the global knowledge platform hosted by the International Energy Agency. Identified key stakeholders from government, academia and the private sector in Chile will join the regional meetings and thematic working groups organized by the global programme to share their knowledge with other countries in the region and to benefit from the know-how generated within the thematic working groups. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme on Supporting the Shift to Global Electric Mobility and will ensure the effective use of funds, both at the country as well as at the global level.
Costa Rica

Child Project Title: Accelerating the Move to Electric Buses in Costa Rica

GEF Agency: UN Environment
Total Project Cost: USD 876,712; CoFinancing: USD 9,170,000 (Inc. PPG USD 40,000)

PROJECT DESCRIPTION

1. Country Context

Costa Rica’s most significant environmental challenges in the urban context are greenhouse gas emissions and air pollution due to transport. The country has a public health crisis, which can be attributed to the high concentration of particulate matter in the air, and road transport is the largest contributor of air pollutants (MINAE, 2015). Furthermore, 54% of greenhouse gas (GHG) emissions by the energy sector are due to the national vehicle fleet (MINAE, 2015). In the transport sector, public transport mobilizes more than three-quarters of passengers in the Great Metropolitan Area of San Jose. Despite the reactivation of an intercity train in 2005, buses are undoubtedly the main means of public transport in the country (MOPT, 2011).

To address this environmental challenge, the government has called for a “transformative intervention” to modernize public transport and optimize its operation. There is an urgent need for fleet modernization, as 30% of the fleet is between 20 and 40 years old. Only 12% of Costa Rica’s fleet is less than 5 years of age. Switching old fossil fuel-based vehicles for electrics is strategic, as it will build upon Costa Rica’s outstanding track record in renewable electricity-production. The urgent need to modernize public transport, cut back its dependence on imported fossil fuels and significantly reduce air pollution and GHG emissions unveils the opportunity to introduce electric buses in Costa Rica powered by renewable electricity.

Costa Rica’s strategic positioning on low-emission transport is aligned with a transformational approach which achieves global environmental benefits. In its NDC, Costa Rica has an absolute and unconditional emissions reduction target to keep net GHG emissions below 9.37 MtCO$_2$e by 2030. Acknowledging that transport is key to achieving this target, the government has developed a series of policies and commitments for this sector, including:

- **National Decarbonization Plan**: Stipulates that by 2035 25% of the vehicle fleet will be electric and 70% of buses and taxis will be zero emission;

- **Law 19744**: Provides fiscal and non-fiscal incentives to electric vehicles and charging infrastructure. Dictates that 5% of the bus fleet will be replaced by electric equivalents every two years.

- **National Electric Transport Plan**: Defines a regulatory roadmap for electric vehicles and charging infrastructure. Also defines tariffs for electric public transport.

- **National Initiative for the Electrification of Public Transport**: Created an inter-institutional task force to coordinate and support technical assistance projects on electric public transport.

In September 2021, all public transport bus concessions in Costa Rica will expire, providing an unprecedented window of opportunity to improve bus service and modernize fleets. The investment framework is focused on this historical momentum and aims to create enabling conditions for deployment and
scaleup of electric buses in Costa Rica. This proposed project, with support from the EV Global Programme, will build upon the aforementioned policies and commitments, and ongoing projects. It aims to create the right financial mechanisms and mobilize resources for the electrification of public transport in Costa Rica, thus drastically reducing air pollution and GHG emissions.

2. Project Overview and Approach

**Geographical target:**

![Figure 1. Metropolitan Area of San Jose](image)

The project focuses on the Metropolitan Area of San Jose (AMSI). It contains 30% of the national population with 1,510,710 inhabitants (INECC, 2019) and the largest share of jobs (650,000 jobs).

**Systemic challenges, environmental threats and associated drivers:**

The key systemic challenge that the AMSJ faces is how to achieve a clean, effective and efficient transport system. According to Costa Rica’s 3rd UNFCCC National Communication, “the great challenge for the country in regard to energy is the transportation sector” (MINAE, 2014). The area has approxi-
mately 2.5 million trips/day (IDB-PIMUS, 2017) and approximately one third (1,700 units) of buses in Costa Rica operate in the AMSJ (Public Transport Council). Due to the rapid growth in the middle class in the 21st century, the number of cars and trips has increased exponentially and is expected to continue increasing, resulting in an over-saturated and congested traffic system. Costa Rica’s Decarbonization Plan (2019) highlights electrification of public transport as a critical action to comply with the NDC. Despite electrification of buses being aligned with Costa Rica’s climate change mitigation targets and current policy framework, several barriers need to be addressed:

**Affordability:** Higher capital cost of electric buses and required charging infrastructure compared to internal combustion vehicles hinders investments. This is despite savings in operation and maintenance costs compensating their total cost of ownership. Currently, neither existing financial instruments nor public transit tendering processes favor electric buses in Costa Rica.

**Need for coordination:** Multitude of public Costa Rican institutions dealing with different but linked responsibilities. This challenges the development and achievement of a long-term vision and interinstitutional cooperation towards common and cross-cutting goals, such as the case for clean transport. Large-scale deployment of electric buses requires coordinated cooperation of a multitude of actors and institutions.

**Lack of experience and knowledge:** The novelty of electric mobility has repercussions in technology adoption. Therefore, strengthening human capacities among relevant stakeholders and offering publicly available information on technical and financial feasibility on operating electric buses is needed.

**Description of the existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline investments:**

<table>
<thead>
<tr>
<th>Project name</th>
<th>Description</th>
<th>Implementation period</th>
<th>Budget (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“MiTransporte Project”</td>
<td>• Demonstration of three electric buses</td>
<td>4 years (until 2021)</td>
<td>6,750,000</td>
</tr>
<tr>
<td>Implemented by: GIZ</td>
<td>• Development of electric mobility regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor: BMUB</td>
<td>• Design of an operation model for electric buses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Leapfrogging to e-buses in Costa Rica”</td>
<td>• Activate IET-Bus</td>
<td>18 months (until 2020)</td>
<td>750,000</td>
</tr>
<tr>
<td>Implementer: UNEEnvironment</td>
<td>• Evaluate technical and financial feasibility of AMSJ bus lines;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor: CRUSA Foundation</td>
<td>• Build capacity of key stakeholders;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Develop a five-year strategic plan to promote electric mobility innovation;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recipient: Public Service</td>
<td>• Define a tariff calculation method-</td>
<td>1 year (until 250,000)</td>
<td>250,000</td>
</tr>
</tbody>
</table>
Institutional framework

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Energy and Environment (MINAE)</td>
<td>Develops policy and oversees sector planning related to energy and environment.</td>
</tr>
<tr>
<td>Climate Change Directorate of MINAE</td>
<td>Lead of the IETP-Bus initiative and oversees country’s climate change agenda.</td>
</tr>
<tr>
<td>Ministry of Transport and Public Works (MOPT)</td>
<td>Develops policy and oversees sector planning related to transport and mobility. Grants contracts to private operators for the provision of bus services.</td>
</tr>
<tr>
<td>Public Service Regulation Bureau</td>
<td>Regulates and supervises public services in Costa Rica. Defines public service tariffs.</td>
</tr>
<tr>
<td>GrupoICE</td>
<td>Largest government-owned electric utility in Costa Rica.</td>
</tr>
<tr>
<td>Bus Operators</td>
<td>CANABUS and CANATRANS are separate union organizations, representing majority of bus operators in Costa Rica.</td>
</tr>
<tr>
<td>Financial sector</td>
<td>Provide specialized financial instrument to bus operators for fleet acquisition and operation.</td>
</tr>
<tr>
<td>Private Investors</td>
<td>Provide equity investment to bus operators for fleet acquisition and operation.</td>
</tr>
<tr>
<td>Local NGO’s</td>
<td>Several local NGO’s are engaged through IETP-Bus.</td>
</tr>
</tbody>
</table>

Stakeholder engagement

All stakeholders mentioned in the institutional framework, and other that might be discovered later through field work, will be consulted in different aspect of the project components. A specific task force supervised by IETP-Bus will be set up to extend scope of work required by the project and engage with financial sector and private investors. This will create an interface between ongoing initiatives and the GEF7 project. Training workshops will be provided to bus drivers. Consulting stakeholder workshops will be organized to allow stakeholders to provide their inputs on elements of the project.

Gender

Women are the primary users of buses in San Jose and Costa Rica, however they experience significant challenges in using them. This is due, inter alia, a lack of comfort, long travel times and insecurity (GIZ, 2018). A recent GIZ survey on public transport in AMSJ found that (1) women use buses more than men; (2) 70% of women spend more than one hour per day in buses; and (3) women have less access to cars than men. This project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics, to allow for an analysis of the interconnectivity of gender and transport.
issues in the country. This will support the integration of gender considerations in electric bus interventions in San Jose.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

The project components fully align with the program’s TOC in that it addresses the key drivers of environmental issues and to reduce the barriers and constraints to the wider adoption of electric mobility. It will demonstrate electric buses for public transport usage in combination with the generation of renewable power for recharging. In accordance with the global program’s theory of change, this child project will also support the development of investment platforms for the large-scale introduction of electric mobility, through the establishment of a financial mechanism.

**Incremental reasoning for GEF financing under the program, including the results framework and components**

**The objective of the project** 936 is to build experience together with existing initiatives for the scale-up and large-scale deployment of electric buses in the Metropolitan Area of San Jose.
These existing projects aim to develop the enabling framework for the demonstration and uptake of electric bus technology. What the GEF7 project aims to fill is a key gap related to a financial mechanism which, together with the enabling framework, will facilitate the broad diffusion of electric buses at scale in the Metropolitan Area of San Jose.
The proposed project will assess the viability of different financial instruments through integrated work with financial sector and private investors. GEF7 grant funds will establish the resulting most-appropriate financial instrument. By the end of the proposed project, the financial mechanism will be operational and will leverage sufficient funds (at least 1:10 ratio compared to grant funds) from financial partners and private investors to achieve a large-scale transformation.

More specifically GEF7 grant funds will be employed to:

**Component 1:** strengthen and amplify work done by IETP-Bus, by engaging key stakeholders from the financial and private sector who are currently not part of this platform.

**Component 2:** No GEF7 grant funds will be required for this component, as activities and outputs will be provided by co-finance from ongoing initiatives. Knowledge generated by the demonstration component will be key for establishing the financial mechanism in Component 3.

**Component 3:** GEF7 grant funds will be employed to design and establish a context-specific financial mechanism, together with financial and private sector partners, to facilitate the achievement of a long-term viable transformation to electric buses.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the urban transport system. The relevant policies, business models and finance schemes in place will provide the market place for the continued adoption of electric mobility.

3. **Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 936,571 (metric tons of CO2e) greenhouse gas emissions, of which 139,940 are direct and 796,631 are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage with the Heavy-Duty Vehicle Working Group.

The EV Global Programme will support the proposed project by providing access to an international network of experts and leading institutions as well as facilitating knowledge sharing with other countries and cities who are at a same stage of technology adoption related to electric buses. For example, proposed project includes capacity building activities of key stakeholders, including bus operators and service providers in Costa Rica. In this specific case, a “train the trainers” approach will be employed and supported by EV Global Programme to facilitate knowledge sharing from most advanced countries to Costa Rican stakeholders.

On the other hand, overall lessons from the proposed project will be of substantial value to the EV Global Programme, by establishing a systemic learning curve for electric bus upscaling and large-scale deployment in a developing country context. Several countries and cities in the region and around the world are at a similar stage of development regarding technology adoption of electric buses. All these lessons generated by proposed project will be disseminated through the Global EV Programme. Thus, there is a direct link between the global programme activities to the child projects. Linkages to the GEF7 Global EV Programme will provide countries a unique opportunity to exchange on-the-ground experiences with electric mobility South to South, North to South and Peer to Peer.
Côte d’Ivoire

Child Project Title: Integrated, Sustainable and Low Emissions Transport in Côte d’Ivoire

GEF Agency: UN Environment
Total Project Cost: USD 408,716; CoFinancing: USD 1,452,000 (Inc. PPG USD 50,000)

PROJECT DESCRIPTION

1. Country Context

Côte d’Ivoire is one of the main economic hubs of West Africa and is the largest economy in francophone Sub-Saharan Africa. The country is an important supplier of energy to the region due to the excess electricity it generates and its reserves of natural gas and oil. In 2015, electricity production was 648 ktoe with 66.5% produced from fossil fuels and 31% from hydro sources.

![Figure 1 Growth in motorization](image)

Côte d’Ivoire is experiencing rapid motorization spurred by high rates of urbanization and economic growth. The Greater Abidjan Agglomeration (GAA) is home to approximately 5.4 million people, representing 42% of the country’s urban population. The total vehicle fleet has more than tripled between 2005 (20,178) and 2016 (77,451). Motorcycles have experienced the biggest jump from 2,226 (2005) to 15,051 (2016). Despite significant public investments in road infrastructure in recent years, Abidjan continues to suffer from slow, expensive and unreliable public urban transport. This will only get worse with expected future population growth. In response people walk and rely on motorcycles to fulfill their daily needs. While, most of the motorcycles are imported new, they largely have two-stroke engines which cause substantial amounts of particulate matter (PM) and black carbon (BC), a potent short-lived climate pollutant. Private vehicles account for just 1.5M (or 11%) of daily trips in Côte d’Ivoire. Therefore, targeting a shift towards electric motorcycles will have a dramatic effect on reducing urban vehicle emissions and toxic air pollutants.

Côte d’Ivoire is facing compounding air pollution problems linked to poor vehicle standards and use of high sulphur fuels. Over 90% of the country’s vehicle fleet is imported used, with the national average vehicle age estimated at 19 years.
To address the situation, in July 2018, the Government of Côte d’Ivoire introduced new regulations curbing the maximum import age of vehicles to 5 years for passenger cars, 7 years for mini-vans and 10 years for heavy duty vehicles. However, no regulations were imposed on motorcycles. These new vehicle regulations are in part attributed to a Global Fuel Economy Initiative (GFEI) project funded with GEF 5 resources. This project highlighted that vehicles imported into the country were less fuel efficient and emitted higher CO2 than the global average. This resulted in the development of policy interventions, including vehicle labelling and the introduction of a feebate tax that taxes inefficient cars higher while providing a rebate to more efficient, less polluting cars.

The Government of Côte d’Ivoire is committed to reducing GHG emissions and air pollution in the country. It has set ambitious goals in its 2016 Nationally Determined Contribution (NDC) and National Strategy for Combating Climate Change 2015-2020 to reduce its GHG emissions by 28% by 2030, including a target to generate 42% of electricity from renewable energy by 2030. Côte d’Ivoire aims to be an economic engine for West Africa in scaling renewable energy technologies.

The Government of Côte d’Ivoire has policies, strategies and planned investments that align with the scope of this project. The strategic 2013-2030 plan for the development of the electricity sector in Côte d’Ivoire aims to expand electricity production capacity, upgrade transmission infrastructure, and increase the generation of renewable energy, which will allow the integration of renewables to electric mobility.

The proposed project, with the support of the Global Programme, will develop supportive policies, incentives and awareness raising activities such as a demonstration of electric motorcycles to foster the electric mobility market and will engage with private sector to increase the market share of electric vehicles in Côte d’Ivoire, thus creating an enabling environment to drastically reduce air pollution and GHG emissions.

2. Project Overview and Approach

Geographical target and associated drivers to be addressed

The project will take place in Abidjan, the capital and most populous city. Abidjan is the country’s main economic hub, contributing approximately 60% of its GDP (implying an average GDP per capita 40% higher than the rest of the country) (World Bank, 2019).
Systemic challenges and specific environmental threats

Energy and transport sectors are the biggest contributors of GHG emissions in Côte d’Ivoire. The energy sector target is to achieve an electricity generation mix of 42% of renewable energy (26% of hydropower and 16% of other of renewable energy sources), 26% of coal, and 32% of natural gas by 2030. In their national commitments to UNFCCC, Côte d’Ivoire has a target of 28% reduction of GHG emissions compared to 2030.

This project will mitigate GHG emissions, improve air quality through promotion of electric mobility in Côte d’Ivoire. This objective will be achieved by a combination of technical assistance and investment in demonstration projects. Demonstration of 2&3 wheelers and charging systems will help de-risk the technologies as well as attract innovative business models and finance schemes.

The increase in the number of vehicles will also come with an increase in associated air pollution. Shifting the transportation sector to electric can improve their air quality, energy efficiency and independence.

Currently, the key driver of the current reliance on internal combustion engine transport is the current lack of socially and economically viable alternatives to fossil-fuel based road transport modes. One of the barriers is higher prices of electric vehicles compared to conventional vehicles. Furthermore, additional barriers are:

- The lack of a coordinating framework at different levels of government;
- The lack of an adequate policy framework for electric vehicles, electric vehicle supply equipment and renewable power integration;
- The lack of public charging infrastructure;
- The lack of experience, and technical and operational skills for responding to future requirements of clean transport and power generation;
• A knowledge gap on the benefits of electric vehicles and misconceptions on the total cost of ownership;
• The limited number of available EV classes on the market;
• The lack of adequate finance schemes and business models.

Description of how the existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration

Existing or planned baseline investments
The National Environmental Fund promotes clean mobility and other environmental targets. The fund caters for motor vehicle anti-pollution standards as well as air quality monitoring. In addition to this, a tax exemption has been established for all imported vehicles, used or new, that are less than six years in age. As mentioned, the GEF 5 funded GFEI project developed recommendations for fiscal and non-fiscal policy measures to promote more efficient vehicles (vehicle labeling, and CO2 linked taxation).

This creates a good enabling environment for the uptake of vehicles with the latest technologies, including electric vehicles.

Other baseline investments are summarized below:

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Implement-Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCF/AFD Transforming Financial Systems for Climate</td>
<td>Providing loans and technical assistance in 17 developing countries across Africa and Latin America and the Caribbean to create self-sustaining markets in energy efficiency, renewable energy and climate resilience.</td>
<td>2019- 2026</td>
<td>42,487,058</td>
</tr>
<tr>
<td>GEF – Abidjan Integrated Sustainable Urban Planning and Management</td>
<td>To enhance local capacity to access and respond to environmental degradation through the application of integrated sustainable urban planning and management methods while encouraging the uptake of innovative lower carbon technologies to reduce GHG emission and improve air quality in the city of Abidjan</td>
<td>2016</td>
<td>38,605,954</td>
</tr>
<tr>
<td>GCF/EIB Geeref Next</td>
<td>Catalysing private sector investment for renewable energy and energy efficiency projects across the developing world.</td>
<td>2017- 2033</td>
<td>26,379,310</td>
</tr>
<tr>
<td>World Bank- Abidjan Urban Mobility Project</td>
<td>To improve accessibility to opportunities and to increase efficiency of the public transport system along the Yopougon-Bingerville corridor and its feeder lines in Abidjan</td>
<td>2019</td>
<td>350,000,000</td>
</tr>
<tr>
<td>GEF/ADB Integrated Sustainable Urban Planning and Management</td>
<td>To enhance local capacity to assess and respond to environmental degradation through the application of integrated sustainable urban planning and management methods while encouraging the uptake of innovative lower carbon technologies to reduce GHG emissions and improve air quality in the city of Abidjan</td>
<td>2016</td>
<td>38,605,954</td>
</tr>
<tr>
<td>Project</td>
<td>Goal</td>
<td>Start Year</td>
<td>Budget</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>GEF/UNEP Stabilizing GHG Emissions from Road Transport Through Doubling of Global Vehicle Fuel Economy (GFEI)</td>
<td>To support Côte d’Ivoire with the development of national fuel economy policies</td>
<td>2013</td>
<td>400,000</td>
</tr>
<tr>
<td>World Bank – Electricity Transmission and Access Project</td>
<td>The project development objectives are to contribute to the improvement of the efficiency and reliability of electricity supply and increased access to electricity in Côte d’Ivoire</td>
<td>2017-2022</td>
<td>325,000,000</td>
</tr>
<tr>
<td>World Bank – Transport Sector Modernization and Corridor Trade Facilitation Project</td>
<td>Improve the efficiency and safety of transport services; institutional strengthening and capacity building of public and private sector participants in the transport sector and support activities that promote the professionalization of the road transport industry</td>
<td>2016-2021</td>
<td>45,000,000</td>
</tr>
</tbody>
</table>

**Institutional framework**

Environmental management involves several ministries. Led by the Ministry of Environment, Urban Safety and Sustainable Development (MINESUDD) and supported by the National Agency for the Environment (ANDE), the Ivorian Anti-Pollution Center (CIAPOL) and the Department of Environmental Quality and Risk Prevention (DQEPR). Additionally, the SICTA (Ivorian Company Control Engineering Cars), the Directorate General of Land Transport (DGTT) and the Ministry of Transport.

