Integrated adoption of electric mobility in the maritime sector through clean technology innovation

Part I: Project Information

GEF ID
10999

Project Type
MSP

Type of Trust Fund
GET

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Integrated adoption of electric mobility in the maritime sector through clean technology innovation

Countries
Cabo Verde

Agency(ies)
UNIDO

Other Executing Partner(s)
Ministry of Industry, Trade and Energy; Ministry of the Sea

Executing Partner Type
Government

GEF Focal Area
Climate Change

Taxonomy
Focal Areas, Influencing models, Demonstrate innovative approache, Convene multi-stakeholder alliances, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Stakeholders, Partnership, Type of Engagement, Participation, Consultation, Information Dissemination, Beneficiaries, Communications, Awareness Raising, Local Communities, Academia, Civil Society, Gender

Equality, Gender results areas, Access to benefits and services, Capacity, Knowledge and Research, Enabling Activities, Capacity Development, Knowledge Exchange, Knowledge Generation, Training, Innovation

Sector
Transport/Urban

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 2

Climate Change Adaptation
Climate Change Adaptation 0

Duration
48 In Months

Agency Fee($)
95,837.00

Submission Date
4/13/2022

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCM-1-2	GET	1,008,806.00	4,819,522.00
	Total Project Cost ($)	**1,008,806.00**	**4,819,522.00**

B. Indicative Project description summary

Project Objective

To advance the adoption of electric mobility in the maritime sector particularly for remote villages integrated with the use of renewable energy (RE) options

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 1: Policy and institutional support to promote low-carbon maritime mobility solutions	Technical Assistance	Outcome 1: Capacity building and support for creation and implementation of low-carbon energy and sustainable maritime transport policy is provided	**Output 1.1.1** Sustainable Maritime Transport Unit (SMTU) is established **Output 1.1.2** Capacity development of interested government agencies is provided **Output 1.1.3** A roadmap for upscale of low-carbon energy and maritime transport solutions is developed and presented for validation by the Ministry of the Sea and Ministry of Industry, Trade and Energy	GET	160,000.00	753,380.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 2: Support the supply of a sustainable energy infrastructure to drive low-carbon maritime mobility solutions and related technologies	Technical Assistance	Outcome 2: Potential of low-carbon energy and transport solutions is demonstrated and recognized	**Output 2.1.1** Feasibility study for broader low-carbon energy and transport solutions is developed	GET	150,000.00	500,000.00
Component 2: Support the supply of a sustainable energy infrastructure to drive low-carbon maritime mobility solutions and related technologies	Investment	Outcome 2: Potential of low-carbon energy and transport solutions is demonstrated and recognized	**Output 2.1.2.** Infrastructure for the charging of electric batteries is installed in two target villages **Output 2.1.3** Center to support the leasing/renting of batteries established in two target villages	GET	209,299.00	1,476,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 3: Stimulation of the demand for electric battery services	Investment	Outcome 3: Demand for electric battery services stimulated and national and local awareness of low-carbon energy and transport solutions enhanced and supported by information from demonstrations	**Output 3.1.1** Demonstration of low-powered, battery-swap electric marine vessels and demonstration of shared access to electric marine propulsion systems in two target villages	GET	180,000.00	730,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 3: Stimulation of the demand for electric battery services	Technical Assistance	Outcome 3: Demand for electric battery services stimulated and national and local awareness of low-carbon energy and transport solutions enhanced and supported by information from demonstrations	Output 3.1.2 Stakeholders? awareness of the benefits, effectiveness and viability of maritime electric mobility is enhanced through community-level awareness raising services provided and educative material disseminated, in particular via the establishment of a public information platform Output 3.1.3 Demonstration projects showcased through case studies Output 3.1.4 Awareness raising sessions and training programs provided on the results and learnings from the demonstrations	GET	138,578.00	521,315.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 4: Monitoring and evaluation	Technical Assistance	Outcome 4: Adequate monitoring of all project indicators in line with GEF, UNIDO and Government of Cabo Verde requirements	**Output 4.1.1** Monitoring and mid-term review **Output 4.1.2** Independent terminal evaluation conducted	GET	80,000.00	400,689.00
				Sub Total ($)	**917,877.00**	**4,381,384.00**

Project Management Cost (PMC)

GET	90,929.00	438,138.00
Sub Total($)	**90,929.00**	**438,138.00**
Total Project Cost($)	**1,008,806.00**	**4,819,522.00**

Please provide justification

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Government of Cabo Verde	Grant	Investment mobilized	339,522.00
Recipient Country Government	Government of Cabo Verde	In-kind	Recurrent expenditures	500,000.00
Recipient Country Government	Government Institutions	Grant	Investment mobilized	80,000.00
Recipient Country Government	Government Institutions	In-kind	Recurrent expenditures	200,000.00
Other	Other multilateral Agencies	Grant	Investment mobilized	50,000.00
Other	Other multilateral Agencies	In-kind	Recurrent expenditures	50,000.00
Private Sector	Private Sector & FIs	Loans	Investment mobilized	3,100,000.00
Beneficiaries	Municipalities	Grant	Investment mobilized	50,000.00
Beneficiaries	Municipalities	In-kind	Recurrent expenditures	50,000.00
Other	Academy	In-kind	Recurrent expenditures	100,000.00
Other	Civil Society Organization	In-kind	Recurrent expenditures	100,000.00
GEF Agency	UNIDO	Grant	Investment mobilized	50,000.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	150,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
			Total Project Cost($)	**4,819,522.00**

Describe how any "Investment Mobilized" was identified

Investments to be mobilized were identified in the course of consultation of stakeholders on funding priorities and according to the existing and forecast pipeline of projects. Each of the project?s four components requires funds to be mobilized. A reasonable proportion of the fund will be used to support the project with vital technical assistance. In addition, Component 2 (Support the supply of a sustainable energy infrastructure to drive low-carbon maritime mobility solutions and related technologies) requires funding to be mobilized for procurement activities, including for the procurement of electric marine propulsion systems, solar charging stations (or at least the services required to connect to existing RE services), services associated with their installation and deployment, and local technical and parts supply services. The procurement of these goods and services will be achieved through a competitive bid process. The project will also depend upon grant and in-kind contributions from the public sector, to support Components 1 and 3, in particular the development of the roadmap and the capacity building activities. Innovations identified under former GCIP projects could be an additional source of co-financing and opportunity to demonstrate the project. The investment to be mobilized will be further defined and confirmed during the PPG phase.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	GET	Cabo Verde	Climate Change	CC STAR Allocation	1,008,806	95,837	1,104,643.00
			Total GEF Resources($)		**1,008,806.00**	**95,837.00**	**1,104,643.00**

E. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

50,000

PPG Agency Fee ($)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	GET	Cabo Verde	Climate Change	CC STAR Allocation	50,000	4,750	**54,750.00**
				Total Project Costs($)	**50,000.00**	**4,750.00**	**54,750.00**

Core Indicators

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO?e (direct)	6000	0	0	0
Expected metric tons of CO?e (indirect)	160000	0	0	0

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

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

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO?e (direct)	6,000			
Expected metric tons of CO?e (indirect)	160,000			
Anticipated start year of accounting	2023			
Duration of accounting	10			

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

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

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

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	600			
Male	1,400			
Total	2000	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Part II. Project Justification

1a. Project Description

Executive Summary

Combinations of advances across a wide range of technologies have yielded numerous new ways of supplying electricity to homes and other premises, and for providing mobility. Some of these solutions appear to be particularly suitable for addressing the many additional challenges faced in SIDS settings. For example, the use of battery swapping appears to be a highly suitable means of providing ?last-mile? electricity supply for off-grid premises with low energy requirements. Likewise, a range of small-format vehicles powered by electric motors and swappable batteries and made available through a shared-vehicle system promises to provide an equally suitable transport solution for remote villages accessible by little more than tracks or small vessels[10].

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[10] Noting that the size of batteries involved and their low voltage makes battery swapping in this context both viable and preferred for many reasons ? reason why the major motorcycle manufacturers have developed a common standard for swap batteries for electric two-wheelers. This is compared with the heavy batteries used for passenger cars and heavier electric vehicles which is not a good match with battery swapping (and there are now very few larger-vehicle battery swapping programs still in existence).

A vision-led process that considered what electricity supply and mobility might look like in the future identified the following new technology methods that stand to be important in the future of SIDS:

- **BATTERY SWAPPING FOR LOW-POWERED PREMISES ENERGY SUPPLY (COUPLED WITH LOW-VOLTAGE PREMISES ELECTRICITY RETICULATION) AND FOR POWERING SMALL-FORMAT, LOW-VOLTAGE LAND-BASED VEHICLES AND LOW-POWERED ELECTRIC MARINE VESSELS, PROVIDED THROUGH AN AUTOMATED CHARGING AND DISPENSING STATION.**
- **THE USE OF LOW-VOLTAGE SOLAR ELECTRICITY GENERATION ? FOR LOW-POWER PREMISES AND MARINE VESSELS.**
- **THE DEVELOPMENT OF SMALL-FORMAT, LOW-VOLTAGE VEHICLE SOLUTIONS THAT USE STANDARDIZED POWERTRAIN COMPONENTS. AND**
- **ACCESS TO THESE VEHICLES PROVIDED THROUGH SHARED VEHICLE ARRANGEMENTS WITH AUTOMATED MONITORING AND BILLING.**

Despite their potential, these technologies and their combinations represent a considerable step forward from the status quo in SIDS. Yet their potential, and the expectation that they will form a significant part of future energy and transport arrangements, means that it is important they are demonstrated as a first step to their becoming normalised, in readiness for national-scale uptake. The process of demonstrating these technologies will also provide the opportunity to calibrate the solution combinations so that they are a better fit for local

circumstances in Cabo Verde, and to provide valuable experience so that they can be more easily designed into future electricity supply and mobility plans.

The decision to target remote village settings for the proposed project was taken deliberately, as it is anticipated that additional benefits may be yielded through application in this setting. For example, electricity supply and energy independence are of greater value in settings where there is often a threat of supply disruption. Nevertheless, many of the learnings are expected to be applicable globally beyond such settings, for both SIDS and non-SIDS, and for remote villages and urban contexts.

The resulting solutions are expected to provide multiple benefits, including:

? **PROVIDING LOW-CARBON ENERGY AND TRANSPORT OPTIONS**

? **IMPROVING LOCAL AIR, GROUND AND WATER QUALITY THROUGH ELIMINATING THE NEED TO USE FOSSIL FUELS (AND ELIMINATING THE OILS THAT ARE USED BY FOSSIL-FUELLED ENGINES)**

? **INCREASING RESILIENCE THROUGH BOTH INDEPENDENT GENERATION OF ENERGY AND THE USE OF MORE ROBUST ENERGY SYSTEMS**

? **PROVIDING MORE ACCESSIBLE AND MORE AFFORDABLE LOCAL TRANSPORT FOR PASSENGERS AND GOODS**

? **PROVIDING GREATER ACCESS TO ELECTRICITY, ENABLING BETTER COMMUNICATION AND BETTER EDUCATION OPPORTUNITIES RELATED TO THESE**

? **REDUCING NOISE AND VIBRATION FROM MOTORISED TRANSPORT.**

Achieving national-scale uptake of the various technologies and combinations thereof will require government interest, supporting policy to be in place, and for the industry and government to follow a well-planned roadmap. Together with those mentioned above, these make up the project?s four components:

? **COMPONENT 1: POLICY AND INSTITUTIONAL SUPPORT TO PROMOTE LOW-CARBON MARITIME MOBILITY SOLUTIONS**

? **COMPONENT 2: SUPPORT THE SUPPLY OF A SUSTAINABLE ENERGY INFRASTRUCTURE TO DRIVE LOW-CARBON MARITIME MOBILITY SOLUTIONS AND RELATED TECHNOLOGIES**

? **COMPONENT 3: STIMULATION OF DEMAND FOR ELECTRIC BATTERY SERVICES**

? **COMPONENT 4: MONITORING AND EVALUATION**

1a. *Project Description*

1) THE GLOBAL ENVIRONMENTAL AND/OR ADAPTATION PROBLEMS, ROOT CAUSES AND BARRIERS THAT NEED TO BE ADDRESSED (SYSTEMS DESCRIPTION)

Overview of the environmental problems in Cabo Verde

Although having graduated to Middle-Income Country status in 2007, Cabo Verde continues to live with significant degrees of environmental and economic vulnerability, and a low gross national income compared to other SIDS. Endemic flora and fauna species are at different stages of vulnerability, even without the looming threat of climate change.

Recent projections indicate a temperature increase of about 1?C for the period 2011-2040 and of 3?C by the end of the century.[11][1] The country?s insularity and fragility has placed it at high risk of climate change impacts, such as threatened ecosystems and resource scarcity (including a reduction in permanent water courses and land suitable for agriculture) as well as extreme natural events, most notably, persistent droughts, storms, soil erosion, salt intrusion and increased desertification. There have been several efforts by successive governments to respond to the challenges in the areas of biodiversity conservation, adaptation to climate change, the fight against desertification and the effects of drought, through national policies and strategies in line with relevant international commitments. The majority of funding for conservation of ecosystems and sustainable development and adaptation has been through the Global Environment Facility (GEF) via the different implementing agencies of the United Nations System.[12][2]

Like most other countries, in 2020 and 2021 the various impacts of the climate crisis were aggravated by the impacts of the COVID-19 pandemic.

[11] Minist?rio da Agricultura e Ambiente, Cabo Verde (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution (NDC)

[12] Cabo Verde (2017) Plano Nacional De Investimentos Para A Economia Azul Em Cabo Verde PNIEA 2020

[13] Minist?rio da Agricultura e Ambiente, Cabo Verde (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution (NDC)

Root causes of emissions increase in Cabo Verde and their solution

Notwithstanding efforts to develop its renewable energy infrastructure and energy efficiency strategies, Cabo Verde remains highly dependent upon imported fossil fuels: currently only about 32 MW of Carbo Verde?s 180 MW of installed electricity generation capacity is from renewable energy sources and 80% of the roughly 400 GWh of electricity produced each year is generated from fossil fuels. Almost 100% of the transport sector is dependent upon the use of imported fuels.

The government has set a target of reaching 54% penetration by renewable energy of its electricity needs by 2030. This will require a concerted effort, as increasing quality of life and extended electricity coverage from the current 93% grid coverage will result in an increase in electricity consumption ? demanding further renewable generation to be installed if the government?s targets are to be met.

The government has also set a 2030 target for a decrease in economy-wide greenhouse gas (GHG) emissions of up to 24% below its 2020 business-as-usual projection, should it receive adequate international support.[13][3] This target will require a shift to lower-carbon transport modes, and the government has offered solutions involving changes to urban planning, improvements to logistics and electrifying the land and maritime fleets.

As shown by Figure 1, transport is responsible for around 40% of Carbo Verde?s fuel energy requirements. Of this amount, around 75% is associated with land transport, and a large proportion of

this is associated with the fuel consumed by passenger cars ? the raison d??tre of the government?s NAMA Support Project (NSP), which promotes electric mobility directed at displacing this vehicle type. However, other smaller-format land transport vehicles are expected to have an important part to play in Cabo Verde?s future mobility plans, and it so happens that these types of vehicles are particularly suitable for electrification. Their electric forms include electric bikes, electric cargo bikes, and electric motor scooters. The role of such vehicles in the transport-scape is expected to increase as public transport evolves (for example, through providing important first- and last-mile connections with public transport, which in turn displaces the likes of passenger car transport), as their electrification makes them more useful and utilitarian (and replaces many services currently provided by fossil-fuelled vehicles), and as awareness of these new forms is raised and they become normalised. As a consequence, the use of such small-format, low-voltage land transport vehicles has the potential to result in the displacement of to the order of 10% or more of the current fuel consumption associated with land transport.

The development of this small-format vehicles sector is also expected to provide some people with new and better access to mobility, which in turn is a further incentive to target the use of renewable energy options for powering this new demand.

Understanding this importance, the proposed project aims to promote awareness of these small-format vehicle types, and to introduce them through the use of modern vehicle-sharing platforms.

Beginning from the energy use figures provided in Figure 1, a bottom-up study that considers the make-up and duty of marine vessels in Cabo Verde?s fleet indicates that the fuel consumed by the artisanal fishing fleet is around 1% of the national fuel consumed, which (applying the figures of total fuel consumed presented in Figure 2) comes to around 2.5m liters of petrol each year. Artisanal fisheries in Cabo Verde constitute around 64% of the country fishing activity, both in terms of catches and fishermen involved, and there were 1,815 vessels in the artisanal fisheries in 2017, and the number of artisanal fleet is estimated to increase with the development of the sector. It is therefore getting more and more important to support artisanal fishing fleet to promote decarbonisation of the sector. Specifically, the project will focus on remote villages where small-scale fisheries are a subsistence activity.

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[14] DNE M (2017) Base de dados dos Registos das Embarca??es e de Pescadores

[15] Fortes, D. (2019) Assessment of economic viability of the artisanal fisheries in Cabo Verde

The type of low-powered vessel used can be relatively easily retrofitted to electric propulsion by exchanging their normally fossil-fuelled outboard with an electric one, and carrying batteries to power the electric outboard. The feasibility of this in practice, and achieving the required range, is dependent upon the specific duty of the vessel. Given the present state of battery technology, such retrofits would be limited to those fishing and passenger transport operations that involve relatively short voyages (by marine standards). However, the proportion of the artisanal fishing fleet that could be considered for electrification is expected to grow as battery technology advances (i.e., as the amount of energy stored per kilogram and per liter increases).

It is expected that targeting this type of vessel ? low-powered vessels that normally undertake short voyages ? will serve to ?prove? electric propulsion technology and thus instigate the electrification of the wider fleet, including of larger vessels, as technology permits.

As with the method proposed for accessing the project?s small-format electric vehicles, it is proposed that access to electric outboards and marinized batteries will be via an asset-sharing platform. These asset-share management services have become readily accessible over the last few years. Because the project is concerned with demonstrating the technology expected to be used in the future, the asset-share services will be based on satellite-tracking of assets plus local communications systems, and access to such services will be a prerequisite for any village targeted for the demonstration projects.

