UN Climate Technology Centre & Network
UNFCCC Technology Mechanism

National Electric Mobility Policy and Market Readiness Framework for the Solomon Islands

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Authors

UNEP CCC

Subash Dhar,
Talat Munshi

and

pManifold consortium

Rahul Bagdia,
Saudamini Telang

and

Gender Expert

Darshini Mahadevia

Local Consultant

Michael Ha'apio

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Abbreviations

2Ws	Two-wheelers
3Ws	Three-wheelers
4Ws	Four-wheelers
ADB	Asian Development Bank
BaU	Business as Usual
BEV	Battery Electric Vehicle
BUR	Bi-enial Update Report
CAPEX	Capital expenditure
CBSI	Central bank of Solomon Islands
COP	Conference of Parties
DVLD	Driver & Vehicle Licensing Division
EEZ	Economic Exclusive Zone
EEZ	Exclusive Economic Zone
e-Mobility	Electric Mobility
EV	Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
FSS	Franchise Shipping Service
FTE	Fixed term estate
GDP	Gross domestic product
GHG	Green House Gases
GST	General Sales Tax
ICEV	Internal combustion engine vehicle
IEA	International Energy Agency
IMO	International Maritime Organsiation
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilo Watt Hour
LCV	Light Commercial Vehicle
MCA	Multi Criteria Assessment
MID	Ministry of Infrastructure Development
MTWU	Ministry of Transport, Waster and Utilities
NTF	National Transport Fund
NTP	National Transport Policy
O&M	Operation and maintenance
OPEX	Operating expenses
OPEX	Operating expenditure
PHEV	Plugin Hybrid Electric Vehicle
PIU	Project Implementation Unit
PV	Photo Voltaics
R&D	Research and development
R&M	Repair and maintenance
SIEA	Solomon Islands Electricity Authority
SIG	Solomon Islands government
SOE	State Owned Enterprises
SWAp	Sector Wide Application
TCO	Total cost of ownership
TOLs	Temporary occupying leases
TPPD	Tranport Policy and Planning Division
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

Context

Solomon Islands is located east of Papua New Guinea and comprises a scattered archipelago of 994 islands combining mountainous islands as well as low lying coral atolls within a tuna-rich and potentially mineral-rich maritime Economic Exclusive Zone. The Islands have a population of more than 700 hundred thousand spread across the region of 28,896 square kilometres with 4,023 kilometres of coastline.

The total GHG emission of Solomon Islands (CO2 equivalent) in 2010 was 618.81 Gg CO2eq for which more than 50% that is 350.46 came from energy sectors. Within the energy sectors road transport alone accounted for 176.91 Gg CO2eq of GHG emissions. The GHG emission from the transport sector have substantially increased from the year 2000 where these were 88.68 Gg CO2eq. Thus mainly transport sector crictical for Solomon to achieve its climate mitiagation and GHG reduction goals.

According to the Intended Nationally Determined Contribution (INDC) submitted to UNFCCC by the Solomon Islands in 2016. Solomon Islands has committed to reduce emissions by 12% below 2015 level by 2025 and 30% below 2015 level by 2030 compared to a business-as-usual projection (BaU). However, with international assistance. The Solomon Islands can further reduce its emissions by 27% by , and and 45% by 2030. This would make the overall reduction by Solomon Islands by more than 50% by 2050. Given that a large part of the current GHG emission comes from the energy sectors, the Solomon Islands is committed to throught development of renewable energy projects in the islands., the focus of the renewable energy generation of electricity will be through the use of solar PV and hydropower generation. And given that a large portion of the energy consumption is by the transport sector, and with the Solomon Islands shifting its energy sources to renewable energy, it is also imperative that the transport sector also shifts its energy use to renewable energy or rather to electricity sourced from renewable energy sources.

In the Solomon Islands, the pressure on urban transport is evident, mainly due to the rapidly expanding urban areas in the Solomon Islands, that is, in Honiara and other rapidly expanding urban areas. Given the past trends of vehicle growth by 2030 and 2050, the Solomon Islands will have a significantly large number of cars used for personal use and as taxis. There will also be many good vehicles given the need for goods movement. As urban areas expand, the need for public transport will also increase, especially for the larger buses that are practically absent from the current inventory. Small buses will still keep growing and used in the newly expanding urban areas. A large number of these new users are likely to use cars and likewise, the need for freight transport is also likely to increase at a rapid rate in the Islands.

To mitigate GHG emissions the country of the Solomon Island needs to take measures to reduce the environmental impact of transport and thereby improve the quality of life, especially in the cities like Honaira. They seek to improve the efficiency of the transport system as a whole. Through transport-oriented and compact development of cities, reducing the need for motorized travel transport demand. Given the intentions to on improving energy sources the focus in the transport sector will aso shift towards vehicles and fuel efficiency as well as on the optimization of the operational efficiency of public transport. The improvement of the energy sources will also need to spiral into use of renewable energy in the motorized transport in th form or electric mobility.

This report therefore focuses on the prioritisation of e-mobility in the Solomon Islands and analysis of barriers for implementing e-mobility options in the Solomon Isiands. Specifically, it

seeks to prioritise the vehicle categories or transport modes for both public and private urban transport and through stakeholder consultation identified the possible barrier e-mobility option will face in the Solomon Islands..

Priorities for eMobility

Formulating electric mobility policy necessitates a range of methods and stakeholder consultations to address cost, benefit, and local context issues related to government budgets, policy scenarios and instruments, and support ecosystems that will promote public acceptance. The multi-criteria assessment (MCA) methodology was adopted for prioritizing EVs in the Solomon Islands. MCA is an analytical tool commonly used for decision-making process, including to rank options or to short-list and provide a scale of preference for a limited number of options. MCA allows the use of mixed methods, i.e. both quantitative and qualitative criteria. It entails a combination of criteria which are valued in both monetary and non-monetary terms. This involves the use of a full range of social, environmental, technical, institutional, economic, and financial criteria. In effect, MCA provides a structured framework for comparing mitigation technologies across multiple criteria. Importantly, given that MCA is a value-judgement based system, the framework was adopted to reflect a well-balanced judgement of all the relevant stakeholders and developed through a consultative process.

	Costs			Benefits						
Vehicle Category	CAPEX	OPEX	Charging infra cost/ charger	Fuel Saving	**Job Creation**	**Gender Equity**	Air Pollution	GHG Emissions	Total Score	Rank
Two Wheelers (2W)	1500	1499	1000	0	0	0	6	0	4005	6
Three Wheelers (3W)	1500	1500	867	10	250	0	6	12	4145	5
Cars - Personal	1339	1465	593	38	500	667	-	39	4640	4
Cars - Taxi	1329	1220	593	121	1000	333	144	125	4865	3
Buses (mini)	400	260	0	550	1250	1000	906	636	5002	2
Buses (standard)	0	0	0	912	1500	1000	906	1054	5372	1
Truck (LDV)	1416	349	0	603	1250	0	1	802	5421	1
Truck (M&HDV)	803	71	0	1000	1000	0	1	1500	5374	2
Weight	15	15	10	10	15	10	10	15		

As can be seen from the above table the analysis for passenger transport showed that Bus (standard) is ranked as the number one prioritised category for EV implementation in the country for passenger transport. This was followed by, bus (mini), four wheelers (taxi), three wheelers, two wheelers and four wheelers (personal).

For the freight transport it was fund that truck light duty was of the top priority in the country. Given that these have been found as the priority vehicle options, fro the roadmap and feasibility study will be done for thes two vehicle segments.

Barriers to e-Mobility and Measures to Address Barriers

The adoption of Electric vehicles (EVs) requires a robust ecosystem and local supporting environment that caters to successful uptake of EVs in the country. Barriers analysis has reviewed and identified barriers across EV vehicle value chain that may hinder the adoption of EVs in the Solomon Islands. The value chain examined here includes vehicle production, vehicle purchase and registration, vehicle use, vehicle repairs and maintenance, and vehicle scrappage and disposal.

In Solomon Island, the barriers identified across the value chain are categorised under two sub-parts including i) Existing barriers and ii) Barriers after EV penetration in the country. Currently, due to the lack of awareness and unavailability of EVs in the market (and no manufacturing capacity), there are no EVs present in the country. The high upfront cost of EVs compared to ICEVs (2X-3X high); low electricity access (~20%); high electricity tariff, low reliability of power are likely to affect the reliability, cost and users' choice to purchase EVs, The other barriers that may significantly impact EV adoption in the country include no vehicle import regulation (age limit and standards), indistinct classification of vehicle during registration, and no scrappage policy for end life management (vehicle and batteries).

To mitigate these barriers the potential policy option was identified for each identified barrier across the value chain. Further, the identified policy options are categorised under in two parts; 1) Demand side measures and 2) Supply-side to ensure wholistic solution for adoption of EVs.

1. Introduction

1.1. Geography

Solomon Islands is a nation Melanesia, east of Papua New Guinea and comprises a scattered archipelago of 994 islands combining mountainous islands as well as low lying coral atolls within a tuna-rich and potentially mineral-rich maritime Economic Exclusive Zone (EEZ) of 1.34 million square kilometres. The country has 28,896 square kilometres and 4,023 kilometres of coastline, and this is the second largest in the Pacific after Papua New Guinea. There are six main islands, Choiseul, New Georgia, Santa Isabel, Malaita, Guadalcanal and Makira, characterised by a rugged and mountainous landscape of volcanic origin. Between and beyond the bigger islands are hundreds of smaller volcanic islands and low-lying coral atolls. The mountainous islands of volcanic origin are forested, with many coastal areas surrounded by fringing reefs and lagoons. More than 300 of the 994 islands are inhabited. The highest point in the country, Mt Makarakomburu is 2447m above sea level and is the highest peak in the insular Pacific. The distance between the westernmost and easternmost islands is about 1,500 km.

Figure 1: Map of Solomon Islands

The map of the islands is shown in figure1. The islands are grouped into three different major "geological provinces; the Pacific Geological Province (including Malaita, Ulawa and North Eastern part of Santa Isabel Island); Central Geological Province (Makira, Guadalcanal and the Florida Islands, Southwestern part of Isabel and Choiseul) and; the Volcanic Geological Province (New Georgia, Russell Islands, Shortland Islands and North Western tip of Guadalcanal and Savo). Guadalcanal is the largest of the bigger islands and the only one in the Solomon Islands with a significant area of grassland and rich alluvium soils. Most of the islands have highly weathered soils of low fertility with pockets of fertile areas, mainly on

volcanic islands and river valleys. Forests and woodland cover 88 per cent of the land area. Most of the islands are part of the Solomon Islands Rain Forests Ecoregion

The country's location within the earthquake belt or" Ring of Fire" results in frequent earthquakes, and the geology, topography and rainfall of the country, as a result, is extremely vulnerable to the effects and impacts of earthquakes, tsunamis and landslips. A major earthquake measuring 8.1 on the Richter scale occurred in the Western Province in 2007, causing a major tsunami that affected the Western and Choiseul provinces causing extensive damage.

The climate is tropical, though temperatures are rarely extreme due to cooling winds blowing off the surrounding seas. Daytime temperatures are normally 77 °F to 90 °F (25 °C to 32 °C), falling about 37 °F to 41 °F (3 °C to 5 °C) at night.

The capital city of Honiara, situated on Guadalcanal, the largest island, has over thirty thousand inhabitants. The other principal towns are Gizo, Auki, and Kirakira.

1.2. Demography

The provisional 2021 census registered 708,482 in the Solomon Islands, with a national population density of 24 persons per km^2. Malaita Province had the highest number of people (173,347), and Renbel Province had the lowest number (4,091). The population growth has grown rapidly at 2.7% annually, with a more or less balanced gender ratio (there were 369,252 males and 352,204 females in 2021), thus there are 1048 males for every 1000 females in Solomon Islands . The life expectancy of females is 75.3 years, whereas for males is 71.6 years[1]. As one expects in countries with rapid population growth rates a significant number of people are from the 0-5-year age group, and the lowest number is from the 80 years and over age group also highlighting that the Solomon Islands is a predominantly young population, the age sex pyramid for both genders is shown in Figure 1. Solomon Islanders make up a diverse population of Melanesians (80%), Polynesians (5%) and Micronesians (5%). Ninety-five different languages are spoken, including ninety Melanesian, four Polynesian, and the Kiribati language spoken by descendants of Kiribati people brought to the Solomon Islands by the British colonial Government in the 1950 "s. About 80% of the population live in rural areas and continue to rely on the subsistence economy with supplementary income from agriculture, forestry and fishery and remittances from relatives working off-island. Around 80% of the national population lives in low lying coastal areas. The capital city of Honiara is the primary area of economic activity and attracts increasing numbers of youth and adults from other islands seeking employment and income.