**Stakeholder engagement**

This project will capitalize on new and existing stakeholder networks established through related work on climate change mitigation. MINESUDD will involve key stakeholders from the beginning of the project. MINESUDD will take the role of the lead executing agency. The project will also engage with various private sector actors and industry associations. The detailed approach to private sector engagement will be explored systematically during project preparation.

**Gender**

In Côte d’Ivoire women are both more likely to be in poverty and head caretakers and thus rely on motorcycles as an affordable and flexible mode in accessing their daily needs and responsibilities. The project will consider the specific needs of women through the design and provision of adequately equipped motorcycles that prioritize women’s comfort, dignity and safety. Increasingly, women have expressed an interest in becoming operators themselves, however they often lack access to capital for purchasing motorcycles. A shift to electric motorcycles can address the disparity of women’s employment in the transport sector by providing opportunities for women as drivers, charging solution providers, fleet operators etc. E-motorcycles will also contribute to reducing the negative public health implications for women and children from transport related air pollution.

The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and develop a gender mainstreaming and action plan for project design, implementation, and monitoring. Further, the project will ensure women are included in all awareness raising ac-
tivities, decision making and capacity building so that all services, vehicles and infrastructure planned for and invested into necessitate that women reap the equal socio-economic and health benefits of shifting to cleaner technology as do men.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

The components and outcomes of the project are in alignment with the Program’s Theory of Change. This project aims at accelerating the introduction of electric mobility through capacity building and demonstration of electric vehicles, and preparation of upscaling and replication through development of appropriate electric mobility policies, and development of business models and financing schemes. In addition, the Global Programme as well as the child project address the bankability of e-mobility by supporting its demonstration in up to 20 low and middle-income countries around the world. It thus contributes significantly to accelerating the introduction of e-mobility in the countries participating in the Global Programme. The proposed project thus significantly contributes to accelerating electric mobility in the countries participating in the Global Programme.

**Incremental reasoning for GEF financing under the program, including the results framework and components.**

GEF funding will remove institutional, regulatory and technology barriers in Côte d’Ivoire to promote the accelerated and sustainable introduction of electric vehicles in the market. This will be underpinned by several baseline investments to develop supportive policies and strategies to foster the electric mobility market and will engage with relevant players to increase the market share of electric vehicles.

**The objective of the project** is to promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Côte d’Ivoire. The proposed project is structured across three components:

**Component 1:** Revision of laws and set up of institutional framework to support accelerated introduction of electric mobility.

**Component 2:** Piloting and demonstration of electric 2&3 wheelers, and cars and establishment of MRV framework for transport which aims to demonstrate the benefits and feasibility of low-emissions transport system, and the adoption of electric vehicles policies.

**Component 3:** Preparation of scale-up and replication of electric mobility. Based on the demonstration, fiscal policies and regulatory schemes, procurement guidelines including technical and business models are developed to incentivize uptake of electric mobility.
3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 177,379 (metric tons of CO2e) greenhouse gas emissions, of which 100,801 are direct and 76,578 are indirect.

The project will take part in the Africa Support and Investment Platform led by UN Environment and will engage with the Light-Duty Vehicles Working Group on 2& 3 wheelers.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Côte d’Ivoire and will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
**India**

**Child Project Title: Electrifying Mobility in Cities: Investing in the Transformation to Electric Mobility in Cities**

**GEF Agency: The Asian Development Bank**  
**Total Project Cost: USD 5,366,976 ; CoFinancing: USD 255,300,000 (Inc. PPG USD 137,616)**

**PROJECT DESCRIPTION**

1. **Country Context**

Air pollution, including related emissions from the burning of fossil fuels, is a major obstacle to sustainable development, particularly in mega-urban agglomerations in India. Thirteen of the top 20 most polluted cities in the world are in India, with Delhi at the top of the list. The energy sector represents 71% of total GHG emissions, of which 11.9% is from fossil fuel-based energy use in the transport sector. The national GHG emissions increased by 44% over a 10-year period from 2000 to 2010. As per a 2007 transport sector GHG inventory, road transport alone accounted for 87% of the GHG emissions, mostly to and from urban clusters. IEA estimates that energy use for transport in India is expected to grow at 5.5% annually, due in large part to growth in vehicle ownership, which is expected to reach 400 million by 2030, from 140 million in 2011. India has committed through its Nationally Determined Contribution (INDC) towards the Paris Agreement to reduce its GHG intensity by 33-35% by 2030, using 2005 levels as baseline. Transformation to e-mobility will contribute significantly to achieving this goal.

The GoI has policies, strategies and planned investments that align with the scope of this project, such as the National Electric Mobility Mission plan, 2013 which sets out the goal for transformation to E-mobility in the country. To implement the mission GoI has established FAME policy framework to provide incentives and investments to scale-up infrastructure (manufacturing and charging infrastructure) and promote use of e-vehicles. The Government has also undertaken a National Clean Air Programme (NCAP), as a national level medium term strategy to tackle the increasing air pollution problem across the country in a comprehensive manner. One of the components for air pollution mitigation under NCAP is e-mobility. The Government of India is also focusing on promoting sustainable and inclusive cities that provide core infrastructure, give decent quality of life to its citizens, a clean and sustainable environment and application of smart solutions. In 2015, the Smart Cities Mission was launched with an aim to have efficient urban mobility and public transport, amongst other elements. Another related initiative is the Green Urban Mobility Scheme (GUMS), 2017 which supports creating e-charging infrastructure to create sustainable transport in cities, including setting up of intelligent transport system, innovating financing and progressively shift to usages of hybrid/electric and non-fossil fuels. GUMS focus is on public transport in 103 cities having greater than five million population, in developing urban transport plans, including charging infrastructure for electric/hybrid vehicles.

The proposed project, with the support of the global programme, will develop supportive policies, incentives and strategies to foster the electric mobility market and will engage with private sector to increase the market share of electric vehicles in India, thus drastically reducing air pollution and GHG emissions.

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2. Project Overview and Approach

Geographical target:
The project has national and city level components. The cities will be selected during PPG stage, in consultation with the MOEFCC and MUHD within the priority cities under relevant national programmes.

![Map of India](image)

Figure 1: Map of India

Systemic challenges, environmental threats and associated drivers:
The systematic challenges that need to be addressed include: i) high dependence on the fossil fuels, ii) rapidly-increasing numbers of vehicles, increase of 10.3% annually (between 2005 – 2012). The top 15 of 20 most polluted urban conglomerations are in India, and increasing vehicular population is a major contributor to local air pollution. This has significant impact on health of the population which gave rise to the National Clean Air Programme to address the issue on an urgent basis. Vehicular fuel use contributes significantly to GHG emissions in urban conglomerations ranging from 13 – 57% of total GHG emissions in the country.

The key driver of the on-going reliance on internal combustion engine transport is the current inexistence of socially and economically viable alternatives to fossil fuel road transport. There are several barriers to the broad adoption of low-emission and climate resilient transport. The key barrier is the higher price of electric vehicles compared to conventional internal combustion engine (ICE) vehicles. Additional barriers include: i) lack of a coordinating framework at national and sub-national levels of government, ii) absence of a comprehensive policy framework for electric vehicles, electric vehicle supply equipment and renewable power integration, iii) inadequate public charging infrastructure, iv) limited technical and operational capacity to address future requirements of clean transport and power generation, v) knowledge gaps on the benefits of electric vehicles and misconceptions on the total cost of ownership, vi) limited number of available EV classes in the market, vii) lack of adequate finance schemes and business models.
**Description of how the existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration**

**Current Institutional framework**

The Ministry of Environment, Forest, and Climate Change (MoEFCC) is the national focal point for all the multilateral environmental conventions. The responsibility on e-vehicles is distributed across Ministry of Transport (operation of vehicles), Department of Heavy Industry (OEMs regulations), Ministry of Power (regulations on charging infrastructure)- with city governments responsible for the public transport. NITI Aayog (Planning Ministry) has been given the responsibility to develop the policy framework for extension of the FAME. The GOI aims to transform the road transport sector and achieve 30 per cent of new sales to be electric vehicles (EVs) by 2030. In view of this GOI has adopted the National Electric Mobility Mission Plan, 2013⁴, and the FAME program (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) to provide incentives and investments to scale-up infrastructure (manufacturing and charging infrastructure) and promote use of e-vehicles. Energy Efficiency Services Ltd. (EESL) is implementing a program to procure 20,000 cars and 4,000 charging stations to stimulate demand. A Green Urban Mobility Scheme (GUMS), 2017 is being implemented to support e-charging infrastructure and contribute to sustainable transport in cities, including e-mobility for public transport. State Governments (i.e. Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Uttar Pradesh, and West Bengal) have established policies to promote e-mobility, or are in the process of finalizing a policy/scheme. A number of OEMs have announced investments to start production of e-cars in India (Maruti-Suzuki, Hyundai, and Volvo). Ashok Leyland, Tata Motors and Mahindra are producing e-cars and e-buses in the country.

The GEF project will be co-financed by a baseline investment from ADB – through the “Scaling Up Demand Side Energy Efficiency Project” – a loan to EESL. The ADB loan project will support e-mobility through electric vehicles smart meters and other intelligent energy management elements (“smart grid”) in eligible states. On e-mobility the loan will provisionally support the roll out of 10,000 electric cars and 4,000 charging stations (the costs of electric vehicles and chargers have not yet been determined). End-user gender sensitive awareness programs will be conducted to maximize gains. In parallel, a network of charging stations will be set up by National Thermal Power Corporation Ltd. (NTPC) and Power Grid Corporation of India Ltd. (PGCIL), both linked to the Ministry of Power, in the National Capital Region.

**Provisional stakeholder engagement framework**

<table>
<thead>
<tr>
<th>Ministry of Environment, Forest and Climate Change</th>
<th>Lead partner on the Component 2 related to resource use efficiency and environmental management. The Ministry is also GEF OPF India and will be part of the Project Steering Committee.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Power</td>
<td>Will lead on approval and implementation of policies related to charging infrastructure</td>
</tr>
<tr>
<td>Ministry of Road Transport and Highways</td>
<td>Will lead on formulating and enabling regulations to accommodate EVs on Indian roads.</td>
</tr>
<tr>
<td>Ministry of Heavy Industry and Public Enterprises</td>
<td>Will lead on policy and incentives mechanisms for OEMs and approval of standards on e-vehicles.</td>
</tr>
<tr>
<td>NITI Aayog</td>
<td>Is responsible for developing policy framework for incentives to promote e-mobility.</td>
</tr>
<tr>
<td>Ministry of Housing and Urban Affairs</td>
<td>Supports baseline investment through Green Urban Mobility program.</td>
</tr>
</tbody>
</table>


⁵ This output could include a variety of hardware and software enhancements that improve electricity system efficiency and operational resilience without major modification to existing systems (i.e., “digital exoskeletons”).
Urban Local Bodies (ULB) | Lead on city level intervention of the project.
---|---
Energy Efficiency Services Limited | EESL will be the lead partner for executing component 2 of the project.
Electricity Distribution Companies | EDCs will be consulted on developing regulations and steps for providing connectivity for charging stations.
Society for Indian Automobile Manufacturers (SIAM) | The industry body would be an important link between industry and the policy making process.
Automotive Component Manufacturers Association of India (ACMA) | The apex body for consultation with Electric Vehicle Supply Equipment (EVSE) Vendors/ Manufacturers in India.
Civil Society Organizations (CSOs) | Relevant CSOs will be identified and involved in design, implementation, and analysis of marketing of e-mobility campaigns.
Other private sector actors | Participant to the stakeholder platform for guiding the project work.

Gender action will encompass the entire EV ecosystem, and consider increasing participation of women: i) as users of EVs, ii) in customer care services, iii) in operations & maintenance services, iv) in value-added services in and around charging stations, v) for billing, and vi) space provision. A provisional stakeholder engagement plan has been developed, which will include participation of key central and state Government bodies, private sector industry associations, automotive parts and component suppliers, NGOs, research and academic institutions.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change (TOC), and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits; and**

The project components fully align with the program TOC by addressing the key drivers of environmental issues, and reduce the barriers and constraints to adoption of low carbon pathways at national and local levels. This will be done through policy interventions and actions to strengthens coordination of national and sub-national agencies, facilitate development of business models and financing schemes, and advance pilot/demonstration investments as proof of concept. This will help create conditions for market expansion, and foster enabling conditions at city level for the introduction of EVs and charging infrastructure to accelerate the transformative process. Strong public awareness of the economic and environmental benefits of EVs will be essential.

The India GEF project will benefit from knowledge products generated for supporting policy making and investment decisions through the Global Program working groups. Component 4 of this child project will benefit from the training courses developed for capacity building to stakeholders at national and city level. Component 3 on investments in pilots/demonstrations (EVs and charging infrastructure) will benefit from the electric mobility market place created through the Global Program, by sharing and transfer of knowledge on best practice, standards, etc.

The project aims to catalyze transformation from ICE mobility to electric mobility; and address air quality issues which have deleterious impacts on public health and safety, the economy (in particular import of fossil fuels), and climate. The project has been structured to address multiple challenges and generate multiple outcomes.

The project will close knowledge gaps and supports the improvement of the institutional framework for e-mobility in India. It will work on enhancing policies to incentivize the uptake of e-mobility. Through
development of business models and finance schemes for EVs for use in fleets, it works towards the creation of conditions for upscaling and replication supported through the regional support and investment platforms. The demonstration projects are essential for gaining in-country experience with e-mobility to de-risk the technology and prepare for wider market penetration.

**Description of the project’s incremental reasoning for GEF financing under the program, including the results framework and components**

The project aims to promote low carbon, low-emission transportation systems. The grant funds provided by the GEF and complemented by co-funding aim at demonstrating different models and financing mechanism to promote investments by private sector. The GEF-financing’s incremental effects will assist to overcome the higher initial costs of fuel efficient and low emissions options. The enabling policy environment created will strengthen institutional capacity and increase public awareness and participation, elements that are instrumental in encouraging the shift towards sustainable low-emission public transport systems as a preferred choice for mobility. The project will contribute to improving energy efficiency and reducing CO2 emissions, air pollution and fossil fuel dependence in the country. GEF 7 grant funds will be employed to:

**Component 1:** Integrated EV policy and framework for the e-mobility transformation - Policies and capacities exist to upscale sustainable use of e-vehicles in the urban environment.

**Component 2:** Environment and resource use management framework for e-vehicles and batteries - Conditions for Environmentally sound management of batteries created.

**Component 3:** Enabling conditions for scale up of e-vehicle markets - Markets stimulated for scaling up EVs and charging infrastructure; and

**Component 4:** Gender-sensitive capacity development and awareness raising - Capacity developed across the EV supply chain and awareness created among consumers on economic and environmental benefits of e-vehicles.

3. **Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 36,310,000 (metric tons of CO2e) greenhouse gas emissions, of which 22,490,000 are direct and 13,820,000 are indirect.

The project will take part in the Asia-Pacific Support and Investment Platform led by The Asian Development Bank and will engage with the Light-Duty Vehicles Working Group.

The project will build upon the materials, capacity development and trainings provided by the GEF global electric mobility programme on “Supporting the Shift to Global Electric Mobility” and will in return, establish feedback loops on lessons, experience, best practices, technical standards and policies, through the global knowledge hub hosted by the International Energy Agency.

Identified stakeholders from government, academia as well as the private sector in India will join the regional meetings and thematic working groups organized by the Global Program. Through this participation they will share knowledge with other countries in the region and small island developing states, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core compo-
nent of the GEF Global Program and will ensure the effective use of funds, both at the country as well as at the global level.

Linkages will also be established with the Global Platform for Sustainable Cities, and help leverage best practices for the participating Indian cities. To further exchange knowledge and experience on EV technologies and policy frameworks, the proposed GEF Regional E-Vehicle Hub will also be created. Component 3 of the India child project will focus on awareness raising activities and Component 1 will focus on developing a knowledge hub to share the knowledge developed in the project is passed on to future engineers, builders, and architects. A detailed Knowledge Management plan aligned with Component 4 will be elaborated at PPG stage and will be an integral part of the project’s implementation plan.
Jamaica

Child Project Title: Supporting Sustainable Transportation Through the Shift to Electric Mobility in Jamaica

GEF Agency: United Nations Development Programme
Total Project Cost: USD 1,784,862; CoFinancing: USD 10,140,000 (Inc. PPG USD 50,000)

PROJECT DESCRIPTION

1. Country Context

Jamaica is almost entirely dependent on imported fossil fuels with more than 94% of the island’s electricity being generated from petroleum-based fuels. The country spent more than $1.3 billion USD in 2018, equivalent to 9% of the country’s GDP on the purchase of imported fuels, which contributes substantially to the country’s prolonged negative trade balance. The transport sector consumed the highest percentage (about 32%) of these total fuel imports (2018). Power generation in Jamaica is dependent on the operation of diesel generators (11% renewables in its energy mix), which result in an expensive and high carbon grid. Consequently, in 2017 electricity prices were as high as USD$0.42 per kWh.

Figure 1 Petroleum Consumption by Activity (Ministry of Science, Energy and Technology, 2018)

Jamaica’s high dependence on fossil fuels in the transport sector has a significant impact on the levels of emissions, air pollution and human and environmental health as well as in the tourism sector which accounts for up to 32.9% of GDP (2017). The transport sector is the second major source of GHG emissions and is expected to increase as motorization continues to rise. The vehicle fleet more than doubled between 2014 and 2017. Jamaica’s vehicle fleet is dominated by gasoline- powered private vehicles (70%) followed by heavy-duty vehicles (21%) and motorcycles (8%) (Tax Administration of Jamaica, 2018). The bus fleet accounts for a disproportionate amount of GHG emissions, NOx and Particulate Matter emissions (PM), despite making up only 2% of the fleet.