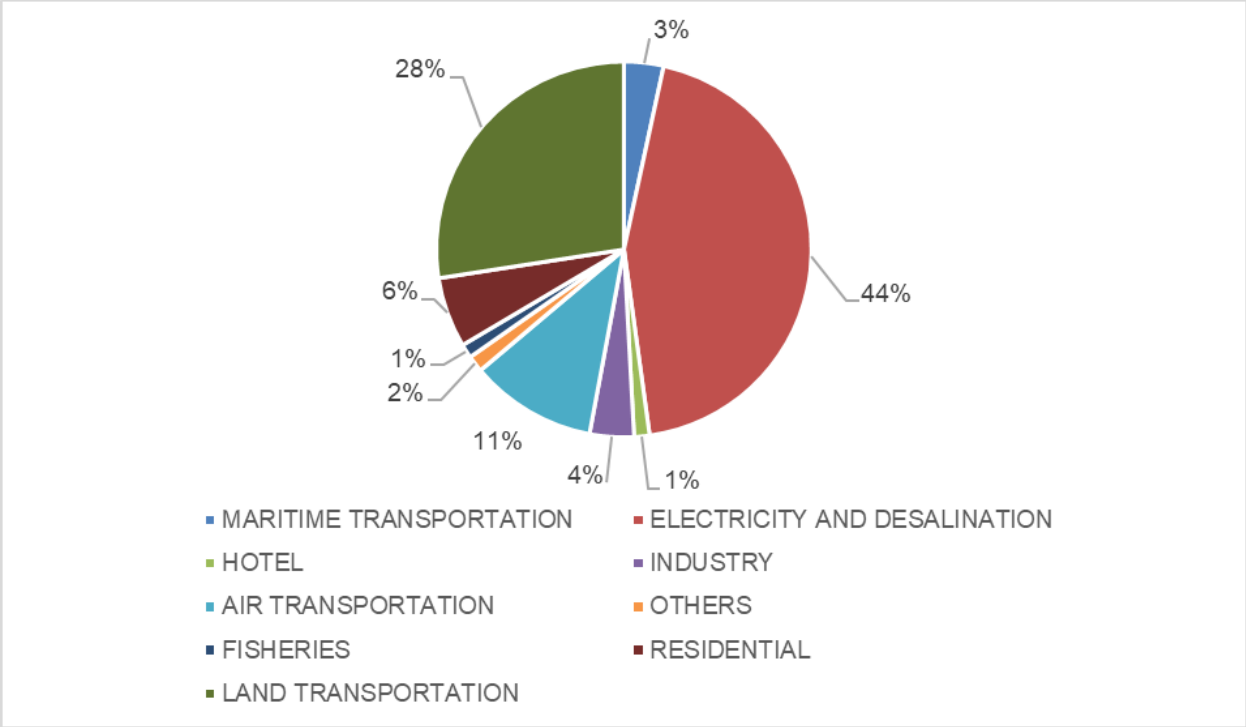

Figure 1: Cabo Verde Internal Fuel Consumption per Sector[16]4

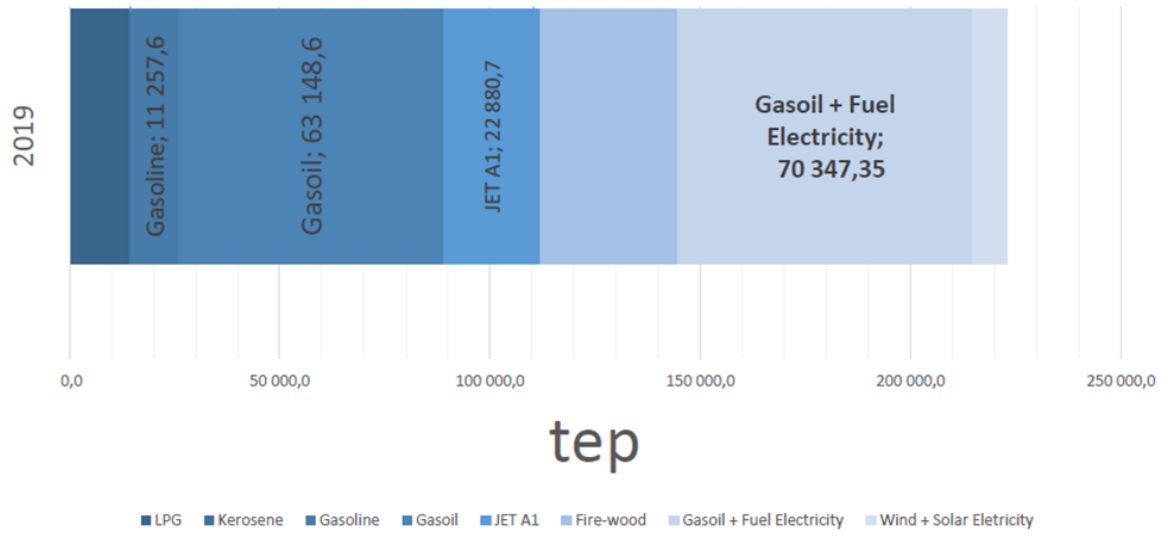

Figure 2: Cabo Verde Total Consumption of Energy[17]5

[16] Ministry of Industry, Trade and Energy (2019)

Addressing the barriers to the uptake of the proposed technologies:

? LACK OF AWARENESS AND KNOWLEDGE

The proposed technologies to be demonstrated are new to Cabo Verde and there is little awareness of them or their capabilities. This lack of understanding, which the proposed project is designed to address, is expected to be a major barrier to the uptake of the technologies involved, particularly where their use on commercial terms at the start of the project is attempted, when the cost of the various technologies may still be relatively high. The proposed project will manage this by offering the use of the demonstration vehicles, electric outboards and batteries at rates that make the use of the technologies very attractive to users. This will require some degree of subsidization over a strictly commercial, ?user-pays? arrangement.

Note that if the anticipated cost reductions and technological advances are realised, similar projects set up towards the end of this project?s term would be commercially and financially attractive to service providers and users, without the need for subsides.

? LACK OF STRATEGY/ROADMAP FOR ADOPTING ELECTRIC MOBILITY IN THE MARITIME SECTOR

The government?s 2020 update to the first Nationally Determined Contribution (NDC)[18]6 names the electrification of the land and marine transport sectors amongst the solutions to reduce the country?s GHG emissions. This must be coupled with the use of renewably generated electricity if the measure is to achieve its full potential. Cabo Verde does have plans for a significant increase in the amount of renewable generation. However, its plans to electrify its land transport fleet are at a very early development stage and focus on passenger car-type electric vehicles. It is almost silent on its plans to support the electrification of marine vessels, beyond the intention advertised in Cabo Verde?s Charter

for Blue Economy, or for the electrification of smaller vehicle types. As such, there is still a need to develop a framework and Action Plan in order to address many of the institutional barriers that exist to the adoption of a wider e-mobility program.

? **LACK OF LOCAL SUPPORTING SERVICES.**

The proposed project targets the use of low-voltage components which are relatively simple in make-up compared to the high-voltage systems used in electric passenger cars. What?s more, the project targets standardized, open-source designs for the main electrical components as a means to control their sophistication and to ensure ?plug and play? compatibility. The goal is to use power electronics and assemblies that are far less challenging to work on, with standardized designs expected to make fault diagnostics and repair possible at a village level, with only a small inventory of spare parts.

The proposed shared asset arrangements also enable every battery and every electrical device to be regularly inspected by a trained person (i.e., as opposed to the more random inspection that might occur if the devices were owned by individuals). It also enables the batteries, vehicles and other electrical devices to be serviced by appropriately trained personnel, specifically engaged to maintain the fleet of shared assets. This service-provider model also lends itself to the use of good practices for managing batteries after their first life as battery-swap batteries, with a higher proportion of post-first-life batteries expected to continue to be used through refurbishment and repurposing than would be the case had the batteries been owned by individuals. For the same reason, the best practice approach is also more likely to continue through to the eventual disposal of the batteries.

[17] Ministry of Industry, Trade and Energy (2019)
[18] Minister of Agriculture and Environment (2020) Cabo Verde: 2020 Update to the first Nationally Determined Contribution

? **LACK OF FINANCIAL INCENTIVES**

While certain tools for implementation of e-mobility in land transportation in Cabo Verde have created financial incentives for passenger car-type EVs, no such incentives are in place to support the uptake of small-format, land-based e-mobility or marine electrification. This needs to be addressed.

? **LACK OF LOCAL AVAILABILITY OF EQUIPMENT**

The project will undergo specification and procurement exercises to acquire the necessary hardware for the proposed demonstration projects. Spares and test equipment will also be procured in support of the ongoing operation of the vehicles, electric outboards, battery systems and battery-swap stations. The standardized specification of power electronics and other components will enable the various electrical devices to be supported from a relatively small inventory of spare parts. Minimum performance specifications will also be used to introduce quality standards for the devices and related components. Note that these minimum performance specifications are important when considering the use of electrical equipment in marine environments (which is the case for the vast majority of SIDS settings), and even more important when considering the safety of marine vessels and their crew and passengers. For the latter, standardized specifications for marinized batteries are also expected to bring about significant cost savings.

? **Energy access gap with a focus on gender and potential productive uses**

The project will address the energy access gap in remote villages. Although rural electrification rate is around 90%, people still have difficulty in accessing affordable, stable and clean electricity due to financial and technical challenges. For example, women, especially those in female-headed households, cannot easily access electricity connections due to their lack of adequate cash incomes. Greater access to electricity is also expected to bring about greater access to education, including through on-line courses available by smartphones, and greater access to friends and family through the use of smartphones also. These stand to improve the quality of village life.

The fishing sector is highly segregated by sex, with men working on fishing boats and women selling the catch in markets or as casual vendors. Expanded and accessible clean energy is a key need for the almost half of Cabo Verde women who are poor, and especially those in remote areas, to decrease the time required for work. Productive uses of clean energy such as cold storage for fish will free women to pursue better-paid employment opportunities as available.

The Fisheries Sector and particularly Fisheries Resource Management Plan 2020-2024 (PGRP) find their place in the Government Programme of the 9th Legislature (2016-2021) and in the Strategic Plan for Sustainable Development PEDS (2017-2021). This sector has played a key role in strengthening food security, reducing poverty, job creation and rural development. Particularly in rural area where 33% of the population live in 2020 and around 30% of the population lived below poverty line with the rural unemployment rate increased from 10.7% in 2010 to 12.3% in 2020, small-scale fisheries are a subsistence activity generating significant economic revenue and job opportunities. Artisanal fisheries in Cabo Verde constitute around 64% of the country fishing activity, both in terms of catches and fishermen involved and it provides important income to a considerable number of rural households from fishing communities. In 2017, there were 1,815 vessels in the artisanal fisheries operated by 5,078 fishermen, and the number of artisanal fleet is estimated to increase with the development of the sector[25]. It is therefore getting more and more important to support fishing sector to promote sustainable economic and social development of remote villages.

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[19] World Bank

[20] SE4ALL, 2015. Action Agenda Sustainable Energy for all ? Cape Verde

[21] SE4ALL, 2015. Situation Analysis of Energy and Gender Issues in ECOWAS Member States

[22] UN Women & AfDB, 2018. Cabo Verde: Country Gender Profile

[23] IFAD (2021) Country profile

[24] DNE M (2017) Base de dados dos Registos das Embarca??es e de Pescadores

[25] Fortes, D. (2019) Assessment of economic viability of the artisanal fisheries in Cabo Verde

2) THE BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS

CABO VERDE?S LONG-TERM GOAL IS TO TRANSITION TO AN EFFICIENT, SAFE AND SUSTAINABLE ENERGY SECTOR, WHICH WILL REDUCE RELIANCE ON FOSSIL FUELS, REDUCE GHG EMISSIONS, AND

ENSURE GREATER ENERGY ACCESS AND SECURITY.[7][7] WITH GHG EMISSIONS GROWTH ROUGHLY AT 1% PER YEAR (3.5% GROWTH FROM 2005 TO 2010), THE NATIONAL PROGRAM FOR SUSTAINABLE ENERGY PLANS FIVE AXES OF INTERVENTIONS, INCLUDING THE DEVELOPMENT OF RENEWABLE ENERGY (RE) AND THE PROMOTION OF EFFICIENCY. IN ADDITION, LAW NO. 102/VIII/2016 CODE OF FISCAL BENEFITS CREATES FISCAL INCENTIVES FOR THE USE OF RE TECHNOLOGY, AND THE SECTORIAL STRATEGIC PLAN FOR RE (SSPRE) LAYS DOWN A PLAN FOR RE BASED ON STUDIES SHOWING THE AVAILABLE RE SOURCES IN THE COUNTRY AND IDENTIFIES ?RENEWABLE ENERGY DEVELOPMENT ZONES? (REDZ). THE RE PROJECTS IMPLEMENTED IN REDZ ARE SUBJECT TO MUCH MORE SIMPLIFIED ENVIRONMENTAL AND SOCIAL IMPACT EVALUATION PROCESSES. A PREVIOUS STRATEGY OF ACHIEVING 100% RENEWABLE ENERGY BY 2021 HAS BEEN RE-EVALUATED AND MORE REALISTIC TARGETS HAVE BEEN SET. THE ELECTRICITY SECTOR MASTER PLAN FOR 2018-2040 TARGETS 30% OF ELECTRICITY PRODUCTION IN CABO VERDE TO BE RE BY 2025 AND 54% BY 2030 (SEE FIGURE 3). THE 2030 TARGET APPEARS WELL WITHIN REACH ? RE MADE UP AROUND 20% OF GRID-SUPPLIED ELECTRICITY IN 2020 AND THERE ARE NUMEROUS TENDERS IN PLACE FOR THE CONSTRUCTION OF RE CAPACITY. THE LONGER-TERM STRATEGY FORESEES THE INSTALLATION OF MORE THAN 150 MWP OF NEW SOLAR PV PROJECTS, MORE THAN 60 MW OF NEW WIND FARMS ACROSS CABO VERDE?S TERRITORY, AND INSTALLATION OF FURTHER STORAGE CAPACITY. HOWEVER, TO ACHIEVE THESE GOALS, SIGNIFICANT INVESTMENT AND FINANCIAL SUPPORT IS REQUIRED.

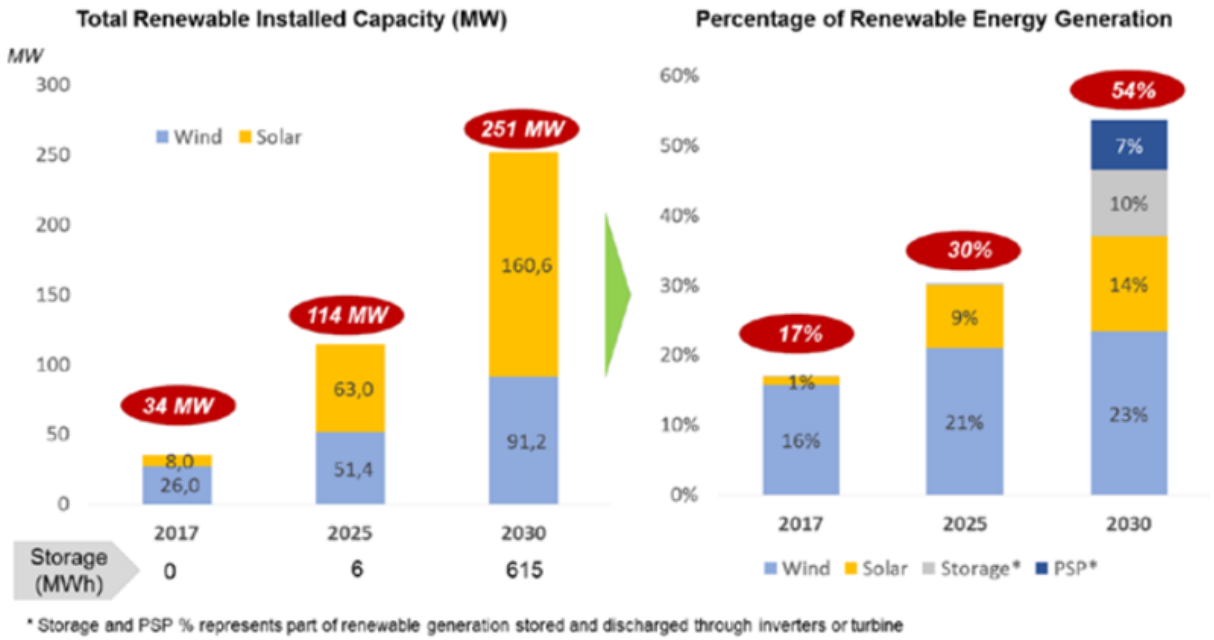

Figure 3: Strategy towards 54% RE by 2030[27][8]

Recently, the government of Cabo Verde has identified the promotion of electric vehicles (EV) as one of the key investments required to reduce GHG emissions related to land transport (which accounts for roughly 28% of total fuel consumption in the country), as well as to reduce air and noise pollution and contribute to improvements in the health of the population. In line with the country?s ambitions, a full transition from fossil-fuelled vehicles to electric vehicles will be sought by 2050. To implement the strategic vision of its policy on Electric Mobility, the government (via the National Directorate of Industry, Trade and Energy and through its membership of the Transport Decarbonisation Alliance) approved the Electric Mobility Policy Charter (CPME) with Resolution No. 13/ 2019 on February 1st 2019.[28][9] It communicates the main measures to guide the creation of the conditions necessary for a long-term uptake of electric vehicles in the country, assuring the adequate development of infrastructures, of the regulatory framework and of services, which allow any citizen or organization access to e-mobility solutions. The Electric Mobility Policy Charter states that: ?The Government will establish in the law that public institutions (Government and Municipalities) may favor the acquisition or preferential use of Electric Vehicles in tenders for the provision of public services.? According to the CPME, the aim is to develop in the timelines 2019-2035-2050 a fleet of electric vehicles (EV) for public transportation (urban and inter-urban public transportation, taxis, rental vehicles, tourist transportation), and private transportation (transportation for private use, private and public companies, and Public Administration). The charter is accompanied by an E-Mobility Action Plan 2019-2035 of which the objective is identifying actions to be developed in the short, medium and long term for the materialization of the objectives established in the mobility charter letter, grouped according to the three axes of intervention. A NAMA Support Project (NSP), Promotion of Electric Vehicles in Cabo Verde (PromAE) 2020- 2025, has recently been approved and aims to develop a market structure that is more conducive to the adoption of e-mobility.

However, the government?s EV initiatives and plans have to date focused on passenger car-type EVs, and besides a small test of an electric outboard, there have been no programs considering the electrification of maritime vessels or the use of small-format land-based electric vehicles.

For the marine sector, the recently approved Charter for the Blue Economy in Cabo Verde, through Resolution No. 172/2020 of December 21 2020, is an indication of the intention of the country to engage with and capitalize upon the opportunities for sustainable growth that a ?blue? economy can provide. The charter is accompanied by a National Investment Plan for the Blue Economy and a Program for the Development of a Blue Economy in Cabo Verde. These instruments indicate that the country intends to reinforce the coherence and integration of public policies related to its maritime economy and the coordination for an integrated approach with other sectors such as transport, renewable energy, industry, tourism, trade, environment, agriculture, fishing and aquaculture, among other areas of social and human development. This ambition foresees the use of EVs in maritime activities which, with the projected growth of the marine transport fleet in coming years, would be yet another way of transferring the benefits of increasing renewable energy grid penetration to the transport sector and helping meet the country?s commitment to annually curb up to 242,000 tCO2eq by 2030[29][10], as well as building resilience through increasing food and energy security.

In addition, the proposed project will be based on the GEF SGP on Co-Financing Artisanal Fishing Vessel Electric Mobility Project which consists of a pilot initiative to implement an electric propulsion system in an artisanal fishing boat in the Salamansa fishing community. The proposed project will cover more comprehensive scope of mobility solutions than the SGP project with battery swap systems and electric boat/vehicle. The lessons learnt from the SGP project will also be incorporated in the proposed project, for example making sure that local communities are engaged from the beginning phase of the project as well as collaboration with reliable private sector, which are challenges in the SGP project.