[1] https://www.worldometers.info/demographics/solomon-islands-demographics/

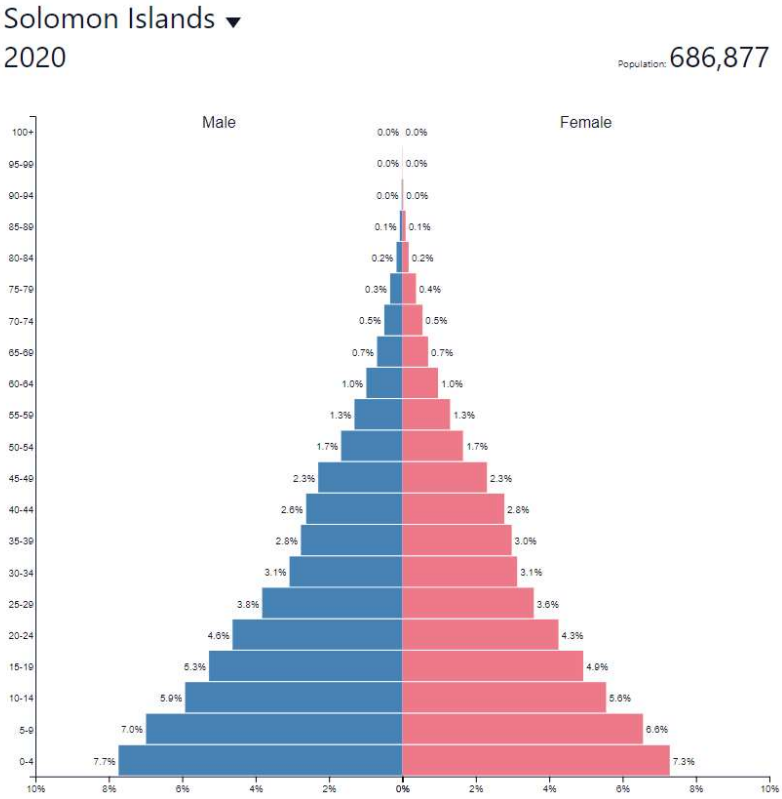


Figure 1: Solomon Islands Age Sex Pyramid with Sex bread up[2]

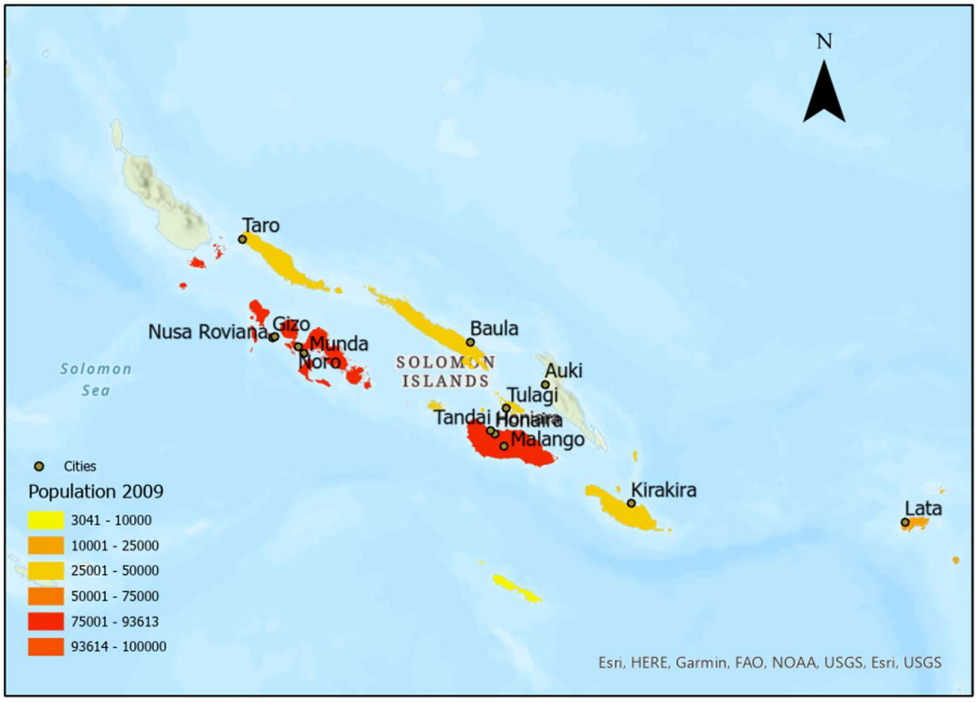
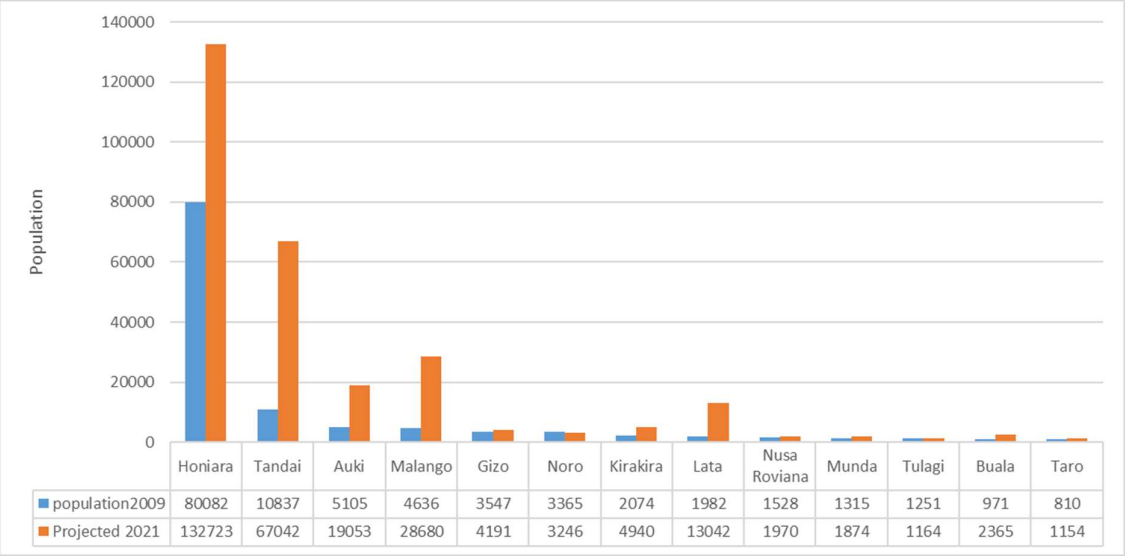


Figure 2: Major Towns in the Solomon Islands and population of provinces

[2] https://www.populationpyramid.net/solomon-islands/2020/

As can be seen from Figure 2 and Figure 3, Honiara the capital of the country is also the biggest city in the country, with an estimated population of a little over 1.3 million (2021) The primacy of Honiara in urban geography is Solomon Island is well established; the next big town is Tandai (in close proximity to Honiara) on the same island and has an estimated population of around 10 thousand. The next big town on a different island is Auki which only has an estimated population of 6000.

Because of the geography of the region, one can expect inter-regional movement through air and water and lost intra-urban trips in the cities of Honiara.



	Honiara	Tandai	Auki	Malango	Gizo	Noro	Kirakira	Lata	Nusa Roviana	Munda	Tulagi	Buala	Taro
population2009	80082	10837	5105	4636	3547	3365	2074	1982	1528	1315	1251	971	810
Projected 2021	132723	67042	19053	28680	4191	3246	4940	13042	1970	1874	1164	2365	1154

Figure 3: Population in major town 2009 and projections for 2021

In 2009, when the last census was carried out, the urban population in the Solomon Islands was 102,030 (as mentioned earlier the estimated population in 2021 is 708,482 which in 2009 was 515,870), which is around 20% of the total population. A large proportion of which, as stated earlier, resides in Honiara. Solomon Island is fast urbanising, and urban growth between 1999 and 2009 was 4.7%. Honiara grew at a rate of 2.7% annual growth rate, whereas Honiara's urban agglomeration area grew at a higher rate of 4.7%. Indicating that the outgrowth of the city of Honiara is fast urbanising. Other towns have grown at a much faster rate Tandai and Malango grew at an annual growth rate of 16.4% and Auki at 11.6% and Lata at 17%. In figure 3 the population of different towns have been projected using the past trends and it indicates that the country is fast urbanising and at the same time is tending towards a balance urban development across the country. The emergence of new urban areas like Munda, Nusa Roviana, and Malango, and the expanding urbanised areas around Honiara in Guadalcanal account for this development. It also means that other towns might soon see similar urban and transport problems as Honiara is facing today.

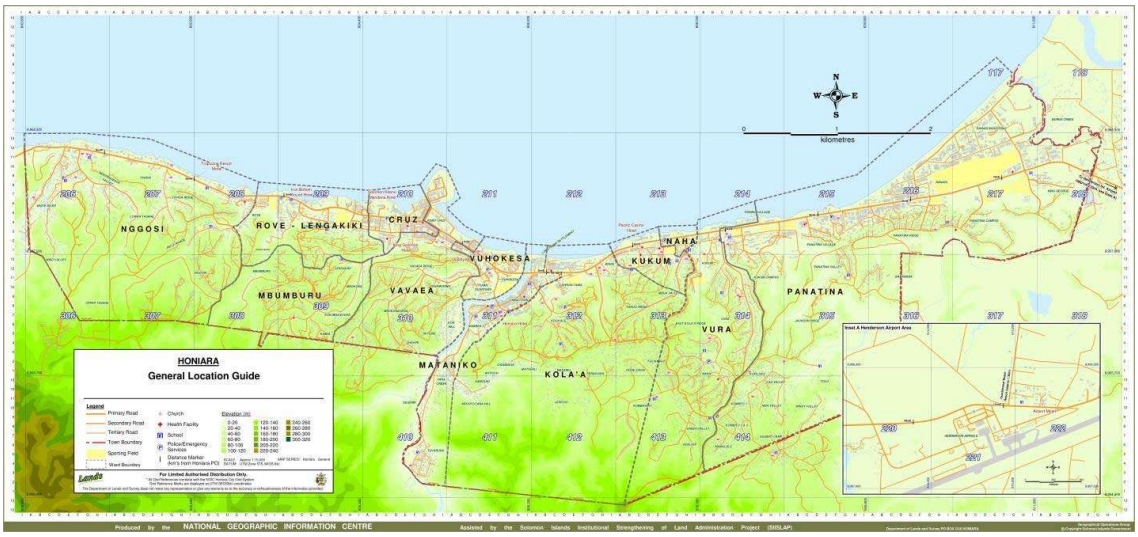


Figure 4: Honiara urban area

Figure 4 shows the boundary of the Honiara urban area. The city is surrounded by customary land and national parks. Through intervention over the years, the city consists of four types of land occupancy. First, as a remnant from earlier years, is a small area of customary land reserved for canoes on the west bank of the Matanikau River's mouth, although this is now a squatter settlement. The second form is a registered leasehold fixed-term estate (FTE) of 75 years with rights to build permanent structures and services.15 Rights lapse if the land is not developed. The third category is temporary occupying leases (TOLs), issued since the 1970s, allowing settlers some limited surety of tenure. The last and fourth category of the population (about one-quarter) lives in slums and squatters.

1.3. Economy

In Solomon Islands' agriculture, forestry and fisheries, account for around 40 per cent of gross domestic product (GDP) and provide employment for most of the population. The GDP was estimated to be US$1.37 billion and an estimated GDP per capita of US$2,339.55 (Duncan, 2019) the Demographics and Health Survey 2015 (Maelaua and Diatalau, 2017) reports per capita GDP of USD 1,612. The labour force participation rates among the females is 82.1% and among the males is 85.5%[3]. The labour force participation rate is the proportion of the population ages 15 and older that is economically active. Since 1990, female labour force participation has remained roughly the same. Compared withlabourr force participation in the lower-middle income group, the gap between men and women is lower in the Solomon Islands[3].

Log exports account for 71% of export value and approximately 20% of all Government revenue in 2018, providing about 10,000 jobs (Kiddle, et al., 2019). Currently, logging contributes 17% to the GDP. In terms of export value, timber exported as logs amount to 72% (~US$ 405 million) of total exports, fisheries 11% (~US$ 64.7 million), agriculture 8% (~US$ 46.9 million), minerals 7% (~US$ 40.3 million), with the rest accounted for by sawn timber and re-exports (Duncan, 2019). Thus, forest use and management will remain a central focus of

[3] https://genderdata.worldbank.org/countries/solomon-islands/#:~:text=Vulnerable%20employment%20among%20women%20is,rate%20in%20East%20Asia%20%26%20Pacific.

development in the Solomon Islands in the foreseeable future. The islands are also rich in undeveloped mineral resources such as lead, zinc, nickel and gold.

According to the Central Bank of Solomon Islands (CBSI), the economy was projected to grow by 3.7% in 2019 with the assumption that forestry will finally decelerate as part of the Government's forestry sustainability initiatives. However, there has been a slowdown in the Solomon Islands economy in 2019 due to low demand and slower domestic activity (Foukona, 2021, Kiddle, 2020). The muted economic performance in 2019 was most pronounced in agriculture and forestry, which are the two most significant contributors to rural incomes and government revenue. The downturn resulted from a fall in the primary sector that accounted for -0.4%, as export prices declined for the country's essential commodities.

Two-thirds of the country's labour force is engaged in the primary sector, consisting of subsistence crops and animal production, hunting and related service activities, and fishing. The secondary sector contributed also fell to a flat 0.6%. In comparison, services only accounted for 1.1% of the real GDP growth during the year, resulting from the declines in the production of the country's key primary commodities while there have been increases in fish catch and cocoa. Logs, palm oil, copra and coconut oil fell by 2.4%, 1.3%, 59.0% and 15.1%, respectively (Foukona, 2021, Duncan, 2019). These falls have led to a net deficit of $292 million balance of payments in 2019, from the $527 million net surpluses in 2018. This sharp decrease emanated from the fall in round logs and agriculture exports and increased service payments, leading to a wider current account deficit of $1,167 million. Tourism, particularly diving, is an important industry for the Solomon Islands. However, growth in that industry is hampered by a lack of infrastructure, transportation limitations, and security concerns.

The economic base of the largest city in the Solomon Islands (Honiara) is dominated by the service sector, as it is Soloman Island's leading commercial and administrative centre. Wholesaling, retailing, banking, restaurant, and hotel-related businesses are the main formal economic activities. The formal sector employs just over 27 per cent of city residents. No large-scale manufacturing industry exists in Honiara besides several construction companies, a brewery and printing presses (Habitat, 2020). The vehicle importers and dealers are also located in Honiara. Some of these are ELA motors, KIM auto, Arit Motors and AMCO Motors and Lee Kwok Kuen Honda and Suzuki dealer.

If the effects of Covid-19 persist throughout the year, the economy of the Solomon Islands is likely to suffer. At the same time, national projects could also be delayed due to restrictions on the movement of people. Fisheries and palm oil are expected to have the least negative impact, as their production would remain uninterrupted unless the pandemic affected workers at their respective sites.

Thus Solomon Islands will have to deal with COVID-19 downside risk by introducing the Government's stimulus measures that can sustain key economic sectors and continue to support public health activities and work with other stakeholders, including development partners, to minimise the effects of the crisis may have on affected workers and firms. In the aftermath of the crisis, the implementation of the stimulus package should continue to be rolled out to help restart the economy. Moreover, the country needs to build up its resilience buffers, through rainy-day funds, institutional policy measures and a broader economic base to cushion future shocks.

1.4. Climate Change and Paris Agreement Targets

The Paris Agreement aims to strengthen the global response to the threat of climate change in the context of sustainable development, taking into account different national circumstances. The Paris Agreement aims to limit the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels. Achieving the long-term temperature goals of the Paris Agreement depends strongly on implementing mitigation actions by 2030. The Paris Agreement aims to reach net-zero GHG emissions in the second half of this century. Any remaining CO2 and non-CO2 emissions are balanced with net CO2 removal or negative emissions. To be consistent with global emission pathways with no or limited overshoot of the 1.5 °C goals, global net anthropogenic CO2 emissions need to decline by about 45 per cent from the 2010 level by 2030, reaching net zero around 2050. Likewise, to limit global warming to below 2 °C, CO2 emissions need to decrease by about 25 per cent from the 2010 level by 2030 and reach net zero around 2070 (IPCC, 2018).

It should be noted that these net-zero target years are for the global pathways and therefore need to be achieved collectively. Setting net-zero targets for individual countries involves considerations of equity and fairness, which means that national net-zero targets do not necessarily have to coincide with the net-zero years and global pathways (IPCC, 2018)

Some Parties have already provided information on long-term mitigation visions, strategies and targets for up to and beyond 2050, sometimes referring to climate neutrality, carbon neutrality, GHG neutrality or net-zero emissions. However, these Parties' contributions would only allow a reduction of 26 (23–29) per cent compared with the 2010 level (source FCCC/PA/CMA/2021/8). There is thus an urgent need for increasing significantly the level of ambition of NDCs between now and 2030, as well as commitments beyond 2030, to attain cost-optimal emission levels suggested in many of the scenarios considered by the IPCC for keeping warming well below 2 °C or limiting it to 1.5 °C. If emissions are not reduced by 2030, they will need to be substantially decreased to compensate for the slow start on the path to net-zero emissions.