The need to replace a significant share of Jamaica’s fleet in the coming years presents economic and environmental opportunities for the country to shift to low and zero emission vehicles. EVs have the potential to reduce energy use, mitigate GHG and air pollutant emissions, enhanced human and envi-
ronmental health and reduce cost on fuel imports. Jamaica’s geographical context makes addressing range constraints and charging infrastructure more manageable than in most developing countries.

In 2018, the Jamaica Public Services (JPS), the sole electric utility, found that if it replaced its executive and metering vehicles with EVs, fuel costs would drop by 73% and CO2 emissions would fall by 72%. The Government of Jamaica has given primacy to the reduction of GHG emissions in the transport sector. This is seen in the policies, strategies and planned investments that align with the scope of this project. Both its Vision 2030 Jamaica – National Development Plan and in its’ Nationally Determined Contribution (NDC) to the UNFCCC commit to reduce energy sector emissions. The emission reduction target of NDC is of 10% of BAU by 2030, of which 7.8% is unconditional representing 20% renewables in the energy mix by 2030.

Further, the National Energy Policy 2009-2030 lays out aggressive targets for a 30 percent renewable energy share and a 50 percent reduction in energy intensity by 2030. Efforts to meet these targets have benefited from the robust enabling environment of tax exemptions and incentives for renewables. The country has significant potential to expand wind, hydroelectric, and solar generation resources, as well as biomass generation technologies. Synergies with renewable energy for charging infrastructure will be approached by the project.

2. Project Overview and Approach

The objective of the project is to support the promotion of low emission public and private transportation systems in Jamaica that are resilient to the projected impacts of climate change. Based on structuring the enabling conditions for the wider adoption of e-mobility in Jamaica, it addresses the transport sector, which is the second largest source of GHG emissions in the country.

The project, with the support of the Global EV Programme, will develop policy frameworks, support legislation arrangements, incentivize and establish mid and long-term strategies including, communication campaigns and capacity building to promote the uptake of electric mobility. A demonstration project with 3 to 4 electric buses and complementary charging infrastructure for public transport will take place in Kingston.

The project will establish a coordination mechanism to integrate the ongoing EV Initiatives in the country. Complementarity with the Jamaica Electric Vehicle Climate Action & Resilience Program which is being structured by the IDB and the Ministry of Energy. This will allow the project to build upon initial policy developments and develop further regulatory and fiscal arrangements needed for the large-scale introduction of electric mobility in the country.

The IDB program will initiate a first phase of demonstration activities on low-carbon power charging infrastructure and the technological shift of part of the governmental car and bike fleet. The GEF project will be focused on public transportation buses through the development of finance schemes and business models specific to the island context. The demonstration of electric buses with integrated renewable power recharging aims at establishing public-private partnerships that can be upscaled once technical and operational conditions are analyzed and evaluated.

The grant funds provided by the GEF and complemented by co-funding aim to de-risking the EV and EV supply equipment technology and to develop the necessary national capacities to operate e-mobility systems. This is key to make possible a wider market penetration and attract private sector investment and for upscaling investments with development banks and funds.
**Geographical Target**

Jamaica is an island nation located in the North Caribbean Sea. The demonstration project will take place in Kingston, the capital and most populous city in Jamaica. Specifically, the Parishes of Kingston and St. Andrew.

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**Figure 2 Map of Jamaica**

**Systemic challenges, environmental threats and drivers**

To date, several barriers are hindering the fast introduction of e-mobility in Jamaica. These include:

- Lack of a coordinating framework at different levels of governments
- Inadequate integration of climate change impacts and resilience aspects within policies and planning measures
- Limited policy framework for electric vehicles, electric vehicle supply equipment and renewable power integration.
- Lack of public charging infrastructure.
- Lack of experience, technical and operational capacity that can respond to future requirements of clean transport and power generation.
- Knowledge gap regarding the benefits of electric vehicles and misconception of Total Cost of Ownership (TCO).
- Limited number of available EV classes on the Market.
- Lack of adequate finance schemes and business models.
- Lack of industry and private sector involvement

**Description of the existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration**

**Current institutional framework**

Jamaica’s Vision 2030 offers a comprehensive planning framework in which the economic, social, environmental and governance aspects of national development are integrated. Vision 2030 includes diversification of the energy supply and the promotion of energy efficiency and conservation.

Jamaica has developed several policies and regulations that seek to reduce air pollution and emissions. The National Transport Policy developed in 2007, is the policy framework that guides all aspects of the
transport sector, Environmental Protection and Energy Efficiency. Further, Jamaica has revised the Motor Vehicle Emissions Standards (to be promulgated under the Road Traffic Act); the Petroleum (Quality Control) Act (1990), which provides requirements for fuel specification (including sulphur content of fuels); and the Air Quality Regulations of the Natural Resources Conservation Authority (NRCA). One of the main features of the air quality regulations include an air pollutant discharge licensing system and the payment of discharge fees for emissions.

Jamaica ultimately seeks to couple the deployment of electric vehicles with renewable energy systems, primarily solar photovoltaic and hydro. In 2009, Jamaica developed its 2009-2030 National Energy Policy (NEP) to achieve a modern, efficient, diversified, and environmentally sustainable energy sector by 2030.

The project will coordinate and complement the activities of the Jamaica Electric Vehicle Climate Action & Resilience Program, managed by the Ministry of Science, Energy and Technology with resources of the Inter-American Development Bank.

### Baseline Investments

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Implementing Agency</th>
<th>Description</th>
<th>Implementation Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamaica Electric Vehicle Climate Action &amp; Resilience Program</td>
<td>Inter-American Development Bank (IADB)</td>
<td>Pilot Program on public sector car, bike and bus fleet</td>
<td>1Q 2019 to Q4 2021</td>
<td>USD 10 million</td>
</tr>
<tr>
<td>Caribbean Clean Energy Programme</td>
<td>USAID</td>
<td>Providing an enabling environment for clean energy development; Optimizing variable renewable energy integration; Accelerating private sector clean energy investment</td>
<td>2015-2020</td>
<td>USD 14,762,353</td>
</tr>
<tr>
<td>Energy Efficiency &amp; Conservation Programme.</td>
<td>Ministry of Science, Technology, Energy &amp; Mining (STEM)</td>
<td>Improve energy efficiency, mainly within the public sector by strengthening the Ministry’s institutional capacities to implement energy efficiency and conservation, in addition to designing and implementing cost-saving energy efficiency and conservation measures in the public sector.</td>
<td>On going</td>
<td>USD 20 million</td>
</tr>
</tbody>
</table>
PetroCaribe Productive line

Development Bank of Jamaica

Provides funds for upgrading the social and physical infrastructure of Jamaica to viable enterprises involved in the productive sector (agriculture & agro-processing, manufacturing, information technology, mining & quarrying, energy, services & tourism).

DBJ product suite

USD 15 million

Jamaica’s Energy Management and Efficiency Programme

JICA/IDB/EU

Aims to bolster the Government’s efforts in the areas of energy efficiency and conservation through the design and implementation of measures targeting key Government facilities, as well as fuel conservation in road transportation to reduce the demand for fuel imports.

ongoing

USD 60 million

Deployment of Renewable Energy and Efficiency in the Public Sector Project

GEF/UNDP

To reduce GHG emissions from fossil fuel-based power generation through energy efficiency and by demonstrating the exploitation of renewable energy resources for electricity generation in Jamaica.

ongoing

USD 12,103,741

Stabilizing GHG Emissions from Road Transport through Doubling of Global Vehicle Fuel Economy (GFEI)

GEF/UN Environment

Support Jamaica improve the fuel economy of their fleet.

2015-2019

USD 400,000

Stakeholder Engagement

UN Environment will be the EV Programme lead and UNDP will be the Implementing Agency for the project in Jamaica. The Executing Agency for this project is the Ministry of Economic Growth and Job Creation (MEGJC) which is the national focal point for all multilateral environmental conventions. The MEGJC is also accredited as a National Implementing Entity to the GCF and the Adaptation Fund. This centralized coordination role will promote synergies with other GEF-financed initiatives as well as other UN Agencies.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role in Project Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Economic Growth and Job Creation</td>
<td>Lead partner for development and detailed design of the project. MEGJC has broad authority over any government function related to economic growth.</td>
</tr>
<tr>
<td>Ministry of Transport and Mining</td>
<td>MTM is primarily concerned with transport policy and has regulatory responsibility for the safety of all modes of transportation. The ministry is largely</td>
</tr>
</tbody>
</table>
focused on infrastructure development and maintenance. The agencies below will support the activities of the ministry:

**Jamaican Urban Transit Company (JUTC):** This government-owned company provides public bus service throughout the Kingston Metropolitan Transit Region. JUTC manages a network of approximately 450 buses that provide service to an average of 250,000 passengers daily.

**Transport Authority of Jamaica (TAJ):** TAJ is responsible for regulating and monitoring the public transportation system in Jamaica.

| Ministry of Science Energy and Technology | Lead legal and regulatory reforms of the electricity and gas sectors and responsible to improve national energy efficiency and conservation. Encourage private sector innovation in the science, technology, energy and mining sectors. Mandate to increase the percentage of electricity generation from renewable sources, thereby reducing dependence on imported fuels and increasing Jamaica's energy security. |
| Ministry of Finance and Public Service | Provide information on fiscal impacts from the incentives programme, tax structures and public investment in e-mobility. |
| Planning Institute of Jamaica (PIOJ) | PIOJ is responsible for initiating and coordinating the development of policies, plans and programs for the economic, financial, social, cultural and physical development of Jamaica; it also oversees Vision 2030. |
| National Works Agency (NWA) | Oversees road safety management and road transport efficiency and effectiveness. |
| Jamaica Public Service | The Jamaica Public Service Company Limited (JPS) is the country's sole distributor of electricity, serving a population of 2.7 million. The company owns and operates four power stations, nine hydroelectric plants, 43 substations and approximately 14,000 kilometres of distribution and transmission lines. |
| National Environment and Planning Agency (NEPA) | NEPA is responsible for developing environmental conservation, protection and management policies, legislation, regulations, standards and programs. |
| Civil society Groups | Support consumer survey, consultations and focus group discussions with women and social groups. |
| Academia, e.g. University of the West Indies, UTECH Ja. | Provide advice and support on policy studies, technology and routing assessments. |
| Development/multilateral partners | Coordinate on survey and assessment results, support capacity development activities and identify potential collaboration on activities planned. |
| Ministry of Local Government and Community Development | Provide support in planning of future EV charging stations and other infrastructure. |

**Gender**

The project will recognize and integrate gender dimensions around mobility; including the analysis of modes of transport used, trip patterns and destinations travelled to ensure services and infrastructure planned are efficient, safe and provide sustainable mobility for women. The project will disaggregate data collection to capture gender-based differences in trip patterns and make an appropriate analysis on gender and transport issues in the country. Issues of sexual harassment in public transportation will be assessed in the PPG phase in the gender analysis and will be addressed in the gender action plan.

*Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits; and*
The proposed components and outcomes of the project are in alignment with the Program’s Theory of Change and the successful delivery of child projects is a key driver in achieving the desired impact of the Program. The project aims at overcoming the current barriers to wider adoption of electric mobility through adapting the regulatory framework as well as building capacity of key stakeholders and enabling replications in the region. In addition, the Global Programme addresses the bankability of electric mobility through the regional support and investment platforms.

**Incremental reasoning for GEF financing under the program, including the results framework and components**

The incremental effects of the GEF-funded activities will be able to assist Jamaica to shift to low emissions mobility. The enabling policy environment that will be created through this project, will strengthen the institutional capacity and public awareness and participation that will be instrumental in encouraging the shift towards sustainable low-emission public transport systems as a preferred choice for mobility in the country. The project will help overcome the systemic barriers for the implementation of low emission transport system in Jamaica and, coupled with the use of renewable energy, will contribute to improving energy efficiency and further reducing CO2 emissions, air pollution and energy dependence in Jamaica.

The market transformation for e-mobility in Jamaica will be addressed by the four components of this project:

**Component 1**: Integration and coordination of National Electric Mobility Initiatives in Jamaica

**Component 2**: Technical and regulatory assessments for the development and update of National EV policies and legislation

**Component 3**: Pilot program designed and deployed in Kingston including electric buses purchase and necessary charging infrastructure of electric buses

**Component 4**: National awareness raising and capacity development for the transition to low-emission electric mobility

The project will close knowledge gaps and support the improvement of the institutional framework for e-mobility in Jamaica in handy coordination with other ongoing initiatives. The demonstration project is essential for gaining in-country experience with e-mobility and de-risk the technology to prepare for wider market penetration of EVs. Since the demonstration of electric vehicles in public transport fleets is a core part of the project, GEF resources will be incremental to promote the shift of technology in Jamaica and to pave a route and lessons learnt for e-mobility in Caribbean SIDS.

### 3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project intends to reduce **103,069** directly ton CO2, from which **1,335** tCO2 come from demonstration projects and **101,734** tCO2 from secondary impacts from policy and regulatory advancements based on a top down approach (40% causality factor). There are a further **69,969** ton of CO2 from indirect emissions. These are initial preliminary estimations based on the stakeholder engagements undertaken at this level of project development and figures will be further analyzed during PPG phase.
The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage with the Heavy-Duty Vehicle Working Group.

As such, the project will build upon the materials and trainings provided by the GEF Global electric Mobility Programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global and regional knowledge platforms hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Jamaica will join the regional meetings and thematic working groups organized by the Global Programme to share their knowledge with other countries in the region and Small Island Developing States (SIDS) to benefit from the know-how generated within the thematic working groups. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme on Supporting the Shift to Global Electric Mobility and will ensure the effective use of funds, both at the country as well as at the global level.
Republic of Madagascar

Child Project Title: Support the Shift to Electric Mobility in Madagascar

GEF Agency: UN Environment
Total Project Cost: GEF Grant – USD 1,142,661; Cofinancing: USD 3,678,000 (inc. PPG USD 50,000)

1. PROJECT DESCRIPTION
Country Context

Madagascar is an island African country which lies 400km east from the Mozambique coast. It is a member of both the Southern African Development Community (SADC) region and Common Market for Eastern and Southern Africa (COMESA). Madagascar has an area of 587,295 km² and as of 2018 had a population of around 25 million inhabitants with about 4 million of these residing in the economic and political capital city of Antananarivo.

Antananarivo is located in the mountainous Central Highlands region of Madagascar. Although the city’s topography makes it challenging to develop road infrastructure, the city is the starting point of all national roads in the country. Antananarivo also houses a station that serves the railway lines of Antananarivo East Coast or “TCE line” and Tananarive Antsirabe or “TA Line” which are no longer operational. As a result, there are significant mobility problems in the city characterized by traffic jams and air pollution. There are also corresponding economic and social loss caused by mobility problems e.g. decrease in quality of life, declining economic productivity falling etc.

In between 1994 and 2010, GHG emission (excluding land use change and forestry related emissions) showed a stable profile, averaging at around 2.5 MtCO2e per year (UNFCCC Emissions Summary Madagascar). Energy sector related emissions in Madagascar increased by 63% from 0.96 MtCO2e in 1990 to 1.84 MtCO2e in 2011 (2016, GHG Emission Factsheet Madagascar). While emissions from energy industries declined from 23% to 16% from 1994 to 2010, transport emissions were approximately 33% across the same time frame (UNFCCC Emissions Summary Madagascar). The transport sector is hence the single largest sector contributing to energy-related GHG emissions.

The power generated in Madagascar has a relatively low carbon footprint, with more than half of the power being generated from renewable sources of energy, mainly hydro (2014, World Bank Data).

According to the Intended Nationally Determined Contribution (INDC) of Madagascar (2015, UNFCCC), the country aims to reduce its GHG emissions by 14% by 2030 compared to a Business as Usual (BAU)
scenario. The Energy Department is planning to promote renewable energy to meet the needs on power supply with many sites currently undergoing prefeasibility surveys.

2. Project Overview and Approach

This e-mobility project is targeting the reduction of GHG and air pollutant emissions from the transport sector in Madagascar, which is the largest single contributor to energy related emissions, through the accelerated introduction of electric mobility. This is aligned with Madagascar’s commitment to reduce GHG emissions by 14% compared to a BAU scenario by 2030. It will furthermore contribute to the target of reduced air pollution, in particular in Toamasina, which has been selected for demonstration of electric vehicles. In particular, the project will pilot up to 10 electric cars, 80 electric motorcycles and 40 3-wheelers.

Systemic challenges, environmental threats and drivers
Since 2010, 2&3 wheelers have seen strong growth as a new mode of transportation in most of big cities in Madagascar such as the capital Antananarivo and Toamasina. In Toamasina, passenger car taxis almost disappeared as a consequence of the growth of 2&3 wheeler taxis. On the other hand, increasing rates of private motorization also led to an increase in passenger vehicles on the road. This resulted in increased energy use, GHG and air pollutant emissions. Nowadays, air quality in Antananarivo and Toamasina is very poor with a significant increase in respiratory diseases. In 2014, cancer related to the respiratory system became the 5th leading cause of death in Antananarivo with especially high prevalence in children under 5 years of age. Madagascar imports all its petroleum fuels and consumption has seen a strong increase since 2013. In 2018, total imports reached 1,074,000 m3 of petroleum product and 14,300 tonnes of butane gas. About 59% of the petroleum products is diesel of which 58% is used for transport.6

Geographical targets
The project will be piloted in two cities in Madagascar, namely the capital Antananarivo and Toamasina, which is the largest harbor and the biggest town in the eastern part of Madagascar. The project will build on the already ongoing activities to introduce electric 2&3 wheelers in Toamasina through the private society “Save And Sustain (SAS) electric motor” and will expand efforts to the introduction of electric light duty vehicles in captured fleets (e.g. government fleets, taxi fleets, delivery fleets), and prepare for upscaling and replication for the large-scale introduction of electric vehicles in the rest of the country.

Figure 2 Map of Madagascar

6 Petroleum newsletter, first term 2019, www.omh.mg
Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;

Baseline investments
The Energy Department plans to electrify 70% of the national territory by 2030. This targets big cities as well as rural areas, through a rural electrification programme, with a focus on renewable power. A public-private partnership company called has set up a 20 MW solar powerplant about 50 km from Antananarivo, which has been in operation since 2018. A programme to promote supply of renewable power for Toamasina has been set up. For example, the hydroelectricity station of Volobe near Toamasina is now under construction. This is a result of a partnership of public (National Society of Electricity/Ministry of Energy) and private consortium of stakeholders\(^7\) and will produce around 120 MW. This project will enable to provide the electricity to 350,000 households in Toamasina and Antananarivo.

Stakeholder engagement
The successful implementation of this project relies on the leadership of the Ministry of Environment. The Ministry Environment will be the executing agency of the project. Key stakeholders will be identified and involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project.

Gender
The project will include an assessment of the impact of the current transport system in women, children, and the elderly, including impacts on health and safety. The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and make an appropriate analysis on gender and transport issues in the country. In addition, the electric vehicles demonstrated in the project will consider gender issues, i.e. motorcycles will be designed in a way that passengers, who are women for the larger share, can minimize contact with the driver.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits; and

The project follows an approach to de-risk electric mobility by putting in place the institutional framework, developing supportive policies, establishing finance and business models and by generating concrete experience with electric vehicles such as electric 2&3 wheelers and electric light duty vehicles for use in fleets on the ground through demonstration of the vehicles. The elements of the project are aligned to the theory of change of the global programme.