[27] The Government of Cabo Verde, 2018 ? The Mid - Atlantic Gateway to the World?s Economy: Energy sector
[28] http://tda-mobility.org/wp-content/uploads/2019/04/Cabo-Verde-Electric-Mobility-Policy-Chapter.pdf
[29] Minister of Agriculture and Environment (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution

3) THE PROPOSED ALTERNATIVE SCENARIO WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT

There are many drivers for change in the energy and transport sectors, including climate change, cost of fuel imports, energy security, air quality, resilience in relation to climate change, and improved mobility. And there are many enablers of change including advances in battery technology, motors and power electronics, networks and communications, smartphones, and GPS/satellite technology. There are also smart combinations of these technologies that provide further potential ? UBER and Grab are examples. These advances and their combinations have opened up many new low-carbon energy and transport solutions and, in particular, they have opened up many new solutions for providing energy and transport for remote villages ? that is, where there is no access to electricity from the national grid and transport requirements within the village are small-scale with an unreliable supply of engine fuels.

These new solutions are expected to provide a better quality of life in remote villages. For example, they include home battery swapping to provide ?last-mile? electricity supply ? enabling electricity to reach those places where local grids do not, and where solar can be unreliable for a variety of reasons. Such electricity is an enabler for better communication, and for education ? important needs for younger people, and important to provide if a village is to avoid losing a high proportion of its younger generation to urban areas. Swap batteries are also likely to provide a more reliable electricity source during and immediately after extreme weather events.

The new solutions also include electric small-format vehicles, which can provide better connectivity within the wider village and with neighboring villages. The new transport solutions also include vehicle sharing ? responding to the low utilization that vehicles often see, particularly when based at a remote village, and the greater accessibility and improved affordability that can be brought about through the use of vehicle share arrangements.

To consider what new energy and transport solutions might be useful, let us first develop a vision of what the energy and transport sectors may look like for a remote village in 2040. Here is one such vision:

- Solar generation is the main energy source for the village and is primarily provided by a centralised solar generation plant that is on one side of the main village hub (as a centralised plant has been found to be more cost-effective and more reliable than individual household solar). It feeds houses within the close village hub via short-run underground distribution (as overhead wires have proved to be a poor option in the more severe storms that CV now experiences).
- The main solar generation plant also provides electricity for
- Chilling necessary for fish and other food preservation (again, using plant based at the solar generation site).
- Charging swappable batteries that are then used for:
- Low-power premises power for premises not on the village?s small electricity supply network (some of these unconnected premises may also have small solar top-up systems, but use battery swapping as this provides a more robust backup, better management of the batteries, and a lower entry-cost solution). Connection to the village grid has been found to be too expensive and/or unreliable (especially with the increasing number of extreme weather events).
- Battery-swap transport, using ?low-capacity?, ?high-capacity?, and ?high-capacity marine?, low-voltage battery systems (all with the same standardized charging connector). These transport options include:
- E-bikes, including cargo-bikes, and e-scooters that are used within the inner village and on the tracks around the greater village area to transport people and goods.
- Electric vessels ? used for fishing and for ferrying passengers to and from nearby fishing villages and transport hubs connecting with other CV destinations. Several e-vessels also have onboard solar generation.
- Direct charging of larger, electric, land-based vehicles and marine vessels which provide freight and passenger services to and from the village.
- The solar generation, refrigeration, battery charging and battery swap plant are shared village services and the energy services related to these plants, including battery charging and swap services, are managed by the village in partnership with an equipment and system provider. This arrangement also ensures a centralised arrangement for providing trained technical support.
- Many of the small vehicles used for passenger and goods transport around the village are shared vehicles accessed via smartphone and billed for according to time in use and distance travelled. As for the main energy-related assets, the shared vehicles are managed by the village in partnership with an equipment and system provider. Some villagers also own their own vehicles and access the battery swap services for the operation of these vehicles. Likewise, marine electric outboards and marinized batteries are available on a shared asset basis.

This energy and transport vision is depicted in Figure 1:

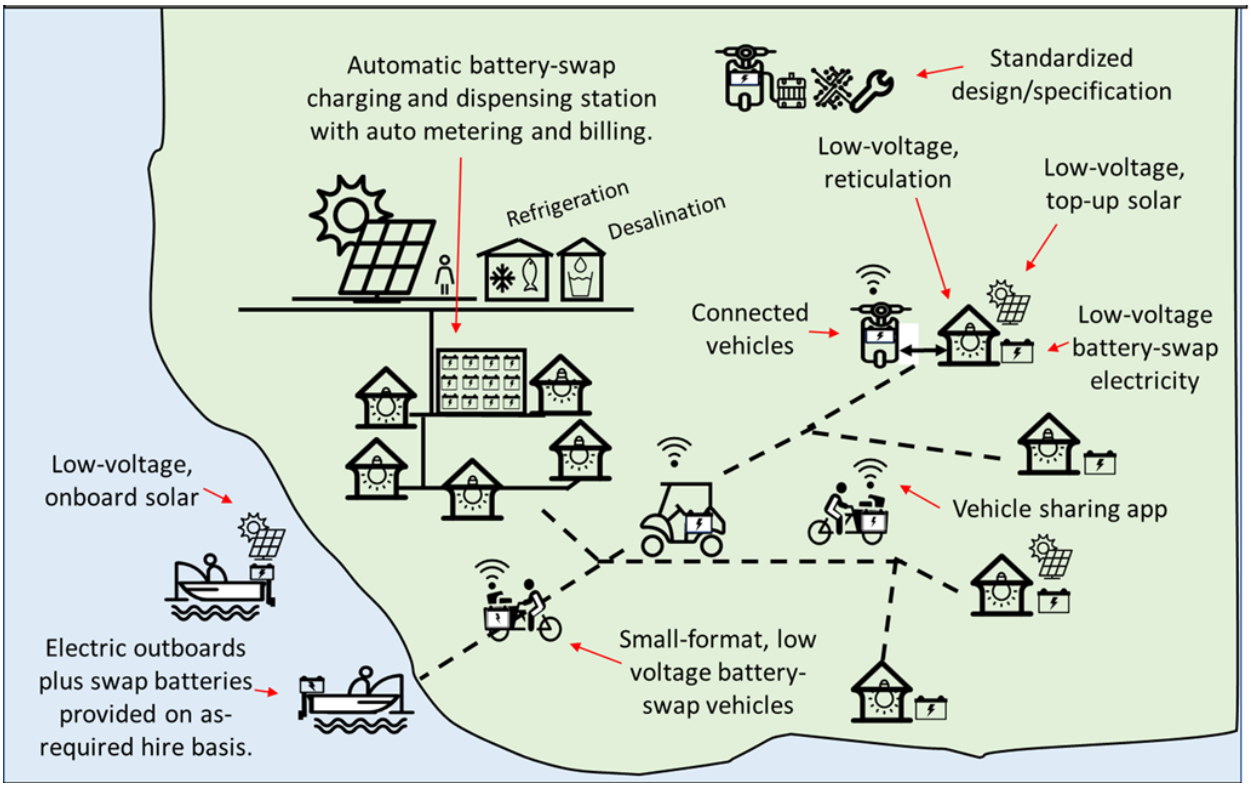

Figure 4: Elements of a Remote Village?s Energy and Mobility System in 2040

The proposed project aims to best prepare the country for the energy- and transport-related elements of this vision through filling gaps in understanding related to them (as these would otherwise likely present barriers to their adoption). This gap-filling comprises a number of projects, including:

- Establishing a centralized, automated battery charging and battery swap service for the village that uses standardized, low-voltage, swappable batteries (for use to power homes, e-bikes, small-format vehicles and e-vessels). The service is also to include management of the health of the batteries, end of first life battery refurbishment, repurposing and/or recycling, and/or disposal.
- Establishing the use of standardized format batteries (and standardized connectors) for low-voltage powering of homes, e-bikes, small-format vehicles and e-vessels. This includes establishing supporting services for the items that use swappable batteries, including establishing codes and best practice for low-voltage homes, establishing service support for land- and marine-vehicle electric drive systems, establishing codes and best practices for electric drive systems on electric vessels, and establishing minimum performance standards across all energy consuming goods.
- Establishing a best practice code for decentralized solar generation of low-voltage houses, including that necessary to integrate with battery swapping.
- Providing demonstrations of the following battery-swap technologies (with capacity building and other support to ensure successful long-term outcomes):
- E-bikes

- E2Ws such as electric motor scooters fit for use on tracks.
- Small-format E4Ws
- Low-voltage homes.
- Low-voltage passenger and fishing electric vessels ? passengers and fishing.
- Establishing business models for accessing shared energy- and mobility-related assets.
- Establishing long-term governance mechanisms across the projects.

As has been mentioned, these outputs take into consideration changes perceived in how services will be provided in the future. These outputs also consider how planning has changed to take account of disruptive technologies and where emphasis is now placed. For example, modern planning methods often refer to vision-led ?predict and provide?, ?pedestrians first?, ?service based?, ?integrated systems?, ?context-specific solutions?, and waste minimization methodologies and approaches. A feasibility study will be conducted at PPG stage to assess the economic and technical viability of battery swapping business models in Cabo Verde while comparing different business models. It will allow us to identify the most suitable technical requirements, potential benefits and challenges of the proposed business model.

Another new technology solution that is placed across the specification of the small-format electric vehicles is the use of standardized, generic ?open source? components for the motor, motor controller, demand sensor, batteries, battery connectors, and connections between (i.e., shifting the product supply paradigm from one where a product is an assembly of model-specific components to one where the base components are generic and open source, enabling components to be interchanged regardless of manufacturer. This is expected to develop a one-design grey market from the outset that requires minimal parts inventories to be held, the cost of the components would be expected to reduce due to higher production runs and competition, fault-finding and repair should be easier due to standardization (to the point where reliable repair at the local village level should be feasible), and there should be lower waste due to the refurbishment of faulty boards and components becoming financially attractive, among others.

Despite the one-design approach, there would still be ample opportunity for evolution:

- The standardized components are base building blocks only and there is still the opportunity to modify the frames and configuration of vehicles around these (for example, manufacturer/suppliers or local craft shops may adapt frames, suspension and wheel configurations to best suit particular circumstances, just as was done in the evolution of the mountain bike). Similarly, the flexibility of the outboard motor arrangement allows it to be fitted to a wide range of vessel types, and the use of different numbers of batteries also provides flexibility.
- There is the opportunity for manufacturer/suppliers to provide higher performance components, so long as this does not prevent their interchange with standard performance components.[11][11]

Note that the proposed project targets deployment at no more than two villages, as the lessons learned from these will likely suggest some degree of recalibration before the next projects are implemented.

Such an approach also allows targeting of villages that have marine vessels with operations that particularly suit the use of small-powered electric propulsion systems, which is where the technology currently sits.

Expected outcomes and components of the project:

Transport and the supply and use of electricity are often tied with the consumption of fossil fuels which have unwanted global and local air quality outcomes. As a consequence, many modern electricity and transport solutions aim to reduce the consumption of fossil fuels or even eliminate their use. And resulting advances in technology have brought about many new electricity supply and transport solutions. The proposed project casts forward to see what those future energy and transport solutions might look like and start down a path of understanding them and preparing for their deployment.

The project makeup has come from a vision of what the energy and transport sectors may look like in 2040 for a remote village ? a setting that is currently least resolved and one that is likely to reap most reward from the use of new solutions. This vision-led process identified a number of technologies and combinations that are expected to play important roles in Cabo Verde?s energy and transport future, including the use of:

? **BATTERIES TO POWER LOW-POWER PREMISES, SMALL-FORMAT LAND VEHICLES AND LOW-POWERED MARINE VESSELS, AND THE USE OF AUTOMATED BATTERY SWAPPING TO CHARGE THESE BATTERIES.**

? **THE PROVISION OF MOBILITY THROUGH THE USE OF SHARED VEHICLES MANAGED THROUGH VEHICLE-SHARE MONITORING AND BILLING SYSTEMS, AND**

? **STANDARDIZED COMPONENT SPECIFICATIONS FOR ELECTRIC PROPULSION SYSTEMS TO ENABLE EFFICIENCIES IN PRODUCTION, SERVICING AND SUPPORT.**

? **THE USE OF LOW-VOLTAGE SOLAR ELECTRICITY GENERATION ? FOR LOW-POWER PREMISES AND MARINE VESSELS.**

These technologies are relatively unknown, and it is the intention of the proposed project to demonstrate these technologies in real village settings so that they can be calibrated for Cabo Verde and so that the demonstrations themselves can begin a process of promoting awareness, paving the way for these technology solutions to be readied for wider deployment in Cabo Verde. Besides the demonstrations, this readiness building includes establishing government leads, developing supporting policy, and providing awareness of the solutions, with the latter essentially becoming a marketing campaign for the local solutions as they are developed. These outcomes are contained within the four project components:

? **COMPONENT 1: POLICY AND INSTITUTIONAL SUPPORT TO PROMOTE LOW-CARBON MARITIME MOBILITY SOLUTIONS**

? **COMPONENT 2: SUPPORT THE SUPPLY OF A SUSTAINABLE ENERGY INFRASTRUCTURE TO DRIVE LOW-CARBON MARITIME MOBILITY SOLUTIONS AND RELATED TECHNOLOGIES**

? **COMPONENT 3: STIMULATION OF THE DEMAND OF ELECTRIC BATTERY SERVICES**

? **COMPONENT 4: MONITORING AND EVALUATION**

Component 1: Policy and institutional support to promote low-carbon maritime mobility solutions

Component 1 aims to build up a national framework for maritime electric mobility, with activities on three major axes: governance, capacity-building and scale-up. The activities of component 1 will lead to an appropriate framework for the electrification of maritime transport in sustainable condition.

Gender dimensions will be considered under each output, with the aim of fostering gender equality and women?s empowerment. This includes consulting gender experts and groups that promote gender equality and the empowerment of women (GEEW) in the process of the roadmap development.

Output 1.1.1: Sustainable Maritime Transport Unit (SMTU) is established

In order to reduce GHG emissions related to transport as well as increasing the share of renewable energy in the energy mix, the Government of Cabo Verde has stipulated the promotion of electric vehicles (EV) as one of its key strategies. The country?s rate of fossil fuels importation is unaligned with the Government?s ambitions. Following the decentralization policy started by the central Government in 2010, the responsibility for transport was transferred to the municipalities, which affected the collaboration between stakeholders at national and local levels. Cabo Verde suffers from an uncoordinated and inadequate transportation policy. In order to mitigate this effect in the maritime sector, the project will establish a National Sustainable Maritime Transport Unit.

An inter-institutional commission was temporarily created, composed primarily of the fuel concessionaires and car dealership, in order to support the creation of policies including the e-mobility charter. Since no specific entity has the mandate for supporting maritime mobility in CV, the National Directorate of Industry, Trade and Energy (DNICE) has taken the lead on e-mobility in general, due to its connection with energy consumption. Therefore, DNICE is the ideal candidate for hosting the Unit. As per their suggestion, the Unit created under this output will be focused on maritime transport and on the blue economy and will analyze the issues with and barriers to conversion of all maritime fleets. The Unit will enhance the sharing of guidance and technical information between the strategic level and the operational level. The Sustainable Maritime Transport Unit will gather stakeholders from relevant national entities to collaborate on the topic of maritime transport and electric mobility (EM) and support the deployment of maritime e-mobility with renewable energy infrastructures.

Activities Output 1.1.1:

? The National Sustainable Maritime Transport Unit is created and hosted by the Ministry of Industry Trade and Energy (MICE) through its National Directorate of Industry, Trade and Energy (DNICE - Portuguese acronym).The national stakeholders meet bi-annually (or more frequently, as required) to enhance dialogue and coordination and facilitate knowledge exchange between national governmental entities, private sector and civil society on maritime electric transport;

? National Sustainable Maritime Transport Unit members discuss, review and validate the roadmap developed under 1.1.3 to be in line with the Nationally Determined Contributions, Electricity Master Plan and the Blue Economy Program and Investment Plan, as well as any other relevant strategies and policies;

? National Sustainable Maritime Transport Unit members are invited to the training workshops and events (virtually and in-person) organized under Outputs 1.1.2 and 3.1.4.;

? National Sustainable Maritime Transport Unit members will disseminate the project deliverables and results within their organization.

The SMTU composition could include the following stakeholders:

- **DIRECTORATE OF INDUSTRY, TRADE AND ENERGY**

- **DIRECTORATE OF MARINE RESOURCES**
- **REPRESENTATIVES OF MINISTRY OF THE SEA**
- **REPRESENTATIVES OF THE NATIONAL BLUE ECONOMY COORDINATION**
- **REPRESENTATIVES OF THE NAMA-FUNDED SUPPORT PROJECT ?PROMAE?**
- **CENTER FOR RENEWABLE ENERGY AND INDUSTRIAL MAINTENANCE OF CABO VERDE (CERMI)**
- **LOCAL FISHING ASSOCIATIONS**
- **INSTITUTE OF THE SEA (IMAR) AND OTHER ACADEMIC INSTITUTES SUCH AS UNICV-UNIVERSIDAD DE CABO VERDE,**
- **ACOPESCA - COMPETENT AUTHORITY FOR FISHERIES PRODUCTS**
- **ECOWAS CENTER FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY (ECREEE)**
- **NATIONAL INSTITUTE FOR THE DEVELOPMENT OF FISHERIES (INDP)**
- **2 NGOS (TO BE SELECTED)**

The exact composition will be determined during PPG phase.

Output 1.1.2: Capacity development of interested government agencies is provided

In line with modern methods used for planning (to best account for disruptive technologies and methods), interested government stakeholders will be taken through a vision-led ?decide and provide? process that takes a leap into the future to look at what the make-up of the energy and transport sectors will need to be in order to meet the net-zero emissions, greater accessibility and mobility targets, was well as any others that may have been set. This provides a vision of the future to aim for: for example, what the energy and transport systems might look like for a village in 2040. Setting the vision as the goal makes it possible to perceive more readily the gaps in our understanding that will stop Cabo Verde from reaching that vision. These are the gaps that need to be addressed in order to realise that vision of a village in 2040.

This ?Cabo Verde Village 2040? process identified the need to expand RE ? which is the subject of other government initiatives. It also identified the opportunity to use swappable batteries in order to provide electricity to homes in villages for ?last mile? electricity reticulation, and also swappable batteries to power small-format, low voltage, land-based vehicles (such as electric motor scooters and bikes, electric cargo bikes, and small-format three- and four-wheelers) and electric outboards for use on low-powered vessels (such as those vessels that make up the artisanal fishing fleet).

With these energy and mobility options identified, the question then becomes: how can Cabo Verde best prepare for these options? The answers to that question comprise the foundation matrix of activities that in turn forms a roadmap for Cabo Verde to follow.

The proposed project begins by starting interested stakeholders on this vision-led journey. It will lead them through identifying those aspects of energy provision and mobility that are expected to be

important to Cabo Verde?s future, and work on demonstrating those parts that are relative unknowns to many ? the new technology solutions that are available but that are currently not in use in Carbo Verde (or in many SIDS, for that matter ? which is why this project has significance for many other countries as well).

At least two training sessions will be offered to stakeholders, with a target of at least 33% women participants. Training material will be prepared, both for these sessions and for possible future sessions. All capacity-building activities will be gender responsive. This includes considering gender-sensitive language, avoiding gender stereotyping, incorporating gender dimensions into training materials, ensuring that both women and men participate in the trainings as trainees and facilitators, etc. Finally, training on unconscious bias will be included into training materials to raise awareness on gender bias and capacity will be built on how to address bias to enhance gender equality and women?s empowerment.