1.5. NDC of Solomon Islands

Solomon Islands submitted its Intended Nationally Determined Contribution (INDC) to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), in accordance with decision 1/CP.20 (Lima Action Plan), on September 30 2015, before the Conference of the Parties (COP21). Following the ratification of the Paris Agreement, the INDC was converted to Nationally Determined Contribution (NDC) and submitted to the UNFCCC secretariat on 21 September 2016.

In its first NDC, Solomon Islands has committed to reducing emissions by 12% below the 2015 level by 2025 and 30% below the 2015 level by 2030 compared to a business-as-usual projection (BaU). However, with international assistance, the Solomon Islands can further reduce its emissions by 27% by 2025; and 45% by 2030. This would mean that Solomon Island needs to make an overall reduction of 50% by 2050. The Solomon Islands believe that it is significant emitters that need to drastically reduce their emissions if the globe has any chance to keep warming below 1.50 degrees Celsius. Even though they are already ambitious, Solomons Islands emission reduction efforts will only be as effective as significant emitters take tangible and drastic actions to reduce their emissions.

In addition to the carbon storage in the forest, coastal and marine ecosystems Solomon Islands unconditional contribution will reduce 8,300 tCO2e annually and the conditional contribution will reduce emissions by 2025, and by 31,125 tCO2e annually by 2030. Approximately 90% of the emission reductions will come from fossil fuel use and forest carbon sequestration.

1.5.1. Review of Nationally Determined Contribution

Following decision CP.21, paragraphs 23 and 24, of the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) and Article 4 of the Paris Agreement, Solomon Islands will review and update its NDC to make a progression beyond its current NDC. The revision or update of the NDC highlights its mitigation contribution with more ambitious long-term and clear adaptation targets to ensure the resilience of its communities and ecosystems now and in the future.

1.5.2. Mitigation Actions

Since 2015, the Solomon Islands Government (SIG) has embarked on a number of actions which resulted in increased use of renewable energy technologies, improved energy security, and reduced greenhouse gas emissions. These mitigation actions include the use of solar photovoltaic farming and hydropower generation. SIG has now planned to roll out more renewable energy technologies over the next few years. Thus, its mitigation contribution could be even more significant if there had been substantial financial resources, technology and capacity-building support from multilateral and bilateral partners.

SIG was however not able to achieve the following from its INDC/NDC:

- Prepare a GHG inventory for 2011-2019 as there is no Third National Communication (TNC) and Biennial Update Reports (BUR)1
- Establish a national climate change trust fund
- Quantification of carbon sequestration from above 400m contour
- Identification and implementation of mitigation actions of sea and land transport sectors
- Fiu Hydropower2, solar homes, mini-hydro and energy usage as a conditional contribution
- Six planned hydropower systems are now included
- Afio solar PV, Kakabona solar PV and Savo Geothermal are now included.

Given that a large part of the current GHG emission comes from the energy sectors, the Solomon Islands is committed to throught development of renewable energy projects in the islands. The The impetus for the renewable energy projects is provided by SIG National Energy Policy 2014, which is aimed at increasing access to reliable, affordable and clean sources of electricity through renewable energy resources and technologies to 100% by 2050. In order to achieve this goal, the SIG has embarked on a number of renewable energy projects that will be implemented over the next years. Thus, the focus of the renewable energy generation of electricity will be through the use of solar PV and hydropower generation.

As stated earlier a large portion of the energy comsumtion is by the transport sector, and with the Solomon Islands shifting its energy sources to renewable energy, it is aslo imperative that

the transport sector also shifts its energy use to renewable energy or rather to electricity sources from renewable energy sources.

1.6. Global trends in electric mobility

Battery Electric Vehicles (BEV) have gained commercial viability within land transport vehicles for two-wheelers, three-wheelers, four-wheelers and buses. Around 15 countries had a BEV market share (share of new vehicles sold) of more than 1% in 2019 for light-duty vehicles (mainly cars) (IEA, 2020) though most are developed countries. The global electric car market has been experiencing rapid growth for more than a decade now and will reach 10 million vehicles in 2020. About 3 million new electric cars will be registered in 2020. China had the largest fleet of electric cars at 4.5 million. Several governments supported electric cars through fiscal, and other incentives and electric cars are slowly become competitive in some countries (IEA, 2021). Figure 1 shows growth of different type of electric vehicles and growth in different regions.

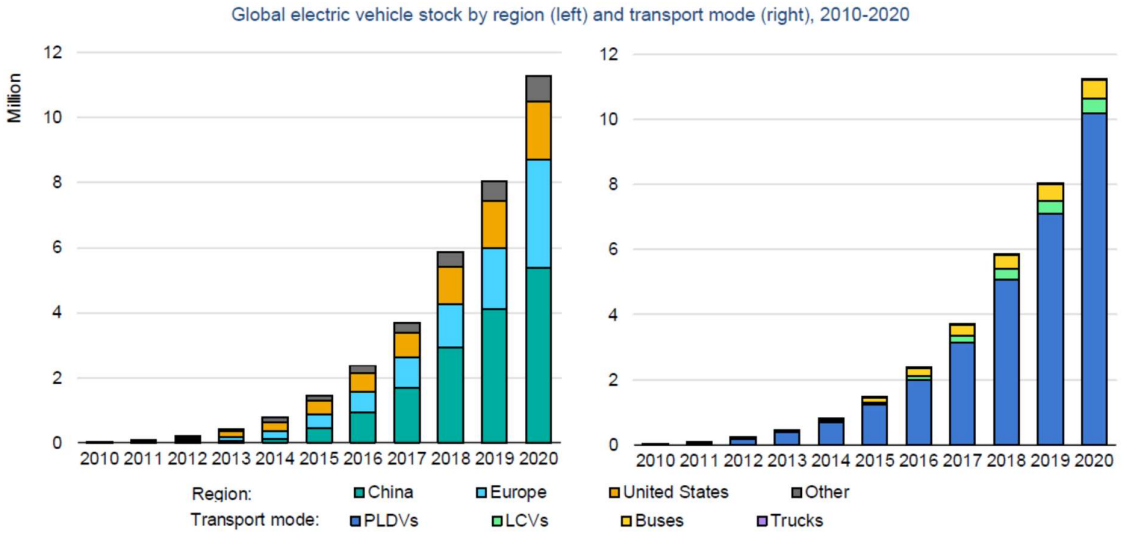


Figure 5: Growth of electric vehicles over the last ten years

Notes: PLDVs = passenger light-duty vehicles, LCVs = light-commercial vehicles. Electric vehicles include battery-electric and plug-in hybrid electric vehicles. Europe includes EU27, Norway, Iceland, Switzerland and the United Kingdom. Other includes Australia, Brazil, Canada, Chile, India, Japan, Korea, Malaysia, Mexico, New Zealand, South Africa and Thailand

Source: IEA, 2021

Electric 2 wheelers have been a great success in China, and now several Asian countries with a large two-wheeler population are a potential market. China has also been at the forefront of electric buses, and many cities worldwide are opting for electric buses. The prospects for EVs have dramatically improved due to strong policy support in many countries that have involved financial incentives, duty exemptions, and mandates for phasing out fossil-fuelled vehicles (Santos & Rembalski, 2021). In this scenario, EVs will become a dominant technology for personal and public transport in cities in the coming decades. EVs are also emerging as a preferred technology for shared mobility.

Major contributors to the growth of the electric market in 2020 were Europe, China and the US. In Europe, the electric car market doubled despite a contraction in the car market due to the pandemic. In several European countries, policies on CO2 emissions standards and

subsidy schemes led to this increase in electric car sales. On the other hand, due to the pandemic, China experienced a slowdown in new electric car registrations in 2020.

Worldwide about 370 electric car models were available in 2020, a 40% increase from 2019. China had the maximum number of models. The average driving range of new BEVs has also been increasing, reaching 350 km in 2020. The sale of electric light commercial vehicle (LCV) also increased in Europe, but total LCV stock was below half- million in 2020. Bus registrations also increased, with China dominating the electric bus market with 78000 new vehicles in 2020. Local policies to curb pollution were the driving force in China for electric buses. In Europe, electric bus registrations (at 2100) reached 4% of all new bus registrations in 2020, and most of this seems to be due to municipal level policies. (IEA, 2021).

BEVs are a crucial solution for decarbonising road transport; however, this will depend on the electricity used for charging and CO2 emissions in batteries' production. Battery electric LDV produced and operated on low carbon electricity would yield a CO2 footprint of only 33 gCO2-eq/vkm for a compact sized car (Ellingsen et al., 2014). Efficient ICE and Hybrid engines running on fossil fuels cannot go below 130 gCO2-eq/vkm for LDVs (GFEI, 2020). However, if BEV is produced using coal-based electricity, the CO2 emissions can even exceed 300 gCO2-eq/vkm on a life cycle basis (Ellingsen et al., 2016). In cases of buses operated within the cities, BEVs have much lower CO2 emissions than all the alternative drive train technologies (ICEs, Hybrid, Plug in Hybrid and Fuel Cell) (European Commission, 2020).

2. Urban Passenger Transport sector in the Solomon Islands: An Overview

Transport is an essential sector in the Solomon Islands, given the fact that there are so many islands and the need to exchange goods and services and interact between communities. A good quality and efficient transport is also required for the country's economic and social welfare.

The Government's vision for the transport sector (as stated in NTP 2011(ADB, 2010)) is *'An effective transport infrastructure and transport services to support sustained economic growth and social development in the Solomon Islands'.*

The pressure on urban transport is evident, mainly due to the rapidly expanding urban areas in the Solomon Islands, that is, in Honiara and other rapidly expanding urban areas. The Island economy is also rapidly growing at around 2.5% annually. This rapid economic growth coupled with rapid population growth and urbanisation rates will lead to additional movement of people and goods, increasing demand for transport services. Considering the future transport demand, the National Transport Plan for Solomon Islands has identified several areas for expansion. Among the essential expenditure, areas have identified raod infrastructure (expansion, rehabilitation and maintenance) and lay importance on air and maritime infrastructure development. Thus, the spending on transport sector infrastructure will be concentrated on rehabilitation and maintenance of existing infrastructure while strategically providing new infrastructure.

Till 1990, in the Solomon Islands, Vehicles were only required to be registered in Honiara (for Honiara and Tulagi), Auki and Gizo and at points accessible by roads from these centres. Statistics do not include vehicles operating elsewhere; roads outside these are mostly not suited for motorised traffic. The statistics for registered vehicles until 2021are given in Table 1.

Table 1: Solomon Islands- Registered Vehicle and Projected Vehicles

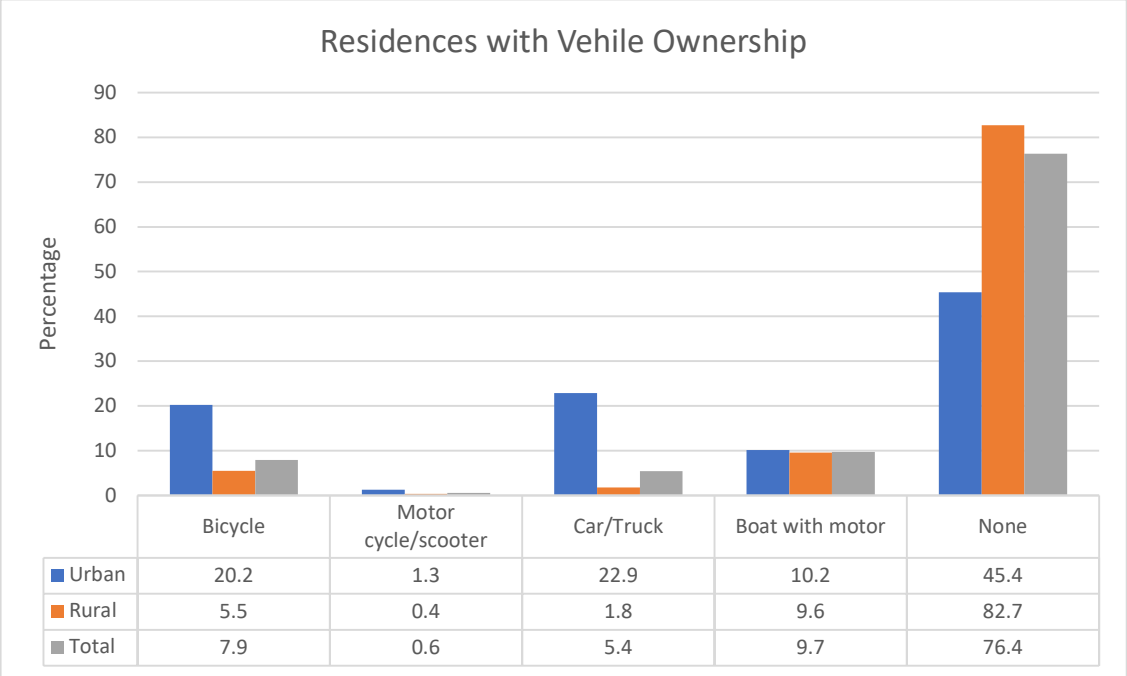
Total Registered Vehicles	2021	Projection 2030	Projection 2050 (from CAGR)	Ajs. Projection 2030*	Ajs. Projection 2050*
Buses	2	2	3	436	853
Light buses (up to 26 seats)	922	1054	1420	1045	1782
Motor Car (upto 2000cc)	12243	13999	18854	13867	23672
Motor Car (above 2000cc)	8055	9210	12405	9124	15575
Taxis	8055	9210	12405	9124	15575
Goods Vehicle (Upto 3.5 tons)	8747	10001	13470	9907	16913
Goods Vehicle (3.5 - 7.5 tons)	428	489	659	484	828
Goods Vehicle (more than 7.5 tons)	1141	1305	1757	1292	2207
Motor cycle	402	460	619	456	777
Other	131	150	202	148	254
Total	40126	45880	61793	45880	78435

* Projections done using CAGR of the population as the basis

* Projections done using CAGR of the population as the basis and with the understanding that public transport will absorb significant future travel demand

From Table 1: Solomon Islands- Registered Vehicle and Projected VehiclesTable 1, it is evident that come 2030 and 2050, the Solomon Islands will have a significantly large number of cars used for personal use and as taxis. The projection of 2030 and 2050 are done using method, where both ratio of vehicle categoires with both population and GDP is used to make the stated projection. Only exception is buses, where original numbers are very low, therefore a judgement based projection is done for buses. Apart from the passanger vehicles, there will also be many good vehicles given the need for goods movement. As urban areas expand, the need for public transport will also increase, especially for the larger buses that are practically absent from the current inventory. Small buses will still keep growing and used in the newly expanding urban areas.