Incremental reasoning for GEF financing under the program, including the results framework and components.

The objective of the project is to promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Madagascar. The project will focus on electric 2&3 wheelers as well as electric light duty vehicles for use in fleets as an entry point to electric mobility. The demonstration project aims at putting up to 120 electric 2&3 wheelers and 10 electric cars on the road. The proposed project is structured across four com-
ponents, which are necessary to address the barriers and facilitate the successful implementation of the baseline efforts to achieve an integrated, sustainable, and low-emissions transport system.

**Component 1 - Institutionalization of electric mobility**: Political and institutional consensus for the promotion of electric mobility is achieved.

**Component 2 - Electric vehicle demonstration**: This will introduce up to 10 electric cars, 80 electric motorcycles and 40 3-wheelers within captured fleets as well as demonstrate solar recharging in Antananarivo and Taomasina. These fleets will be experienced private and/or public sector operators of internal combustion engine vehicles who maintain records detailing capital and operating costs, maintenance, safety issues, etc. so that the demo accurately evaluates the technical and economic feasibility of various electric vehicles technologies against internal combustion engine vehicles. GEF resources will only cover the incremental cost between the electric vehicle including the charger and the respective conventional vehicle. The contribution of the vehicle owner to the purchase costs is accounted as co-funding to the project.

**Component 3 - Preparation of scale-up and replication of electric mobility**: Conditions are created to accelerate the shift towards electric mobility in Madagascar.

**Component 4 - Promotion of long-term sustainability of electric mobility**: Measures are developed to ensure the long-term sustainability of electric mobility.

3. **Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 5,665,780 (metric tons of CO2e) greenhouse gas emissions, of which 3,259,210 are direct and 2,406,570 are indirect.

The project will take part in the Africa Support and Investment Platform led by UN Environment and engage in one of the global thematic working groups, namely the Light-Duty Vehicles Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Madagascar will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Republic of Maldives

Child Project Title: Integrated, Sustainable and Low Emissions Transport in the Maldives

GEF Agency: UN Environment
Total Project Cost: USD 1,826,339; Co-Financing: USD 4,887,952

PROJECT DESCRIPTION

1. Country Context

The Government of Maldives (GoM) is fully dependent on imported fossil fuels for energy supply with an annual rate of increase of 11% annually. Power generation and transportation for land and sea transport are the main source of GHG emissions and air pollution. Other sources of emissions are municipal waste and industries. The transport sector alone accounts for 31% of overall energy consumption. According to a 2012 Asian Development Bank report, the CO₂ emissions from the whole transport sector in the Maldives can reach 900,000 tons by 2020.

The transport sector is expected to account for a larger share of GHG emissions and as well as air pollution as motorization and urbanization continue to rise in the country. In the Malé region, air pollution is becoming a serious concern. According to statistics published by the Health Protection Agency the incidence of respiratory diseases has aggravated over the years and is one of the leading causes of death in Maldives.

There are no public transport services on the island, but a relatively reliable taxi service is available. The main mode of transport is by gasoline scooters accounting for about 80% of all trips in the island. The main roads are narrow with two lanes bi-directional traffic while narrower feeder roads are usually one way. Cars, scooters and other vehicles are parked on the curb contributing to more congestion. There are bicycles and electric bicycles as well in the vehicle mix.

The GoM recognizes that the high level of dependence of imported fossil fuel poses several challenges in the transition to a low emissions development pathway and in reducing GHG emissions and air pollution in the country. The GoM will like to improve their air quality and reduce their dependence of fossil fuels. They believe that this project will not only help them address these challenges, but also help them experiment with electric mobility and renewable energy integration so that they can put in place tailor made conditions to enable an accelerated and sustainable market transformation.

The GoM has policies, strategies and planned investments that align with the scope of this project, such as the Low Carbon Strategy for the Transport Sector which focus on developing the transport sector through better urban planning and promoting low carbon vehicle technology and includes specific references to promoting electric mobility, the plans to become carbon neutral by 2020, and the country’s NDC which includes the transport sector as a key sector for achieving it emissions targets. In addition, one of the thematic goals of the Maldives Climate Change Policy Framework (2014-2024) is to “strengthen a low emission development future and ensure energy security for the Maldives” and includes references to adopting environmentally friendly transport modes. In terms of planned investments, there is a plan to raise the country’s production to 20-40 MW through a World Bank funded project possibly with renewables, which will allow the integration of renewables to e-mobility.
The proposed project, with the support of the global programme, will develop supportive policies, incentives and strategies to foster the electric mobility market and will engage with private sector to increase the market share of electric vehicles in Maldives, thus drastically reducing air pollution and GHG emissions.

2. Project Overview and Approach

**Geographical Target**

The project will be piloted in Male, along the bridge connecting Male, the airport and Hulhumale, and in Hulhumale.

![Map of Maldives](image)

**Figure 1 Map of Maldives**

**Systemic challenges, environmental threats and drivers**

Most of the country’s energy (fig 1) comes from diesel powered generators, boats and ferries, trucks and other vehicles. While (Fig 2) shows the estimated GHG emissions in 2011 projected up to 2030. GHG emissions are estimated to reach more than 3 million tons in 2030 compared to only a million tons in 2011. Figure 2 shows the estimates of GHG emissions in 2011 and the projections up to 2030 according to INDC of Maldives. The figure also shows the estimated GHG emissions reduction considering the conditional and unconditional reduction targets of the country, which is 10% below BAU and 24% below BAU respectively.
To achieve sustainable and low-emissions transport, several barriers need to be addressed:

**Policy and Planning Barrier:** there are no comprehensive policies on urban development and transport, except for Hulhumalé development where there is a transport master plan in place. However, the lack of a transport master plan for the entire Malé region poses a serious concern in achieving a low-emissions pathway. There is also a lack of policy to ensure that vehicles imported to the country are cleaner or having zero emissions (fully electric).

Other barriers are: lack of institutional capacity; lack of investment and market access and lack of awareness and fragmented island geographical outreach challenge

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline investments**

The reclaimed land, Hulhumalé, has been developed adjacent to the Airport (Hulhulé island). Its first phase of development is completed and now has an estimated population of 30,000. Phase 2 is still under development and no firm dates to be open. Phase 1 and Phase 2 development is estimated to accommodate 260,000 people according the plans of the Housing Development Corporation (HDC), which
is responsible for the development of both phases. There are currently buses that serve Hulhulé island and connects to Hulhumalé that serves some passengers going to various resorts and hotels from the airport. The Malé-Hulhulé bridge was opened on Sep 2018 and cars and scooters now move freely across the three islands, Malé, Hulhulé, and Hulhumalé. Unless an integrated transport system is put in place, it is expected that traffic will eventually get worse along with increased fossil fuel consumption, GHG emissions and air pollution.

Other baseline investments are summarized in the table below:

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Implementation Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) Implementing Partner-MEE</td>
<td>Supporting National Planning for Action on Short-Lived Climate Pollutants in the Maldives</td>
<td>2015 - ongoing</td>
<td>87,400</td>
</tr>
<tr>
<td>Low Emission Climate Resilient Development</td>
<td>The programme assists the Laamu Atoll and its islands to address low carbon and climate resilient development. It seeks to mainstream low carbon issues into local level development planning and service delivery for greater community level ownership and sustainability of programme benefits. The programme works in tandem with the local councils, civil society, private sector and stakeholders to establish improved coordination and enhanced participation in local planning.</td>
<td>2013-ongoing</td>
<td>9,200,000</td>
</tr>
<tr>
<td>Urban Ambient Air Quality Monitoring Implementing Partner – Maldives National University</td>
<td>MEE has the existing mandate of developing policies and strategies related to pollution control including air pollution and GHG reductions. It has an ongoing programme on improving the air quality to safeguard human health and establish fully equipped Ambient Air Quality Monitoring Station in densely populated islands. It is planning to monitor emissions from point and mobile sources and establish standards for such pollution sources.</td>
<td>2014-ongoing</td>
<td>50,000</td>
</tr>
<tr>
<td>Landuse Zoning in the Greater Malé Region Implementing</td>
<td>The project comprises of land-use planning and zoning.</td>
<td>2016-ongoing</td>
<td></td>
</tr>
<tr>
<td>Project Name</td>
<td>Description</td>
<td>Implementation Period</td>
<td>Available or Approved Budget, US$</td>
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<tr>
<td>Partner - HDC</td>
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**Institutional framework**

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td>EPA will be involved closely in the project design and provide inputs on policy and regulatory aspects pertaining to the GHG and air pollution emissions sector.</td>
</tr>
<tr>
<td>Ministry of Health (MoH)</td>
<td>The ministry is responsible for establishing policies for protection of public health. Provide policy advice and inputs on the detailed design of the project.</td>
</tr>
<tr>
<td>Maldives Transport Authority</td>
<td>Project technical inputs and information on the demo planning, design as well as policy inputs to the Project Document. Provide support in the design of the integrated inventory data collection.</td>
</tr>
<tr>
<td>Male City Council and Local Government Authorities</td>
<td>Project technical inputs and information on the demo planning, design, integrated inventory data collection, as well as policy inputs to the Project Document</td>
</tr>
<tr>
<td>Academe, Civil Societies (e.g. Maldives National University)</td>
<td>Provide advice and support on planning and design of the project, low carbon interventions selection etc. Role in the carrying out the research, field testing and data management. CSOs will also play a major role in awareness and outreach.</td>
</tr>
<tr>
<td>Housing Development Corporation</td>
<td>Support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Maldives Transport and Contracting Company</td>
<td>Support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>STELCO</td>
<td>Support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Private Sector</td>
<td>Support in the implementation of the projects.</td>
</tr>
</tbody>
</table>

**Stakeholder engagement**

The successful implementation of this project relies on the leadership of the MEE. MEE will be the executing agency of the project. Identified key stakeholders will be involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project.

**Gender**

The project will incorporate gender considerations on mobility. The project will disaggregate data collection to capture gender-based differences in the modes of transport used, trip patterns and destinations travelled. This will be undertaken to ensure services and infrastructure planned respond to the specific
needs of women, men and children. Vehicles demonstrated will be designed in way to respect privacy and increase comfort of women.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits; and**

**The objective of the project** is to promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector. The proposed project is structured across three components, which are necessary to address the barriers and facilitate the successful implementation of the baseline efforts to achieve an integrated, sustainable, and low-emissions transport system.

**Component 1**: Policy framework for integrated, sustainable and low-emissions transport in Maldives which aims for the adoption of an adequate regulatory and institutional framework for integrated transport and urban planning and low-emissions transport modes

**Component 2**: Demonstrating low emissions technologies for transport and establishing the measurement, reporting, verification (MRV) framework for transport which aims to demonstrate the benefits and feasibility of low-emissions transport system for Maldives, and the adoption of electric vehicles policies.

**Component 3**: Knowledge management and public awareness campaign, and outreach for sustainable and low emissions transport, which will increase public awareness on the benefits and affordability of low emissions transport options.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the urban transport system, through barrier removal activities. Improved pedestrian facilities will provide for short trips and electric vehicles (buses, scooters/ motorcycles, and electric bicycles) will provide for longer trips. The promotion of electric vehicles coupled with the use of solar power will contribute to further reducing CO₂ emissions and air pollution in the Malé region.

The components and outcomes of the project are in alignment with the Program’s Theory of Change. The proposed project is structured across three components, which are necessary to address the barriers and to facilitate the successful implementation of the baseline efforts to achieve an integrated, sustainable, and low-emissions transport system. It will demonstrate different modes of public transport while fostering integration of EV charging with renewables. When combined with renewable power, e-mobility’s mitigation impact can be substantially increased. Further, the experience in EVs gained under this project will attract follow-up finance from development banks and green funds through the Programme’s regional and investment platforms. It thus significantly contributes to accelerating the adoption of e-mobility in the countries participating in the Global Programme.

**3. Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 257,773 (metric tons of CO₂e) greenhouse gas emissions of which 129,030 are direct and 128,742 are indirect.
The project will take part in the Asia Support and Investment Platform led by the Asian Development Bank (ADB) and engage in global thematic working groups, namely the Light Duty Vehicles Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on *Supporting the Shift to Global Electric Mobility* and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Maldives will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region and small island developing states, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Republic of Peru

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

*GEF Agency: United Nations Development Programme*

*Total Project Cost: GEF Grant – USD 1,784,862; Cofinancing: USD 14,909,000 (inc. PPG USD 50,000)*

1.PROJECT DESCRIPTION

Country Context

The transport sector is the highest energy consumer, accounting for 45.2% of national energy consumption. In 2012, land transportation accounted for 11% of total GHG emissions. The vehicle fleet (including 2-3 wheeled vehicles) almost doubled from 1,619,035 to 2,938,770 vehicles (2007-2017), and it is projected to grow at a rate of 9.5% per year. The fleet is relatively old with an average age of 13 years, and public vehicles are estimated to be older than privately owned vehicles.

This growth has caused an intensification in the use of fossil fuels increasing GHG and air pollutant emissions, especially in urban areas. GHG emissions have grown by 63% during the last ten years and vehicle numbers are increasing by 150,000 – 200,000 cars per year. The emissions have serious health and socioeconomic effects due to the old vehicle fleet and the low quality of fuels.

WHO estimates that annually, 4,239 deaths in Peru are correlated to air pollution, with ischemic heart disease being 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. If current trends are not reversed, Peru will face even more severe traffic congestion and public health problems in addition to noise, traffic accidents, economic losses and increase of GHG emissions.

Peru’s electricity grid has historically had a very low carbon intensity, since it is mainly based on hydropower. The carbon footprint of the electricity grid will likely stay below 0.3 kgCO2/kWh and, therefore, the electrification of transport is a win-win opportunity for the country to achieve global environmental benefits. Although most of the country is connected to the National Interconnected Electric System, the Loreto region is the largest isolated system which produces electricity from residual oil (with emissions of 11.27 tCO2/gallon). The fuel used in the region comes from the Iquitos refinery and has a high sulfur content of over 700ppm (compared with 50 ppm in the rest of the country). Recently, the Ministry of Energy and Mines (MEM) established a working group to address the energy problem in Loreto. Due to its high potential for GHG emissions mitigation, this project also intends to work in Loreto to promote clean transport solutions.

The transport sector has been addressed in Peru’s NDC and includes one measure on electric transport, which aims to have 5% of the national vehicle fleet (heavy and light duty) electric by 2030. This project will contribute to enhance the ambition of this NDC measure to 7% of the fleet share, supporting the sustainability of the transport sector while backing the achievement of Sustainable Development Goals.

The Government is already implementing diverse initiatives to improve the efficiency and sustainability of the transport sector in Peru, such as pilot demonstrations and regulatory proposals on electric mobility. Yet, these initiatives are dispersed and fragmented and are not structured under a national planning
instrument or overarching strategy. This project aims to facilitate the establishment of such enabling conditions so investments in e-mobility in the public and private sector can kick off in the country.

2. Project Overview and Approach

Geographical targets

Figure 1 Map of Republic of Peru

The project aims at introducing and accelerating the shift towards electric mobility in the national transport system. This will be done by conducting an in-depth analysis of the legal and economic barriers, and developing a regulatory, technical, operational and economic framework to enable viability of electric vehicles for public transportation and through demonstration of various electric public buses and private three-wheeler fleets (means of transport most used by the population in Peru).

It will also include preparation of a strategy for an uptake of the Extended Producer Responsibility (EPR) approach to batteries and other electric vehicle components and develop finance schemes and business models. It will encourage private sector participation and investments, in the widespread deployment and commercialization of low carbon transport systems, to generate GHG emissions reduction without focusing on classic incentive schemes (subsidies).

The project will have an impact at a national level, but it will focus on developing demonstration projects for electric buses and electric three-wheeler taxis in two cities. The potential cities in the scope for the demonstration component are Lima, Arequipa, Trujillo and Iquitos. Cities will be chosen in the PPG phase, considering the following criteria: a) national priorities regarding urban transport, b) local government commitment and adherence to urban planning, c) GHG emissions reduction potential, d) co-benefits (life quality, health, national industry, among others), e) synergies with renewable energy for charging infrastructure.

The systemic challenges identified to be addressed by the project range from regulatory, political and institutional to financial and technical barriers, as follows:

- Lack of a unified mobility policy and poor inter institutional coordination (unclear roles and responsibilities),
- Informal and scattered public transport market and outdated transport regulation,
- Lack of sustainability criteria in public Procurement,
- High EV purchase prices, high financing and insurance costs for EV,
- Lack of EV charging infrastructure regulations,
- Lack of feasibility studies for envisaged demonstration and pilot projects,
- Uncertainty regarding the financial viability of investments in EV for investors,
- Lack of dissemination of knowledge and education regarding EV operating conditions,
- Risk that EV batteries are not properly disposed in the end of their life.
Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration

In Peru, the most relevant urban transport initiatives are: The Sustainable Urban Transport NAMA, known as TRANSPeru (supported by the GIZ and KfW), and the Electric Transport NAMA (a GEF project led by the MEM). The latter, which will end in 2020, is the most advanced initiative regarding electric mobility and has developed studies related to the introduction of electric and hybrid heavy and light duty vehicles to the market, including business models.

Regarding regulations, in 2018, the MTC approved the amendment of the National Vehicle Regulation which allows for electric vehicles importation and regulates the use of minor electric vehicles (2-3 wheeled). Also, in 2018, the Ministry of Economy and Finance enacted a Resolution which established a 0% excise tax for electric and hybrid vehicles while increasing the excise tax to at least 10% for Internal Combustion Vehicles (ICVs). In January 2019, the President created an executive working group with public and private sector actors to discuss and propose solutions for issues related to urban transport.

The INNOVATE program, implemented by the Ministry of Production (PRODUCE), has provided financial support for innovation to entrepreneurs who assemble 2-3 wheeled electric vehicles and other entrepreneurs performing conversion from ICV to EV in minor vehicles. A potential ally to scale up these projects is COFIDE (Development Finance Corporation), which has shown interest in developing a fund to promote electric mobility while integrating local businesses.

Private investments are already in place. Enel, Engie and BYD promoted the first electric vehicles in Lima under the Electric Transport NAMA in alliance with local governments and are investing in additional buses for new pilots. Peruvian small companies are interested in exploring the options to convert conventional motorcycles into electric ones and develop chassis for minor vehicles.

Stakeholder engagement has been undertaken since the first steps of this project conceptualization. Internal stakeholders and partners within the government have been consulted, as well as private sector, through bilateral interviews and workshops.