Activities Output 1.1.2:

? Verify training needs of key stakeholders with respect to gender dimensions (i.e. gender differentiated needs)
? Develop training program tailored to governmental institutions? needs in Cabo Verde
? Prepare gender-responsive training material
? Deliver a minimum of two training sessions to key stakeholders who are members of the National Sustainable Maritime Transport Unit (Output 1.1.1) and other possible stakeholders identified through stakeholders mapping (minimum 30% women participation)
? Report on training sessions, lessons learned and recommendations

Output 1.1.3: A roadmap for upscale of low-carbon maritime transport solutions is developed and presented for validation by the Ministry of the Sea and Ministry of Industry, Trade and Energy

Terms of reference will be written to identify a group of consultants to support the stakeholders in developing a roadmap for upscale of low-carbon maritime transport solutions (and to include consideration of technically-related low-voltage mobility and energy solutions). The consultation will integrate the key issues of the project, specifically gender dimensions and climate change mitigation. The work of the consultants will include a review of the current landscape: stakeholder mapping, technology review, and any existing challenge or barriers. A literature review and a global benchmark of best practices and state-of-the-art strategies will also be performed.

The roadmap for upscale of low-carbon maritime transport solutions will be developed through consultation workshops with stakeholders. These will generate an action plan for the electrification of maritime vessels aimed at the reduction of GHG emissions from maritime transportation. Thus, the use of renewable energies will also be addressed. The roadmap will include recommendations on measures and guidelines with respect to the environmentally sound management of used batteries (e.g., including repurposing, recycling, and disposal). Key stakeholders will be involved throughout the roadmap development process, including through participation in workshops and through input into roadmap drafts.

To ensure that the roadmap for the upscale of low-carbon maritime transport solutions is gender responsive, social and gender dimensions are being considered during their development. This includes conducting gender analysis, collecting gender disaggregated data during data collection, considering

gender dimensions in the surveys and interviews and involving gender experts, gender focal points and/or organizations that promote gender equality and women?s empowerment. Moreover, women?s organizations will be invited to validate it from a gender perspective.

Component 2: Support the supply of a sustainable energy infrastructure to drive low-carbon maritime mobility solutions and related technologies

Component 2 will address potential barriers for local project implementation. It will address these barriers through feasibility studies, covering technical, economical and organizational issues and the implementation of pilot projects in two villages to be selected during the PPG phase.

The component will also generate data to support policymaking and generate experiences and lessons learned for other villages, thus creating confidence.

This project component will be gender responsive. This includes conducting gender analysis and involving gender experts and women?s organizations, in order to understand the needs and priorities of women in the development of project activities, including the planning and design of demonstrations, as well as ensuring that women have equal opportunities to lead, participate in and benefit from all project activities.

Details of the component outputs and activities are described below.

Output 2.1.1 Feasibility study for broader low-carbon energy and transport solutions is developed

The advancement of modern battery technologies has resulted in a rapid uptake of a wide range of new low-voltage electricity supply and mobility solutions. Many of these developments have been without regard to standardization or quality controls, leading to unnecessary safety concerns, inefficiencies, wastage and poor outcomes for consumers. Careful standardization has the potential to significantly improve upon this situation without impeding innovation, and more robust development of the sectors involved is expected. Yet apart from a few specific examples, standardization is only just emerging. The feasibility work aims to identify the ?AA battery? specifications of this low-voltage market, for both batteries and appliances. The outputs comprise:

- Global developments in battery swapping are considered, including standardized specification for batteries and connectors, in-service and post-service battery management, automated charging and dispensing stations, and business models.
- Global developments in low-voltage mobility are considered, including for maritime vessels and small-format land vehicles, the potential for standardized specification of powertrain and related electronic components, and models for ownership, maintenance and hire.
- Global developments in small-scale, low-voltage electricity generation from solar are considered, including that relevant to maritime vessels, and the potential for standardized specification.

Activities Output 2.1.1:

? Undertake feasibility studies (technical, social and financial) These studies are led in partnership with the targeted municipalities/fishing communities and co-financiers to secure necessary finance from all co-investors. They will also solicit the opinion of local community, recommend ways of promoting women?s participation in the demonstration pilots and describe potential scale-up options for each of the pilots

? Elaborate final project designs and implementation plans, and identify the need for associated technical assistance

? Provide transaction advisory services for the projects (support in procurement document preparation, etc.)
? Facilitate the realisation of a scalable e-mobility investment

Output 2.1.2: Infrastructure for the charging of electric batteries is installed in two target villages

Following the Specification of a standardized low-voltage battery swap system, as determined in the feasibility studies under Output 2.1.1, infrastructure for the charging of electric batteries is manufactured and installed in two target villages.

The specifications should include standardized specification of the battery, battery holder, quick-connect/disconnect battery connector, and battery performance, for the following applications:

- **Low-power premises**, including homes, that are fitted with low-voltage electricity reticulation and low-voltage solar electricity generation.
- **Land-based, small-format, battery-swap electric vehicles**.
- **Low-powered, battery-swap electric marine vessels**, including those fitted with low-voltage solar electricity generation.

In keeping with modern-day approaches, the battery charging and exchange station will operate autonomously with automated user identification, user access, and billing services. The health of the batteries will also be automatically monitored, and faulty batteries identified and held for maintenance. The swappable batteries are also to include a quality battery management system (BMS), GPS tracking and current user/base immobilisation (as a deterrent to theft and improper use).

The electricity demand from battery charging could be usefully managed alongside the demand for electricity from ice-making, which would be useful for fishers. It is therefore proposed to set up ice-making in parallel with the battery-swap station to take advantage of any excess electricity available once sufficient or all of the batteries available in the changing station have been fully charged. It is proposed that the ice-making equipment will be gifted to the village, and its operation, maintenance and use of the ice will be managed by a village project committee as part of the management of the battery and battery-swap system.

Activities Output 2.1.2:

? Prepare contractors? terms of references for each type of project selected from feasibility studies
? Demonstration of an automated battery swap station (with automated metering and billing, and primarily powered by solar generated electricity) based on specifications established in the feasibility studies under Output 2.1.1, including integrated power management with an ice-maker to absorb any excess electricity supply
? Provide training workshop and technical assistance to ensure the durability of the project and the investments (e.g. Battery testing, servicing, refurbishment and/or repair; repurposing refurbished swappable batteries for stationary energy storage associated with solar generation; monitoring and performance improvement; fault diagnostics and repair)
? Monitoring and verification of the pilots: prepare a report on pilot projects containing results, analysis, and lessons learned.

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Output 2.1.3 Center to support the leasing/renting of batteries established in two target villages

There are many potential business models that could be used for providing charged batteries as a service. The project will trial the use of a Center to support the leasing/renting of batteries as a point of

difference to the more familiar, entrepreneur-led start-up approach, as this provides greater certainty in establishing the demonstration, and any gifting of assets that might be provided would then benefit the community rather than a private party. Village ownership is also hoped to bring about a sense of community ownership and pride, and attract benefits associated with this approach. Battery monitoring and data analysis will be automated with exception alerts provided to the nominated, trained village battery ?housekeeper? for action. Battery use data, alerts and work carried out on batteries will be overseen by a battery expert (likely from the battery supplier). And battery and user data, plus battery station/village earnings and costs, will be analyzed by a project analyst with findings used as an input into the upscaling roadmap.

Activities for output 2.1.3:

- A village battery ownership and management model, with technical oversight by a battery expert and project analyst is developed
- A center to support the leasing/renting of batteries is established in two villages
- The operation of the village battery charging stations and the swap batteries is monitored.

Component 3: Stimulation of the demand of electric battery services

Component 3 will focus on exchanging knowledge, experiences and lessons learned and on disseminating project results. Low-powered, battery-swap electric marine vessels and shared access to electric propulsion systems will also be demonstrated in this component. Details of the component outputs and activities are described below.

Output 3.1.1: **Demonstration of low-powered, battery-swap electric marine vessels and demonstration of shared access to electric marine propulsion systems in two target villages**

Following the specification development for low-voltage, electric outboards and battery swap systems suitable for use by low-powered vessels in the feasibility studies under Output 2.1.1, low-powered, battery-swap electric marine vessels and shared access to electric propulsion systems are demonstrated in two target villages.

The development of standardized specifications will include those for the main components of the electric outboards and marinized swappable battery systems, including for the motor/drive unit, motor controller, demand sensor, marinized battery, battery compartment/holder, programming and diagnostics port, the electrical connectors used by these components and compatibility across them.

The demonstration of the low-powered, battery-swap electric marine vessel will comprise replacing the petrol outboard and tank with an electric outboard and swappable batteries and done in such a way that the safety of the crew, the vessel and the electric outboard and batteries is not compromised. A portable, low-voltage solar electricity generation panel and controller will also be provided for vessel operators to use onboard their vessel.

Training will be provided in support of these, which will include training in best use of the electric outboard and battery systems and in general vessel planning and use.

It is proposed that ownership of the electric outboards, marinized batteries, and portable solar generation systems will be bestowed upon the village, and that their use and maintenance will be managed by a village committee set up for this purpose. The vessel operators will be given the option

to choose to use an electric outboard and battery system through a shared access arrangement managed by an asset-share app (that manages the hire of the electric outboard, swappable marinized batteries and solar generation system at the same time), with oversight of the operation by the village committee. The committee will set the rules of the shared-access app and set the rates of hire to stimulate high use of the electric outboards.

The marinized swap-batteries will have battery calisthenics and GPS monitoring and this data will be used to monitor the use and health of the batteries with exception reporting causing a battery to be held for checking and maintenance by the village?s trained battery maintenance person, with oversight by a battery expert. The battery use data will also be used to monitor the use of the electric outboards and will be analyzed by the project?s analyst. Note that the choice to use an electric propulsion system is expected to significantly address the barrier that would otherwise present itself if fishers had to opt for an electric propulsion system on a permanent basis. This short-term access arrangement takes advantage of the ability to quickly switch between an electric and a petrol outboard and also provides the vessel operator with the choice to opt to use a petrol outboard when they are required to undertake a long voyage (i.e., when a battery propulsion is not a good fit, due to the weight of batteries required).

Activity Output 3.1.1:

? Prepare contractors? terms of references for each type of project selected from feasibility studies
? Demonstrate low-powered, battery-swap electric marine vessels, demonstrate a shared propulsion system and demonstrate vessel on-board solar generation based on specifications established in the feasibility studies under Output 2.1.1 and managed by the village committee.
? Provide training workshop and technical assistance to ensure the durability of the project and the investments (e.g. the retrofit of low-powered vessels to electric propulsion, technical support of the electric propulsion system including best practices for mounting the electric outboard and batteries, fault diagnosis and repair, voyage planning and best practice operation.)
? Monitoring and verification of the pilots: prepare a report on pilot projects containing results, analysis, and lessons learned.

Output 3.1.2: Stakeholders? awareness of the benefits, effectiveness and viability of maritime electric mobility is enhanced through community level awareness raising services provided and communication material disseminated in particular via, the establishment of a public information platform

The project will ensure that knowledge capture and dissemination activities will be gender-responsive and have a strong focus on women?s stories and case studies, and by encouraging equal opportunities in the award of contracts for knowledge capture and dissemination activities and throughout the project?s implementation.

Activities output 3.1.2:

? Community-level awareness raising services provided
? Develop gender-responsive outreach material showcasing the pilot demonstrations implemented under the project
? A maritime electric mobility online information platform hosted by DNICE is created and deployed for knowledge sharing. Material produced will be made available for project stakeholders and wider audiences on the web platform, providing a knowledge database for other national and international stakeholders to learn about innovative approaches to maritime e-mobility.

Output 3.1.3 Demonstration projects showcased through case studies

The project will explore visually appealing and innovative approaches to knowledge capture such as participatory video- making and photo storytelling to collect project success stories and best practices. Knowledge management processes will be implemented by the Project Management Unit. The material collected will be used to develop case studies, with a particular emphasis on stories about women and youth.

Activities Output 3.1.3:

Develop case studies, lessons learned and best practices that consider gender dimensions.

Critical assessment of the demonstrations carried out.

Output 3.1.4 Awareness raising sessions and training programs provided on the results and learnings from the demonstrations

Not only will Cabo Verde play a pioneering role in e-mobility for other SIDS and ECOWAS member countries, but it also it will also benefit from the knowledge learned by UNIDO through other projects and the Global Program to Support Countries with the Shift to Electric Mobility. To ensure the disclosure of useful information, participation of relevant stakeholders in events and targeted training programmes will be supported.

Activities Output 3.1.4:

- ? Participation of key stakeholders in national workshops, awareness raising sessions and events on the results and learnings from the demonstrations (synergies with events organized by the NAMA)
- ? Participation of key stakeholders in teleconferences (synergies with events organized by the NAMA)

Potential synergies with GEF Small Grants Program and UNDP GEF 7 Project.

Component 4: Monitoring and Evaluation

Component 4 aims to establish and implement effective project monitoring and evaluation mechanisms, alongside capturing progress and lessons learned. Gender-disaggregated data will be gathered wherever possible during monitoring and evaluation efforts. The PEE will monitor progress of all activities to ensure the project is completed on time and to budget, as well as be responsive to and proactive about any potential adjustment or opportunities that arise that might further leverage the GEF grant for achieving additional GEBs. Monitoring is considered a day-to-day activity and as such is carried out by the PEE. ESMP will also be monitored and updates will be provided in the Project Implementation Report (PIR) to the GEF. UNIDO will provide oversight and guidance. As per GEF and UNIDO guidelines, a mid-term review (MTR) and an independent terminal evaluation will be conducted at the conclusion of the project to collect best practices and lessons learned for future projects. All monitoring and evaluation tools and documents, such as the monitoring plan, progress reports, final evaluation report, and thematic evaluations (e.g., training needs assessment), will include gender dimensions, and report with respect to an established baseline for gender- related targets in the gender mainstreaming action plan. UNIDO will be responsible for the MTR and the TE only.

Outcome 4: Adequate monitoring of all project indicators in line with GEF, UNIDO and GoCV requirements

The expected outputs that will contribute to the realization of the overall outcome of Component 4 are the following:

Output 4.1.1 Monitoring and mid-term review

This output under the monitoring and evaluation component includes the activities below:

? **ACTIVITY 4.1.1.1: REGULAR MONITORING OF PROJECT ACTIVITIES AGAINST PROJECT TARGETS (PEE):**

Establish a Project Steering Committee (PSC)
Hold a Project Inception Workshop within the first three months of project?s start and prepare an Inception Report
Draft and approve annual workplans on planned project activities and outputs
Project monitoring plan designed and executed
Undertake day-to-day monitoring of the overall project activities as well as periodic progress reviews
Monitor the ESMP, gender action plan, stakeholder engagement plan

? 4.1.1.2 Independent, mid-term review conducted (UNIDO)

Output 4.1.2 Independent, terminal evaluation conducted

? 4.1.2.1 Independent, terminal evaluation on the project conducted at the end of the project

Terminal evaluation (TE) will consider the envisaged gender outcome at the end of the project. TE will be conducted by international and national independent evaluation experts, as per UNIDO and GEF guidelines.

Theory of Change (ToC)

The project solutions in the ToC are based on the identified root causes of the unsustainable methods found in Cabo Verde?s marine transport sector, and the project outputs are structured to target several of these root causes. Figure 5 shows the logic pathways, including driving forces and assumed scenarios, between the outputs and outcomes, all of which are shown with arrows connecting the boxes. Different colours indicate the different Components of the project: Component 1 in red, Component 2 in amber, and Component 3 in blue. Component 4 (on monitoring and evaluation, gender mainstreaming and environmental and social impact assessment) is considered cross-cutting and is not shown in this ToC diagram.

The ToC diagram shows that IF the outputs (project interventions) are conducted successfully, THEN the project will reduce GHG emissions resulting from maritime transportation BECAUSE creating evidence through pilot technology demonstration, building capacity around maritime e-mobility and enabling policies and investment conditions for the private sector will accelerate the adoption of maritime EVs and promote sustainable maritime transportation in Cabo Verde.

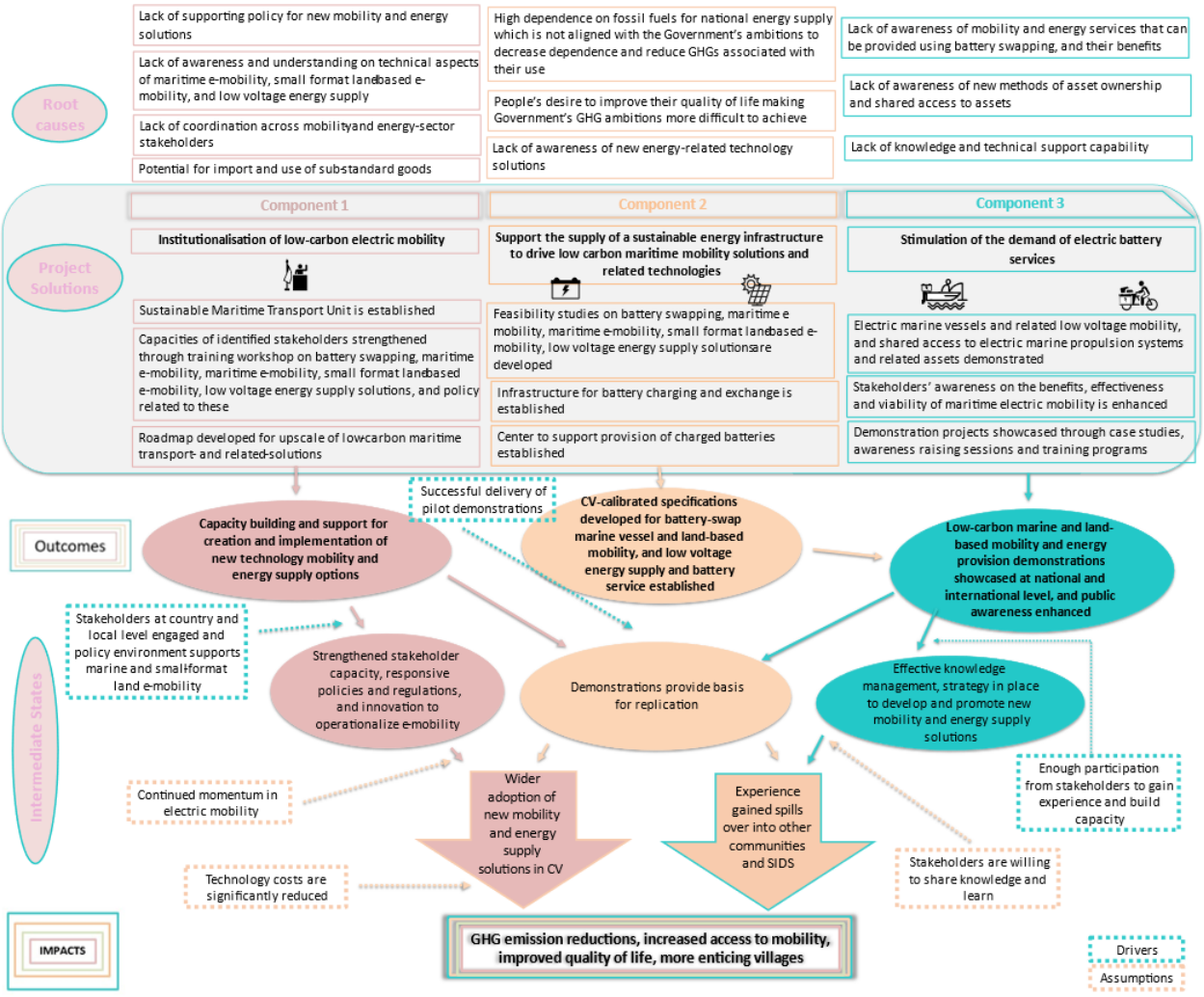

Figure 5: Theory of Change Diagram for the Project

4) Alignment with GEF focal area and/or Impact Program strategies

The project will develop institutional and technical capacities leading to relevant policies, plans and associated processes at sub-national and national level and support Cabo Verde in realizing Global Environmental Benefits outlined under GEF-7. The project aligns with the GEF-7 strategic objective to finance low-carbon technologies and mitigation options and promote integrated low-emission transport, catalyzing technology innovations towards scale, whilst counteracting environmental impacts of air and ocean pollution through the transport and fishing sectors. While the projects core outcomes are largely described by Climate Change Mitigation (CCM) Focal Area (FA) element CCM-1-2 ?Promote innovation and technology transfer for sustainable energy breakthroughs for electric drive technologies and electric mobility?, the project also addresses other GEF 7 FA elements, including: CCM-1-1 (?Promote innovation and technology transfer for sustainable energy breakthroughs for decentralised power with energy usage?), through developing battery-as-a-service, and ?last mile? electricity reticulation; CCM-1-3 (?Promote innovation and technology transfer for sustainable energy

breakthroughs for accelerating energy efficiency adoption?), including through demonstrating the energy efficiencies that can be realized through better application of low voltage systems; and CCM-1-4 (?Promote innovation and technology transfer for sustainable energy breakthroughs for cleantech innovation?), including through demonstrating the use of intelligent demand management systems with RE generation.