From Demographics and Health Survey 2015 (Maelaua and Diatalau, 2017) data on household ownership of selected assets, including transport, are available. Ownership of a means of transportation (bicycle, motorcycle, boat with or without a motor, or private car or truck) is a sign of the household's level of mobility. Around 8% of all households own a bicycle, and these households are more likely to be in urban areas (20%) than in rural areas (6%). 23% of households own a car or truck in urban areas compared with 2% of rural households. In contrast, 10% of rural and urban households own a boat with a motor. The total sample for the survey was 4192 households, of which 850 were from urban areas and 4192 from rural areas. From the statistics presented in Figure 5, it is apparent that a section of the population does not own mobility options, and residents in the rural areas depend more on boats as transport infrastructure in the rural areas is very poor.



	Bicycle	Motor cycle/scooter	Car/Truck	Boat with motor	None
Urban	20.2	1.3	22.9	10.2	45.4
Rural	5.5	0.4	1.8	9.6	82.7
Total	7.9	0.6	5.4	9.7	76.4

Figure 5: Residences with Vehicle Ownerships(Maelaua and Diatalau, 2017)

2.1. Transport infra and travel characteristics in urbanising Solomon cities

According to an Asian Development Bank report on the transport sector in the Solomon Islands (ADB, 2010), the Solomon Islands road network was 1875 sq kilometres, of which only 6% (104 km) has a sealed surface. The rest of the road network is surfaced with gravel, coral or earth. As mentioned earlier, most roads, about 66% (1230 km) and almost all the sealed roads, are located within the islands of Guadalcanal and Malaita. The condition and maintenance of these roads, in general, are poor; however, the Ministry of Infrastructure and Development is responsible for road maintenance in the Solomon Islands and, since 2006, has overseen the rehabilitation of more than 923 km of the existing road network as per the ADB report on the Solomon Islands. The ownership of vehicles is closely linked with road infrastructures, as the locations with poor road infrastructure also have lower vehicle ownership.

Honiara is the main urban centre, capital, and economic centre of the Solomon Islands. Good transport infrastructure and services within Honiara are essential for achieving the country's economic objectives. Poor transport in Honiara will restrict access to critical international transport facilities, hinder the working of the main political and civil institutions and limit investment. The principal organisation responsible for the planning and managing of transport in Honiara is Honiara City Council. However, the Honiara urban area has extended past the Council boundary, and significant urban areas now lie within the jurisdiction of Guadalcanal Province. Even though, as stated earlier, Honiara has most of the paved roads in the Solomon Islands and likewise also have the highest vehicle ownership, the future development of urban transport will meet the needs of this expanded area. Funding for Honiara City Council transport comes from the Council's own resources and an annual grant from the central Government for road maintenance.

Urban Transport Services Public bus services provide an intensive service along the main Kukum Highway. But as we move away from this core route, services are generally thin, with many residential areas are not serviced. Honiara urban buses typically do not operate in the neighbouring populous regions in Guadalcanal Province, including Honiara airport, because of restrictive Provincial licensing arrangements. The availability of taxis is generally good at all times, the condition of the vehicles is variable, with many appearing to be unroadworthy. Not many transport studies have been undertaken in the Solomon Islands. The integrated transport study (TechEcon, 1987) reviewed the transport sector and identified critical modal issues. The Solomon Islands Rural Transport Project (EEC, 1989) extended this study to the road transport sector.

The land freight industry is almost entirely in the private sector. The Ministry of Transport, Waster and Utilities (MTWU) maintains a fleet of vehicles for its own and general Government needs. There is no regulation of routes or rates for freight transport and no data on the freight task. The industry is dominated by company-owned vehicles, particularly in the Jogging and oil palm industries and the transport of fuel. Several operators provide freight vehicles for hire.

Formal **public transport** services on Guadalcanal are built to a minimum provided by private bus companies operating a fleet of large buses and minibuses. Most services are operated within Honiara; however, some services are provided with both east and from along the North Coast Road for a distance of approximately 40 km each. The Government regulates fares and licenses routes for the bus services. Licensed taxis provide services at negotiated fares, mostly within Honiara. Informal public transport is provided in other country areas, usually in open trucks without seats, as an accompaniment to freight transport.

The strategic road network in Honiara is restricted to a single road, the Kukum Highway. This road provides access to the main port and airport and acts as the main service road for much of the main business area. The single main road places significant pressure on several key locations in the town, including Mataniko Bridge, Old Mataniko Bridge and the Point Cruz junction. Many roads in residential and commercial areas are poorly constructed and poorly maintained, causing difficulties in accessing some parts of Honiara. Despite improvements to existing underpasses, pedestrian facilities, through footways and crossings do not allow free movement within the central business area. Poorly positioned or inadequate crossings lead to pedestrians being forced to use roadways. This increases accident risks and causes road congestion. Pedestrian facilities generally do not cater for the disabled.

Figure 6 is the preferred development scenario of the Honiara region. As can be seen the urban agglomeration area is set to expand in all direction and will put pressure on the already ailing transport infrastructure, especially public transport services.

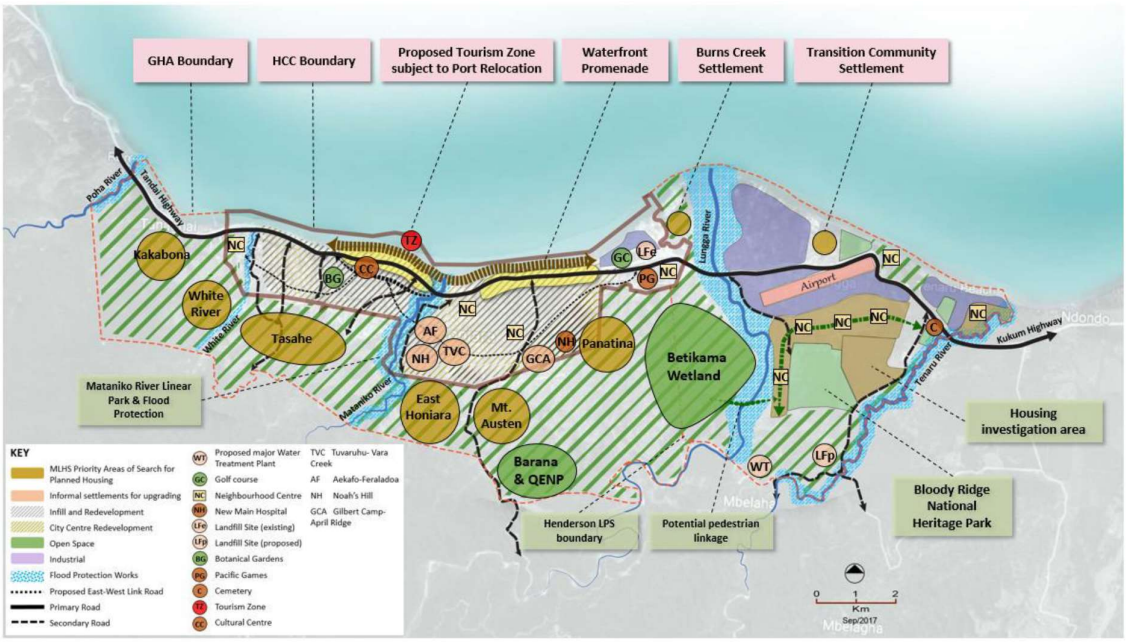


Figure 6:Solomon Islands Preferred development scenario

2.2. Institutional structure and policy frameworks

2.2.1. Ministry of Infrastructure and Development

Ministry services include:

- Managing the development of public roads, bridges, structures, airstrips and wharves
- Vehicle and ship inspections
- Driver and seafarer certification
- Architecture and building safety, maritime and road safety
- International representation and compliance to international conventions and protocols.

To achieve its mission, the Ministry delivers services through its five (5) Departments.

Corporate Support Services Department

This Department is responsible for Human Resource planning including managing staff retention, orientation and training. They also look after staff development along with budget and procurement planning.

Architecture Building Management Services Department

This Department is responsible for maintaining building safety standards, and inspecting and scoping for identification of maintenance needs. They also conceptualize designs and carry out technical evaluation and recommendation.

Mechanical Works Services Department

This Department is responsible for managing vehicle fleets, and inspecting Public / Private vehicles for licensing and insurance. They also examine and test drivers for licensing and classification.

Transport Infrastructure Management Services Department

This Department is responsible for the National Transport Fund Planning and Audit along with asset management.

Solomon Islands Maritime Safety Administration Department

This Department is responsible for complying with the National Legislation and International Maritime Organization (IMO) standards along with inspection of vessels and marine pollution and protection.

2.2.2. National Transport Plan 2007 - 2026

The National Transport Plan 2007 - 2026, sets up the roles of the various institutions within the transport sector as planning, rulatory and management roles, as appropriate. The delivery of transport service is outsourced to private sector providers. Departments and Divisions have been restructured to meet their revised roles and human resource development plans implemented to ensure that all institutions have appropriately skilled and equipped personnel. The following major changes in the structure of institutions within the sector have been done.

- The National Transport Fund with its Board has been set up;
- The Solomon Islands Maritime Safety Administration has been set up;
- The CAASI has been put in place;
- The Road Transport Board has been established and
- MID has been restructured and re-focussed into a planning and regulatory role.

2.2.2.1. National Transport Fund Board

The NTF Board was set up by the corresponding Act in 2009. The NTF is designed to provide a consistent, ring-fenced source of funding for the transport sector, as well as providing a suitable method of co-ordinating and administering development partner funding to projects. This is a key component to moving towards a sector wide approach.

The make up of the NTF Board was defined under the NTF Regulations passed in mid 2010. These regulations also set out the form of the Board's secretariat. Government is committed to ensuring that the NTF operates in a transparent fashion, in accordance with SIG Financial Instructions and development partner requirements. The NTF is actively supported by Australian Adi and Asian Development Bank.

According to www.nft.gov.sb

"NTF was established as a special fund for the purposes of maintaining, developing and managing transport infrastructure in Solomon Islands. It serves as a mechanism for the government and development partners to fund the transport sector. NTF priorities are guided by National Development Strategy (NDS) that provides a 20-year strategic framework to guide development in the Solomon Islands."

Thus the Solomon Islands Government will seek assistance from development partners to fund support for the NTF Board and Secretariat from local and international experts. This will particularly assist the NTF Board in developing appropriate procedures and embedding proper planning, programming and budgeting practices within the NTF Secretariat.

The current projects include

- New sealing to Honiara selected gravel roads 4 km, Honiara
- Honiara Highway from Alligator bridge to White River 17.4 km (2 contracts), Honiara
- Periodic and routine maintenance of Vura – Borderline and Vura – Panatina 3 km, Honiara
- Periodic and routine maintenance of Guadalcanal Main road from White River to Naro Hill & Alligator to Mberande bridge 79.9 km (4 contracts), Guadalcanal Province
- Construction of Mongga Bridge, Guadalcanal Province
- Feasibility Study of 28 km of roads and 12 bridges, Guadalcanal Province
- Periodic and Routine Maintenance UnSealed Honiara Feeder Roads (East/Central)
- Specific / Routine Maintenance UnSealed Feeder Roads (West/Central) Lot-1
- Rehabilitation of Malaita East road from Dala to Atori & Nafinua/Kwaibaita 59 km, Malaita Province
- Specific / Routine Maintenance UnSealed Feeder Roads (West/Central) Lot-2
- Labour based maintenance of unsealed roads 42 km (5 contracts), Isabel Province
- Periodic maintenance of Ulawa ring road 24 km, Makira Province
- Labour based maintenance of Ulawa ring road section 3 - 5 km, Makira Province
- Specific Maintenance of landslide scoured section along Naha 4 unselaed feeder roads in East Honiara
- Periodic and Routine Maintenance of Gizo Inland Gizo D, Trunk & Coastal roads 14.6 km (2 contracts), Western Province
- Wharves routine maintenance (5), Lambulambu, Koriovuku & Lengana, Western Province
- Periodic and routine maintenance of Noro & Munda roads 18.4 km, Western Province
- Labour based maintenance of Bellona unsealed road 9.1 km (2 contracts), Renbel Province
- Specific & Routine Maintenance Selected Sealed Feeder Roads, East Honiara Lot 1
- Specific & Routine Maintenance Selected Sealed Feeder Roads, West Honiara Lot 2
- Construction of Drainage Structures on North Malaita Road - Malaita Province
- LBES Afio Road (sect1) - Routine & Specific. Small Malaita- Malaita Province
- LBES Afio Road (sect 2) - Routine & Specific. Small Malaita- Malaita Province

Thus the transport board is involved in feasibility studies, construction and maintenance of transport infrastructure, which is mainly roads and bridges at this moment.

2.2.2.2. Road Transport Board

The RTB was set up by the 2009 Traffic Amendment Act. This placed responsibility for the licensing and regulation of road transport, and the enforcement of traffic regulations with the RTB. The Board itself consists of a mix of Government representatives, Royal Solomon Islands Police(RSIP) and key stakeholders.

This Board is advised by the Chief Mechanical Engineer of MID (Ministry of Infrastructure Development). The Act also provides for a number of licensing, inspection and enforcement officers, which are transferred from within the Mechanical Division of MID to a new free-standing Division.

The new Driver and Vehicle Licensing Division(DVLD) works closely with RSIP to develop enforcement regimes and to ensure proper training of DVLD staff. The first stage in development of the DVLD will be to set out a new Highway Code and regulations defining traffic rules and penalties.

2.2.2.3. Transport Policy and Planning Division

Among the restruction plans of MID the Transport Policy and Planning Division (TPPD) has been established to centralise the management of transport strategic planning and transport asset databases. The TPPD is responsible for preparing and maintaining the National Transport Plan with input from MID and MCA departments, national and provincial agencies, industry representatives and relevant community groups.

The TPPD is the coordinator of all development partner projects within the MID. The Division maintains close liaison with the MDPAC to ensure the integration of MID plans and programs with National plans.

TPPD will liaise with the MDPAC and other MID and MCA divisions when:

- preparing on an annual basis the rolling three year works program; and,
- producing annual works programs for maintenance and construction including budget estimates and procurement strategies.

The division's role will be extended and intensified by changes taking place in respect of the delivery of development partner funded projects and, in respect of the Franchise Shipping Service (FSS). These changes take the form of a move toward a Sector Wide Approach (SWAp), the defining characteristics of which are:

- All significant funding for the sector supports a single sector policy and expenditure programme, under Government leadership;
- Adopting common approaches across the sector; and
- Relying on Government procedures to disburse and account for all funds.

Requirements for TPPD to accommodate this extended role include both the tools and abilities to plan government activities within the sector in a robust and transparent way and strengthened abilities in supporting areas, in particular accounting.