The project will discuss with diverse stakeholders opportunities for gender mainstreaming in pilot activities supported by the project. It will promote balanced gender representation in the project activities, especially with regards to collaboration with research institutions and transport companies. The analysis of gender-based violence and harassment in public transport will be approached and assessed by the project as well. During the PPG phase, a baseline will be established and gender analysis structured, including the development of an action plan. The Project will be also aligned with Peru’s Action Plan on Gender and Climate Change, which provides guidelines for the design and implementation of actions with gender-responsive actions to strengthen climate change adaptation and mitigation.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits;

The project will close knowledge gaps and supports the improvement of the institutional framework for e-mobility in Peru through the establishment of a coordination initiative. It will work on enhancing policies to incentivize the uptake of e-mobility. Through development of business models and finance schemes for EVs for use in fleets, it works towards the creation of conditions for upscaling and replication supported through the regional support and investment platforms. The demonstration projects are essential for gaining in-country experience with e-mobility in order to de-risk the technology and pre-
pare for wider market penetration. The national e-mobility coordination initiative will be the focal point to share data, lessons learnt and policy best practice with the Global Programme. The project will contribute to the achievement of the GEF’s global environmental benefits at the local level in LAC. The integrated approach for cities will also be adopted by the project, linking land use planning with emissions reductions in the transport sector and empowering cities and municipalities to develop e-mobility and low emission transport strategies.

In addition, this project is aligned with Objective 1 of the GEF Climate Change Focal Area: “Promote innovation and technology transfer for sustainable energy breakthroughs”. More specifically it is in total alignment with point 2 “Electric drive technologies and electric mobility”.

**Incremental reasoning for GEF financing under the program, including the results framework and components**

The objective of this project is to Enhancing sustainability in e-mobility for low carbon urban transport and an Extended Producer Responsibility (EPR) approach in batteries and vehicle components. This objective will be achieved by a combination of technical assistance and investment into e-vehicle demonstrations. Thus, the project will work towards the removal of the above mentioned barriers through:

**Component 1: Electric mobility institutionalization:** Political and institutional consensus for promotion of e-mobility is achieved.

**Component 2: Demonstration of e-mobility in public transport systems:** Demonstrations provide evidence of technical, financial and environmental sustainability to plan for scale-up electric mobility in cities.

**Component 3: Investments in e-mobility:** Business and financial models are available.

**Component 4: Extended Producer Responsibility approach for electric vehicle batteries and other vehicle components:** A strategy for EPR approach implementation in electric batteries and other vehicle components is structured.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the urban transport system in Peru. The promotion of electric vehicles, coupled with the use of already clean power from the Peru interconnected grid and forthcoming integration of renewable power e.g. in Iquitos, will contribute to further reducing CO2 emissions and air pollution in Peru. This will leverage investments and promote business models that will be closely related to implementation of EPR strategies and the development of related regulation. The accelerated introduction of electric mobility in Peru will support the objective of the programme to significantly increase the market share of electric vehicles in low and middle-income countries worldwide.

Related to Global Environmental Benefits, this concept uses a methodology and assumptions developed by UN Environment, bringing consistency in approach across the program. On this basis, the project intends to reduce directly 480.949 ton CO2, from which 6.214 tCO2 come from demonstration projects and 474.735 tCO2 from secondary impacts from policy and regulatory advancements based on a top down approach (20% causality factor). There are a further 342.417 ton CO2 from indirect emissions. These are initial preliminary estimations based on the stakeholder engagements undertaken at this level of project development and figures will be further analyzed during PPG phase.
3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 823,365 (metric tons of CO2e) greenhouse gas emissions, of which 480,949 are direct and 342,417 are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage in three global thematic working groups, namely the Heavy-Duty Vehicles Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Peru will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
**Republic of Seychelles**

**Child Project Title: Support the Shift to Electric Mobility in the Seychelles**

*GEF Agency: UN Environment*
*Total Project Cost: GEF Grant – USD 423,716; Cofinancing: USD 1,496,000 (inc. PPG USD 35,000)*

**1. PROJECT DESCRIPTION**

**Country Context**

The Republic of Seychelles is an archipelago of 115 islands on the Indian Ocean in Eastern Africa. Three-quarters of the 94,737 population lives on the main island of Mahé (UN, 2017). Seychelles has the highest Gross Domestic Product (GDP) per capita in Africa ($15,410 in 2016), but inequality is significant. The country is categorized as a Small Island Developing State. Climate change poses long-term sustainability risks to the country.

According to the Seychelles’ Second National Communication, approximately 95% of all national emissions took place in the energy sector in 2000. The remaining 5% of national emissions was accounted by forestry. Both the generation of public electricity and transport accounted for 82.0% and 82.8% of all emissions in 2000 and 2007, respectively. Public electricity and transport are therefore priority sectors for emissions reductions in Seychelles.

Between 1990 and 2011, GHG emissions increased by 285% in the Seychelles (2015, GHG in Southern Africa). The Seychelles contribute only about 910,000 tCO₂ to global greenhouse gas emissions, but the archipelago state is vulnerable to global climate change. In 2005 the transport sector was the single largest energy demand sector, consuming 42% of the total energy consumption (2009, Seychelles National Climate Change Strategy).

The total power generation capacity in Seychelles is 93MW supplied from two systems; 77 MW in Mahé and of 16 MW in Praslin and La Digue. These two systems generate power primarily through diesel generators (97% and 99%, respectively). Only about 2.5% of electricity is generated through solar and wind. The legislated targets of renewable energy consumption are set at 5% by 2020 and 15% by 2030, as outlined in the 2010 Energy Policy. Already, the government has begun making investments in wind and solar energy generation.

The Government of Seychelles also recognizes that reducing dependence on fossil fuels for the transport sector through low carbon transport strategies is not only desirable to reduce air pollution and GHG emissions, but also sustainable. This project will thus help Seychelles towards a low carbon transport pathway, with the demonstration project providing the much-needed experience with electric mobility and renewable energy integration. With the support of the global programme, the proposed project will analyze the existing transport and fiscal policies; develop supportive legal, regulatory and institutional framework to promote the introduction and uptake of electric mobility in Seychelles; and incentivize private sector engagement in investing in electric vehicles in Seychelles, thus drastically helping to reduce air pollution and GHG emissions.
2. Project Overview and Approach

Geographical targets

A demonstration project introducing electric vehicles as well as the demonstration of solar recharging is planned to be carried out in the island of La Digue and the capital Mahe. The demonstration project will show the technical and economic feasibility of electric vehicles of various types and ultimately aims at the entire shift of all motor vehicles on La Digue island (approximately 48 registered vehicles) to electric vehicles and at the accelerated introduction of electric public vehicle fleets in the capital Mahe.

La Digue Island has been selected for the demonstration project as it provides the possibility to completely shift to electric mobility in the near term. According to the La Digue Land Transport Policy report (2018), the island hosts 38 conventional vehicles and 46 electric buggies (See Table 1).

Currently, policies are in place to regulate the number of vehicles in use on the island to a maximum of 60, to promote public means of transport including the use of traditional ox carts, and to incentivize the shift towards electric mobility. The integration of renewable energy sources for La Digue will be critical in the shift to electric mobility to ensure sustainable low emission transport. In this regard, the use of renewable power charging for the electric vehicles is planned.

The project will build on these government policies and will generate on the ground experience with electric vehicles of various types, integrating charging of the vehicles based on solar power/or other renewable energy sources.

<table>
<thead>
<tr>
<th>Table 1 Current vehicle fleet in La Digue (2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional ICE</td>
</tr>
<tr>
<td>LCV</td>
</tr>
<tr>
<td>Ambulance</td>
</tr>
<tr>
<td>Jeeps (5 seater)</td>
</tr>
<tr>
<td>Minibus (12 seater)</td>
</tr>
<tr>
<td>Taxis car</td>
</tr>
<tr>
<td>Taxi 9 seater van</td>
</tr>
<tr>
<td>Fire engine</td>
</tr>
<tr>
<td>Pick-ups 3 tons</td>
</tr>
<tr>
<td>Pick-ups 1.5 tons</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Electric buggies</td>
</tr>
<tr>
<td>Electric buggies</td>
</tr>
</tbody>
</table>
**Systemic challenges, environmental threats and drivers**

Fossil fuel consumption in Seychelles was projected to increase from 21,324 t (2005) to 53,620 t in 2030 (UNFCCC 2015). Presently, energy imports typically account for about a quarter of total import spending. Almost all electricity (about 97% in 2013) is generated from fuel oil and gas oil with diesel engines which results in expensive and high carbon footprint electricity. This exposes the Seychelles to effects of the global oil price changes since 97% of the countries’ energy demand is covered through oil imports.

**Policy and Planning Barrier**

The government directed the scrapping of duty on all fully electric vehicles with effect from 15th July 2015. Duty on hybrid vehicles was also reduced to five percent. As from April 2018, excise tax rates for plug-in hybrid vehicles were significantly reduced as a way of encouraging the purchase of these vehicles.

**Investment and Market Barrier**

Fiscal policies and public financing mechanisms have no provision for prioritizing low emission options or in reflecting lifecycle costs. This is further exacerbated by inadequate financial incentives such as grants, tax incentives and concessional financing schemes.

**Awareness and Outreach Barrier:**

There is low level of awareness among stakeholders on the linkages and potential common interventions to address climate change from the transport sector.

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration**

**Baseline investments**

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Funded/Run by</th>
<th>Period</th>
<th>Amount/Available Budget US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Romainville and Mahe Solar farms</td>
<td>5MW</td>
<td>Ministry of Environment, Energy and Climate Change; Seychelles Public Utilities Company; Abu Dhabi Fund for Development</td>
<td>2018-2022</td>
<td>$17.4 M</td>
</tr>
<tr>
<td>II. Ile du Port and Ile Romainville Islands wind farms</td>
<td>6 MW</td>
<td>Public Utilities Company/ MASDAR</td>
<td>2016-2020</td>
<td>$28 M</td>
</tr>
</tbody>
</table>

**Current institutional framework**

The successful implementation of this project will rely on coordination between the Ministry of Environment, Energy and Climate Change (Executing Agency) and establishing clear roles for key stakeholders listed below.
The Ministry of Environment, Energy and Climate Change will be the executing agency of the project. Key stakeholders will be identified and involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project.

**Stakeholder engagement**

The Ministry of Environment, Energy and Climate Change will be the executing agency of the project. Key stakeholders will be identified and involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project.

**Gender**

The project will consider the specific needs of women, elderly and the disabled through the design and provision of adequately equipped vehicles that prioritize comfort, dignity and safety. A shift to EV’s can addresses the disparity of women’s employment in the transport sector by providing opportunities for women in new businesses and business models and as drivers, charging solution providers, fleet operators etc. EVs and e-buses will also contribute to reducing the negative public health implications from vehicles for men, women and children. The project will disaggregate data collection to capture gender-
based differences in trip patterns and other characteristics and develop a gender mainstreaming and action plan for project design, implementation, and monitoring. Further, the project will ensure all gender are included in all awareness raising activities, decision making and capacity building so that all services, vehicles and infrastructure planned for and invested into necessitate that men and women reap the equal socio-economic and health benefits of shifting to cleaner technology.

*Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits.*

The proposed project significantly contributes to accelerating electric mobility in the countries participating in the Global Programme and successful delivery of child projects is a key driver in achieving the desired impact. The project will create enabling environments for e-mobility in Seychelles through the establishment of a national coordination body that oversees e-mobility policies and will be responsible for enhancing policies to incentivize the uptake of e-mobility. The project also aims at accelerating wider penetration of electric mobility in the country, overcoming existing barriers, adoption of the regulatory framework as well as building confidence in EV technologies both at the country and regional levels. Further, the Global Programme addresses the bankability of electric mobility through the regional support and investment platforms.

*Incremental reasoning for GEF financing under the program, including the results framework and components.*

The **objective of this project** is to reduce GHG and air pollutant emissions as well as to reduce costs for fuel import and the related foreign exchange risks through the accelerated introduction of electric mobility in the Seychelles. This objective will be achieved by a combination of technical assistance and demonstration of electric vehicles.

The first component of the project is to institutionalize electric mobility in the Seychelles, including the development of a national electric mobility strategy, the set-up of a national electric mobility coordination body, and the training and capacity building of public and private stakeholders on issues relevant to e-mobility.

The introduction of an adequate electric mobility policy framework, the development of procurement guidelines for electric vehicles and the development of business models and finance schemes for the purchase, operation and maintenance of electric vehicles of various types will lay the grounds for upscaling of electric mobility in the Seychelles.

Finally, the project will investigate the options to link the integration of renewable power with the uptake of electric mobility and the ability to schedule large demand of power. The project will also look into aspects of battery re-use, recycling and safe disposal.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the transport system in the Seychelles and in particular on La Digue island. The project aims at a transformational change whereby half of the current vehicle fleet on La Digue island could be shifted to electric vehicles. The promotion of electric vehicles coupled with the use of solar power will contribute to further reducing CO2 emissions and air pollution in the Seychelles.
3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 17,194 (metric tons of CO2e) greenhouse gas emissions, of which 14,253 are direct and 2,941 are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage in three global thematic working groups, namely the Charging infrastructure, grid, system and power market integration Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Seychelles will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region and small island developing states, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Republic of Sierra Leone

Child Project Title: Supporting Sierra Leone with the Shift to Electric Mobility

*GEF Agency: UN Environment*
*Total Project Cost: GEF Grant – USD 423,716; Cofinancing: USD 2,266,000 (inc. PPG USD 35,000)*

1. PROJECT DESCRIPTION

Country Context

The Republic of Sierra Leone is bordered by Guinea to the north and northeast, Liberia to the south and southeast, and the Atlantic Ocean to the west. The country has a total area of 71,740 km², divided into a land area of 71,620 km² and water of 120 km².

Power generation and transport are the main source of GHG emissions and air pollution. The transport sector is expected to account for a larger share of greenhouse gas emissions and as well as air pollution as motorization and urbanization continue to rise in the country. To achieve Sierra Leone’s INDC, significant improvement in energy efficiency should be made in the transport sector where an aging vehicle fleet and high reliance on diesel hinder efficiency. In Freetown, the country’s capital, emissions from the road transport are becoming a serious concern.

In Freetown, there are buses that are owned and operated by the government while there is no organized taxi service available. Imported used vehicles make up the majority of Sierra Leone’s fleet. The main mode of transport is by motorcycle taxi accounting for about 46% of all trips in Sierra Leone.

The Government of Sierra Leone recognizes that the high level of dependence of imported fossil fuel poses several challenges in the transition to a low emissions development pathway and in reducing GHG emissions and air pollution in the country. In its Intended Nationally Determined Contribution (INDC), Sierra Leone indicates its intention to maintain its emissions levels below 7.58 MtCO2e by 2035 and to be carbon neutral by 2050.

The Government of Sierra Leone has policies, strategies and planned investments that align with the scope of this project, such as the Renewable energy policy of Sierra Leone, with incentives and the country’s NDC which includes the transport sector as a key sector to be strengthened for achieving its emissions targets. Sierra Leone has developed vehicles maintenance regulations including vehicle emission testing and has plans in place that promote public transport for passengers and cargo to reduce traffic congestion and GHG emissions. In terms of planned investments, there are a number of plans to add to the country’s generation capacity through renewables including a 146 MW extension of Bumbuna hydropower plant and US $18 million Solar Park Freetown Project (6MW), which will allow the integration of renewables to e-mobility.

The proposed project, with the support of the Global Programme, will develop supportive policies, incentives and awareness raising activities such as a demonstration of electric motorcycles to foster the electric mobility market and will engage with private sector to increase the market share of electric vehicles in the Republic of Sierra Leone, thus creating an enabling environment to drastically reduce air pollution and GHG emissions.
2. Project Overview and Approach

**Geographical targets**

![Map of Sierra Leone](image)

Figure 1 Map of Sierra Leone

The project will be piloted in Freetown, the country’s capital (Figure 1).

**Systemic challenges, environmental threats and drivers**

Sierra Leone’s reliance on imported energy is high with no indigenous sources of coal or natural gas. The majority of Sierra Leone’s population relies on inefficient, polluting conventional fuels. In 2015, total production of electricity was 28 ktoe of which 46% came from fossil fuels and 43% from hydro (AFREC, 2015) resulting in expensive and high carbon footprint electricity. Diesel accounted for 57% of total fuels demand in 2017 and has averaged 52% of share from 2011 to 2017.

According to the Third National Communication of Sierra Leone to the UNFCCC, the total energy-related CO₂ emissions increased from 20 MtCO₂Eq in 2005 to 28 MtCO₂Eq in 2013 representing an almost 50% growth. This jump in emissions was attributed to increase in fuel consumption in mining and transportation alone. There is therefore a high impetus to improve energy efficiency and to reduce GHG emissions in the transport sector as it has the highest share on total GHG emissions of all the energy sectors and it is the fastest growing energy demand sector.

This project will mitigate GHG emissions, promote energy security, and improve air quality through promotion of electric mobility in Sierra Leone. This objective, which is in line with ambitions set in the 3rd National Communication to the UNFCCC, will be achieved by a combination of technical assistance and investment in demonstration projects. In particular, the project will pilot up to 2 electric cars, 30 electric motorcycles and 22 3-wheelers. These electric mobility and solar charging demos will de-risk the technology as well as test innovative business models and finance schemes.

The motorcycle market is ideal for the demonstration of electric vehicles for several reasons:

1. Most motorcycles in Sierra Leone are used as taxis with high driving distances of up to 100km/day. Thus, the GHG and air pollutant emissions reduction potential of shifting to electric propulsion is high.

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8 Calculated based on 2006 IPCC Guidelines
2. Growth rate of motorcycles is high; between 2000 and 2017 more than 147,000 motorcycles were added to the fleet in Sierra Leone further compounding the mode’s GHG and air pollutant emissions footprints.

3. This project will develop finance schemes and business models to overcome the higher upfront investment cost hurdle and to make the long-term benefits accessible to motorcycle taxi operators.

4. Electric motorcycles batteries can be charged using affordable solar energy. This project will explore innovative business models where ownership for recharging of electric motorcycles is combined with solar mini-grids.

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline investment**

There are a number of investments being planned on hydropower and solar power. Sierra Leone imports gasoline and diesel from North West Europe and currently has no plans to build a refinery.

Sierra Leone has approximately 100 MW of installed power capacity but has a net deficit of 300 - 500 MW that is bridged by captive generation (industry) diesel generators (residential)\(^9\). The Bumbuna on the Seli River is the largest hydropower dam with peak capacity of 50 MW\(^10\). The government is planning an expansion of Bumbuna dam by 143 MW for commissioning by mid-2022. Solar radiation in the country averages between 1,460 - 2,200 kWh/m which is suitable for exploitation to boost the installed capacity of 25 MW (REEEP, 2012). There are upcoming investments such as the US $18 million Solar Park Freetown Project that will generate about 6 MW of power and a $40 million World Bank project for a 50 MW solar plant.