In addition, the project's achievement could also be related to IW and CW, which is considered to be a co-benefit: IW-1-3 (?Strengthen blue economy opportunities by addressing pollution reduction in marine environments?), through avoiding the use of fuels and lubricants for small marine vessels; CW-2-3 (?Strengthen the enabling environments in LDCs and SIDs to manage harmful chemicals and waste?), through introducing battery stewardship as part of the battery services provided plus introducing standardized specifications that are expected to enable local repair and other leading to reduced e-waste; and CCA-1 (?Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation?), through the introduction and awareness provided to more weather event-robust energy and mobility technologies.

The project will support Cabo Verde in realizing Global Environmental Benefits (GEBs) by reducing GHG emissions through numerous changes that the project is expected to make in how energy and mobility is provided in the future. These GHG reductions include those related to ?last mile? electricity supply using swappable batteries replacing small fossil-fuelled generation, the use of small-format electric vehicles displacing the use of larger fossil-fuelled vehicles either directly or indirectly (including that related to enabling greater use of public transport through providing better first- and last-mile mobility options), the use of electric outboards displacing the use of gasoline-fuelled outboards, and many others.

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

By developing capacities as well as supply/demand sides for promoting the adoption of electric mobility in remote villages in Cabo Verde, the country will be able to integrate sustainable transport system with the use of renewable energy (RE) options particularly in the maritime sector to achieve GHG reductions. The GEF?s value added will build capacities to align low-carbon mobility solutions within national decarbonisation strategies and policies, strengthening the supply of a sustainable energy infrastructure to drive low-carbon maritime mobility solutions, and stimulating the demand of electric battery services and related technologies at community and national level.

The GEF?s role in the design and implementation of the project will be targeted to activities that develop a roadmap for upscale of low-carbon maritime transport solutions and provide demonstrable low-carbon mobility benefits by installing infrastructure for the charging of electric batteries and showcasing case studies on low-powered, battery-swap electric marine vessels and shared electric marine propulsion systems in target villages. Co-financing plays an important role to ensure that low-carbon maritime mobility solutions are well institutionalized within national transport structures and mechanisms. As a result, the following benefits beyond business-as-normal are expected to be realized from the execution of the project:

Component 1: Policy and institutional support to promote low-carbon maritime mobility solutions

? **GOVERNMENT LEADERSHIP GROUPS WILL BE ESTABLISHED SO THAT CHANGE PROGRAMS CAN BE WELL ORGANISED AND COORDINATED.**

? THE GOVERNMENT AND IMPORTANT INDUSTRY STAKEHOLDERS WILL BECOME BETTER INFORMED ABOUT NEW ENERGY- AND TRANSPORT-RELATED TECHNOLOGIES THAT WILL PROVIDE MULTIPLE BENEFITS.

? A ROADMAP WILL PROVIDE A COORDINATED APPROACH FOR THE GOVERNMENT AND PRIVATE SECTOR TO BEST PREPARE FOR AND THEN EXECUTE A NATIONAL-SCALE UPTAKE OF THE NEW TECHNOLOGIES.

Component 2: Support the supply of a sustainable energy infrastructure to drive low carbon maritime mobility solutions and related technologies

? CABO VERDE WILL BE INTRODUCED TO MANY NEW ENERGY- AND TRANSPORT-RELATED TECHNOLOGIES THAT ARE EXPECTED TO PLAY IMPORTANT ROLES IN CABO VERDE?S FUTURE. THE PROPOSED PROJECT WILL BRING ABOUT EARLIER AWARENESS OF THEM AND EARLIER NATIONAL-SCALE UPTAKE, WITH MANY BENEFITS ASSOCIATED WITH THIS.

? DEVELOPED STANDARDIZED SPECIFICATIONS WILL BRING ABOUT MANY EFFICIENCIES IN THE SUPPLY AND MAINTENANCE OF THE NEW TECHNOLOGIES.

? CAPACITY BUILDING, IN SUPPORT OF THE PROPOSED DEMONSTRATION PROJECTS, PLUS STANDARDIZED SPECIFICATION OF COMPONENTS USED IN THE DEMONSTRATIONS, WILL ALLOW CABO VERDE TO BECOME SELF-SUFFICIENT IN MAINTAINING THE NEW TECHNOLOGIES.

Component 3: Stimulation of the demand of electric battery services

? LOW-POWERED, BATTERY-SWAP ELECTRIC MARINE VESSELS AND SHARED ACCESS TO ELECTRIC MARINE PROPULSION SYSTEMS WILL BE DEMONSTRATED, WILL SHOW THE MANY BENEFITS OF THESE TECHNOLOGIES AND ENCOURAGE THEIR ADOPTION.

? INFORMATION OF THE DEMONSTRATIONS WILL BE USED IN AWARENESS AND MARKETING OF THE NEW TECHNOLOGY SOLUTIONS AIMED AT PREPARING THE MARKETPLACE FOR UPTAKE OF THE TECHNOLOGIES.

Component 4: Monitoring and evaluation

? A QUALITY PROJECT MANAGEMENT SYSTEM WILL BE USED TO DELIVER THE PROJECT.

The project aims to set the stage for future provision of energy and mobility. The project?s focus on a village setting is due to the additional benefits to be realized, but the methods and systems are applicable to the urban environment as well. Hence the scaleup opportunities are immense, with global application, and beyond only SIDS. Even considering Cabo Verde only, Cabo Verde imported US$320M in refined petroleum in 2015[1], over 80% of which was used for electricity generation or transport. A project-triggered change resulting in a 10% reduction in such imports would provide an annual savings in the cost of fuel imports of around US$29M.

The expected contribution from co-financing can take several forms. Besides in-kind contributions from the GoCV, it is expected that the project will attract input from standards organisations, battery developers, and small format vehicle developers.

6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF);

The demonstrations of the project are not expected to result in a significant direct reduction in GHG emissions due to the relatively small scale of the proposed demonstrations. The direct greenhouse gas

(GHG) emissions reduction is small, at around 360t CO2e for the five-year project. This estimate is based on the following:

? **Every electric outboard is expected to save to the order of 5,000 liters of petrol per year. One battery swap station in a remote village could displace to the order of 400 liters of fossil fuel used for premise electricity generation, per year. A battery swap small format electric vehicle could displace the likes of one 4WD track bike and avoid around 200 liters per year per vehicle.**

? **Using these figures, a village demonstration comprising four electric outboards, ten small-format electric vehicles, and battery-swap, last-mile electricity generation would avoid the consumption of around 22,400 liters of petrol equivalent. At the GEF emissions factor or 2.7 kg CO2e/liter for petrol, this is a savings of around 60 tonnes CO2e per year.**

? **Two such villages with 3.5 years operation over the 5-year project (providing time for deployment) is equal to a total savings of 360 tonnes CO2e.**

However, this low figure needs to be viewed in the context of the proposed project?s ultimate aim, which is to promote awareness of the new e-mobility, vehicle sharing and low-voltage electricity supply solutions, so that these solutions feature in Cabo Verde?s energy and mobility future. Considering the potential for change in these sectors, including the GHG reductions related to ?last-mile? electricity supply (using swappable batteries replacing small fossil-fueled generation), the use of small-format electric vehicles to displace the use of larger fossil-fuelled vehicles (including gains from the greater uptake of public transport that will accompany better options for first- and last-mile travel), the use of electric outboards displacing the use of gasoline-fuelled outboards and marine electrification extending to other vessels, and many others, the proposed project has the potential to seed an annual decrease in GHG emissions of to the order of around 10,000 tonnes CO2e per year. This estimate is based upon the following:

? **Displacing around 10% of the fossil fuel used by the land-transport sector through a shift to low-voltage, small-format electric vehicles.**

? **Powering around 50% of the artisanal fishing fleet with electric propulsion systems (which results in a minor change in comparison to that expected to be achieved through a shift in mobility modes to small-format electric vehicles).**

? **Base data for GHG emissions from land transport: 230,000 Ton of Equivalent Petroleum (TEP) total fuel consumption for Cabo Verde[1], transport making up 28% of Cabo Verde internal fuel consumption[2] and the GEF emissions factor of 2.7 kg CO2e/liter for petrol.**

These estimates will be reviewed at PPG stage.

Similarly, the number of persons benefiting directly and immediately from the project is relatively small, as the number comprises only those people in the two target villages along with the stakeholders involved in the training and other capacity building activities. This may amount to no more than 2000 persons. However, the ?Cabo Verde Village 2040? vision has the potential to influence the future make-up of every village in Cabo Verde, plus a proportion of those living in the urban environment. Currently over 30% of Carbo Verde?s population lives in villages[3], which is around 160,000 persons. Suppose battery swap mobility were to be used by 10% of the urban population within 20 years? time,

a further 56,000 persons (based on current population data) would stand to gain. Together, there is the potential for the project to influence the energy and mobility habits of around 215,000 persons (split relatively evenly between women and men).

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[1] Ministry of Industry, Trade and Energy ? 2019

[2] Ministry of Industry, Trade and Energy ? 2019

[3] Derived from World Bank data: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=CV

There are also many other benefits to be realised from establishing the new technology solutions, including improved access to more affordable electricity and mobility, improved local air, ground and water quality, improved robustness and dependability, greater resilience, and improved quality of life. These have the potential to make village life more attractive and may be an enabler to slow the movement of population from villages to urban settings.

7) innovation, sustainability and potential for scaling up. ?

Innovation:

The project involves the demonstration of many new technologies that have not been seen before in Cabo Verde and that are not well understood. This will leap Cabo Verde into the use of currently novel systems and solutions for electricity supply and mobility. These new ways are expected to have a follow-on effect of seeding innovation in other sectors as well. Specific innovations that the project will introduce or enable include:

1. **BATTERY SWAPPING, ACCESSED THROUGH AUTOMATIC BATTERY CHARGING AND SWAPPING STATIONS IN COMBINATION WITH AN ACCESS APP.**
2. **ELECTRIFICATION OF MARINE VESSELS THROUGH THE USE OF ELECTRIC OUTBOARDS AND BATTERY-SWAP BATTERIES, BOTH ACCESSED VIA A SHARED-ASSET APP.**
3. **THE INTRODUCTION OF SMALL FORMAT BATTERY SWAP VEHICLES, ACCESSED VIA A SHARED-ASSET APP.**
4. **THE STANDARDIZED SPECIFICATION OF POWERTRAIN COMPONENTS TO PROVIDE FOR EASIER SERVICING AND SERVICING, REDUCED WASTAGE, SMALLER PARTS INVENTORIES, AND ENABLING INNOVATION IN THE LOCAL MARKETPLACE IN THE FORM OF MODIFICATION OF SMALL FORMAT VEHICLES THROUGH TO LOCAL ASSEMBLY OF THE SMALL-FORMAT VEHICLES USING IMPORTED, GENERIC DRIVETRAIN COMPONENTS.**
5. **THE INTRODUCTION OF ?LAST-MILE? ELECTRICITY RETICULATION THROUGH BATTERY SWAPPING.**
6. **THE INTRODUCTION AND USE OF LOW VOLTAGE SOLAR ELECTRICITY GENERATION SYSTEMS.**
7. **THE INTRODUCTION OF MODERN POLICY PLANNING METHODOLOGIES.**

Environmental Sustainability:

The project focuses on establishing new, low-carbon technologies in Cabo Verde ? improving the environmental sustainability of the energy and transport sectors is a core target for the proposed project.

Further, the standardized specification of electrical components is expected to reduce waste through avoiding the need for extensive parts inventories to be held, making repair more efficient and predictable, and enabling economic repair of power electronics and motors.

Sustainability of Market Development after the project:

The new technologies are expected to provide more accessible and lower cost electricity in off-grid settings and more accessible and more affordable transport in a variety of settings. Most benefit is expected in remote village settings. These, along with the threat of disruption to fuel supply are expected to be powerful drivers for uptake of the various technologies. To support this, the project will develop supporting policy and a roadmap for ensuring market uptake.

Potential for scale-up:

Although the project targets demonstration of the new technologies in remote villages, this is because there are added benefits to be realized in such settings. However, apart perhaps from battery swapping to provide premise electricity supply, the new technologies to be introduced are applicable to almost any SIDS setting and a significant uptake of the new technology solutions is expected.

Take the example of vehicle sharing: There is a global trend towards the use of shared vehicles and commentators predict that vehicle sharing will become the predominant means by which people will access self-drive vehicles. The proposed project will introduce the vehicle-share concept across a fleet of small-format electric vehicles that are provided for the village as a whole to use. This makes sense in a village setting as the vehicles are relatively seldomly used to the point that low utilization is a deterrent to self-owning a vehicle. Cabo Verde will likely follow globally trends eventually and the demonstration of vehicle sharing will make it easier for uptake due to the familiarization realized.

The scene will be set for there to be a very high likelihood of successful scale up of the various technologies demonstrated. For example, the Sustainable Maritime GET Transport Unit (SMTU) will be provided with the necessary tools, roadmap, and capacity development to deliver on that roadmap and keep it current. Likewise for the scale up of land-based low voltage mobility and related low voltage systems. In line with good practice roadmap techniques, the private sector will also be provided roles to ensure long-term, program robustness.

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[1] Minist?rio da Agricultura e Ambiente, Cabo Verde (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution (NDC)

[2] Cabo Verde (2017) Plano Nacional De Investimentos Para A Economia Azul Em Cabo Verde PNIEA 2020

[3] Minist?rio da Agricultura e Ambiente, Cabo Verde (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution (NDC)

[4] Source: Ministry of Industry, Trade and Energy - 2019

[5] Source: Ministry of Industry, Trade and Energy - 2019

[1] OEC, World (https://oec.world/en/profile/bilateral-product/refined-petroleum/reporter/cpv)

[6] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Cabo%20Verde%20First/Cabo%20Verde_NDC%20Update%202021.pdf

[7] http://tda-mobility.org/wp-content/uploads/2019/04/Cabo-Verde-Electric-Mobility-Policy-Chapter.pdf

[8] https://peds.gov.cv/caboverdef4dev/wp-content/uploads/2018/12/Ennergy-Sector-web.pdf

[9] http://tda-mobility.org/wp-content/uploads/2019/04/Cabo-Verde-Electric-Mobility-Policy-Chapter.pdf

[10] Minist?rio da Agricultura e Ambiente, Cabo Verde (2021) Cabo Verde: 2020 Update to the first Nationally Determined Contribution (NDC)

[11] i.e., similar to how desktop computer components can be relatively easily switched.

[12] Based on displacing around 10% of the fossil fuel used by the land-transport sector plus powering around 50% of the artisanal fishing fleet with electric propulsion systems, and use of the data in Figure 3 and the GEF emissions factor or 2.7 kg CO2e/liter for petrol. The contributions expected from the electrification of the marine sector and through providing electricity to premisses using swappable batteries is expected to be small in comparison.

1b. Project Map and Coordinates

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

Exact location of the activities will be decided at PPG stage.

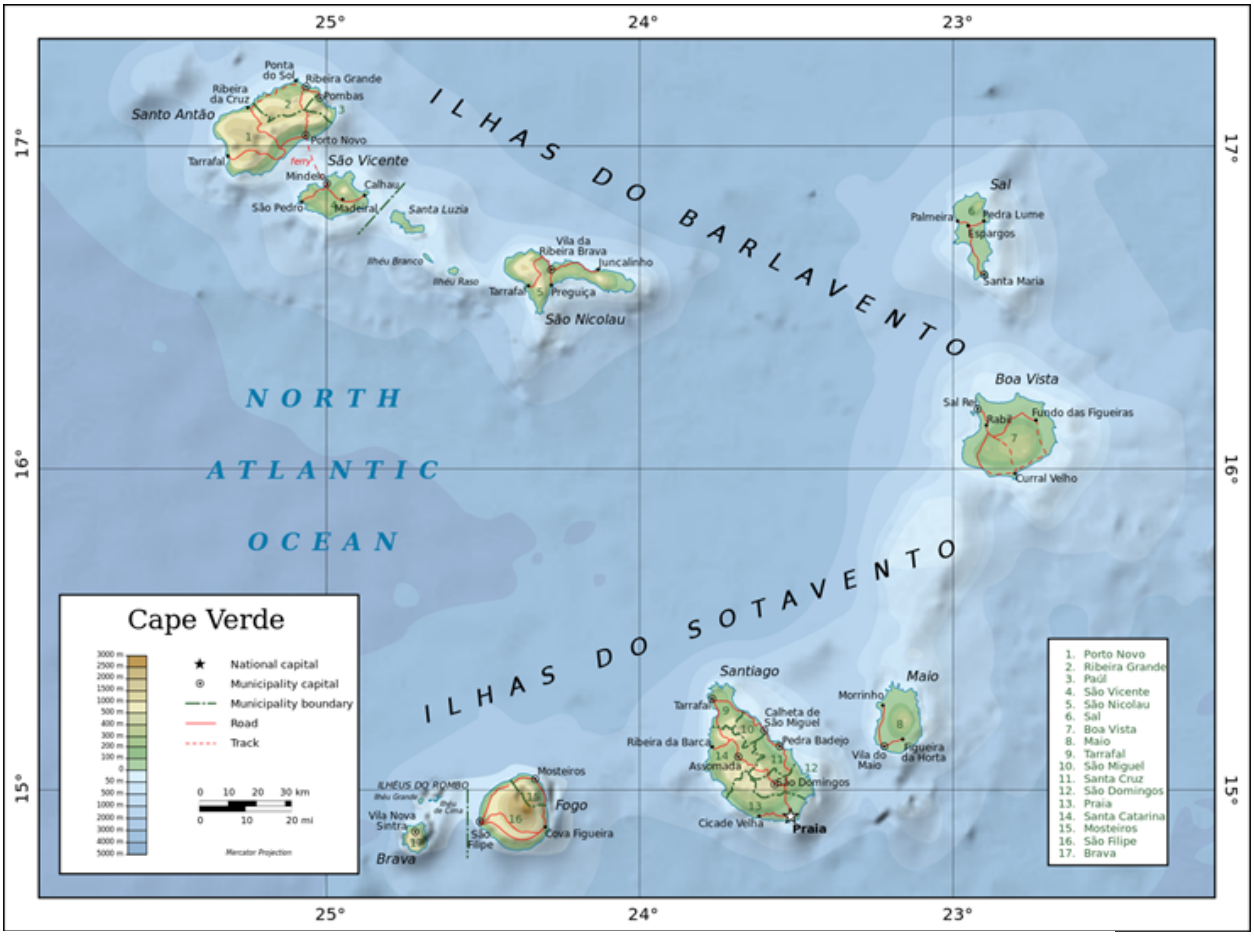

Image 1: Map of Cabo Verde

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities Yes

Civil Society Organizations

Private Sector Entities Yes

If none of the above, please explain why:

- Indigenous Peoples and Local Communities: YES (the consultations with local communities took place several times in 2021 through telephone conversations and email exchanges; there are no indigenous peoples in Cabo Verde)
- Civil Society Organizations: NO
- Private Sector Entities; YES (the consultation took place in February 2022 through a meeting)

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement

The Ministry of Industry, Trade and Energy is envisaged to act as the Lead Executing Agency (to be confirmed by HACT assessment at PPG stage). It provides key strategic expertise for the entire project and coordinates the project steering committee. It is directly involved in all the activities described under the Component table and it coordinates its work with other government ministries, particularly with the Ministry of the Sea, and stakeholders relevant to the project. The Ministry of Industry, Trade and Energy will facilitate the technical assistance activities and it will correlate with the Ministry of the Sea to assist in the identification of relevant project infrastructure and their locations. It will also provide data and support for Monitoring and Evaluation.