2.2.2.4. Operations and Maintenance Division

The new role of Operations and Maintenance Division in the restructured plan for MID will be to manage the construction and maintenance of roads, bridges, wharves and airfields. It will undertake design and documentation and manage construction and maintenance works. External service providers will be engaged to carry out works and maintenance. External service providers will also be engaged to undertake design, documentation and project management beyond the capacity or capability of the Division.

2.2.2.5. Central Project Implementation Unit

Government and development partners are committed to bringing the planning and management of all projects, regardless of funding source, under a single implementation unit. This Central Project Implementation Unit will be established within MID in its restricting plan, including the key functions of works contract management and supervision, budgeting and costing. This will combine the functions and staff of existing separate PIU's such as those set up for SIRIP and DMSP. This will be a key element in the Transport Sector Development Project, which will provide technical support and capacity building assistance to MID and the CPIU in particular.

2.2.2.6. Mechanical and Workshops Division

The Mechanical and Workshops Division presently has responsibility for: the procurement and management nt, maintenance of government vehicles and plant, and the hire of government vehicles.

In line with the general approach to MID functions, the Division will be re-formed as a regulatory function, meeting the requirements of the Traffic Regulation Act. Key staff members from the Division will be transferred to the new Driver and Vehicle Licensing Division.

The Mechanical Division is currently responsible for the maintenance of the MID fleet of road works plant. Much of this was provided under the CSP project, but is now not required, as maintenance and construction functions have been transferred to the private sector. Government is currently in the process of transferring this equipment to the private sector. This will increase the capability of the private sector, whilst also potentially realising a capital receipt for SIG.

Private vehicle road-worthiness testing will be out-sourced to accredited service providers (vehicle testing stations). Where there are no suitable service providers, such as in remote locations, MID inspectors will continue to provide a roadworthiness inspection service. MID staff will inspect the licensed providers on a regular basis. Annual registration papers and stickers will continue to be issued by the MID.

With this transfer of functions to the private sector, it will be possible to also transfer the remaining staff, assets and functions of the Mechanical Division to the private sector, potentially realising a capital receipt for SIG.

2.2.2.7. Human Resources Development

Human resources have been a key constraint within the sector for some time. This is true in both MID and the private sector. Government is committed to ensuring that the transport sector has sufficient qualified and experienced people to enable the delivery of this plan. This requires a substantial increase in training for certain grades and skill sets. Government will investigate options for this, including the possibility of significantly expanding the current program of externally provided funding, or setting up new technical training facilities in Honiara.

Once individual Divisional organisational structures are confirmed, human resource developed for each Division to provide the staff to meet revised Divisional roles. Position profiles will be raised or re-written for each position, training needs determined and suitable training identified and undertaken.

A number of positions in the present Divisional organisations will not exist in re- organised Divisions. Where practical, staff will be re-trained for new positions. However, since the training, especially the on-the-job training, is likely to occur over an extended period, the remaining length of service of individual staff will need to be taken into account. Formal training is to be structured on conditions and practices suitable for application in Solomon Islands.

The work of MID is being disrupted because the recruitment and promotion of staff is not proceeding through the Ministry and other government agencies, such as Public Service Commission quickly enough, at times taking 12 months or more. If they are not improved, such lengthy processes will continue to inhibit MID divisions in making organisational changes in a timely manner and will have an adverse impact on the implementation of this NTP.

The TPPD is a critical link in the implementation of this Plan. Several positions in the TPPD need to be filled and the staff trained. The present TPPD staff need to be supplemented by people to manage the proposed asset management system, as well as a number of other functions. Vacant positions need to be filled and the staff trained. This is to be accorded a high priority.

These constraints are likely to become more restrictive as a sector-wide approach is implemented. This will put an emphasis on local contract administration staff and works supervisors. These people need to be put in place as soon as possible, to ensure that sufficient training can be given.

2.2.2.8. GHG emissions from the transport sector and need for electric mobility

Of the total CO2 emissions of 618.61 Gg CO2 eq. in 2010 a large portion of 350.64 Gg CO2 eq came from energy use of this around half (176.81 Gg CO2 eq came from the road transport

sector.), sea and land transport combined accounts for 61% CO2 eq emissions. The road transport sector is infact the second highest source for CO2 emission in Solomon Island after Solid Waste Disposal on Land (Domestic) sector. This sets the needs to mitigate CO2 emission from transport.Air Quality in Cities.

As stated earlier given that Solomon Island plans for rapid expansion towards renewable energy sources, it is also imperative that policies and enabling framework is created which allows for use of electricity produced from renewable energy sources in the transport sector. From the vehicle growth scenarios, that main areas that could be targeted are the cars, goods vehicles and the public transport buses small and big.

3. Electric Mobility Priorities in Solomon Islands

3.1. Decision Context: Country aims and expectations

Solomon Islands government has ratified the Paris Agreement in 2016 with a strong call to pursue efforts to limit the global average temperature increase to 1.5°C above pre-industrial levels, if it is to withstand the risks and impacts posed by climate change. With such an overarching objective, the Government has revised its Nationally Determined Contribution (NDC) with objectives to increase its emission ambition by targeting a net zero emission by 2050 as compared to 45 % emission reduction by 2050 in its initial NDC.

It is interesting also to note in the revised NDCs that the Government has included Adaptation sector in its NDC submission because mitigation and adaptation are inseparable for a low emitting, highly vulnerable and small island developing country like Solomon Islands. Furthermore, it is also clear that the Government need to have access to predictable, dedicated and low cost financial resources, and technical support to meet its ambitious targets in mitigation, and address the negative impacts of climate change, and achieve sustainable development. In its effort to achieve its long term mitigation targets, Solomon Island government is embarking on applying renewable energy and energy efficient technologies in the energy sector; in short, it is committed to low-carbon technologies to support sustainable development.

This includes electricity generation through the application of Solar PV and hydro-power and other clean technologies in both urban and rural areas of the country. The Government is committed also to promote renewable energy and energy-efficient technologies in the sea and land transport sub-sectors which is the heart of this policy development. Thus the introduction of Electrical vehicle especially in the land transport sector in the country is a step in the right direction towards achieving the Government's objective of zero emission by 2050 as earlier stated.

3.2. Methodology for Prioritisation

The project has adopted a Multi-Criteria Analysis (MCA) model to select and prioritised the most preferred vehicle category to be first implemented with EV in the country.The advantage of MCA methodology is that it can be used to identify and compare different policy options by assessing their effects, performance, impacts, and trade-offs. Below Figure 7 is an eight (8) step process on how we have undertaken the prioritisation process.

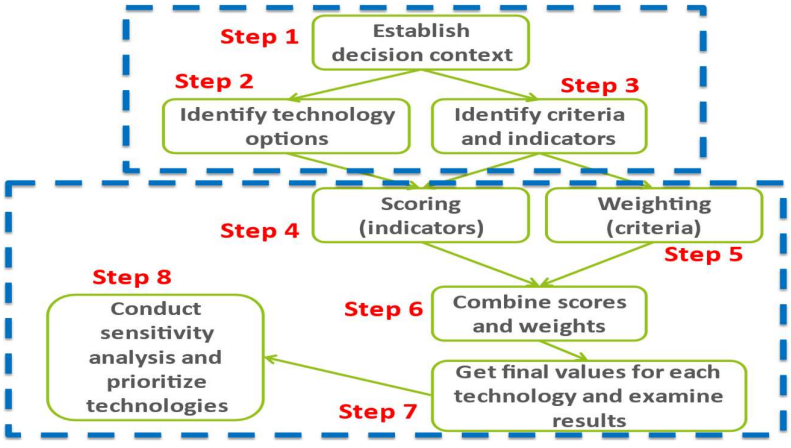


Figure 7: MCA process

Step 1 – Establish decision context -We have established that the shift from Internal Combusting Engine (ICU) to EV is a priority objective of the Government. This is inline with the NDC ambitious objective to reaching zero emission by 2050.

Stept 2 – Identify Technology Options – Through consultation process with stakeholders from different Ministries, private sector, civil society, etc. , different vehicle categories were selected. This is again re-affirmed through the workshop with relevant stakeholders on the 31st March 2022 at the Pacific Casino Hotel (See participant list at Annex 2).

Step 3 – Identify criteria and indicators - A range of criterion and indicators were discussed and adopted by workshop participants to form the basis for the MCA. The criterion includes, Capex, opex, infrastructure costs, fuel savings, job creation, gender equity, air pollution and GHG reduction.

Step 4 – Scoring Indicators- The workshop participants have allocated different marks to the identified criterion based on their skills, knowledge and experience with the type of technologies assessed.The scores given are out of 100. Forexample if cost is high, a low score is allocated. Like wise if the cost is low, the score allocated is high. With the benefits, scores are corelated with the level of benefit as perceived.

Step 5 – Weighting Criteria- The workshop participants have agreed to allocate different scores against different criterians for each technology. The different criteria has different weighting depending on its significance. All must add up to 100.

Step 6 – Combine scores and weights- All the scores and weights are added for each technology catercory.

Step 7 – **Get final values for each technology and examine** – The technology with the highest score gets the highest priority compared to the least score with the least priority.

Step 8 – **Conduct Sensitivity analysis and prioritise options** – After step 7, the participants apply some qualitative analysis and conluded with understaking a sensitivity test with the ***what if*** strategy should any one of the criteria changes and whether the result remains the same or also changes.

3.3. Options for EVs in Solomon Islands in terms of vehicle categories and user types

EV Options/ Vehicle Categories
Two Wheelers (2W)
Three Wheelers (3W)
Four Wheelers (Personal)
Four Wheelers (Taxi)
Bus (Mini)
Bus (standard)
Truck (Light Duty)
Truck (Heavy)

3.4. Criteria (Attributes) for prioritisation of EVs in Solomon Island

The criteria that are relevant to the decision were established in consultation with the stakeholders and can be at highest level differentiated in terms of costs and benefits. This kind of framing is used often in the appraisal of projects.

Costs – Cost is one of the core criterion that influences the prioritisation process of the technologies. The stakeholders identified capital costs as the most important cost criteria. The other components of costs identified were operational and infrastructure costs.

Benefits – The benefits can be broadly categorised as economic, social and environmental that can arise from using EV instead of IC Engines.

Under economic benefits fuel savings that can happen if all the fleet of IC Engines were replaced with EVs was considered.

Under social benefits job creation and gender inclusion were considered. job creation can also help in increased revenue collected by authorities should be used in enhancement and expansion of businesses in the industry. Often new investments neglect gender inclusion which involves looking at needs of some of the very important members within the community, e..g., women, children, the olderly and the disabled members. The criterion tries to capture the voices of these people as part of the prioritisation process.

Under environmental benefits improvement to local air pollution and GHG reduction were considered

3.5. Criteria Scoring

3.5.1. Criteria (Attribute) Values

The attribute values can be both quantitative and as well as qualitative. The quantitative values are required for establishing the total cost of owning and operating the EV and are reported on a ration scale. The quantitative values were used for cost, economic and environmental criteria and provided in the Performance Matrix (Table x). The units of these values are also provided in the performance matrix.

The qualitative values were estimated using the stakelholders and two different scales were using for job creation and gender. For job creation the attribute values ranges from 100 to zero (0). In case of gender inclusion a scale of 1 to 5 was used.

Before proceeding to converting attribute values to scores it is important to understand whether a higher attribute value is preferable or a lower attribute value is preferable. This is indicated with the Performance Matrix. For example if the technology or EV category is costly, then a lower value will be awarded for its scoring. Vice-verser, if the cost is cheaper then a higher value will be apportioned against its score in the MCA.

Table 2:Performance Matrix providing the attribute values

Vehicle Category	Costs			Benefits						
				Economic	**Social**		Environmental			
	CAPEX	OPEX	Charging infra cost/ charger	Fuel Saving	**Job Creation**	**Gender Equity**	Air Pollution			GHG Emissions
	US$	US$/year	US $	US$/year			PM (kg/year)	Sox (kg/year)	NOx (kg/year)	Kg CO2/year
Two Wheelers (2W)	2.400	778	962	15.859	30	2	0,913	2,74	0,04	555,52
Three Wheelers (3W)	2.456	760	4.055	38.853	35	2	0,913	4,68	0,10	1.479,18
Cars - Personal	45.760	1.347	10.452	101.574	40	4	0,848	6,77	0,25	3.650,02
Cars - Taxi	48.608	5.430	10.452	291.797	50	3	2,453	19,71	0,72	10.571,70
Buses (mini)	299.266	21.428	24.284	1.268.681	55	5	10,950	511,00	3,13	51.443,01
Buses (standard)	407.245	25.755	4.284	2.093.324	60	5	10,950	511,00	5,17	84.880,96
Truck (LDV)	25.055	19.936	24.284	1.390.197	55	2	12,000	560,00	3,43	64.721,41
Truck (M&HDV)	190.436	24.570	24.284	2.293.824	50	2	12,000	560,00	5,66	120.569,72
Scale	Ratio	Ratio	Ratio	Ratio	0 to 100	1 to 5	Ratio	Ratio	Ratio	Ratio
Preferred Value	Lower	Lower	Lower	Higher	Higher	Higher	Higher	Higher	Higher	Higher

3.5.2. Value Functions

Value functions are required to covert all the attribute values into a score on a scale of 0 to 100. There are two different value functions that can be used depending on whether the higher value is preferred or a lower value is preferred (See equations below).

Higher Value preferred

$$Y_i = \frac{X_i - X_{min}}{X_{max} - X_{min}} * 100$$

Lower value preferred

$$Y_i = \frac{X_{max} - X_i}{X_{max} - X_{min}} * 100$$

…….. *Equation 1*

Where

Y_i is the score on a scale of 0 to 100
X_i is the attribute value
X_{min} is the mininimum attribute value
X_{max} is the maximum attribute value

Using the value functions the Performance Matrix is converted into a scoring matrix.Table 3 Scoring Matrix

Table 3: Scoring Matrix

Vehicle Category	Costs			Benefits						
				Economic	Social		Environmental			
	CAPEX	OPEX	Charging infra cost/ charger	Fuel Saving	**Job Creation**	**Gender Equity**	Air Pollution			GHG Emissions
							PM	SOx	NOx	
Two Wheelers (2W)	100	100	100	0	0	0	1	0	0	0
Three Wheelers (3W)	100	100	87	1	17	0	1	0	1	1
Cars 0 Personal	89	98	59	4	33	67	0	1	4	3
Cars 0 Taxi	89	81	59	12	67	33	14	3	12	8
Buses (mini)	27	17	0	55	83	100	91	91	55	42
Buses (standard)	0	0	0	91	100	100	91	91	91	70
Truck (LDV)	94	23	0	60	83	0	100	100	60	53
Truck (M&HDV)	54	5	0	100	67	0	100	100	100	100

3.5.3. Criteria Weighting

Table 4: Criteria Weighting

Criteria Weighting	Base	Revised	
Attributes			**Attributes details**
Costs- Capital	15	15	Capital cost is apportioned with 15 points because of its importance in the overall cost of the project.
Costs- Operational	15	15	Operational cost also cary the same points since running of a new technology is critical for long term.
Costs- Infrastructure	10	10	Introduction of this new technology will certainly require new infrastructure investment
Economic- Fuel savings	15	10	The shift from ICU to EV must result in fuel savings
Social – Job creation	15	15	The money saved from introduction of the new technology must be able to enhance further investments
Social- Gender Inclusion,		10	Decision made by stakeholder to also include gender inclusion and accordingly weights were redistributed
Improved air quality#	15	10	Air pollution is critical factor in the technology selection
GHG reduction,	15	15	The implementation of EV must contribute toeards reduction of GHG emission
Total	**100**	**100**	

It was decided to have only one air quality indicator and therefore PM which is a very common criteria pollutant was used.