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\(^9\) Ministry of Energy

\(^10\) This varies significantly especially during the dry season.
Institutional framework and Stakeholder engagement

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Protection Agency (EPA-SL)</td>
<td>EPA-SL will be involved closely in the project design and provide inputs on policy and regulatory aspects pertaining to the GHG and air pollution emissions sector.</td>
</tr>
<tr>
<td>Ministry of Lands, Country Planning and the Environment</td>
<td>The ministry is responsible for establishing policies with regards to urban planning and the environment as well as providing policy advice and inputs on the detailed design of the project. Project technical inputs and information on the demo planning, design as well as policy inputs to the Project Document. Provide support in the design of the integrated inventory data collection.</td>
</tr>
<tr>
<td>Ministry of Transport and Aviation</td>
<td></td>
</tr>
<tr>
<td>Local Government Authorities - Freetown</td>
<td>Project technical inputs and information on the demo planning, design, integrated inventory data collection, as well as policy inputs to the Project Document.</td>
</tr>
<tr>
<td>Academic, Civil Societies (e.g. local university)</td>
<td>Provide advice and support on planning and design of the project, low carbon interventions selection etc. Role in the carrying out the research, field testing and data management. Civil societies will also play a major role in awareness and outreach.</td>
</tr>
<tr>
<td>Housing Development Corporation, Freetown bus authorities</td>
<td>Support in the design and implementation of demo projects and co-financing investments. Support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Local finance institutions</td>
<td>Support in the design and implementation of demo projects and co-financing investments.</td>
</tr>
<tr>
<td>Private Sector</td>
<td>Support in the implementation of the projects.</td>
</tr>
</tbody>
</table>

Figure 2 Sierra Leone Stakeholders Project Roles

Gender

In line with Pillar 8 of Sierra Leone’s five-year development plan focus on women’s empowerment, the project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics; develop a gender action plan for project design, implementation, and monitoring and ensure women are included in all awareness raising activities, decision making and capacity building so that they reap the equal socio-economic and health benefits of shifting to cleaner technology as do men.

The project will also consider the specific needs of women through the design and provision of adequately equipped motorcycles that prioritize women’s comfort, dignity and safety. Increasingly, women have expressed an interest in becoming operators themselves\(^\text{11}\), however they often lack access to capital for purchasing motorcycles. A shift to electric motorcycles can addresses the disparity of women’s employment in the transport sector by providing opportunities for women as drivers, charging solution providers, fleet operators etc. E-motorcycles will also reduce air quality health implications for women and children who are the most vulnerable to transport related air pollution.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits;

\(^{11}\) Gender Mainstreaming in the Motorcycle Taxi Sector in Rural Sierra Leone and Liberia; Peters, Mokuwa, Richards and Jenkins et. al. (2018)
The components and outcomes of the project are in alignment with the Program’s Theory of Change. Successful delivery of child projects is a key driver in achieving the desired impact. The project will create enabling environments for e-mobility in Sierra Leone through the establishment of a national coordination body that oversees e-mobility policies and will be responsible for enhancing policies to incentivize the uptake of e-mobility. To upscale and replicate the demonstration efforts, the Global Programme as well as the child project in Sierra Leone address the bankability of electric mobility by offering a platform to invite follow-up finance through the Programme’s regional and investment platforms. The proposed project thus significantly contributes to accelerating electric mobility in the countries participating in the Global Programme.

**Incremental reasoning for GEF financing under the program, including the results framework and components.**

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the transport system in Sierra Leone and in particular in Freetown.

**The objective of the project** is to promote an introduction of electric mobility in Sierra Leone and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector as follows:

- **Institutionalization of electric mobility in Sierra Leone**: This includes the development of a national electric mobility strategy, the set-up of a national electric mobility coordination body, and the training and capacity building of public and private stakeholders on issues relevant to e-mobility.

- **Demonstration project**: This will introduce up to 54 electric cars and 2&3 wheelers within captured fleets as well as solar recharging in Freetown. Demos will be done amongst private and/or public fleets with records detailing capital and operating costs, maintenance, safety issues, etc. so that the demos accurately evaluate electric vs conventional mobility. GEF resources will only cover the incremental cost between the electric vehicle including the charger and the respective conventional vehicle. The contribution of the vehicle owner to the purchase costs is accounted as co-funding to the project.

- **Preparation of scale-up and replication of electric mobility**: The introduction of an adequate electric mobility policy framework, the development of procurement guidelines for electric vehicles and the development of business models and finance schemes for the purchase, operation and maintenance of various electric vehicles will lay the ground for replication within West Africa.

**3. Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 165,618 (metric tons of CO2e) greenhouse gas emissions, of which 98,829 are direct and 66,788 are indirect.

The project will take part in the Africa Support and Investment Platform led by UN Environment and engage in the global thematic working groups, namely the Light-Duty Vehicles Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the
private sector in Sierra Leone will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Saint Lucia

Child Project Title: Support the Shift to Electric Mobility in Saint Lucia

GEF Agency: UN Environment
Total Project Cost: GEF Grant – USD 785,688; Cofinancing: USD 2,695,000 (inc. PPG USD 40,000)

1. PROJECT DESCRIPTION

Country Context

The Government of Saint Lucia (GoSL) is almost entirely dependent on imported fossil fuels for energy supply, between 1990 and 2011 greenhouse gas (GHG) emissions increased by 57%. Saint Lucia contributes only about 0.002% to global GHG emissions, but the island state is disproportionately vulnerable to global climate change (USAID, 2017). In addition, Saint Lucia is highly exposed to global oil price changes since 98% of the countries’ energy demand is covered through oil imports, largely from Trinidad and Tobago (2012). Power generation in Saint Lucia depends on the operation of 10 prime movers (diesel generators), which result in expensive and high carbon footprint electricity. The average price of electricity peaked in 2014 at $0.38 kWh. The GoSL and the Saint Lucia Electricity Services Limited (LUCELEC), the sole electricity utility, aims to reduce price volatility and diversify its energy mix by integrating its abundance of renewable energy sources.

Saint Lucia’s high dependence on fossil fuels in the transport sector (63% of total energy consumption) has a significant impact on the levels of air pollution and hence public health on the island as well as the tourism sector which accounts for up to 41.5% of GDP (UNCTAD, 2018).

![Figure 1: Energy use in different sectors (2010-2012)](image)

The GoSL has policies, strategies and planned investments that align with the scope of this project. In its Nationally Determined Contribution, the Government has set an ambitious goal (UNFCCC, 2015) to reduce GHG emissions by 16% by 2025 and 23% by 2030. In 2015 Saint Lucia implemented the Motor Vehicles and Road Traffic Act– Section 193 which makes provisions for establishing emission standards and maximum levels of air contaminants from motor vehicles.

Further, the Island Energy Program co-implemented by the GoSL and LUCELEC is developing Saint Lucia’s first National Energy Transition Strategy (NETS) and first utility-scale solar power plant. The NETS present a five-year plan of cost-effective energy efficiency programs, renewable energy integration and energy storage investments to set Saint Lucia on a pathway to meet its energy transition goals. Several projects in the expansion of renewable energy have been implemented or are in the pipeline – particularly on geothermal and solar energy.

The transport sector is the second major source of GHG emissions in Saint Lucia and is expected to increase as motorization continues to rise (OCADE, 2018). Saint Lucia’s has a rapidly aging fleet, with around 80% of its government fleet being over 7 years (RMI, 2018). Its’ fleet is dominated by gasoline-
powered private vehicles followed by goods vehicles, taxis and passenger vans. The need to replace a significant share of Saint Lucia’s fleet in the coming years presents an opportunity for the country to shift to low emission vehicles. Saint Lucia’s local context makes addressing range constraints and charging infrastructure more manageable than in most countries.

In 2018, an assessment was undertaken of shifting 131 GoSL vehicles to electric, which found that electrifying selectively deployed GoSL fleet would reduce not only operational costs but also fleet emissions by 82% and fossil fuels consumption by 378,997 liters per year as compared to a Business-As-Usual scenario (RMI, 2018).

The proposed project, with the support of the global programme, will build on the assessment on electrifying government vehicles previously carried out and will review and enhance supportive policies, implement demonstration projects and prepare for upscaling and replication to accelerate the introduction of electric mobility in Saint Lucia, thus drastically reducing air pollution and GHG emissions.

2. Project Overview and Approach

The overall objective to accelerate the market introduction of electric vehicles in Saint Lucia will be achieved by a combination of technical assistance and investment into electric mobility demonstration.

Geographical targets

![Map of St. Lucia](image)

Figure 2: Map of St. Lucia

The demonstration project will be piloted in Castries, the capital and largest city of Saint Lucia and will be focusing on the introduction of electric vehicles to the government fleet.

Systemic challenges, environmental threats and drivers

As most Caribbean island states, Saint Lucia is almost 100 per cent reliant on imported fossil fuels in order to meet its energy needs. It is estimated that the island imports 3,000 oil barrels per day, mainly from Brazil and Trinidad and Tobago (IDB, 2015).

This dependency on imported fuels also leaves the country vulnerable to global oil price fluctuations, which directly impacts electricity prices.
There is a high potential to improve energy efficiency and to reduce GHG emissions in the transport sector. While electric vehicles have the potential of bringing significant carbon mitigation benefits, such benefits will only materialize to the extent that the carbon intensity of electricity is reduced. Therefore, in addition to the introduction of electric mobility, this project aims at investigating the potential synergies of the large-scale introduction of electric vehicles with the upscaled integration of variable renewable sources of energy for power generation.

To date, a number of barriers such as the higher price of plug-in hybrid and electric vehicles compared to conventional vehicles exist. In particular, these barriers are:

- Lack of a coordinating framework at different levels of governments
- Lack of a holistic policy framework for electric vehicles, electric vehicle supply equipment and renewable power integration.
- Lack of public charging infrastructure.
- Lack of experience, technical and operational skills and abilities that can respond to future requirements of clean transport and power generation.
- Knowledge gap regarding the benefits of electric vehicles and misconception of Total Cost of Ownership (TCO).
- Limited number of available EV classes on the Market.
- Lack of adequate finance schemes and business models.

Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration

Current institutional framework
Currently, some policies are already in place to incentivize the shift towards electric mobility, such as the exemption from import duties for the import of electric vehicles. Furthermore, in 2015 Saint Lucia implemented the Motor Vehicles and Road Traffic Act– Section 193 which makes provisions for establishing emission standards and maximum levels of air contaminants from motor vehicles. The GoSL is currently reviewing their National Energy Policy, this will include advancement in e-mobility and future plans for the energy sector.

Baseline Investments

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Implementation Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Island Energy Program - Rocky Mountain Institute (RMI) and the Clinton Climate Initiative (CCI)</td>
<td>Developed National Energy Transition Strategy (NETS) and Utility-scale solar power plant (The Vieux Fort-area renewable energy project)</td>
<td>2018- Present</td>
<td>20 Million USD</td>
</tr>
<tr>
<td>IDB/GCF- Sustainable Energy Facility for the Eastern Caribbean</td>
<td>Financing commercial Geothermal Energy (GE) projects while strengthening legal and regulatory frameworks</td>
<td>2017- 2025</td>
<td>27.4 Million USD</td>
</tr>
</tbody>
</table>
**Stakeholder engagement**

Identified key stakeholders will be involved from the beginning of the implementation with established roles in order to successfully implement the various components of the project. The successful implementation of this project relies on the leadership of the Ministry of Infrastructure, Ports Energy and Labour. Ministry of Infrastructure, Ports Energy and Labour will be the executing agency of the project.

<table>
<thead>
<tr>
<th><strong>Institutions</strong></th>
<th><strong>Role</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government stakeholders</strong></td>
<td>Ministry of Infrastructure, Ports Energy and Labor</td>
</tr>
<tr>
<td></td>
<td>Ministry of Economic Development, Housing, Urban Renewal, Transport and Civil Aviation</td>
</tr>
<tr>
<td></td>
<td>Ministry of Education, Innovation, Gender Relations and Sustainable Development</td>
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<td></td>
<td>Ministry of Health and Wellness</td>
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<td>Ministry of Legal Affairs</td>
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<tr>
<td></td>
<td>Customs &amp; Excise Department</td>
</tr>
<tr>
<td><strong>Private Sector</strong></td>
<td>To be identified during development phase</td>
</tr>
<tr>
<td><strong>Public Entities</strong></td>
<td>Saint Lucia Electricity Services Limited (LUCELEC)</td>
</tr>
<tr>
<td><strong>Academe, Civil Societies (e.g. local university)</strong></td>
<td><strong>E.g University of the West Indies</strong></td>
</tr>
</tbody>
</table>

**Gender**

In St. Lucia women are both more likely to be in poverty and head caretakers, thus have less disposable income for fuel and make shorter and more frequent trips often with children. The project will consider the specific needs of women, elderly and the disabled through the design and provision of adequately equipped vehicles that prioritize comfort, dignity and safety. A shift to EV’s can addresses the disparity of women’s employment in the transport sector by providing opportunities for women in new businesses and business models and as drivers (more affordable to maintain and run), charging solution providers, fleet operators etc. EVs will also contribute to reducing the negative public health implications from vehicles for women and children.

The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and develop a gender mainstreaming and action plan for project design, implementation, and monitoring. Further, the project will ensure women are included in all awareness raising activities, decision making and capacity building so that all services, vehicles and infrastructure planned for and invested into necessitate that women reap the equal socio-economic and health benefits of shifting to cleaner technology as do men.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

The proposed project significantly contributes to accelerating electric mobility in the countries participating in the Global Programme and successful delivery of child projects is a key driver in achieving the desired impact. The project will create enabling environments for e-mobility in Saint Lucia through the establishment of a national coordination body that oversees e-mobility policies and will be responsible for enhancing policies to incentivize the uptake of e-mobility. By accelerating wider penetration of electric mobility in the country, overcoming existing barriers, adaption of the regulatory framework, the project will contribute to building confidence in EV technologies both at the country and regional levels. Further, the Global Programme addresses the bankability of electric mobility through the regional support and investment platforms.

**Incremental reasoning for GEF financing under the program, including the results framework and components**

The objective of the project is to promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Saint Lucia. The proposed project is structured across four components, which are necessary to address the barriers and facilitate the successful implementation of the baseline efforts to achieve an integrated, sustainable, and low-emissions transport system.
Component 1 Institutionalization of electric mobility: Political and institutional consensus for the promotion of electric mobility is achieved.

Component 2 Electric vehicle demonstration: Demonstrations provide evidence of technical, financial and environmental sustainability to plan for scale-up of electric mobility.

Component 3 Preparation of scale-up and replication of electric mobility: Conditions are created to accelerate the shift towards electric mobility in Saint Lucia.

Component 4 Promotion of long-term sustainability of electric mobility: Measures are developed to ensure the long-term sustainability of electric mobility.

The demonstration project will target various types of vehicles as part of government fleets and will build on and expand the expertise which has already been gained with the piloting of 2 electric cars and 1 electric light commercial vehicle within the fleet of the Ministry of Infrastructure, Ports, Energy and Labor.

A proposed budget of about 380,000 USD will be available for the demonstration of electric vehicles of various types including cars, small commercial vehicles and/or smaller 30-seater buses and their respective chargers.

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the transport system in Saint Lucia and in particular in Castries, the island’s capital. The promotion of electric vehicles coupled with the use of low carbon power charging will contribute to further reducing CO2 emissions and air pollution in Saint Lucia.

3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate \(59,452\) (metric tons of CO2e) greenhouse gas emissions, of which \(50,196\) are direct and \(9,256\) are indirect.

The project will take part in the Latin America and Caribbean Support and Investment Platform led by the Mario Molina Center in Chile and engage in one of the global thematic working groups, namely the Light-Duty Vehicles Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Saint Lucia will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region and small island developing states, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
**Togolese Republic**

**Child Project Title: Support the Shift to Electric Mobility in Togo**

**GEF Agency:** UN Environment  
**Total Project Cost:** GEF Grant – USD 423,716; Cofinancing: USD 1,496,000 (inc. PPG USD 35,000)

### 1. PROJECT DESCRIPTION

**Country Context**

Togo’s population of 7.8 million people\(^{12}\) is growing at 2.8% annually with over 40% of this population living in urban areas. The country’s 2017 Gross Domestic Product was estimated at US$ 5.43 billion with an annual growth rate of 5%. The 1990s and the first half of the 2000s were marked by political and social tensions that considerably weakened Togo’s economic and development progress. However, there has been considerable stability in the last few years.

![Figure 1 Historical petroleum demand of Togo from 2005-2017](image)

**Figure 1 Historical petroleum demand of Togo from 2005-2017**

With no refineries of its own, Togo is entirely reliant on imports to meet its refined petroleum products requirements. The quality of this fuel has come under criticism in the last few years owing to the high level of sulphur and other additives that aren’t permitted in Europe. The share of gasoil demand in total transport fuels mix was 61% in 2017 – up from a low of 57% in 2012. This is evidence of a higher demand for gasoil than gasoline. Following the trends, the oil import bill is projected to continue its upward trajectory unless there is an intervention.

In 2014 the World Bank estimated CO2 emissions at 0.4 metric tonnes per capita. As is the case in many other countries, a significant percentage of these emissions can be attributed to transport. Clean and sustainable transport remains a challenge for Togo despite several initiatives. There is evidence that there exist many opportunities in cleaning up the vehicle fleet that haven’t been explored. Promotion of low-carbon transport modes and development of renewable energies (target of 4% of the energy mix) are some of the priority measures adopted in Togo’s INDC under the Energy Sector.

The proposed project, with the support of the global programme, will analyze the existing transport and fiscal policies; develop supportive legal, regulatory and institutional framework to promote the introduction and uptake of electric mobility, and demonstrate electric vehicles in Togo. The demonstration of up to 2 electric cars and 30 2&3 wheelers and incentivize private sector engagement in investing in electric vehicles in Togo, thus drastically helping to reduce air pollution and GHG emissions.

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\(^{12}\) Based on 2017 estimates
2. Project Overview and Approach

A core component of the project is to demonstrate up to 30 electric 2&3 wheelers and 2 electric cars in selected captured fleets. The demonstration will generate experience with e-mobility, raise awareness, show the cost effectiveness, de-risk the technology and will thus be the incubator for private investment.

**Geographical targets**

The project will be piloted in Lomé, the administrative capital city and the country's industrial center and home to West Africa’s leading container port. The bulk of the vehicle fleet is found in Lomé. 96% of the total fleet is composed of light duty vehicles (LDVs) and 65% motorcycles (Figure 2). The project will thus focus on the uptake of electric LDVs and motorcycles, while also developing strategies for uptake of electric urban buses. In particular, the project will pilot up to 2 electric cars, 20 electric motorcycles and 10 3 wheelers.

**Systemic challenges, environmental threats and drivers**
Togo depends on imports for a large proportion of its power consumption with most of Togo’s generation being thermal. The current installed power generation capacity is 230 MW with 164 MW generated from thermal sources and 66 MW generated from hydro. The current national access to power is 35% - rural access is a paltry 5% while urban access is 74%. Togo’s national vehicle fleet has grown from 773,665 vehicles in 2008 to 1,768,520 vehicles in 2016 (Figure 3). This is an average annual growth 11%. LDVs have an annual growth rate of 6% while motorcycles have been growing at 13% annually. Between 2005 to 2016, 97% of all vehicles imported were used while 3% were new.

**Figure 4 Growth of vehicle fleet by mode over time in Togo**

Transport remains the largest and fastest growing contributor to energy related GHG emissions. The country aims to reduce its GHG emissions by 31% by 2030 compared to a Business as Usual (BAU) scenario\(^{13}\) (Figure 4). The project will thus contribute to the achievement of this target. When combined with renewable sources of power, accelerated introduction of electric vehicles (buses, cars, motorcycles, and bicycles), will substantially reduce fossil fuel consumption, GHG and air pollutant emission and fuel costs in the country.

**Figure 5 GHG emissions under a BAU and a conditional mitigation scenario**

\(^{13}\) UNFCCC (2015)
Although Togo has targets for the reduction of GHG emission, no overall strategy on how to reduce energy use and emissions from the transport sector which is the largest emitter in the energy sector.