Villagers and local fishing communities will be engaged through stakeholder meetings during the design phase and will be fundamental in the identification of necessary infrastructure and location of demonstration projects. They will also be part of the awareness and capacity-building envisioned by the project and in propulsion of scale-up initiatives.

The project team has conducted meetings with national stakeholders to sharpen the project activities and expected outcomes, collect baseline information, assess gaps, identify the project role. The consultations were conducted from 2021 to 2022 mainly through online meetings with the following agencies:

- **DIRECTORATE OF INDUSTRY, TRADE AND ENERGY**
- **DIRECTORATE OF MARINE RESOURCES**
- **REPRESENTATIVES OF MINISTRY OF THE SEA**
- **REPRESENTATIVES OF THE NATIONAL BLUE ECONOMY COORDINATION**
- **REPRESENTATIVES OF THE NAMA FUNDED SUPPORT PROJECT ?PROMAE?**
- **REPRESENTATIVES OF SALAMANSA FISHING ASSOCIATION**

The relevant outcomes of these meetings are integrated in the PIF document. The project team collected detailed baseline information on energy, gender mainstreaming, potential for maritime e-mobility. Literature review and relevant studies were conducted.

Indicated partners have been identified through early consultations and will be confirmed (along with their exact role) during the PPG phase. Some of these stakeholders will be part of the project?s steering committee during implementation to ensure scale-up of lessons learned across the country and sustainability of the project.

Stakeholder	Roles and Responsibilities
Lead Executing Entity Directorate of Industry, Trade and Energy	Ministry of Industry, Trade and Energy, through its Directorate of Industry, Trade and Energy will be the Lead Executing Entity. The Lead Executing Entity will be responsible for (Component 1), will facilitate the technical assistance activities (Components 2 and 3), and (Component 3). It will also provide data and support for Monitoring and Evaluation (Component 4).

Government Partner Agency Ministry of the Sea	Ministry of the Sea, through the Blue Economy Coordination team and through its General Directorate of Marine Resources, will be a key entity in coordination with the Lead Executing Entity, providing data and coordination with local fishing communities. The Ministry of Sea will also analyse synergies with the Blue Economy Program and analyse alignment with the Blue Economy Investment Plan for government co-funding.
Villages and Artisanal fishing communities targeted by the project	Implementation of pilot projects with the support of the DNICE
ACOPESCA - Competent Authority for Fisheries Products	Under the General Directorate of Marine Resources, this agency is in charge of enforcing fisheries regulations across all fleets (artisanal, industrial, domestic and international, inside and outside the coastal zone), overseeing the implementation of bilateral fisheries agreements, controlling and certifying product quality (sanitary, IUU compliance) for exports and imports to add value to fish products, overseeing and training 20-25 fishery landing inspectors on all islands / ports. This entity will be crucial in analysing synergies between government projects seeking sustainability within the fishing industry.
Institute of the Sea (IMAR) and other academic institutes such as UNICV-Universidad de Cabo Verde	These academic institutions, which have programs relating to biodiversity conservation and maritime sustainability can be involved in data gathering as well as stakeholder awareness and capacity-building.
Local Fishing Associations	Fishing Associations will be involved in data collection, stakeholder engagement, capacity-building and in identifying needs of fishing communities as well as identification of project demonstration pilots.
Center for Renewable Energy and Industrial Maintenance of Cabo Verde (CERMI)	CERMI has the objective of ?Enhancing Governance of the Energy Sector in West Africa (AGoSE-AO)? program in terms of capacity building. The Center is specialized in developing curriculums and engaging organising capacity building events regarding renewable energy. The Center has provided capacity building support for other GEF projects in Cabo Verde and other African countries and could provide this support for the Project.
ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)	The ECOWAS Centre for Renewable Energy and Energy Efficiency has the mandate of strengthening support for and the development of economic and technological infrastructure in the realm of renewable energy and energy efficiency for sectors such as transportation, water and power. ECREEE could be involved in providing financial and technical support for the Project.

Table 3: Project stakeholders and their role in the project

Other possible relevant partners could be:

- Inter-institutional Commission for Electric Mobility (CIME) in Cabo Verde,
- Ministry of Tourism and Transport
- The Municipalities and National Association of Municipalities

- National Tourism Institute
- PROEMPRESA
- The Chambers of Commerce and Chamber of Tourism

- the National Directorate of Environment/ the Ministry of Agriculture and Environment (MAA),
- National Institute of Water and Sanitation (disposal of batteries),
- the Ministry of Internal Administration (responsible for road transport),
- the Ministry of Finance (responsible for the arbitration of public funds, for fiscal policy and the mobilization of resources from international partners),
- organizations representing local authorities and civic organizations,
- National Directorate of Fisheries and Aquaculture
- Port Management Entity (ENAPOR), Institute of Employment and Professional Training (IEFP),
- The Government of Cabo Verde is developing the Blue Economy / Blue Growth Strategy with initial financial support of the FAO,
- GiZ,
- LuxDev,
- University Jean Piaget (UJP),
- University of Cabo Verde (UNICV),
- University of Mindelo
- Water and Waste Management Authority (ANAS),
- Atlantic Technical University (UTA),
- Quality Management Institute and Intellectual Property (IGQPI),
- ONGs that work in and around coastal communities (LANTUNA, BIOSCV),
- Motor vendors,
- ONGs that deal with training, promote gender equality, and women?s empowerment environmental conservation
- Regional fisheries organisations : R?seau sur les Politiques de p?che en Afrique de l?Ouest (REPAO), the African Confederation of The Artisanal Fishery Professional/Conf?d?ration africaine des organisations professionnelles de p?che artisanale (CAOPA)
- The World Bank office in Cabo Verde-Institute of Employment and Professional Training (IEFP)
- PPP companies such as the utility company Aguas de Ponta Preta (who are involved in projects for the sustainability of fishing communities (Monte Trigo Sustainable Project) and who are interested in the electric mobility and charging station sectors (among entities in Cabo Verde they have the largest fleet of land-based EVs).
- Private companies such as Semi-Industrial and Industrial fishing groups such as Frescomar and Nortuna
- Fishing associations, Maritime Association

The project will engage with NGOs working on women?s and youth empowerment and local civil society through consultation meetings to assess and mitigate any emerging social and environmental risks related to the pilot projects. Furthermore, the project will consult with the civil society representatives in relation to policy-related activities under the Component 1 and pilot demonstrations in Component 2 and 3.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

UNIDO recognizes that gender equality and the empowerment of women have a significant positive impact on sustained economic growth and inclusive development of sustainable transport, key drivers of poverty alleviation and social progress. The UNIDO vision, as laid down in the 2019 Policy on Gender Equality and the Empowerment of Women (DGB/2019/16), is that women and men can equally lead, participate in, and benefit from inclusive and sustainable industrial development. Towards this vision, UNIDO follows a comprehensive approach to gender equality and the empowerment of women, recognizing the interests, needs and priorities of both women and men and the intersecting diversity of different groups. Moreover, UNIDO recognized the importance of involving vulnerable groups (incl. women of color, young women) and the economy and society at large (with a special focus on groups most affected by climate-prone natural disasters).

A gender analysis will be conducted during the PPG phase to analyze possibilities for the project to utilize a gender responsive approach. To establish a gender baseline and develop gender-based targets, basic data and qualitative information on social and gender aspects of the project will be collected during PPG phase. PPG funds will be allocated towards a review of the project design by a gender expert and to seek input from vulnerable groups.

As a guiding principle, the project is designed to ensure that both women and men (including as staff in institutions, as experts, and as audience, speakers and panelists at events, or where relevant in communities benefiting from the e-mobility pilots) are provided equal opportunities to lead, participate in and benefit from the project.

In practical terms, this will be demonstrated in a multitude of ways:

- A **Gender baseline report** will be prepared for this project during the PPG. During project inception, the gender analysis and the gender mainstreaming action plan (including the gender responsive targets and indicators) will be validated and approved by the PSC as well as monitored during project implementation.
- **Gender-sensitive recruitment** will be practiced at all levels where possible, especially in selection of project staff, researchers and experts, as well as technical staff. Gender-responsive TORs will be used to mainstream gender in the activities of consultants and experts. In cases where the project does not have direct influence, gender-sensitive recruitment will be encouraged. Furthermore, whenever possible existing staff will be trained and their awareness raised regarding gender issues.
- Existing and new staff will be trained and their **awareness** raised on gender issues when possible.
- Gender dimensions will be considered when data collections or assessments are conducted as part of project implementation. Examples include **sex-disaggregated data** collection and performing gender analysis as part of Environmental and Social Impact Assessments. Research, data and assessments will consider gender and age differentiated needs of women and men from different social groups.

- Gender dimensions will be considered in all **decision-making processes**. With respect to project management, the National Transport Coordination Unit meetings will aim to be gender balanced and to extend invitations to observers who represent gender dimensions, such as organizations / associations promoting gender equality and advocating women?s empowerment. During project activity implementation, effort will be made during stakeholder consultations to focus on gender equality and women?s empowerment issues, in particular during policy review and formulation.
- At project management level, Project Steering Committee will make efforts to be **gender balanced** and/ or during meetings will invite observers to ensure that gender dimensions are taken into consideration. At the level of project activity implementation, effort will also be made to consult with stakeholders focusing on gender equality and women?s empowerment issues. This is especially relevant in policy review and formulation.
- Efforts will be made to promote **participation of women in training activities**, both at managerial and technical levels, as participants and trainers. This can include advertising of the events to women?s technical associations, encouraging companies to send female employees, provide childcare and safe transport, offer scholarships or reduced fees for women, adjusting TOR for selection of the trainers, etc.
- The project will pursue thorough **gender-responsive communication** and ensure stakeholder involvement at all levels, with special regard to involving women and men, as well as civil society and non-governmental organizations promoting gender equality. This will mitigate social and gender related risks, promote gender equality, create a culture of mutual acceptance, and maximize the potential contribution of the project to improving gender equality in the energy field.

The planned project outcomes will be enhanced by considering gender equality and women?s empowerment by adopting a gender lens at high-level decision-making bodies and forums, and within planning and developments relating to sustainable transport. A component-by-component short description is provided:

Component 1: The consultations for the roadmap have women consultations targets. Women?s organizations will also be invited to the validation workshop. The roadmap will be gender-sensitive. At least one National sustainable maritime transport Unit member is assigned as the Gender Focal Point to ensure that the relevant project interventions are gender responsive. Meetings and training workshops under this component have women participation targets.

Component 2 and 3: The main focus of these components is the successful implementation of a demonstration-scale pilot project. The project will consult with the women associations and local community during the design of the pilot projects to not only integrate the needs of women and youth into project design but also provide equal opportunities for women and men to lead, benefit from and participate in the demonstration-scale pilot projects.

Component 3: Events and training activities under this component have women participation targets and women's training needs are taken into account following consultations with local women?s organizations.

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

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

improving women's participation and decision-making; and/or

generating socio-economic benefits or services for women. Yes

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

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

The private sector will directly benefit from all project components. They will be consulted in Component 1 for the roadmap definition and will be directly engaged in Components 2 and 3 (training workshops). During project design, stakeholders from the private sector interested in electric mobility will be consulted for their input on how best to implement the strategies and targets of the project. The private sector will also be represented during the implementation phase through the participation of specific companies and/or associations in stakeholder meetings. The project will benefit from UNIDO's extensive experience and the ability to leverage investment from private sector actors, in particular through establishing a sectoral approach.

Estimated co-financing options will be validated at PPG stage through stakeholder engagement with private sector entities.

In addition, the private sector will benefit from targeted technical assistance, training and awareness-raising programs.

Beyond the immediate benefits of the e-mobility project for the villages and artisanal fishing communities, the proposed technical assistance components will also enable opportunities for private participation across the full spectrum of the villages? infrastructure projects. If successful, innovative financing mechanisms are to be identified for the communities. These will validate commercial-based

solutions (from land-value capture to pooled/hybrid financing) that could serve other villages in Cabo Verde as well.

Private sector partners could include:

? **Private sector actors and electric utilities**:
o Electra SA (public utility)
o Cabeolica SA (IPP)
o Electric (IPP)
o APP (IPP / private Utility)
o AEB (private utility)

? **Private companies distributing electric vehicles in Cabo Verde**

? LARGE CABO VERDIAN FISH EXPORTING ENTITIES SUCH AS SEMI-INDUSTRIAL AND INDUSTRIAL FISHING GROUPS (FRESCOMAR AND NORTUNA)

? **Supporting Alliances**:
o Transport Decarbonization Alliance

5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Risks	Risk Level	Risk description / Mitigation Actions
Political and institutional risk	Low/Medium	This risk entails lack of support and engagement from the relevant ministries and institutions. Component 1 of the project includes extensive engagement with the relevant institutions at national, municipal and local levels. Given the political will of all political parties and ruling governments in finding solutions to energy independence, this overall project risk is low.

Delays in the proposed improvements to institutional and regulatory framework by public institutions	Low	The demonstration component of the project can proceed without such changes, providing time for improvements to institutional and regulatory frameworks to be made. The risk to the project is therefore considered to be low. The risk will be managed by identifying and engaging external consultants through the project to develop draft policies which can be quickly adopted by the government.
Climate change risks - Infrastructure developed is vulnerable to climate risks.	Low	The project involves the demonstration of more resilient solutions and as such is expected to have a lower climate change risk than business as normal.
Financial risk/Lack of participation from the co-funding partners (public and private)	Low	The successful implementation of the demonstrations is not highly dependent upon gaining the support of local co-financing entities. The project will also be designed so that the new technology solutions that are introduced are financially attractive to users, to ensure a good uptake of the use of the technologies ? as the experience of many users is a valuable output for the project.
Environmental and social risk	Low	The project components address the problem of sustainability considering local ecosystems. ESMP which will be developed during PPG phase will further detail the baseline risk and mitigation action plan of environmental and social risks.

Technology risk	Low	The introduction of new technologies carries a risk that they may not be suitable for the location and use intended. This risk will be managed through the specification of the new technologies and project management used to identify problems early in their deployment and use. Further, despite the demonstration of many technologies, the demonstrations will be designed so that there are fallback options so that an issue with the deployment of one new technology solution does not prevent the demonstration of another. For example, should the automated battery swap station prove difficult to commission, then a manual battery charging arrangement will be deployed so that there are charged batteries available for the vehicle demonstration, etc.
Inadequate engagement from women .	Low	This risk will be mitigated through specifically targeting women involved in the sector for participation in consultations on needs of the village communities, policy improvements under Component 1, as well as policies that will guarantee further involvement of women in the sector through the capacity building aspect of the Project.

Social/ Gender Risk:	Low	To ensure gender inclusiveness of all project activities, UNIDO methodology for gender assessment and gender responsive communication showing the benefits of gender equality for both women and men will be applied. To mainstream gender dimensions and empower women, adequate and gender responsive communication strategy will be implemented, and sensitization workshops will be organized. A full gender analysis should be carried out to produce recommendations that can be incorporated into the project design.
Lack of participation by villagers:	Low	With the importance placed on demonstration of the new technology solutions, the pricing for access to the batteries, small-format electric vehicles and electric outboards will be made very attractive. In this respect the project is a demonstration and not a test of business models using commercial terms.

Inadequate battery disposal	Low	In case batteries are not disposed properly, toxic chemicals could contaminate the soil and water affect wildlife and humans health. This risk will be mitigated through awareness raising of local communities and government on waste management.

Table 4: Project risks

COVID-19 risk analysis

The project will fully consider the negative implications of COVID-19 and identify the most appropriate ways to conduct implementation by using safety measures and preventive precautionary procedures. Such as organizing virtual meetings and trainings where face-to-face meetings bear health risks. The project team will be in continuous consultations with the governmental project stakeholders on how COVID-19 could impact the implementation of project activities and additional challenges that may subsequently arise due to the national pandemic restrictions. That would be pinned in the project schedule to accommodate to the prolongation of activities implementation and mobilization challenges during the pandemic period.

Due to the pandemic, the country was closed at different periods of 2020 and many activities restricted. While at certain months of 2020 circulation was severely restricted, including those to and from professional activities, members of the food industry such as fisheries, among other essential workers, were more quickly allowed to return to their professional activities. Nonetheless, the pandemic induced negative effects on most of Cabo Verde?s industries, including within the fishing and tourism sectors. Currently, the country is fully opened, and with the high effectiveness of the vaccination program, it is unlikely that activities, particularly fishing, will be limited again due to this pandemic, making this risk very low.

The national recovery process and restoration will be guided by a strong Sanitation Program within the Agenda of the Strategic Sustainable Development of Cabo Verde, which is equally envisaging the promotion of Cabo Verde?s post-pandemic economy.

Risk	Risk level	Risk mitigation measure
Further project evolution in implementation phase cannot be executed as per expected timelines due to the pandemic, leading to a delay in implementation	Low	The Covid-19 pandemic did not prevent consultations on the project in Cabo Verde, as the lockdown periods were limited and the online meetings were well prepared and effective. Post-COVID-19 opportunities will be communicated in order to increase the level of stakeholder confidence in how the project can help Cabo Verde not only address its climate challenges.