3.6. Results and Sensitivity Analysis

The result showed that Bus (standard) is ranked as the number one prioritised category for EV implementation in the country for passenger transport in Table 5. This was followed by, bus (mini), four wheelers (taxi), three wheelers, two wheelers and four wheelers (personal).

Amongst the vehicles used for freight transport heavy duty trucks came as the number one priority followed by trucks (light).

Table 5: Vehicle Priority Ranking

	Costs			Benefits						
Vehicle Category	CAPEX	OPEX	Charging infra cost/ charger	Fuel Saving	**Job Creation**	**Gender Equity**	Air Pollution	GHG Emissions	Total Score	Rank
Two Wheelers (2W)	1500	1499	1000	0	0		9	0	4008	5
Three Wheelers (3W)	1500	1500	867	15	250		9	12	4153	4
Cars - Personal	1339	1465	593	56	500		-	39	3992	6
Cars - Taxi	1329	1220	593	182	1000		216	125	4664	3
Buses (mini)	400	260	0	825	1250		1.359	636	4730	2
Buses (standard)	0	0	0	1368	1500		1.359	1054	5281	1
Truck (LDV)	1416	349	0	905	1250		1.5	802	6222	2
Truck (M&HDV)	803	71	0	1500	1000		1.5	1500	6374	1
Weight	15	15	10	15	15	0	15	15		

Sensitivity Analysis Result

This result was reviewed by stakeholders and after some deliberations, gender was included as one of the critical assessment criterian that must be considered in the MCA prioritisation process. This is uninomusly aggreed by the stakeholders considering gender inclusion must be considered in all these aspects of the government project development, also in-line with the TNA requirements.

With the sensitivity analysis, we included gender in the MCA matrix (Table 6) , run the additional data and found that bus (standard) still prioritised as the first ranked category of vehicle to be implemented with EV for passenger transport. This was followed by bus (mini), four wheelers (taxi), four wheelers (personal), three wheelers, and two wheelers.

With both the result with the sensitivity Analysis tests bus (standard) came out as the most preferred (to be prioritised). This indicated that majority of the stalke holders wanted bus (standard) to be the first vehicle for EV implementation.

Table 6: Prioritisation after Sensitivity Analysis

	Costs			Benefits						
Vehicle Category	CAPEX	OPEX	Charging infra cost/ charger	Fuel Saving	**Job Creation**	**Gender Equity**	Air Pollution	GHG Emissions	Total Score	Rank
Two Wheelers (2W)	1500	1499	1000	0	0	0	6	0	4005	6
Three Wheelers (3W)	1500	1500	867	10	250	0	6	12	4145	5
Cars - Personal	1339	1465	593	38	500	667	-	39	4640	4
Cars - Taxi	1329	1220	593	121	1000	333	144	125	4865	3
Buses (mini)	400	260	0	550	1250	1000	906	636	5002	2
Buses (standard)	0	0	0	912	1500	1000	906	1054	5372	1
Truck (LDV)	1416	349	0	603	1250	0	1	802	5421	1
Truck (M&HDV)	803	71	0	1000	1000	0	1	1500	5374	2
Weight	15	15	10	10	15	10	10	15		

3.6.1. Attitude of stakeholders for EVs

Introduction of EVs represent totally a new concept and technology as there is none in the country. This comes with great interest and skeptism on how the technology will work and perhaps sustained in the long term. Regardless of such attitude towards the proposed technology there is a high level commitment by the stakeholders which supported by the Government's ambition to reduce its GHG emission due to the direct impact of climate change both at national and global level. To solve the global climate crisis, the stakeholders agreed that we need to make the vehicles on our roads as clean as possible.Emissions from cars and trucks are not only bad for our planet, they're bad for our health. Air pollutants from gasoline- and diesel-powered vehicles cause asthma, bronchitis, cancer, and premature death. The long-term health impacts of localised air pollution last a lifetime, with the effects borne out in asthma attacks, lung damage, and heart conditions.

With such culminating attitude and perspective, the stakeholders agreed that the country should first introduce EVs with the public transport sectors and with corporate companies providing transport privately to their company or ministry employees then to other vehicle categories.

3.6.2. Priorities for EVs

From the stakeholders workshop, below are the results of the prioritisation result with justitication why the category is preferred ahead of others.

3.6.2.1. Passenger Transport

Bus (Standard)

Standard bus is mainly owned and operated by companies, government ministries, and state-owned enterprises (SOEs) for transportation of employees, pick-ups, and drop-offs, of children from schools (as part of the employment benefits of certain companies in the country) etc. According to the participants at the prioritisation workshop, these companies, SOEs and government ministries have the capacity and resources to invest in this expensive and low-emission technology. This technology category should be first introduced with the EV implementation in the country. Investing in Bus (Standard) will also help in strengthening of public transportation system and contribute to improved accessibility for socially disadvantaged groups such as women, children, older people.

Bus (Mini)

Mini bus is the second prioritised category for EV implementation in the country. Besides the standard bus as described above, a good number of individuals or transport operators used mini bus technology as means of providing public transport. Almost all short routes from the feeder roads into suburbs and other destinations from the central bus stations, used mini buses as mode of transportation. Thus, according to workshop participants, its only wise to secondly introduce EV model after successful implementation with the standard bus in the country. Once again investing in Bus (Mini) will help in strengthening of public transportation system and contribute to improved accessibility for socially disadvantaged groups such as women, children, older people.

Four Wheelers (Taxi)

The third prioritised category is the four (4) wheelers but used as public transport- as taxis. There is a potential that taxi operators could use the technology for their business operations. In the Solomon Islands, taxi operators are usually individuals who operate in this business. Some also operated by companies but very minimal. Nevertheless, there is potential that some taxi operators could invest in this technology.

Four Wheelers (Private)

Beside the standard bus and mini bus categories, four (4) wheelers are used by individuals for private purposes is ranked 4th in the prioritisation list. This prioritisation is based on the perception that certain individuals and companies could also be able to invest in this technology besides public purpose ownerships. It is also noted that many SOEs, government ministries and corporate business houses also invested and operating four wheelers for private uses. The workshop participants also perceived that these vehicles should also be introduced with the EV system.

Three Wheelers

The three (3) wheelers are the fifth category to be prioritised by the workshop participants as part of the technology prioritisation. It is noted that three wheelers are not a popular transport option in the country. Some individuals own this technology but it's not a technology that you will see every day in Honiara City.

Two wheelers

Two (2) wheelers or motor bikes as it commonly known in the country and by workshop participants is the least common category of all the technologies. Like three wheelers not so many people own a bike in the country, beside few operated by the Royal Solomon Islands Police Force. You can't see them on the road on daily basis, but at some special occasions only. Although, it is the cheapest category according to our CTO analysis but, it's not a popular mode of technology which could attract many users' ownership and investment.

3.6.2.2. Freight Transport

Truck (Light Duty)

Light duty Trucks are used mainly for loading of goods, market produces and other commodities. This is prioritised 1st according to the workshop participants for freight. It is also noted that majority of light truck operators are on Malaita Province, the most populace province in the country.

Truck (Heavy)

Heavy duty trucks are operated by business houses such as Tongs corporations Limited, Red devils and others in the market. According to the workshop participants, this group has the money to implement the EV system but for now, they will likely remain using diesel and ICs. Very few operators in the country.

4. Total Cost of Ownership (TCO)

ICEVs and EVs both are different technologies as they have different powertrains, operational requirements and Maintenance practices. Total cost of ownership is an effective tool which helps comparing different technologies on the cost parameters. The operational parameters of vehicle such as daily distance travel, vehicle efficiency, fuel tariff, maintenance, manpower requirement and others can be translated to the cost requirement and give a consolidated effective cost required throughout vehicle's life and operated (estimated/actual) kilometres.

The Total Cost of Ownership (TCO) study is undertaken to compare different ICEVs and equivalent EV segments using the costs (capital expenditure-Capex. and Operational expenditure-Opex) involved in their operations[4]. The different Capex and Opex costs are annualized (i.e., adjusted to reflect a value on an annual basis) to arrive at total yearly cost, which is then used to derive TCO in USD per km.

The Capita Costs (Capex) include;

- ICEVs – Vehicle cost
- EVs – Vehicle, Battey and Charging Infrastructure cost

The Operational Costs (Opex) include;

- ICEVs – oil/diesel, annual maintenance, manpower and insurance cost
- EVs – electricity, annual maintenance, manpower and insurance cost

There are some other parameters common across ICEVs and EVs; such as the financing cost for which an annual rate of 10%[5] is considered.

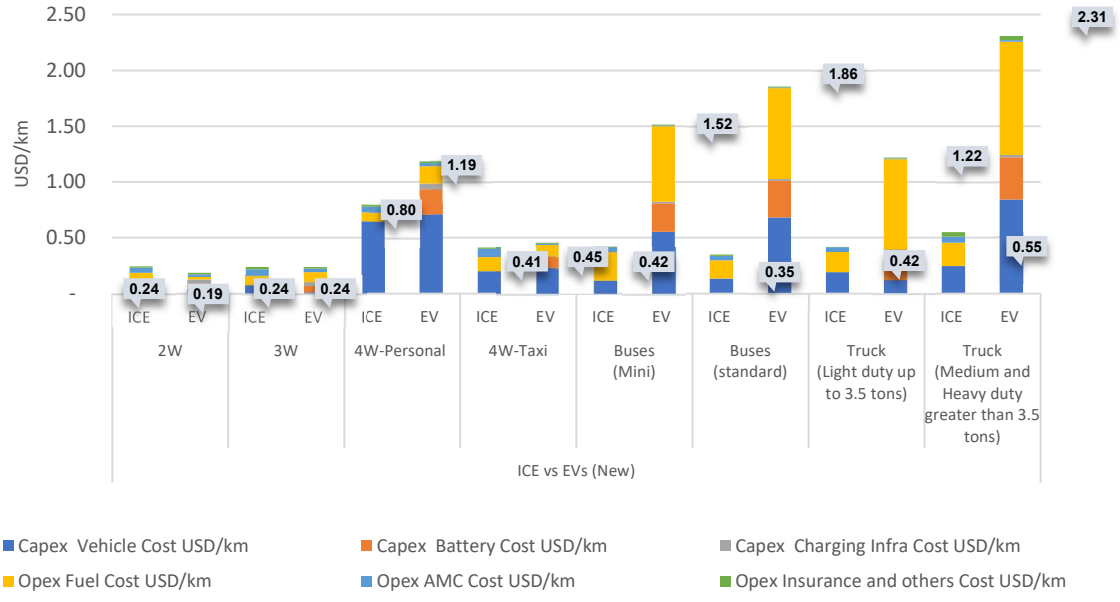


Figure 8: TCO of ICE vs EVs (New) across different vehicle segment

[4] Stakeholder consultation reference
[5] Global best practices and financing rates

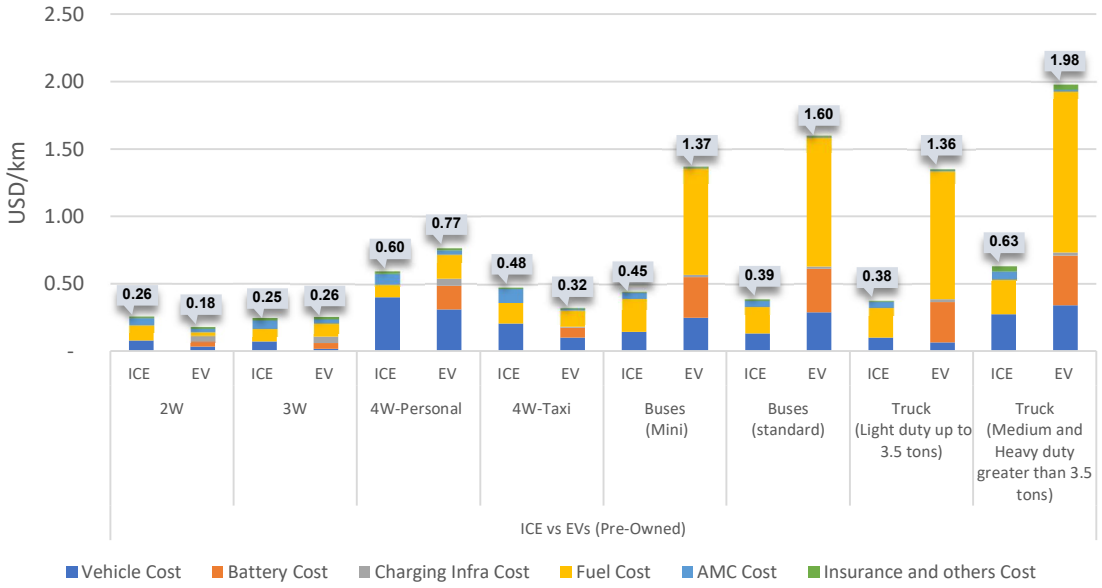


Figure 9: TCO of ICE vs EVs (Pre-Owned) across different vehicle segment

The **Figure** 8 and **Figure 9** represents the comparative TCO analysis of all vehicle segment for new and pre - owned vehicle. It can be observed that, TCO for EV 2-W and 3-W vehicle segment is lower than their ICEV counterparts. For 4-W personal and taxi segment the TCO for new EVs respectively 54% and 53% is higher than new ICEVs. Relatively, TCO for new EVs is higher than that of ICEV counterpart due to higher vehicle, battery and battery capitalisation, compared to their ICEVs counterpart. The TCO for new e- Bus(mini) is respectively 6 times higher, and new e- bus (standard) is 4 times higher compared to their new ICEV counterparts, as a result of both high Capx and operational cost. The operational cost of e-Buses is high due their daily operational kilometres i.e. 120 km; and high electricity tariff in the country. Therefore, this vehicle segment will require government support to bring down its TCO and Capex to parity with its ICE counterparts. For freight vehicle segment the TCO of new light duty truck is 1 time higher and for heavy-duty e-truck is 3 time higher, compared to its ICE counterpart. These similarly follow th trend of buses with having high Capex and Opex.