**Institutional Capacity Barrier:**
There is a lack of capacity within the national government to address the issue of integrated sustainable transport and as well as promote low-emissions technology for the country. So far, no coordination body exists to address issues of sustainable mobility.

**Investment and Market Barrier:**
There are limited opportunities to access finance or create enabling partnerships for investment in sustainable mobility. There is a lack of innovative sources of financing to liberate private sector investment.

**Awareness and Outreach Barrier:**
There is no effective system to monitor, gather, analyze and disseminate information on low emissions mobility. There is low level of awareness among planners and decision makers on the linkages and potential common interventions to address climate change from the transport sector.

**Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration;**

**Baseline investments**
The government has launched the CIZO project which will see to up to 50 percent of the country’s energy needs in 2030 being met by solar. Under this project, the government, led by the Togolese Agency for Rural Electrification and Renewable Energies (AT2ER), under the Ministry of Energy and Mines, will install 300 ‘mini’ solar plants across the country and provide solar kits to over 500,000 households. The project will be rolled out in three phases over 12 years with a total cost of approximately US$ 1.7 billion funded through public-private partnership (PPP) of which 18% will be financed by the government and the remainder by private investors. The African Development Bank (AfDB) has pledged to avail about US$ 35 million to finance private investors.

**Institutional framework and Stakeholder engagement**
The successful implementation of this project will rely on coordination between the Ministry of Environment and the Ministry of Transport (Executing Agencies) as well as establishing clear roles for key stakeholders (Figure 5).
In Togo women are both more likely to be in poverty and head caretakers thus rely on motorcycles as an affordable and flexible mode in accessing their daily needs and responsibilities. The project will consider the specific needs of women through the design and provision of adequately equipped motorcycles that prioritize women’s comfort, dignity and safety. Increasingly, women have expressed an interest in becoming operators themselves, however they often lack access to capital for purchasing motorcycles. A shift to electric motorcycles can address the disparity of women’s employment in the transport sector by providing opportunities for women as drivers, charging solution providers, fleet operators etc. E-motorcycles will also contribute to reducing the negative public health implications for women and children from transport related air pollution.

The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and develop a gender mainstreaming and action plan for project design, implementation, and monitoring. Further, the project will ensure women are included in all awareness raising activities, decision making and capacity building so that all services, vehicles and infrastructure planned for and invested into necessitate that women reap the equal socio-economic and health benefits of shifting to cleaner technology as do men.

Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits; and

The components and outcomes of the project are in alignment with the Program’s Theory of Change. The project will develop supportive policies and strategies and will engage with private sector to increase the market share of electric vehicles in Togo. The project addresses existing barriers through adapting the regulatory framework as well as building institutional capacity, supporting demonstration
projects and enabling replication. Further, an e-mobility coordination body will be established which will be the focal point to share data, lessons learnt and policy best practice with the Global Programme.

*Incremental reasoning for GEF financing under the program, including the results framework and components.*

The objective of the project is to promote low-emissions mobility to reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector. The project is structured across four components:

**Component 1:** Develop legal, regulatory and institutional framework to support electric mobility uptake in Togo

**Component 2:** Demonstration of electric motorcycles and cars and establishment of measurement, reporting & verification (MRV) framework

**Component 3:** Preparation of scale-up and replication of electric mobility

**Component 4:** Promotion of long-term sustainability of electric mobility

GEF resources will only cover the incremental cost between the electric vehicle including the charger and the respective conventional vehicle. The contribution of the vehicle owner to the purchase costs is accounted as co-funding to the project. The promotion of electric vehicles coupled with the use of solar power will contribute to further reducing CO₂ emissions and air pollution in the Lomé region.

3. Engagement with the Global / Regional Framework

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 2,638,637 (metric tons of CO₂e) greenhouse gas emissions, of which 1,609,288 are direct and 1,029,349 are indirect.

The project will take part in the Africa Support and Investment Platform led by the UN Environment and engage in the global thematic working groups, namely the Light-duty vehicles (two and three wheelers and cars) working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on Supporting the Shift to Global Electric Mobility and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Togo will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Ukraine

Child Project Title: Transition Towards Low and No-Emission Electric Mobility in the Ukraine: Strengthening Electric Vehicle Charging Infrastructure and Incentives

GEF Agency: UN Environment/ The European Bank for Reconstruction and Development
Total Project Cost: USD 1,601,376; CoFinancing: USD 13,915,000 (Inc. PPG USD 50,000)

PROJECT DESCRIPTION

1. Country Context
Ukraine has a strong dependence on imported fossil fuels - both crude and refined. In 2017, 82.5% of fuel imports were for domestic energy needs, making oil products Ukraine’s largest import. The State spent more than $ 4.1 billion on the purchase of imported fuels, with over $ 440 million spent on crude oil for domestic refineries. The 2017 consolidated national budget was $30 billion with 15% representing fuel imports. Thus, fuel dependency is a heavy burden on Ukraine’s national economy.

Ukraine’s Greenhouse Gas Inventory 1990-2015 showed that in 2015 the energy sector accounted for around 66% of greenhouse gas emissions of which 15% was from transport. Within the transport sector itself, road transport was the largest emitter with 70.7% in 2015. The transport sector therefore has great potential to reduce energy use, address air pollution and mitigate CO$_2$ emissions.

The increase in the number of vehicles will also come with an increase in associated air pollution. The pollution from vehicles is mostly due to discharge like CO, unburnt HC, PB, NOx, SOx and SPMs. While, Ukraine’s ambient air quality standards are stricter than the standards recommended by the WHO Air Quality Guidelines for Europe, almost all large Ukrainian cities exceed the WHO standards for specific pollutants.

The Government of Ukraine would like to improve their air quality, energy efficiency and independence by shifting their transportation sector to electric. In their 2030 Strategy, they set a target for a + 50% share of EVs in total vehicle sales and 100% EV public transport fleet. In addition, there are targets for local manufacturing and production of EVs. In late 2017, the Ukrainian Parliament adopted a provisional exemption on value-added tax and excise tax for all EVs for 2018 – which has now been extended through 2019 up to the year 2022. In 2017, Ukraine was the fastest growing market for electric vehicles in Europe, with sales tripling in 2017 alone (GFEI, 2018). In 2018, about 4,800 electric vehicles had been imported. The share of EV sales continues to grow exponentially, mostly used vehicles ranging between 4-5 years in age. On the other hand, the necessary charging infrastructure build-up does not keep pace with the e-mobility fleet.

Additionally, Ukraine has an advantageous electricity grid. The electricity grid currently provides power at 287 gCO2eq/kwh with a large share of nuclear, hydro and only some coal, which leads to immediate GHG emission reductions from electrifying the transport sector.\textsuperscript{14} Ukraine 2035 Energy Strategy, specifies that adoption of renewable sources as an important factor for improving Ukraine’s energy security.

\textsuperscript{14} https://www.electricitymap.org/
Figure 1: Plug in Shares and Composition 2017 (https://www.kievcheckin.com/discover-kiev/are-we-entering-the-era-of-the-electric-car-heres-everything-you-need-to-know)

Figure 2: First Registrations of Hybrids and EVs in the Ukraine (Global Fuel Economy Initiative (GFEI) baseline study 2018)
2. Project Overview and Approach

**Geographic Target**
Candidate charging station sites will be identified and selected during project implementation as part of the feasibility and market analysis (Output 3.1) ideally targeting within a 100 km radius of Kiev or Lviv. The site selection process will be based on several factors reviewed as part of the feasibility and market studies, potentially including: i) availability of fast chargers in the vicinity, ii) public access to site(s), iii) proposed demonstration effect (i.e. key corridors for charging infrastructure) and iv) readiness of manufacturers / vendors to deliver.

![Map of Ukraine](image)

**Figure 1 Map of Ukraine**

**Systemic challenges, environmental threats and drivers**
For the current momentum of EV sales and adoption to continue, and the concurrent need for the deployment of infrastructure, Ukraine needs to address:

- The limited incentives and institutional support for EVs;
- Inadequate electric vehicle supply equipment, including public fast-chargers, and a harmonized approach across industry partners;
- Lack of adequate legal codes and provisions for charging service providers and address the availability of charging infrastructure.

**Barriers**

**Risks and time required for re-charging:** The gas station network for conventional cars make the driving risk-free since fuel is easily available. For EVs, one of the biggest challenges is the presence of charging stations, speed of charging and most importantly, the cost of charging. Significant investments are needed to put in place charging infrastructure to support early adopters. This also requires clarity and certainty of policies and regulations to enable the private sector to make long term investments and profits. This would require subsidies and other fiscal incentives in initial stages to scale up charging infrastructure.
While Ukraine’s EV fleet continues to grow, its recharging infrastructure is lagging behind. According to Schneider Electric in Ukraine, the total number of charging stations for EVs will increase to 4,000 by the end of 2018; currently, 25% of these chargers are located in Kiev. However, most of these chargers are only hooked up to 220-240AC requiring 6-8 hours for a full charge. There are very few available fast/superchargers which operate on a much higher voltage with most privately-owned fast chargers requiring membership.

**Policy and Regulatory Barriers:** The exemption on VAT and excise tax for all EVs for 2018 was on a pilot basis with no guarantee for extension. Prolonging these exemptions for a multi-year period will give both the industry (including recharging service providers) and consumers certainty to invest in EVs and infrastructure. Legislative certainty will also help to attract investors. Additional incentives like free parking, exemption from registration and circulation tax would provide further support for the electrification of transport.

The current legal situation for charging service providers does not promote open business practices and has led to ambiguous practices and pricing. Currently, Ukraine prices per-minute which is highly dependent upon the technical condition of the car’s battery and varies at different stages of the charging process.

**Restrictive regulation regarding the relationship between owners of charging stations (or charging service providers) and electric vehicle owners,** EV charging should be interpreted as a service and not as a supply of electricity. According to the Ukraine Electricity Market Law, charging service providers should have free access to the choice of the electricity supplier and EV owners should have access to charging stations without being required to enter a contractual relationship with any electricity provider.

**Lack of harmonization with industry and standardization bodies in charging standards.** There are no harmonized charging standards in the Ukraine (level, current, power rating and types, i.e. sockets and connectors). In addition, there are differences in communication methods of the different charging protocols.
Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration

Baseline investments

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Implementation Period</th>
<th>Available or Approved Budget, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiver on electric vehicle VAT</td>
<td>The State Fiscal Service of Ukraine waived the VAT on electric vehicles. Between 2017 and 2019, about 14,700 EVs has been imported to Ukraine.</td>
<td>2017 to now</td>
<td>30,000,000</td>
</tr>
</tbody>
</table>
| Ukraine Sustainable Energy Lending Facility (USELF III) | Provides European Bank for Reconstruction and Development loans from €1 million and free technical advice for small and medium renewable energy projects.  
EBRD/BSTDB: 57.6 MW Solar plant will reduce CO₂ emissions by 40,000 tones, Located in the Mykolaiv region.  
The construction of a 250 MW windfarm in the Kherson region of southern Ukraine | Ongoing               | 250,000,000  
|                                              |                                                                                                                                             |                       | 19,000,000  
|                                              |                                                                                                                                             |                       | 150,000,000                        |
| EBRD - Renewal of Public Transport          | The EBRD is supporting the modernization of public transport in Ukraine with a loan of up to €13 million for the acquisition of up to 72 low emission, low-floor trolleybuses for the city of Mariupol. | Ongoing               | 13,000,000                        |
| EU- Assistance to Ukraine in the process of implementation of energy sector reform in line with Ukraine’s international commitments | The contract shall provide assistance to the Ministry of Energy and other relevant stakeholders in the process of implementation of Energy Community Treaty and energy provisions | 2016-2019             | 22,29950                         |

Stakeholder engagement

The successful implementation of this project relies on the leadership of the Ministry of Ecology and Natural Resources of Ukraine. The Ministry of Infrastructure will play an advisory role and provide expert advice on aspects related to policy formulation and legal / regulatory measures related to public and private sector charging infrastructure providers and will be engaged already during the development phase. The Ministry of Fuel and Energy will provide expert advice on aspects related to electricity generation and renewable grid integration. The Ministry of Regional Development, Construction, Housing and Communal Services will support the design and implementation of demo projects and co-financing investments. The State Agency on Energy Efficiency and Energy Saving of Ukraine and the Local authorities will be consulted during the development phase and implementation to shape the demo planning, design, integrated inventory data collection, as well as policy inputs to the Project Document. Electricity distribution companies will be consulted on developing regulations and steps for providing connectivity for charging stations. Some of the EDCs are also interested in investing in the charging infrastructure.

The Child Project involves two GEF Agencies: UN Environment as the lead agency and the EBRD with responsibility specifically for executing Component 3. UN Environment will be responsible for all monitoring, reporting and evaluation of the project including leading on annual reporting, mid-term review and terminal evaluation.
The project will include an assessment of the impact of the current transport system on women, children, and the elderly, including impacts on health and safety. The project will disaggregate data collection to capture gender-based differences in trip patterns and other characteristics and make an appropriate analysis on gender and transport issues in the country and develop a gender action plan during the development phase.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

The project addresses the charging infrastructure barrier by putting in place a minimum recharging infrastructure in selected cities and along main connecting highways. In addition, the global programme as well as the child project in Ukraine address the bankability of electric mobility by supporting the demonstration of electric mobility in up to 20 low and middle-income countries around the world. The grant funds provided by the GEF and complemented by co-funding aim at de-risking the electric vehicle and electric vehicle supply equipment technology in order to attract non-grant funding for upscaling of the demonstration projects from financial institutions such as development banks and funds such as the Green Climate Fund. It thus significantly contributes to accelerating the introduction of electric mobility in the countries participating in the Global Programme.

More specifically, this project expected impacts are:

- Targeted, convenient and safe recharging infrastructure is deployed across Kiev, other strategic points. EV public charging stations are more readily available (e.g. at Ministry of Ecology and Natural Resources of Ukraine).
- Early leadership in developing a market for EV’s creates jobs and makes Ukrainian businesses more competitive. Ukraine is a regional leader on electric mobility infrastructure and policy.
- Demonstration of EV charging infrastructure under the GEF 7 project attracts follow-up finance from development banks and other green funds.

**Incremental reasoning for GEF financing under the program, including the results framework and components.**

The incremental effects of the GEF-funded activities will be able to extend the integrated, sustainable and low emissions concept to the transport system in the Ukraine. The project aims to deploy targeted, convenient and safe recharging infrastructure across Kiev and other strategic points. The promotion of electric vehicles coupled with the use of renewable energy will contribute to further reducing CO2 emissions, air pollution and energy dependence in the Ukraine.

**The objective of the project:** Is to support and enable the Government of Ukraine to make the transformative shift to de-carbonize transport systems by promoting the scaling up of electric mobility at a national scale

**Component 1:** Institutional frame work, awareness raising and capacity building for electric vehicles

**Component 2:** Development of an electric mobility policy framework with a focus on electric vehicle infrastructure/ charging stations, and fiscal/non-fiscal incentives
**Component 3**: Demonstration of electric vehicle charging station infrastructure, public fast charging stations

**Component 4**: Enabling scaling-up

The project will close knowledge gaps and support the improvement of the institutional framework for e-mobility in Ukraine in coordination with other ongoing initiatives. The deployment of EV charging infrastructure is essential to de-risk the technology. Additionally, the project will target renewable energy integration so that the Ukraine can put in place tailor made conditions to enable an accelerated and sustainable market transformation.

3. **Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The project will mitigate 4,886,612 (metric tons of CO2e) greenhouse gas emissions, of which 4,244,209 are direct and 642,402 are indirect.

The project will take part in the Africa Support and Investment Platform led by UN Environment and will engage with the Charging Infrastructure and Grid Integration Working Group.

The project will build upon the materials and trainings provided by the GEF global electric mobility programme on *Supporting the Shift to Global Electric Mobility* and will in return provide feedback on the experience gained, best practices identified, and policies developed to the global knowledge hub hosted by the International Energy Agency. Identified stakeholders from government, academia as well as the private sector in Ukraine and will join the regional meetings and thematic working groups organized by the Global Programme. Through this participation they will share knowledge with other countries in the region, supporting them to benefit from the know-how generated within the thematic platforms. The transfer of knowledge and best practices from South to South, North to South and peer to peer is a core component of the GEF Programme and will ensure the effective use of funds, both at the country as well as at the global level.
Uzbekistan

Child Project Title: Tashkent- Sustainable Green Cities- Promoting Green Urban Development in Tashkent Through Accelerating Investments in Low-Emission Vehicles

GEF Agency: United Nations Development Programme
Total Project Cost: USD 3,569,725; CoFinancing: USD 50,500,000 (Inc. PPG USD 100,000)

PROJECT DESCRIPTION

1. Country Context

The Government of Uzbekistan (GoU) is striving to improve the sustainability of its economy supported by modern infrastructure balanced with efforts to meet its global environmental commitments. As the most carbon intensive economy in the world\textsuperscript{15}, Uzbekistan is party to United Nations Framework Convention on Climate Change (UNFCCC), a signatory to the Paris Agreement on 19 April 2017 with the Senate of the Uzbekistan’s Parliament ratifying the Paris Agreement through adoption of a Law “On Paris Agreement Ratification” on 27 September 2018. This is to be done through the nationally determined contributions (NDCs) declared by the country: The national mitigation objective is to decrease specific emissions of greenhouse gases per unit of GDP by 10% by 2030 from level of 2010. Uzbekistan’s commitments under the Paris Agreement are in line with implementation of the targeted policy for energy saving in the key economy sectors. “Decreasing in GDP energy consumption by approximately 2 times as a result of broad introduction of the advanced energy saving technologies has been identified in Uzbekistan as the one of targeted tasks for period up to 2030.

As a consequence, the GoU and Uzbekistan’s municipal governments are all driven towards this vision as they endeavor to manage urban issues related to increasing urbanization, issues that are increasingly putting a strain on municipal resources. They both have, as a priority, the introduction of a new and innovative segment of the automotive industry, the production and operation of electric vehicles deemed to be "green", a clean mode of transport that receives its energy from electricity. GEF’s strategy for “Sustainable Cities” will be critical to address both short-term and long-term climate change challenges in the rapidly growing urban sector. The Sustainable Cities Impact Program targets urban interventions with significant climate change mitigation potential to help cities shift towards low-emission and resilient urban development in an integrated manner. The Strategy lies with city-level projects that focus on integrated solutions to urbanization across sectors that includes inter alia urban mobility, ecosystem conservation, climate change adaptation, and smart technologies. This proposed project has a primary focus on improving urban mobility integrated with solutions that cross these sectors.

Under the ratified Paris Agreement (2018), Uzbekistan’s climate change mitigation objective (NDC) is to decrease the specific GHG emissions per GDP unit (against the baseline of 2010) by 10% by 2030, a process to be guided by the President of Uzbekistan’s Decree (issued January 2019) on “measures to fundamentally improve the processes of urbanization”, which envisages widespread adoption of best practices on “green urban development”, and sustainable management of the urban environment, of which the development of sustainable urban transport is significant and imperative.