Availability of Technical Expertise and Capacity and Changes in Timelines	Low	The project will carefully anticipate and monitor all possible implications of COVID-19 for a project start in 2023. This includes in particular the maintenance of containment regulations and their respective implications on the planning and working conditions of the various stakeholders as well as capacity changes with the implementing entity and other project partners. With regard to capacity changes of the main partners, these are institutionally well established and have just been strengthened by the creation of a ministry dedicated to agriculture and environment. The local scope of the project will also reduce risk, and communication within the technical working groups and other forums such as the roundtables will help maintain an open dialogue between the different public and private parties.
Stakeholder Engagement Process	Low	A framework for stakeholder consultation is planned within the framework of the project, consisting of the representative steering committee, virtual meetings (when necessary) and technical assistance to the municipalities throughout the project. Currently, all restrictions have been lifted in Cabo Verde with a high vaccination rate (54% of the population given at least one dose and 44% of the population fully vaccinated). However, the virtual mode worked well during the PIF development period and may be an alternative if this is necessary.
Enabling Environment	Low	The promotion of e-mobility in the fishing sector is in line with Cabo Verde?s energy policy and its commitments under the Paris Agreement. The Cabo Verdean Government has an ambitious strategic vision for the adoption of electric mobility in the country and the implementation of a public charging infrastructure
Financing (National debt crisis, availability of co-financing, price increases in procurement)	Low/medium	As per the foreseen budgeting approach, GEF funding and a diversity in co-financing allows the project to develop a certain resilience against financing risks. A close monitoring of financing risks and an open dialogue with co-financiers will be conducted by the PEE.

COVID-19 opportunity analysis

Under the current circumstances, the COVID-19 pandemic introduced profound changes on a national and international level, which decelerated the prioritization of climate change mitigation and adaptation measures and severely affected some of the country?s main sectors, such as that of tourism. At the end of 2020, the government of Cabo Verde, the United Nations and other partners concluded work aimed at preparing and anticipating the post-Covid recovery and stabilization phases, with a view to aiding in its recovery plan as well as improving the country's capacities to withstand future global systemic shocks.[1]

The national recovery process and restoration will be guided by a strong Sanitation Program within the Agenda of the Strategic Sustainable Development of Cabo Verde, which is equally envisaging the promotion of Cabo Verde?s post-pandemic economy.

The 6 pillars of the National Response and Recovery Plan are:

1. Strengthen the Health system.
2. Ensure social protection and food security for all.
3. Enable the continuity and recovery of the education sector.

4. Stabilize and promote the local economy and micro, small and medium-sized enterprises, in a process of sustainable economic, social and environmental growth and job creation (including transition to formalization)

5. Take the necessary macroeconomic and fiscal measures to stabilize and recover income, consumption and investment.

6. Ensure policy coherence at all levels and a human rights approach, adapting the response to each territory (territorializing the response), strenghtening public administration and human security, and reinforcing the responsible use of natural resources in a context of sustainable development and social cohesion.

The plan specifies that special attention will be given to population most at risk of falling outside of the scope of the government aid, due to geographical or social isolation for example. Fishing communities are specifically mentioned.

Under the pillar 2, for the medium term, the objectives aim to at least maintain the level of social protection and food assistance achieved in the emergency and immediate response phase, and to accompany the recovery of income generating activities of the most vulnerable people, and their transition towards more resilience. Two particular points mentioned concern our project:

- **STRENGTHEN THE AGRICULTURAL AND FISHERIES SECTOR AND THE AVAILABILITY AND DISTRIBUTION OF DRINKING WATER, THUS PROMOTING INCOME ACTIVITIES**
- **ENSURE FOOD SECURITY ON A SUSTAINABLE BASIS FOR ALL, AND STRENGTHEN LOCAL FOOD PRODUCTION**

Moreover, there are the opportunities COVID-19 could bring for the project under the pillar 4. Indeed, the project aligns with Government?s National Response and Recovery Plan to COVID-19 pandemic on green recovery and creation of green jobs. The pillar 4 (Green/blue) employment and income, is tending toward a longer-term objective of building a more resilient, self-sufficient and circular economy, with growth that creates (blue/green) jobs and reduces inequality, within an integrated and inclusive sustainable development process. Improvement of sustainable agricultural and fisheries systems is among the first recommendations. The project?s objective to promote adoption of electric mobility in the maritime sector through clean technology innovation will indeed contribute to the pillar 4. In addition, point 4 (Strengthen local value chains) and point 8 (Update the blue economy strategy, and sectoral fishing and transport strategies) under this pillar correspond well with project activities supporting rural fishing industry. Such alignment of the project with the government?s policy strengthens the project?s rationality and will facilitate to get the buy-in from governmental institutions.

Climate change risk

For Cabo Verde, an island country, reduction of coastlines due to a possible rise in sea level could likely be a significant constraint to development and will dramatically affect coastal areas and the population (since 80% of the population live in coastal areas), tourism, loss of habitat, biodiversity and fisheries. In Cabo Verde, the main effects of sea level rise are increased coastal erosion, partial

flooding depending on the tides, increased salinity in wells and boreholes located in the lowlands of the rivers, displacement of people to inner parts of the islands, abandonment of some tourist facilities located in areas affected by tides.[2]

Coastal flood hazard is classified as medium according to the information that is currently available. This means that there is more than a 20% chance of potentially-damaging coastal flood waves occurring in the next 10 years[3]. Landslide susceptibility is classified as high. This means that this area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides a frequent hazard phenomenon.
Based on this information, the impact of coastal flood and landslide will be considered in the relevant project activities since they will be located near the coast. Project planning decisions, project design, and construction methods will take them into account, particularly during site selection for the demonstration projects.
The trainings targeting governmental stakeholders and decision makers will include climate risks and corresponding mitigation measures for Cabo Verde. The project will enhance the awareness of fisheries on the increased frequency and severity of climate hazards and the vulnerability of this sector due to its dependence on natural assets (marine biodiversity).

DURING THE PPG, A DETAILED CLIMATE RISK ASSESSMENT INCLUDING MITIGATION MEASURES WILL BE CONDUCTED AS PART OF THE ESMP AND DISSEMINATED WITH ALL THE RELEVANT STAKEHOLDERS. THE OUTCOME OF THE CLIMATE RISK ASSESSMENT WILL BE INCORPORATED INTO TECHNOLOGY INVESTMENT PLANNING AND DESIGN.

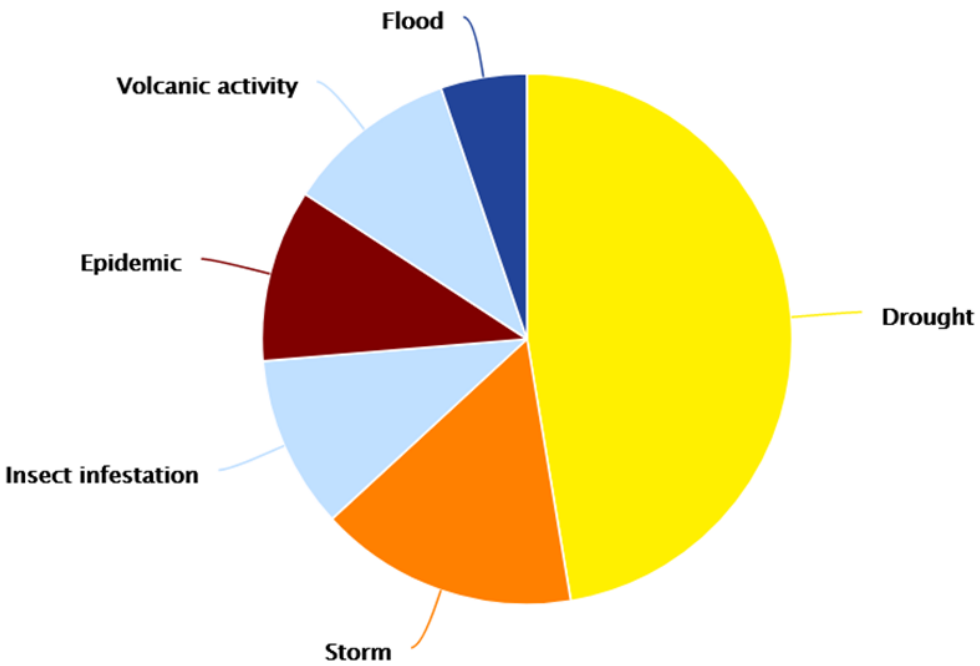

Figure 6: Average annual natural hazard occurrence for 1900-2018

[1]https://www.mf.gov.cv/documents/20126/0/Nota+de+imprensa++Apresentac%CC%A7a%CC%83o+PCNA+%281%29.pdf/a5a68adc-4f43-23cb-e01c-0462b07aa54f?t=1605887020183

[2] https://climateknowledgeportal.worldbank.org/country/cape-verde/vulnerability

[3] https://thinkhazard.org/en/report/47-cape-verde/CF

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

As the GEF Implementing Agency, UNIDO is responsible for the implementation of the project, providing overall administrative management and ensuring that the project is being carried out in accordance with GEF standards and requirements. The Project Executing Entity (PEE) is envisaged to be the Ministry of Industry, Trade and Energy (Portuguese acronym ?MICE?) through the Directorate of Industry, Trade and Energy (Portuguese acronym ?DNICE?). The DNICE is responsible for the design, execution and evaluation of energy policy (including electric mobility), as well as the presentation of proposals aimed at growth, improvement and increased productivity and competitiveness in the sector. It is also responsible for ensuring the implementation of the industry, trade and energy development strategy, as well as encourage the creation of energy, industrial and commercial infrastructure. During the PPG phase, the project will use the HACT (Harmonized Approach to Cash Transfers) tool to conduct the assessment of the Ministry of Industry, Trade and Energy to determine the institution?s capacity. HACT establish common principles and process for managing cash transfers among UN agencies that have adopted the approach across all countries and operational contexts.

The PEE will have a contractual agreement with UNIDO to execute all the project activities and related services under the component 1, 2 and 3. The component 4 that consists of monitoring and evaluation activities will be executed by the PEE and UNIDO jointly. Monitoring is considered a day-to-day activity and as such is carried out by the PEE. UNIDO will be responsible for the MTR and the TE only. The Ministry of the Sea will play an important role in the project.

Component 1 and 3: the Ministry of Industry, Trade and Energy will host the Sustainable Maritime Transport Unit. The Ministry of the Sea will be the co-chairs, with the Ministry of Industry, Trade and Energy overseeing the related components activities and outputs. Component 2and 3: The PMU hosted by Ministry of Industry, Trade and Energy will administer the bid for tender on identified pilots and coordinate other activities under the component.

Due to the cross-sectoral impacts of this project, additional entities will be involved in the delivery of specific project outputs and implementation of selected activities (see diagram below).

Overall supervision and coordination will be provided by a Project Steering Committee (PSC), which will meet at least once yearly (or as decided by the chair of the PSC). The PSC will be co-chaired by the Ministry of Industry, Trade and Energy and the Ministry of the Sea. Co-financiers will be invited to sit on the PSC to ensure additional oversight of the project. The PSC will approve the annual work plans and budgets, as well as the annual progress reports. The PSC will act as an advisory mechanism to ensure the successful design and implementation of the project through providing operational

guidance as well as overall, high-level coordination. Any changes/amendments proposed to the project and/or to the workplans and budgets by the PSC are done in accordance with the approved project document, the GEF policy, and UNIDO rules and regulations. Minutes of meetings are signed by UNIDO and the PSC Chairperson(s). The primary roles of the PSC are: (1) to provide overall guidance to the execution of the project; (2) to ensure good coordination among participating agencies and other organizations; and (3) to approve any substantial change or addition of new project outputs in response to the emerging issues.

A Project Management Unit (PMU) will be established by the project executing entity (PEE) and will execute the day-today activities. Generally, the PMU will implement the following tasks:

- ? Develop the annual work plans and budgets and track progress and monitoring
- ? Draft the Project Implementation Reports (PIR). UNIDO will provide oversight and guidance the submit to the GEF
- ? Execute the project activities in line with the established work plans and in close coordination with assigned executing partners and subcontractors
- ? Ensure coordination and collaborations with other projects with synergies
- ? Ensure public relations and communicate project results, lessons learned and success stories.

The project PMU forms the secretariat of and reports to the PSC on the progress of the project.

A Project Steering Committee (PSC) will be comprised of:

- **? REPRESENTATIVES OF THE MINISTRY OF INDUSTRY TRADE AND ENERGY**
- **o NATIONAL DIRECTORATE OF INDUSTRY, TRADE AND ENERGY**
- **? REPRESENTATIVES OF THE MINISTRY OF THE SEA**
- **o GENERAL DIRECTORATE OF MARINE RESOURCES**
- **? REPRESENTATIVES OF CERMI**
- **? REPRESENTATIVES OF VILLAGES AND FISHING ASSOCIATIONS**
- **? REPRESENTATIVES OF THE CABO VERDEAN INSTITUTE FOR GENDER EQUITY**
- **? REPRESENTATIVES OF ECREEE**

The final composition of the Committee will be formed during the PPG phase.

Coordination

The project implementation arrangement will be structured as follows:

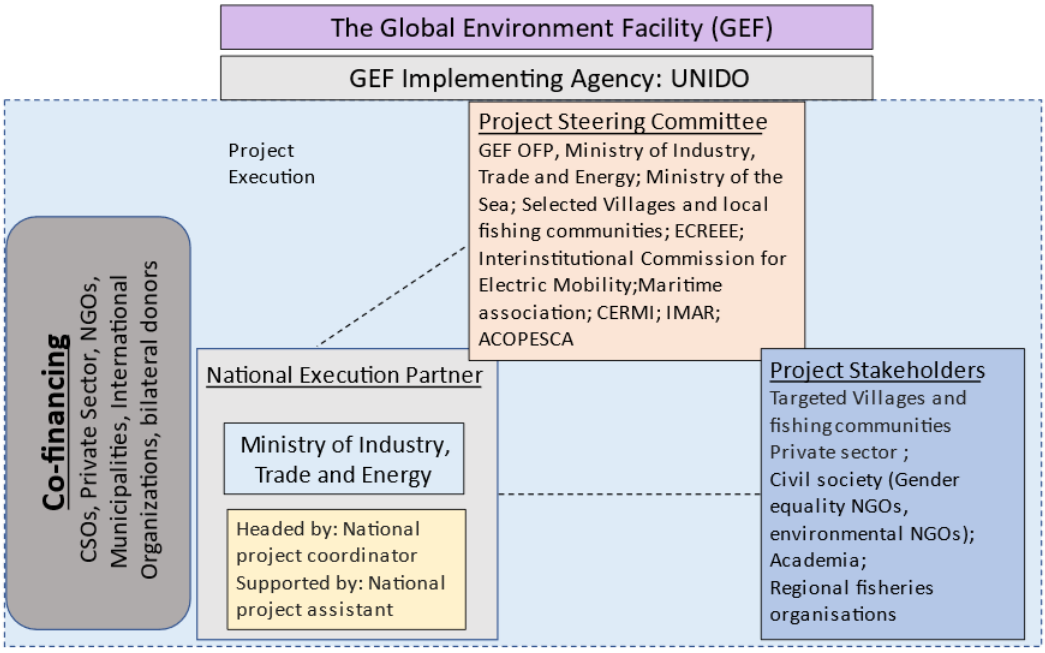

Figure 7: Institutional arrangements and flow of funds

The project will collaborate with ongoing GEF and other international and national projects in Cabo Verde.
The table below shows existing and planned baseline investments.

Description of ongoing project in Cabo Verde (National and Regional level)

Project title	Description
Rolling out the Common Assessment Framework (CAF) and establishing a CAF Resource Center (2nd phase)	The project aims to contribute to the improvement of the business environment in Cabo Verde by promoting organizational learning in economic institutions. The immediate objective is capacity building for improved service quality of economic institutions within the context of the new Government reform. The Government wants to roll out this very systematic tool to improve the public-sector services and foster a mindset of quality, excellence and entrepreneurship.

Sustainable energy access to manage water resources: Addressing the Energy-Water Nexus	To overcome the low natural availability of water, desalination plants and underground boreholes are used to secure access to freshwater even though they require large amounts of energy to operate. In this regard, Cape Verde is facing an increasing power deficit which is already hampering economic and social development. The project will bring about an alternative scenario that combines technical assistance for improving the existing regulatory and institutional framework and investment in RE systems for water pumping in rural areas and water desalination in urban areas. Besides to support the scaling up efforts, the project will build technical capacity to install and maintain the RE systems for water pumping and desalination and will raise awareness among relevant stakeholders on the technical and financial feasibility of such interventions.
Formulation of the Industrial Policy / Diagnosis of the industry	Overall, the project seeks to strengthen institutional capacity of the Government of Cabo Verde and private sector stakeholders with evidence-based diagnosis and benchmarking that will support the future design of industrial strategy and policy. More specifically, the project will perform a diagnosis of the present situation of the industry in Cabo Verde (Situation As Is) and identify recommendations for the implementation of the new vision of Industry in Cabo Verde (Situation To Be).
Capacity-building support for the ECOWAS Centre for Renewable Energy and Energy Efficiency in the scope of the Global Network of Regional Sustainable Energy Centres	The project is a follow-up to the provided UNIDO technical support for the establishment of the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) between 2008 and 2014. The Executive Board of the centre, requested UNIDO to assist ECREEE technically and institutionally in the implementation of the Strategic Plan 2017 to 2021 and key recommendations of a recently undertaken external evaluation. The centre is currently at cross-roads and needs to adapt its internal proceedings, competence and services to the growing demands from ECOWAS Member States and the private sector. Moreover, the project will assist ECREEE to become an active member of the Global Network of Regional Sustainable Energy Centers (GN-SEC) and to take leadership in joint south-south actions in partnership with other centers.
West Africa Competitiveness and Quality Infrastructure Project	Strengthening industrial competitiveness of the West African priority countries through value chain development and an enhanced level of production, transformation and export capacities of the private sector (to be implemented under the framework of the 11th European Development Fund West Africa Competitiveness Programme).

Inception phase for the ECOWAS comprehensive Pharmaceutical Manufacturing Industry Development Programme	This one-year project builds (I) on the Good Manufacturing Practices Roadmap Framework for the pharmaceutical industry that UNIDO has developed for the ECOWAS Region and (ii) on the National Roadmaps that have been produced under this overarching structure (ID 160202). The initial project has developed the technical approach for upgrading the industry according to a common standard, to agreed timelines and to using a consistent methodology for both the diagnostic work across the region and the specific categorization of GMP compliance levels and ongoing monitoring. To actually implement the framework and the roadmap is a long-term undertaking which will involve cooperation between countries, a number of key partners, as well as political will at the national and regional levels. Hence a comprehensive programme is required. WAHO has agreed to fund a 1-year inception phase during which the key objective will be to establish such a comprehensive programme (governance structures, technical cooperation, advisory solutions, etc.) and prepare it for launch. Special steps will also be taken to maintain and build on the momentum created with the initial project in ECOWAS Member States on the ground during the inception phase. Significant ongoing funding will be required for the implementation of the envisaged comprehensive multi-year programme; hence joint resource mobilization (as identified in the Joint Declaration signed by the UNIDO & WAHO DGs) will be a further critical component of the inception phase.
NAMA Facility financed project ?PROMAE?	Given the fact that the market for EVs in Cabo Verde is still in its infancy, the NSP - Promotion of Electric Mobility in Cabo Verde (Portuguese acronym ?PromAE?) will follow a comprehensive approach addressing all barriers (technical, legal, financial, institutional) to the adoption and sustainable use of EVs by households, companies, public institutions and nongovernmental organizations (NGO). The objective of the project is to support GoCV in further developing and implementing its policy for the promotion of EVs over a period of five years (09/2020 to 08/2025) in order to reach a significant market share of EVs by the end of the implementation period and place the country on track for the planned complete conversion of the vehicle fleet by 2050.