Considering the advancements in battery technology with improving energy density and scale will drive overall EV battery cost reduction in future. Which in turn will drive further lowering of TCO over years for different vehicle segments. Till then, at the initial stage government support (fiscal/non-fiscal/ subsidies) will be required for EV adoption and scale up in the Solomon Islands.

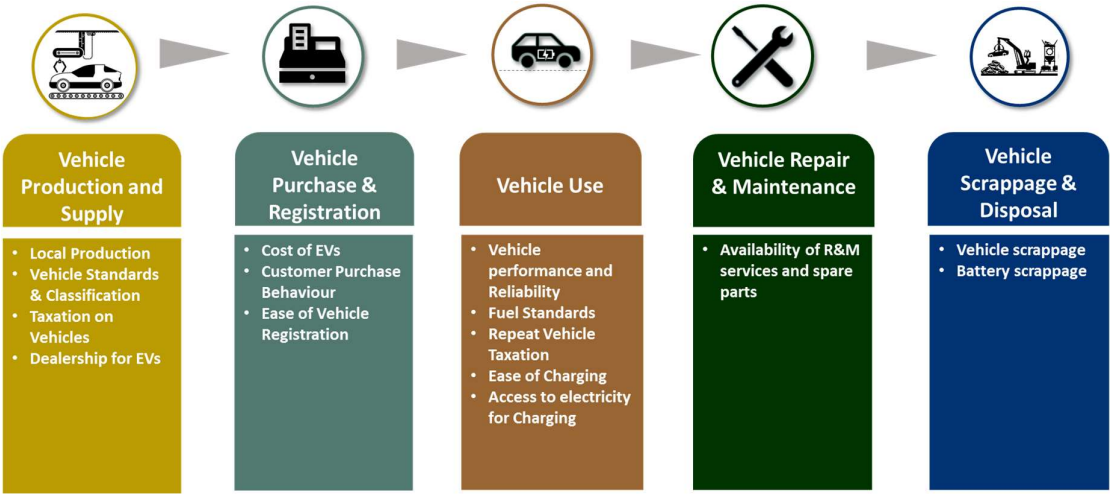
5. Barriers for Prioritised EVs

5.1. Methodology for Barrier Analysis

Barrier analysis is undertaken to map the behavioural patterns of all involved entities and stakeholders across the lifecycle of vehicles (ICEVs- Internal Combustion Engine Vehicles and EVs- Electric Vehicles). It includes mapping the challenges and barriers in the adoption of EVs (Existing and envisaged barriers after EV Penetration). Further, to mitigate these barriers, potential policy options are identified basis to global best practices for EV policies, and stakeholder's consultations (*Refer:* ***Figure 11***); building on to existing policies and plans.

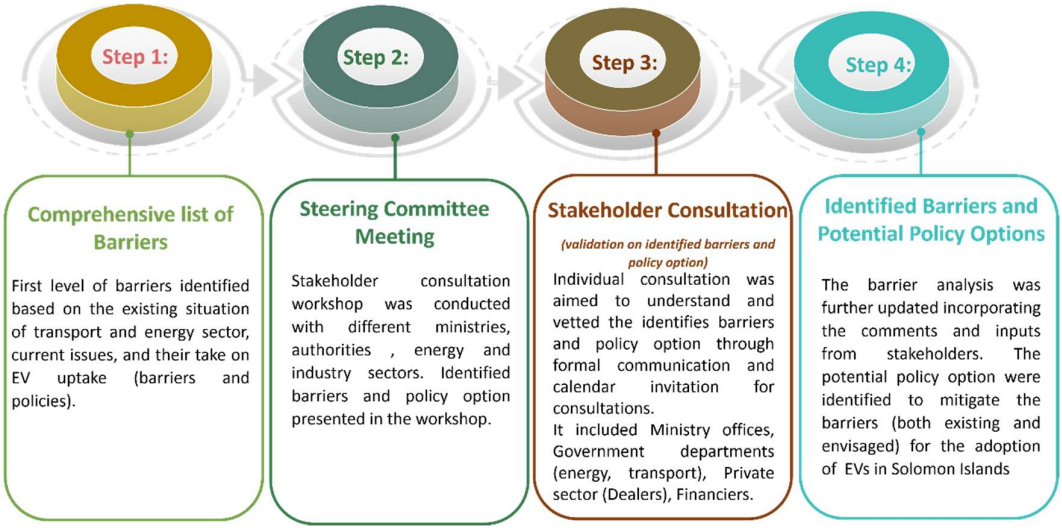
The value chain of vehicles is mapped across **production, purchase and registration, regular use, repairs and maintenance, and final vehicle scrappage and disposal**, as shown below.

Figure 10: Value chain of vehicles (ICEVs and EVs) across lifecycle



The barriers are identified in consultation with local experts and stakeholders, involving Govt. and industry players and further grouped under Economic and Financial barrier (E), Technological barrier (T), Institutional barrier (I), Infrastructure barrier (Inf), Social barrier (S), Market barrier (M), Regulatory barrier (R) and Policy barrier (P).

Figure 11: Process of stakeholder consultation



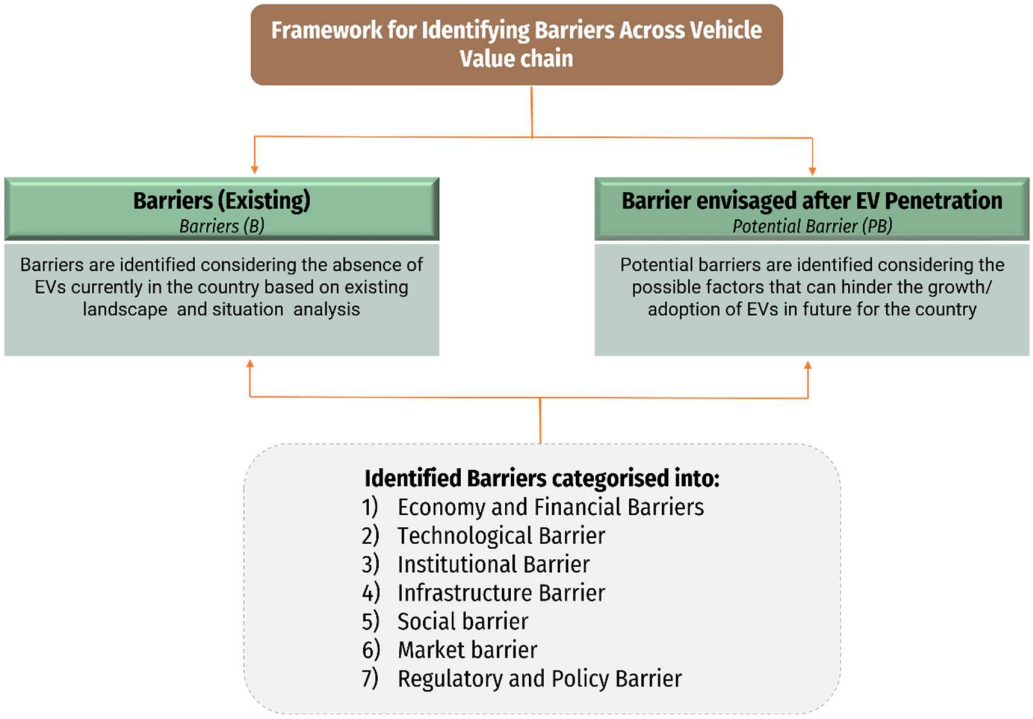
5.2. Framework for Identifying Barriers and Enabling Measures

The barriers were identified in the two parts across the value chain of the vehicle explained in ***Figure 12***.

1) **Barriers (Existing- B):** Identified considering the absence of EVs currently in the country based on existing landscape and situation analysis.
2) **Barrier envisaged after EV Penetration (Potential Barrier- PB):** Identified considering the possible factors that can hinder the growth/ adoption of EVs in future for the country; provided adoption of EVs.

The first list of potential policy option is mapped across the barriers (Value chain, and type of barriers); that could be considered for e-Mobility adoption and growth in the Solomon Islands. The policy options were benchmarked for identified barriers from global best practices and discussed with local experts and stakeholders.

Figure 12: Framework for Identifying Barriers



5.3. Overview of Barriers to EV adoption across value chain

This section analyses the AS-IS assessment of the country and the barriers across the value chain of the vehicles.

5.3.1. Vehicle Production and Supply

The Solomon Islands has a 6.78 lakh population having a total registered vehicle of 40,126.[6] Having limited local capacity and resources the country is mainly dependent on the import of vehicles predominantly coming from Japan. Vehicles being imported into the country are primarily pre-owned vehicles that do not have any import age limit restrictions.[7] Average age of vehicles

At present the country do not have defined fuel and vehicle standards for vehicles. The imported fuel is equivalent to EURO 2; and vehicles are equivalent to EURO 3 and lower for vehicle standards.[8] The importation of low-quality and aged vehicles trend is likely to continue in future for the importation of EVs in the country. The lack of regulation in the direction to protect the environment in terms of vehicle standards, fuel standards, and air pollution regulations shrinking the scope of the adoption of low carbon technologies (EVs) in the country.

As there are no local manufacturing capabilities and primarily dependence on imports, it is likely to follow the same trend for the import of EVs. In addition to that, having a limited number of vehicle dealers are likely to retain their monopoly in the market. The existing less demand for EVs due to lack of knowledge and understanding of this new technology (Evs); may hold back the industry acceptance/development of EVs and vice-versa.

low affordability of the users and cheap prices of pre-owned ICEVs compared to new vehicles are leading to an increase in low-grade imports and eventually adding low-quality and

[6] Inland Revenue Division Solomon Islands
[7] Import Regulations in Solomon Islands for Japan Used Cars
[8] Stakeholder consultations

inefficient vehicles into the fleet. No existing market for Electric vehicles (EVs) in the country creating the void that causes invisibility and unawareness about EVs.

The vehicle classification system at present used for registration is based on ICE vehicle weight and CC capacity. It makes no distinction between EVs and their types (such as BEVs, PHEVs, HEVs, FCEVs). This will restrict the options for recognising EVs during import/registration/periodic renewals and further incentivise them (such as exemption import duty, etc.) for higher adoption.

ICE imported and registered in Solomon Islands are subject to pay about, 15% customs and excise charges duty for light Vehicles (including car) and 10% for all buses and heavy vehicles. In addition to that, the Goods Sales Tax (GST) is charged by Inland Revenue Division (IRD) but it is collected by Customs at the rate of 19.5%.[9] Given the high purchase cost of EVs, the current import duties will increase EV vehicle purchase and registration costs. This can lead to a decrease in the adoption of EVs in the Solomon Islands.

At present, there is no push from the government side to encourage the adoption of EVs in the country. The absence of planning and goals (long/short term) for Electric vehicle adoption will hold back the market growth, customer acceptance of EVs, and all-over ecosystem development in the country.

5.3.2. Vehicle Purchase and Registration

In Solomon Island, vehicle registration needs to be done every year for private vehicle segment and quarterly for light and heavy public vehicle segment. Currently, there is no separate category to register EVs in the country or any financing mechanism/ reduced taxes for EV purchases. This will limit options to differentiate EVs during registration and further incentivise them (like exempted registration charges, etc.) for higher adoption. In addition to that, the vehicle license is required to update a maximum of every 5 years. During every renewal process, the change in the number plates also misses to keep the track of vehicle age, performance, overall history, and presence in the country's vehicle stock.

Presently, pre-inspection checks and standards are absent for importing ICEs into the country and will likely to be continue for EVs in future. This will lead to add up to the existing polluting fleet and will require frequent maintenance. This will mount up the operational cost of a vehicle and may affect the vehicle's life also.

EVs are relatively new and more expensive than ICEVs vehicles. Given the high upfront cost (cross reference of TCO section) of EVs vs ICEVs as discussed earlier, similar registration fees and taxes will make EVs significantly more costly and uneconomical for customers. The detailed vehicle registration and licensing fees for all types of vehicles are given in the **Annexure: 1** Vehicle registration and licensing fees

Compare to the global average lending interest rate of 10.31 % for 2020 (based on 82 countries) the country has a very high-interest rate of 15% to 17% for bank loans. Higher interest rates, as well as the lack of a financing mechanism/loans for vehicle purchases, will make EVs even less appealing and costly. Taking all of this into consideration will result in customers opting for less expensive and higher-emitting vehicles.[9]

The country has a lack of consumer awareness about the benefits of EV technology. There are no targeted campaigns to create mass awareness of EVs, and their benefits over ICEVs. Unawareness of technology raises concerns, particularly for EVs, about range, charging time,

[9] Stakeholder consultation

charger accessibility, electricity supply, repair parts, serviceability, and general safety, which influences customers' decisions to opt for EVs.

5.3.3. Vehicle Use

ICEV vehicles currently used in the country have EURO 2 / EURO 3 standards. Having no regulation for standards, periodic check for quality control and parity across the vehicle and fuel standards will lead to increase the air pollution in the country. As per ICCT research "Applying the stringent limit on vehicle emission can force the technologies that can reduce the emission of local air pollutants by more than 99% over uncontrolled Vehicle".[10] In the case of hybrid electric vehicle adoption in future, the lower standards and limited regulations will not give the country full benefits EV adoption.

To build confidence in the customers and visibility about electric vehicles required pilots, research, and development (R&D) initiatives that cater the path to the widespread adoption of the EVs countrywide. As of now, there are no pilots done in the country for EVs implementation, which lower the consumer confidence to adopt this new technology as their daily travel mode. No pilots in the country will limit the scope of R&D, and areas of advancement in automobile industry based on the learning from pilots.

To run EVs availability of electricity and adequate charging infrastructure holds at most importance. While, in Solomon Island the lack of availability and reliability of power supply is one of the major challenges for EV adoption and may reduce the confidence of users.[11] As per country's second national communication, 2017 only 20% of the national population of Solomon Islands has access to electricity.[12]

In country ~ 80% of generating capacity and 87% of all energy generated come from diesel-fuelled power generators.[11] High accountability of fuel in electric generation mix leading to high electricity tariff in the country. As per Solomon Islands Electricity Authority (SIEA) Tariff Report 2021, the current tariffs are among the highest in the world. The cost of power generation is highly influenced by the market price and transportation cost of fuel and extremely high electricity tariff is set to ensure the sound management of Solomon Power (SP).[13] Being a low-income country the existing tariffs are very unaffordable for 40% of the households.[14] The country has an average electricity tariff of 0.83 USD/ kWh for domestic, 0.77 USD/ kWh for commercial, and 0.76 USD/ kWh for Industrial.[15] The global world average electricity price for domestic is 0.138 USD/ kWh and 0.128 USD/ kWh for business users.[16] The high cost of electricity with a lack of reliability may hinder the adoption of EVs concerning high operational costs.