\textsuperscript{15} Uzbekistan’s carbon intensity is 0.64 kg per 2011 PPP $ of GDP. Source: According to World Bank (https://data.worldbank.org)
2. Project Overview and Approach

Due to the large influx of people to the largest centers of Uzbekistan that includes Tashkent, Samarkand and Namangan, municipal governments are experiencing challenges in managing the urban growth and providing basic municipal services associated with modern cities.

Figure 1: Location of Tashkent, Uzbekistan

Figure 2: City of Tashkent with potential corridors for a green urban transport corridor
This includes the provision of modern urban mobility services in the form of improved and efficient public urban transport systems. Their barriers and challenges to the provision of these services includes:

- an increasing number of motor vehicles, mainly in urban areas resulting in urban congestion, increased air pollution, and increased GHG emissions. This has increased urban air pollution. Nationally, road transport pollution is 60% of all air pollution in Uzbekistan, which is more than 3 times higher than in developed countries of the world;  
- the absence of a strategy or concept for integrated spatial planning for sustainable urban development that focuses on promoting sustainable low-carbon urban transport, smart road infrastructure in concert with city greening. Current practices do not provide an adequate protection network for green spaces in and close to cities to ensure appropriate levels of protection for wildlife, flora, and fauna. Development of urban infrastructure for transport and buildings leads to an increase in tree cutting of trees aggravated by the invasion of tree pests, diseases and increased aridization of the urban climate;  
- a municipal budgeting system that does not provide incentives for innovations in urban development such as PPPs and attraction of private sector investment;  
- lack of a national system for the monitoring of environment-related indicators that reflect changes in the quality of the urban environment and serve as the basis for well-informed decision-making. Such a system should allow for the regular monitoring of emissions from air pollution sources complete with a system to validate and verify collected data  
- no standards or regulations that would serve as safeguards against environmental hazards associated with the manufacture of electric vehicle batteries and their disposal at their end-of-life. These regulations will need to cover proper disposal to minimize environmental impact and exposure to the society.

Existing or planned baseline investments, including current institutional framework and processes for stakeholder engagement and gender integration

The Urban Planning and Construction Code of the Republic of Uzbekistan provides the legal framework of urban planning and construction policy. The national concept of sustainable cities is rooted in the Goal #11 of the National SDGs adopted by a Government Resolution on 20 October 2018. Uzbekistan also has a National Action Strategy 2017-2021 that stipulates the formation of a newly established Ministry of Economy and Industry (achieved on 11 January 2019) that is mandated to lead in these new urbanization development approaches, under which the Agency for Urbanization has been established. The Agency will, inter alia, develop transport sector measures and infrastructure based on energy efficient and environmentally friendly technologies and materials that will provide significant improvement of transport services, increase passenger safety, reduce emissions of harmful air pollutants, provide new comfortable buses for public transport, provide construction and reconstruction of passenger-friendly bus stations, and develop sustainable management approaches to urban development.

The Tashkent City Municipality will serve as the Project’s implementation partner. In November 2018, Tashkent City Municipality and its Public Council launched the “Tashkent 2025: Transformation” project, with the aims of a competitive urban economy, sustainable development, and an improved living stand-

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16 In 2018, air polluting emissions in Tashkent totaled 410,000 tons of which 94% are from mobile sources with road transport accounting for up to 80% of these emissions. Nationally, road transport pollution is 60% of all air pollution in Uzbekistan, which is more than 3 times higher than in developed countries of the world.

17 This rate is 18% for developed countries, 40% for Russia, and 30% for Kazakhstan.

18 Electric vehicle batteries are produced from rare earth metals, some of which are not environmentally friendly. Disposal of unrecyclable material from battery manufacturers must be handled properly.
ard for the residents of Tashkent. The Tashkent 2025 project includes development of transport, including introduction of electric buses, and Tashkent road infrastructure for 2019-2025, and envisages the optimization of the public transport route network, introduction of dedicated lanes for public transport with development of cycle paths. Currently, the TCM administration is undertaking a pilot project for the development of a single electric bus and a charging station from Belarus. The City is also seeking opportunities to pilot other aspects of its Tashkent 2025 project that will encourage its replication in other cities and regions in Uzbekistan, such as Samarkand and Namangan.

Marketing and development studies on consumer perspectives on EVs have been carried out by “Uzavtosanoat” since 2018 in an effort to better understand the development of the EV market in Uzbekistan. Consumer perspectives from these studies have included positive attitudes towards EVs such as their significantly lower operating costs in comparison with internal combustion vehicles and lower maintenance. Their perspectives also included national benefits to the country in the context of saving domestic consumption natural gas and improving the country’s natural gas export potential. The Innovation Center at the Turin Polytechnic University in Tashkent in collaboration with Uzbekenergo (National Power Company) have also provided pilot infrastructure for charging electric vehicles.

There have also been discussions between the Government’s Ministry of Innovative Development and representatives of the Changan Automobile Group (China) in June 2018 to discuss the prospects of possible cooperation and production of electric vehicles in Uzbekistan. This included expressions of interest by Changan to setup an EV assembly plant in the Ferghana Valley region that may also include production of modern hybrid engine automobiles, transitioning to the production of 21 new EV models operating exclusively on electricity by 2025.

Other stakeholders with an interest in EVs in Uzbekistan include:

- Local truck and bus manufacturers (some of whom have partnerships with companies in developed countries) who have the capacity to assemble electric buses for domestic public transport and possible export to other Central Asian countries. There are currently plants assembling in Uzbekistan CNG fueled low-floor buses of large capacity for both export and domestic use in Tashkent. The emergence of a strong market for electric buses in Uzbekistan would catalyze these companies to invest several millions into an electric bus assembly lines at various plants in Uzbekistan;

- Foreign multi-national companies located in Uzbekistan who have technologies related to other sustainable transport measures such as green and synchronized road and pedestrian traffic control systems, and smart parking. The emergence of a strong EV market in Uzbekistan would catalyze these companies to invest in assembly lines related to the supply of fast charging stations for EVs;

- Uzbekistan Government Agency on Standardization and Certification who would be involved with the emergence of an EV market in the area of certification of EVs, considered new technology being introduced into the country;

- Traffic police of Tashkent, who have oversight of traffic law enforcement. Traffic laws may change with the completion of the green urban transport corridor that would provide public transport priority to electric buses and other high occupancy vehicles. Their cooperation to ensure general public compliance to these new laws is important to the successful demonstration of the pilot green urban transport corridor and electric buses and EVs.

The benefits of enhanced public transport for females as well as vulnerable social sectors of Tashkent can be realized through the development of a GUTC that are well lit with well-designed infrastructure

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19 Other aspects of the Tashkent 2025 project would include approaches to mitigating water pollution, sustainability in waste management, air quality improvements, efficiencies in the use of water and electricity, and greening of cityscapes through rehabilitation of green belts and encouraging natural infiltration of surface runoff.
for walking and cycling. This would increase their urban mobility which can be monitored through the gender sensitive indicators and gender disaggregated data/statistics.

The private sector in Uzbekistan will be involved with the supply, installation and operation of smart and clean technologies for the pilot GUTC. Their involvement will also be contingent on support they may receive from international private sector companies that will provide technical support for these smart technologies which in general will be imported into Uzbekistan. Moreover, private sector engagement (owners of taxi fleets, private bus companies and delivery companies) will be encouraged by the project to make EV investments through expected increased confidence of electric bus operations which will demonstrate the viability of EV operations in Uzbekistan.

**Description of how the integrated approach proposed for the child project responds to and reflects the Program’s Theory of Change, and as such is an appropriate and suitable option for tackling the systemic challenges, and to achieve the desired transformation with multiple global environmental benefits**

This project strongly aligns with the GEF-7 Climate Change Focal Area Investments and Associated Programming’s Objective 1: Promote innovation and technology transfer for sustainable energy breakthroughs, specifically the entry point on the “Global Electric Mobility Programme” that is intended to support growth of low-carbon transport options. The proposed project consists of technical assistance and investments in pilots for low carbon electric buses and efficient public transit corridors with best international practices for bus-rapid-transit and improved infrastructure for cyclists and pedestrians, coupled with new, low-carbon sources of renewable energy and improved grid reliability. The success of this pilot should catalyze the Uzbekistan market for electric drive technologies, creating jobs with existing entities in Uzbekistan with infrastructure capacity for manufacturing of equipment necessary for the growth of electric buses and vehicles that are already established in the country. With existing barriers to wider adoption of electric mobility in Uzbekistan, true commercial scaling of electric vehicles in Uzbekistan will be facilitated through the proposed project’s support for the strengthening of existing regulatory frameworks, planning for disruptive market changes, and fostering integration of electric vehicles into the Uzbekistan grid.

Both the Government of Uzbekistan and the Tashkent City Municipality (TCM) have placed high priority on the introduction of low carbon vehicles that will be new and innovative to Uzbekistan. Electric vehicles (EVs) are "green", using electrical energy for all or a significant portion of its energy generated from renewable energy sources such as solar and wind. Widespread adoption of EVs will substantially reduce greenhouse gases emissions (CO₂) as well as other harmful air pollutants associated with emissions from internal combustion engines. Since most private automobile trips are made within the city with higher energy intensities and emitting higher levels of GHGs per kilometer traveled, EVs will generate global environmental benefits (GEBs) and significantly contribute to the improvement of the urban environment including a reduction of noise on the roads, all of which has health benefits to urban residents. The City of Tashkent is the first city in Uzbekistan to utilize these measures and new approaches to wider adoption of EVs.

The project strategy will correspond to the priority direction of programming the funds of the 7th GEF cycle in the target area of “climate change mitigation", specifically CCM 1:2 with a focus on the advancement of technologies operating on electric power and electric transport. This project will complement ongoing efforts of the Tashkent 2025 Project and provide incremental assistance to issues where there are insufficient efforts by the involved national organizations and companies. These entities are not as aware of best international practices in greening urban infrastructure and are more focused on the development of current infrastructure and meeting current demands for internal combustion en-
gines and vehicles. Thus, grant financing will complement the national funding allocated for this priority and innovation tasks.

The estimated direct GHG emission reductions estimated cumulative over the 6-year duration of the project was estimated to be 217,341 tonnes CO₂. These benefits will be generated from the use of electric buses, their increased average speed along the pilot GUTC corridor that increases the daily number of passengers on the route, transport modal switches from private cars to transport along the pilot GUTC, and other GUTCs being constructed in Tashkent based on the success of the pilot GUTC. The direct GHG emissions will not be realized until Year 4 of the project with feasibility studies and construction of the pilot GUTC needing to be completed as well as the procurement process for electric buses (which may take up to 2 years but within the time frame of this proposed project). The estimated 20-year period lifetime emission reductions (indirect emission reductions) from these sources is 5.6 million tonnes CO₂ that assumes a linear growth of green urban transport corridors from 20 km to 200 km in 10 years (2023-2033). These estimates were calculated using the Transport Emissions Evaluation Model for Projects. The PPG will be used to collect more information that will provide more precise estimates of the Global Environmental Benefits from this proposed project.

**Incremental reasoning for GEF financing under the program, including the results framework and components.**

GEF grant funds can be utilized to cover the incremental costs related to assisting the Government of Uzbekistan and the Tashkent City Municipality to implement Tashkent 2025 Project with a focus on improving urban mobility and urban environmental conditions through the introduction of electric buses, optimizing the public transport route network, and introducing dedicated lanes for public transport with development of cycle paths and increased adoption of e-mobility at both the national and municipal level. The strategy will involve an initial focus on developing a comprehensive and innovative concept for green urban transport corridors (GUTC) that feature electric buses as well as investment grants to assist with the construction of pilot green urban transport corridors related to electric buses and fast recharging stations. A key aspect of this strategy is to conduct a successful and highly visible demonstration project on the operation of electric buses in Tashkent with improvements in the efficiency of public transport; this can catalyze interest and development of the electric vehicle industry in Uzbekistan as well as modern public transport systems in Uzbekistan’s cities. This project will complement ongoing efforts of the Tashkent 2025 Project and provide incremental assistance to issues where there are insufficient efforts by the involved national organizations and companies. These entities are not as aware of best international practices in greening urban infrastructure and are more focused on the development of current infrastructure and meeting current demands for internal combustion engines and vehicles. Thus, grant financing will complement the national funding allocated for this priority and innovation tasks.

In the absence of this proposed project, the pace of development for modernizing Uzbekistan’s urban transport systems under the Tashkent 2025 Project (including the introduction of electric buses, the optimization of the public transport route network, and introduction of dedicated lanes for public transport with development of cycle paths) is anticipated to be slow. While Government officials are cognizant of the emerging problems with urban transport congestion and attendant air pollution issues,

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20 The Transport Emissions Evaluation Model for Projects (TEEMP) has been modified and extended to serve as a standard method to evaluate GEF projects. The short-cut method in the TEEMP model was used since it only requires the inputs of passenger loads and length of BRT corridor line using global default values for BRT lines. The GUTC will be similar to a BRT corridor with an assumption of a 20 km length with a daily passenger load of 14,000 (information from JSC “Tashshaharhizmat”). Actual emission reductions can increase with the improvement of the grid emissions factor in Uzbekistan from its current value of 0.569 tonnes CO₂/MWh, and an increase in the average speed of these buses from proposed public transport priority measures (in Component 2) such as synchronized signaling and dedicated bus lanes. Further emission reductions could also be realized through improvements in the quality of transport with electric buses which would encourage transport modal switches from private automobiles to public transport.
their capacities to resolve these issues with the knowledge of their current personnel is limited. As a result, they have limited capacities to prepare feasibility studies and financial plans for the financing of the basic urban transport elements of the Tashkent 2025 Project. The improvements to Tashkent’s urban transport systems and emerging problems on increased transport-related GHG emissions and air pollution will take more than 10 years to resolve at which point these issues will become exponentially more difficult to resolve.

The incremental benefits of the proposed project are the exposure of local stakeholders to the best international practices in developing green urban transport corridors where low carbon urban transport with EVs can be promoted. Through this GEF project, the capacities of the Tashkent City Municipality will be enhanced to plan and manage the feasibility studies, engineering designs, tendering, construction supervision, operation and maintenance of a pilot GUTC featuring electric buses. The implementation of the pilot GUTC using electric buses in Tashkent will raise the visibility of EVs in Uzbekistan and their environmental benefits (such as reduced emissions of GHGs and other gases associated with internal combustion engines and improved urban environmental quality along the corridor) and economic benefits (such as reduced operational costs of the corridor and transit-oriented development along the corridor). This will induce the desired impact of positive perceptions of GUTC concepts and improved confidence in electric buses sufficient to catalyze investments and accelerate the adoption of EVs into Uzbekistan (by Year 5), and to reduce GHG emissions in the transport sector.

The objective of this project is to accelerate the adoption of electric vehicles in the City of Tashkent that can be replicated in other cities in the Republic of Uzbekistan, significantly reduce greenhouse gas emissions in the transport sector, and improve urban environmental quality. This objective will be achieved by a combination of technical assistance and investment into e-vehicle demonstrations. Thus, the project will work towards the removal of the above mentioned barriers through:

**Component 1 National and municipal laws, plans, regulations, and policies** to promote green urban transport corridors (that includes electric vehicles (EVs), high quality transport services, and green urban infrastructure)

**Component 2 EV and green urban transport corridor demonstration** projects in the City of Tashkent

**Component 3 Capacity building, training, and awareness raising** for managing green urban transport corridors

**Component 4 Feasibility studies, business plans, and activities** to stimulate and to encourage replication and scaling up

**3. Engagement with the Global / Regional Framework**

This project responds to CCM 1-2: Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility. The estimated direct GHG emission reductions estimated cumulative over the 6-year duration of the project was 217,341 tonnes CO₂ from electric buses and green urban transport corridors being used for public transport. The 20-year period lifetime emission reductions (indirect emission reductions) from these sources is 5.6 million tonnes CO₂ that assumes a linear growth of green urban transport corridors from 20 km to 200 km in 10 years.  

The project will take part in the Asia & the Pacific Support and Investment Platform led by The Asian Development Bank and engage with the Heavy-Duty Vehicle global thematic working group.

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21 Estimated through the use of the short-cut method in the TEEMP model which requires only passenger loads and length of BRT corridor line using global default values for BRT lines. The green urban transport corridor will be similar to a BRT corridor.
This project will engage with the global and regional framework through Outcome 2.1: Conditions are created for market expansion and investment in electric mobility through support and investment platforms. With the project’s knowledge management approach leveraged to encourage replication of the pilot green urban transport corridor, its technologies and actions, Uzbekistani stakeholders will be engaged with global knowledge platforms that will improve investment conditions for electric drive vehicles. With the preparation of a feasibility study to be used for business planning of scaled-up fleets of electric vehicles, the project will accelerate the use of this knowledge through national workshops (that support Outcome 3.1) to share findings of environmental monitoring of the pilot green urban transport corridor with other municipalities for learning and formulating joint actions and policies to improve and sustain urban environmental quality. This knowledge will also be transferred to other municipalities in Uzbekistan (such as the large cities of Samarkand and Namangan) wanting to develop their own green urban transport corridors (notably their ability to improve their articulation of their financing needs with rationale for GUTCs and conversions to electric buses), and to private sector companies who want to invest in their own fleets of EVs. Finally, knowledge from this project will be provided to higher learning institutions of Uzbekistan for inclusion into their curriculum.

Despite the positive developments, the pace of development for developing modern urban transport systems under the Tashkent 2025 Project (including the introduction of electric buses, the optimization of the public transport route network, and introduction of dedicated lanes for public transport with development of cycle paths) is anticipated to be slow without exposure to local implementers of the best international practices in developing green urban transport corridors where low carbon urban transport with EVs can be promoted.

The project has been setup in Component 4 to realize the potential for scaling-up of other GUTCs to be developed along other corridors in Tashkent and other large cities of Uzbekistan such as Samarkand and Namangan. Component 4 includes technical assistance and workshops to inform other municipalities of the environmental benefits of GUTCs for their respective cities and facilitate actions towards further GUTC developments. Component 4 also provides technical assistance to facilitate private sector investments into electric vehicle fleets which will accelerate scale-up of EVs in Uzbekistan. These actions dovetail into the global and regional framework under Outcome 2.1 with technical assistance to expose Uzbekistani stakeholders to best practices for scaling-up of EV fleets and usage.

The design of this project is innovative for Uzbekistan since the concept of a green urban transport corridor has not yet been tested in the country. By facilitating the use of clean electric vehicles along a transport corridor that prioritizes public transport, Uzbekistan will have a demonstration of the positive environmental and economic benefits of a pilot GUTC and electric vehicles which have not had the required visibility nor the public and investor confidence of the economic and environmental viability of EVs in Uzbekistan.

Sustainability of this project can be assured through its close links to the Tashkent 2025 Project, which will tie the activities closely with and through strong support from the national and local governments. Civil society groups such as the Public Council of Tashkent will apply its strong advocacy abilities to support the actions of this project, notably for their calls for improved public transport services and an expansion of safe cycling corridors. In addition, the project will leverage investment, upon the strong interest that it will raise through its demonstrations and pilots, from local manufacturers of motor vehicles to assemble electric buses and EVs in Uzbekistan to create local employment, and from private sector companies to convert vehicle fleets thereby sustaining the growth of electric vehicles within the Tashkent City as well as other cities in Uzbekistan such as Samarkand and Namangan.