Promotion of Electric Mobility in Cabo Verde (Financed by the NAMA Facility and Implementd by the Deutsche Gesellschaft f?r Internationale Zusammenarbeit (GIZ) GmbH)	Given the fact that the market for land based EVs in Cabo Verde is still in its infancy, the NSP Promotion of Electric Mobility in Cabo Verde (PromAE) will follow a comprehensive approach addressing all barriers (technical, legal, financial, institutional) to the adoption and sustainable use of EVs by households, companies, public institutions and nongovernmental organizations (NGO). The objective of the project is to support GoCV in further developing and implementing its policy for the promotion of EVs over a period of five years (09/2020 to 08/2025) in order to reach a significant market share of EVs by the end of the implementation period and put the country on track for the planned complete conversion of the vehicle fleet until 2050.
Coastal Fisheries Initiative ? Challenge Fund (World Bank)	"Has the objective of preparing investment-ready packages for sustainable coastal fisheries development in Cabo Verde and funding for four selected projects: - Development of a refurbishment project for the Santa Maria pier in Sal as a nexus for safe and sustainable coastal fisheries/tourism activities - Pilot program for deep-sea shrimp fishery exploration - Fleet reconversion program for artisanal/semi-industrial fisheries - Pilot program for a wholesale fishery auction system (?lota?) in the Praia Fishing Complex
Costal Fishery Initiative (FAO)	Strengthen fisheries governance, management and value chains, through the implementation of an ecosystem approach to fisheries (EAF), of relevant international instruments and of innovative governance partnerships in three countries in West Africa (Cabo Verde, Cote d?Ivoire and Senegal)
Blue Economy (FAO)	Aiming to consolidate the national strategy for the Blue Economy (CaSUEB) and strengthening the institutional framework in place through the implementation of an OEA, develop a national investment plan for the Blue Economy (PNIEB) coupled with a priority program to promote the BE developed on the basis of a participatory approach.
Enhance capacities of CV in addressing the effects of climate change in key sectors of the BE (FAO)	Aims to assist the Government of CV in fully mainstreaming climate issues into the BE, and in implementing the priorities defined in the iNDC and the NAPA (2007). Include the development of detailed investment plans that can be used to readily implement adaptation (and mitigation) actions relevant to the sectors of the BE.
Hand in Hand (FAO)	Aims to improve governance including the coordination and monitoring of international support, by improving the value chain of fisheries targeting national markets and by creating decent blue jobs, all for the priority benefit of women and young non-graduates in connection with already existing fishing infrastructures

Empowering communities for sustainable development through natural resource management and ecotourism and inclusive and participatory community management (UNDP)	Aims to build capacity of beneficiaries and the general population with greater knowledge of good practices in the innovative and sustainable blue economy and intra-community organization
Managing multiple sector threats on marine ecosystems to achieve sustainable blue growth (UNDP)	Aims to strengthen the systemic and institutional capacity for reducing multiple threats to globally significant marine ecosystems and achieve sustainable blue growth in Cabo Verde.
GEF SGP (UNDP)	As of 2021, the GEF SGP in Cabo Verde is co-financing an artisanal fishing vessel electric mobility project promoted by the Salamansa Fishing Association, based in S?o Vicente, Cabo Verde. This project consists of a pilot initiative to implement an electric propulsion system in an artisanal fishing boat in the Salamansa fishing community. As a source of clean energy, a small photovoltaic system will also be installed to charge the motors' batteries. The proposed project will coordinate with the SGP by exchanging the information with the Association and other stakeholders to ensure that lessons learnt from the SGP project will be applied in the proposed project and have synergies between the projects. To do this, members of the association will be invited to meetings at the inception phase of the proposed project.
Blue Economy Challenge (UNDP)	Aims to stimulate the adoption of digital tools and promote technology-based solutions in key areas of Blue Economy, such as fisheries and aquaculture, renewable energies, aquatic ecotourism, maritime transport and safety.
Sustainable and Resilient Tourism on Small Islands and in Coastal Destinations (WB)	Support to sustainable coastal tourism practices by improving the knowledge on the state of Blue Tourism, elaborating a mapping of tourism stakeholders and coordinate with country teams to engage local public and private stakeholders.

Blue Economy/Tourism Project (WB)	Aims to provide support to the Government?s vision and strategy for the development of the Blue Economy

Transfer of Assets

Full or partial ownership of equipment/assets purchased under the project may be transferred to national counterparts and/or project beneficiaries during the project implementation as deemed appropriate by the government counterpart in consultation with the UNIDO Project Manager.

Legal Context

?The Government of the Republic of Cabo Verde agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 31 January 1976 and entered into force on 14 January 1978.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assesments under relevant conventions?

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The project is consistent with the national strategies, plans and assessments given in the table below:

Policies, Plans, Programs and Legislation	Type	Description	Comment
SE4ALL Action Agenda (AA)	Plan	Document endorsed by Resolution 100/2015, providing guidance on the country path towards 2030 regarding Energy Access	
Decree Law n? 1/2011 of the 3rd of January	Legislation	Promotion and Incentives for the Use of RE, establishes the regime for promotion, licensing and exploitation of independent production of electricity based on RE sources and creates incentives in the form of fiscal incentives and custom duties exemptions.	*modified by Decree Law n? 18/2014*

Decree Law n? 18/2014	Legislation	Promotion and Incentives for the Use of RE. Establishes the regime for promotion, licensing and exploitation of independent production of electricity based on RE sources and creates incentives in the form of fiscal incentives and custom duties exemptions.	Updated by Law n? 102/VIII/2016
Law n? 26/VIII/2013 Code of Fiscal Benefits	Legislation	Creates fiscal incentives for the use of RE technology. Establishes principles and rules applicable to tax benefits for investment (Investment Tax Credit by deduction of Corporate Income Tax (CIT) collection in an amount equal to 50% for RE production and manufacture and installation of RE equipment) and exemption from custom duties to registered industrial companies on materials incorporated in the production of goods or services intended for RE generation.	Updates incentives found on Decree Laws n? 1/2011 and no? 18/2014
Law n? 102/VIII/2016 Code of Fiscal Benefits	Legislation	Creates fiscal incentives for the use of RE technology. Establishes principles and rules applicable to tax benefits for investment (Investment Tax Credit by deduction of Corporate Income Tax (CIT) collection in an amount equal to 50% for RE production and manufacture and installation of RE equipment) and exemption from custom duties to registered industrial companies on materials incorporated in the production of goods or services intended for RE generation.	Modifies Law n? 26/VIII/2013
Sectorial Strategic Plan for RE (SSPRE)	Plan	Approved by the Resolution of the Council of Ministers n? 7/2012, lays the plan for RE based on studies showing the available RE sources in the country and identified the ?Renewable Energy Development Zones? (REDZ). The installation of RE equipment in REDZ does not require the completion of the ESIA process for licensing.	

Dispatch n? 14/2011	Legislation	Approves the tariff regulation of the electricity sector and establishes the electricity sector tariff methodology.	
National Electricity Sector Master Plan 2018-2040	Plan	Provides Forecasts of energy growth and outlines key strategies for the execution of on/grid energy related policies and targets between 2017/2040	To be analysed and adjusted every 5 years
Strategic Sustainable Development Plan (PEDS) 2017-2021	Plan	It constitutes the main vehicle for Cabo Verde to fulfill the sustainable development agenda, Municipal Strategic Sustainable Development Plans (PEMDS), are an example of participation within the framework platforms of local multi-stakeholder platforms and promotion of the SDGs.	
National Program for Sustainable Energy (PNSE)	Program	The long-term goal is to transition to an efficient, safe and sustainable energy sector, thus reducing reliance on fossil fuels and ensuring universal access and energy security. 5 axes of interventions are identified as crucial to the success of the PNSE, among them the development of renewable energy (RE) and the promotion of efficiency.	
Article 9 of Decree-Law No. 56/2015 of October 17th	Legislation	Establishes the general rule applicable to the prevention, production and management of waste. It states that the entity responsible for "the act of introduction of the vehicle in the national territory? is responsible for managing the vehicle at its end-of-life.	
Electric Mobility Policy Charter (CPME) **resolution No. 13/ 2019 on the February 1st 2019**	Charter	It is framed as an instrument to establish the country?s strategic vision in this matter and to communicate the main measures that will guide the creation of the necessary conditions for the initial phase, followed by the long term massification of electric vehicles (EV) in the country, assuring the adequate development of necessary infrastructures, regulatory framework, and services offerings that allow any citizen or organization to have access to electric mobility solutions.	
Cabo Verde E-Mobility Action Plan 2019-2035	Plan	Has the objective of identifying the actions to be developed in the short, medium and long term for the materialization of the objectives established in the mobility charter letter, grouped according to three axes of intervention.	

Decree-law n? 46/2021	Legislation	Establishes the principles and rules for the exercise of the activities of Energy Service Companies (ESCOs)	
Cabo Verde 2020 Update to the first Nationally Determined Contribution (NDC)	Plan	Establishes the country's NDC contribution (2030), including increase in renewable energy uptake, and long-term decorbonisation vision (2050).	
Blue Economy Charter	Charter	Promotes the country's sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.	
National Investment Plan for the Blue Economy	Plan	Investment Plan based on 3 pillars: (i) Investments (ii) Projects aimed at adapting existing elements (iii) New specific investments for the Blue Economy.	
Blue Economy Promotion Program	Program	structured in three interrelated components, which aim to support the process of transition to the Blue Economy	

In addition, the project complies with the international conventions listed below:

- National action plan for adaptation (napa) under ldcf/unfccc
National action program (nap) under unccd
Asgm nap (artisanal and small-scale gold mining) under mercury
Minamata initial assessment (mia) under minamata convention
National biodiversity strategies and action plan (nbsap) under uncbd
National communications (nc) under unfccc
Technology needs assessment (tna) under unfccc
National capacity self-assessment (ncsa) under uncbd, unfccc, unccd
National implementation plan (nip) under pops
Poverty reduction strategy paper (prsp)
National portfolio formulation exercise (npfe) under gefsec
Biennial update report (bur) under unfccc

8. Knowledge Management

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

Following the IEO (2020)[1] the knowledge is an important resource of GEF that supports its strategic objectives to address global environmental concerns. The purpose of knowledge management (KM) is to streamline and improve the impact of UNIDO/GEF funded project in Cabo Verde and inform global, regional and national policy dialogues to reverse environmental problems through innovative low

carbon maritime mobility solutions. Further on the knowledge-sharing and learning across the UNIDO partnership should be strengthened, particularly through the enhanced support for deepening the local benefits. At country level the KM consider applications to assist national policy to review specific legal and technical direction through new gains in order to consolidate achieved products and learn from other projects as a baseline for future investments.
The KM sub/component will explore the ways to create, manage and disseminate knowledge on low carbon maritime mobility solutions and environmental related issues in the project focus area and national wide. The implementation will follow a KM system that will be constantly updated throughout the project implementation period. The approach will explore different ways and processes to better manage knowledge gained and cycles, aiming at interlinking knowledge from multiple stakeholders and end-users.

The project will consider from its start developing a comprehensive work plan for building a knowledge management system. To that fact the following steps will be undertaken:
- Creation of KM team (composed with members from the project team and different central and local project partners)
- Preparation of detailed KM implementation plan
- Build KM tools easily integrated into IT platforms through an open access approach (Online platform Component 3).

The project will focus on streamlining an effective KM roadmap including:
- Improve the information management sharing and collaboration and learning across the partners (other projects/programs, central and local project partners, national agencies active in e-mobility approaches in Cabo Verde)
- Strengthen/expand the approaches for up taking the lessons and best practices (use of UNIDO experiences and current projects)
- More systematically integrate knowledge capture, dissemination and learning into UNIDO/GEF project design, implementation and reporting.

In more details:
-Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums such as those used by the NAMA Facility funded project on Promotion of E-mobility in Cabo Verde.
- The project will identify and participate, as relevant and appropriate, in meetings and conferences which may be of benefit to project implementation through lessons learned. The project will identify, analyze and share lessons learned that may be beneficial in the design and implementation of similar future projects.
- The project will incorporate the lessons learned from similar relevant projects in Cabo Verde into the media coverage and marketing campaigns with the UN in Cabo Verde.
- Different tools such as creation of project website to share its activities, expected impact and the role of the civil society and private sector. Collaboration with other entities through their information exchange platform can be an added channel. Promotion through social media channels, UNIDO portal and participating in EXPOs that in addition to other tools that will be generated on later stage shall be efficient as support to knowledge management. To easily share knowledge and lessons learned within

and beyond the project intervention zone, UNIDO?s Open Data Platform will be used to collect relevant reports and data on technology investments projects.
- All knowledge management activities (such as workshops, trainings, awareness raising) will be gender mainstreamed. This includes integration of gender dimensions into project documents (incl. action plans), publications, for instance presenting sex-disaggregated data, gender-energy nexus theory, gender sensitive language in publications, photos showing both women and men, and avoid presenting stereotypes, as well as assuring that women, men and the youth have access to and benefit from the knowledge created.
- Continuous monitoring will be conducted throughout the project life-time. Up-to-date reports will be shared with the main stakeholders. The project will develop strategic communication plan for information exchange with the key organizations active in the area and other international organizations that can pave the way to achieving project targets and outcomes.

Not only Cabo Verde will have a pioneering role in maritime e-mobility and other technologies showcased by the project for other SIDS and ECOWAS member countries but also will benefit from the knowledge learned by UNIDO through other projects and the Global Programme to Support Countries with the Shift to Electric Mobility. As a GEF Implementing Agency, UNIDO has a growing global experience (e.g., China, Philippines, Thailand, Nepal, Jordan, Albania, Tunisia, South Africa, Malaysia) in the implementation of e-mobility projects and the knowledge and network to be leveraged by the proposed project will consolidate knowledge of the sector within and across UNIDO projects and for global level initiatives. This approach will enable and facilitate knowledge sharing between stakeholders involved in maritime e-mobility to provide an ongoing coordination mechanism that will remain in place beyond the project period.
Moreover, the project can benefit from all knowledge products which will be made publicly and freely accessible through a joint GEF 7 / EC SOLUTIONS plus e-mobility on-line toolbox (or in some exceptional cases through the partners dedicated GEF 7 Global Electric Mobility Programme webpages).

[1] IEO (2020): Evaluation of Knowledge Management in the GEF. Independent Evaluation Office of GEF, report, p.43

9. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE

Medium/Moderate

Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), the Environmental and Social screening template has been completed and the project has been categorized as ??B??. Hence, an Environmental and Social Management Plan (ESMP) will be developed during the PPG phase.

Supporting Documents

Upload available ESS supporting documents.

Title	Submitted
E&S_Screening_Template_SAP_ID_200308_Cape_Verde_E-Mobility	

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Agueda Margarida Rosa de Burgo	National Director of Environment / GEF OFP	Ministry of Agriculture and Environment	5/23/2022

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

Exact location of the activities will be decided at PPG stage.

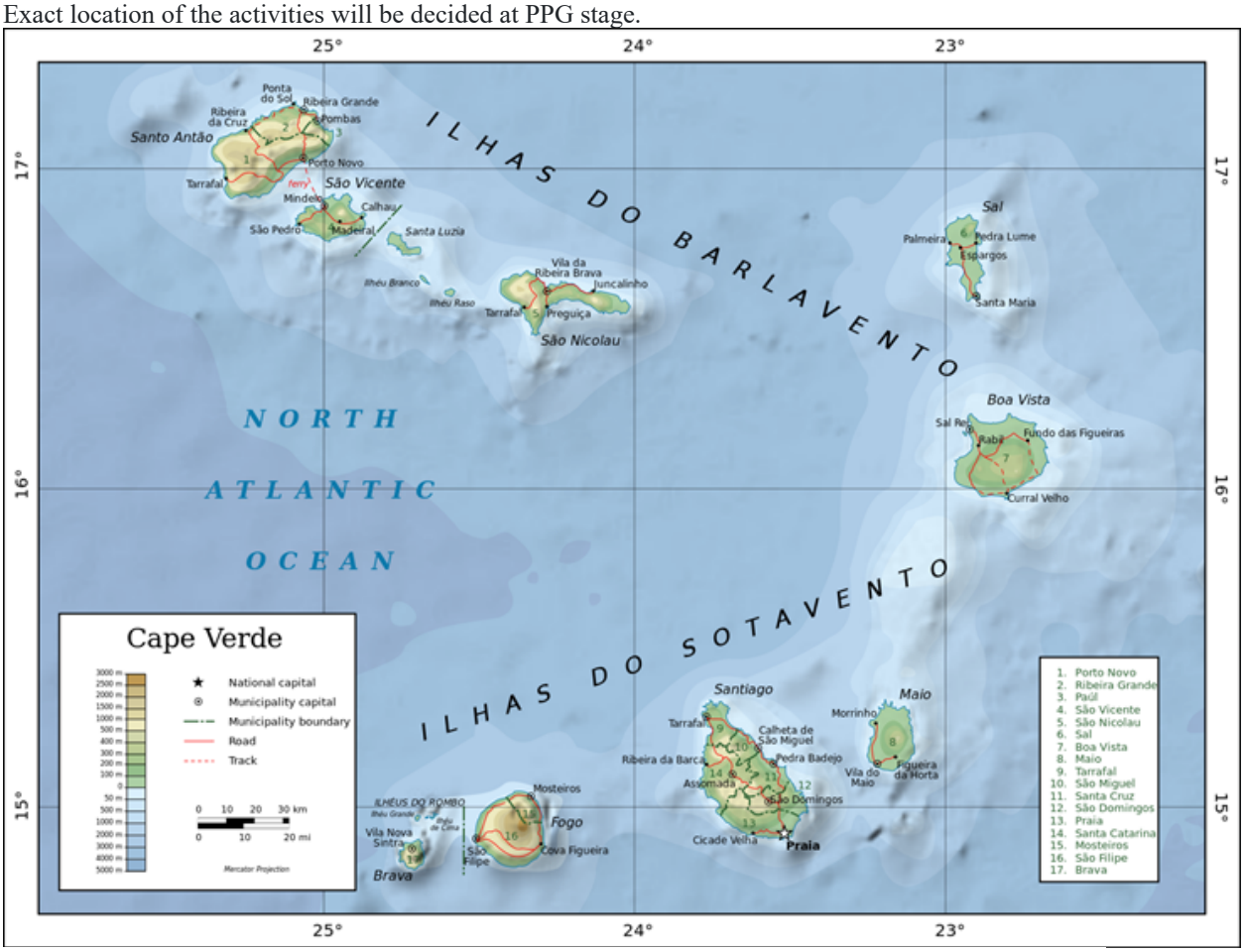

Image 1: Map of Cabo Verde