The country has a high potential for renewable energy integration specific to solar power. Current electricity legislation/regulation and institutional framework do not specifically support solar PV projects as a specified development, preventing decentralised solar power solutions.[17] In Solomon the feed-in tariff/net metering mechanism is not applicable for the excess energy from domestic and commercial PV systems (meter only records power consumption from grid). Currently, there is an inadequacy regarding government assistance schemes for Solar PV installation or renewable energy certification and that will discourage

[10] Impact of stringent fuel and vehicle standards on premature mortality and emissions
[11] Electrification in Oceania: Case Study of the Solomon Islands
[12] Solomon Islands Second National Communication, 2017
[13] The Project for Formulating Renewable Energy Road Map in Solomon Islands, May 2021
[14] Cost of service study and tariff review, Tariff Report - 2021
[15] Electricity (Charges for Supply), December-2021
[16] Global electricity prices, 2021
[17] Solomon Islands Electricity Access and renewable Energy Expansion Project (Phase Ii), December 2017

the customers to install solar PVs. In addition to that, there is an absence of charging infrastructure in the country which reduces the confidence in EV users to perform normal trips and timely re-fuelling. Considering the high domestic electricity cost, absence of charging infrastructure and low thrust for solar installation will become a significant barrier to the adoption of EVs in the country – especially for private vehicle owners as home charging will be significantly expensive.

5.3.4. Vehicle Repairs and Maintenance

One of the major challenges in automobile sector in Solomon Island is having limited local capacity and skills for manufacturing as well as Repair and Maintenance (R&M) of vehicles, especially for electric vehicles. Existing R&M services with under-skilled set-ups cannot serve EVs efficiently as required and hence may result in lowering users' confidence in operating EVs. In the absence of a standard procedure for periodic vehicle inspection for health checks and roadworthiness, the limited R& M service will become a barrier for EV adoption in the country.

5.3.5. Vehicle Scrappage and disposal

Vehicles scrappage and disposal is an essential part of the value chain of vehicles. The Solomon Islands do not have any scrappage policy at present. Previously imported ICEVs are still running on the road includes older and highly polluting ICEVs. There are no current efforts toward getting old and polluting vehicles out of the system and off-the roads by Government.

A similar trend could be established for EVs with pre-owned EVs market. EVs come with batteries which is a distinct part of EVs than that of ICEVs. Apart from the vehicle body the battery also has disposable as well as reusable parts that can generate good economy through second use for different other purposes. Batteries are subject to replacement and still have 70% of their usable capacity after the end of its effective life. The used batteries have potential for their second life applications till it becomes waste. In addition to that, batteries cost nearly 30% - 60% of an EV's cost are key to determining EV's Salvage Value. There is no established secondary market /after-market to support EVs and obtain their benefit.

The waste batteries can be made useful by recycling. Envisaged EV uptake is subject to create market for used batteries or else will produce huge electronic and chemical waste which is harmful to the environment. Currently, no policy clearly guides and regulates the disposal of an ICEV and EV in the country.

5.3.6. Gender Barrier Analysis in the Solomon Islands.

Solomon Islands Government recognizes the growing gender inequalities and high prevalence of violence against women and girls and commits to several global and regional commitments to gender equality including the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). Within this contextual background, the perception towards gender particularly of women and men in the community still have some implications into all walks of life. For example, while the government promotes gender equality in all government departments and ministries there is still evident of gender gap in terms of employment across the country. This also reflected in the vehicle ownership in the country. For example:

i. **Two wheelers** – This vehicle category is perceived to be men's only vehicle type. It is perceived that only men could own and ride a motor cycle in the country. This is clearly demonstrated with the Royal Solomon Islands Police Force (RSIPF) that only male

police officers could use motor cycles even in the country's police force. A barrier still yet to overcome.

ii. **Three wheelers** – Three wheelers are not commonly found technology in the country. This category would be highly relevance to male than female in the Solomon Islands' context. The perception towards this category of vehicle would lean towards male ownership compared to female. This is due to the safety and risk attribute of owing a vehicle of this nature.

iii. **Four wheelers (Personal)** – This is a popular category amongst both male and female across the country. However, private four-wheeler owners in a household would mainly be the male members, who are perceived as main income-earners in a family. It is also likely that if a single four-wheelers owned by a household is purchased using household savings, it would be registered in the name of male member of the household and predominantly used by the male member of the household.

iv. **Four wheelers (Taxi) –** The general perception in most of the households across the country would think that males (husbands) in most cases are the bread winners in any family unit. As such, in almost all business ventures often resulted in males always the leading figure or registered person in such undertakings. This usually deprived female's participation and decision making in small businesses including taxi (four-wheeler) category.

v. **Bus (Mini) –** The main public transport in the country, especially in Honiara City and most of the township is by Mini buses. In terms of ownership, most mini bus transports are owned and operated by males compared to females' counterparts. This is reflective of the male dominance society. But with regards to preference to travel, females would prefer to travel by Mini bus than taxi, two wheelers or three wheelers across all locations given that they do not tend to own their own vehicle. Besides, the women from lwo-income households wherein the ownership of a private vehicle is low, women of these households too tend to use bus (mini-bus) as their preferred mode of travel.

vi. **Bus (Standard) –** There are few standard buses in operation across the country. The gender barriers which are prevalence to mini bus category as explained above are also evident in this category of vehicle. Nevertheless, females would prefer to use this category than any of the earlier discussed categories due to its safety perceptions that comes with. In terms of ownership, more males are likely to own and operate this category than females.

vii. **Truck (Light Duty)** - Light vehicles are used primarily by small businesses, rural passengers, and provincial based travelers. In terms of ownership, again it resembles the bus (standard) and mini-bus categories as described above. This is again another male dominant category of vehicle.

viii. **Truck (Heavy Duty)** – There are few heavy trucks in operation across the country. This category is mainly found in Honiara and at logging camps at various locations across the country. This is also a male dominant category including ownership and employment. Females are perceived unsafe to work in this category.

5.4. Identified Barriers and Potential Policy Options

This section represents the key barriers and potential barriers across the vehicle value chain based on the above assessments. The policy options are identified against respective barriers based on the framework explained in **Figure 12** through global best practices and further customised for the Solomon Islands. Since there is one-to-many mapping of policy options to barriers (i.e. multiple policy option helping resolve specific barriers), the policy options are categorised into two groups i) demand-side policy options for stimulating EV adoption and iii) supply-side policy options to stimulate local EV production and growth.

To Read the table:

BL= Barrier Level B = Barrier (Existing) PB = Potential Barriers P = Policy option

5.4.1. Enabling Policies for Economy and Financial Barriers

Table 7 Economy and Financial Barriers with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
1	Cost of EVs	B1	**High cost of EV purchase:** EVs are 1.2 to 3 times higher than ICEVs; Also, no current incentives on EVs purchase.	P1 A	**EV end-user purchase subsidy:** Encourage end-consumers for EVs adoption through subsidising different types of EVs that meets quality and safety standards. The capital subsidy to be linked to battery size	Demand
				P1B	**EV end-user interest subsidy:** Develop mechanisms to allow easy and lower interest rate of financing for EVs (including, any interest subsidy from Govt.)	Demand

		B2	**High Interest rates on Bank loan:** Current rates for bank loan are 15% - 17%. There are no financing options available for vehicle purchase and interest rates are high. (Current interast rate are higher than the gloable Average lending interest rate for 2020 based on 82 countries was 10.31 percent)	P2	**Ease and lower cost of Financing:** Develop mechanisms to allow easy and attractive retail (B2C) and commercial fleet (B2B) financing for EVs at differential reduced interest rates from banks (National banks, Private banks, NBFCs). This to include Individual end-users and commercial fleet operators. Direct banks to include EV financing into their priority sector lending portfolio. Allow accelerated depreciation and/or tax holidays on investment in New EVs	Supply

5.4.2. Enabling Policies for Technological Barrier

Table 8 Technological Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
2	Availability of R&M services and spare parts	B3	**No capacity of repair and maintenance services for EVs:** current R&M service practices only limited to ICEVs vehicles and no familiarity with R&M of EVs (due to no present EVs use).	P3	**Guidelines for strong supply chain and localisation of EVs:** Develop guidelines for OEMs and Dealers to have strong supply chain established with increased localisation for EVs and components, including post-sales spare parts and repair services	Supply

5.4.3. Enabling Policies for Institutional Barrier

Table 9 Institutional Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
3	Administration and Ev goals	PB1	**No current government Support, Planning, and Goals for EVs:** No Government push to encourage the adoption of EVs in the country. Absence of policies, planning would be accountable for continuing import of old polluting vehicles.	P4 A	**EV Adoption Mandate for Govt. Departments:** Mandate different Govt. departments to go for EVs only for their new fleet procurement and/or leasing. This can be made 100% or gradual increase from 50% to 100% in 2-3 years	Supply
				P4B	**Supporting EV pilots and Experimentation:** Encourage EV pilots through EV taskforce coordinating actively with academia and industry; supporting and focusing on running pilots, developing different use cases, viability and scalability of pilots. Enable funding/subsidies and incubation support for purchase, research and implementation of EVs (shared fleet and individual use cases)	Supply
				P4C	**EV Adoption targets:** Set EV targets for different fleet applications (2Ws, 3Ws, cars and buses) for new EVs procurement, gradually becoming 50-100% of new purchase in next 5-10 years	Supply
				P4D	**EV bulk Procurement Mandate for Govt. Departments:** Give mandate to one Govt. Dept to organise bulk procurement of EVs for aggregated demand from Govt. and private offices	Supply

4	Vehicle Standards & Classification	B4	**Indistinct classification of EVs:** No distinct classification for EVs for i) importation ii) registration and iii) periodic renewals	P5	**Revision of vehicle classification:** Revise existing vehicle classification system (separate for passenger and freight transport and distinguishing commercial versus private use) to rightly fit different types of EVs (and any other future vehicle technology)	Supply
5	Ease of Vehicle Registration	B5	**No differentiation of EVs during registration:** Current no separate category to register EVs differently from ICEVs in their respective usage categories.	P6	**Revision of vehicle classification:** Revise existing vehicle classification system (separate for passenger and freight transport and distinguishing commercial versus private use) to rightly fit different types of EVs (and any other future vehicle technology)	Supply
		PB2	**In-distinct Registration fees and taxes for EVs:** No reduced taxes (one-time and recurring) and registration fees for EVs. *(Registration fees, Licensing fees, Custom Duty, GST)*	P7A	**Exemption/ reduction of repeat taxes for EVs:** Exempt the repeat taxes (registration renewal and licensing) on EVs for first 3 years and gradual increase later till EVs are rightly established	Demand
				P7B	**Exemption/ reduction of registration fees and taxes for EVs:** Exempt registration fees, one-time taxes and recurring taxes on EVs (as per revised vehicle classification) for 3 years till right market development and price parity is reached	Demand
				P7C	**Single window clearance for EVs registration and licensing:** Single window clearance system for vehicle registration and licensing (aligned with new and clear vehicle classification system)	Demand

				P7D	**EV Standards (EVs, sub-systems & components):** Develop right EV standards and quality assurance mechanisms, interoperability of technologies, safety and periodic inspection standards across the value chain for different applications and vehicle segments 1. for import - before vehicle purchase 2. After import - on-road use	Supply
		B6	**Iterative registrations renewal process:** Requires vehicles to re-register every year for private (and quarterly for commercial vehicle segments); including change of number plates at every renewal	P8	**Revise and enable uniform Vehicle Registration process**: Revise vehicle registration process keeping the same vehicle number throughout its lifecycle (~15 years). Provision of different numbering system for EVs to identify vehicle type.	Supply
6	Vehicle Performance and Reliability	PB3	**Absence of pre-inspection checks and standards for importing vehicles (ICEVs and EVs):** No serviceability criteria/ inspection for ICEVs. This will likely to be continue for EVs in future leading to the import of aged, low performing vehicles.	P9A	**EV Safety standards (new & pre-owned EVs):** Adopt relevant global quality and safety standards (with customisation) for different types of EVs (new, pre-owned and retrofits), advanced EV battery technologies (no Lead), charging technologies, EVs and chargers' inter-connection and their inter-operability, chargers and grid inter-connection and communication, security against theft and end consumer communications including vehicle to Load/Home/Grid standards.	Supply

				P9B	**Formulation of EV (Vehicle, sub-system & components) Quality, Safety and technology compliance guidelines for dealers to avail subsidies and incentives:** Create guidelines for dealers for right OEM partnerships (both International and National) ensuring EVs quality and safety standards are complied, right subsidy transfer to end consumers, supporting right charging infrastructure and services, and also skilled post-sales repairs and services.	Supply
7	EV experimentation and pilots	PB4	**No EV pilots and experimentation:** Currently no pilots of different use cases of EVs (shared fleet and individual use) to drive improvement in supplies, performance and quality	P10	**EV Technology R&D:** Encourage Technical education (Postgraduate, Degree, diploma, certification courses, ITI courses); start-ups across EV value chain through R&D grants/funds and right incubation support for production, assembly; skill and capacity building. Encourage Academia to introduce EV certification, degree courses driving R&D on various aspects of EVs and low carbon transport and energy practices. (including EV - Vehicles, batteries and sub-systems, EV - Repair and Maintenance, EV - Education)	Supply
8	Battery	PB5	**No Battery recycling/re-use policy:** Battery is most significant part of an EVs. On its end of life, if not disposed properly, it would lead to the pollution through discharge of hazardous material.	P11	**Battery recycle and re-use guidelines:** Develop LIB recycle - re-use guidelines covering collection, storage, transportation and recycle of waste batteries (for suppliers, manufacturers and consumers)	Supply

5.4.4. Enabling Policies for Infrastructure Barrier

Table 10 Infrastructure Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
9	Access to electricity	B7	**Low access to electricity grid and poor power quality:** Currently only 20% of population access to electricity *(As per SIEA's Tariff Report 2021, the current tariffs (among the highest in the word) are very unaffordable for households (40%) being a low- income country).*	P12	**Encourage expansion of electricity infrastructure:** 1. Drive Govt. and private investments in National Grid expansion 2. Encourage (DRE) mini grids (by Govt. and Private players) to integrate EVs (including plug-in charging and swap batteries). Allow easy and lower interest rate of financing for DREs 3. Revise/reduce (Concession) the electricity tariffs across different utility sectors and encourage competitive prices across the nation	Supply
		B8	**Low penetration of decentralised solar power solutions:** Currently i) low penetration of solar power/renewable energy, ii) no government assistance schemes for Solar PV installation iii) No Renewables energy certificate scheme iv) Feed-in tariff/net metering is not applicable for the excess energy from domestic and commercial PV systems (meter only records power consumption from grid)	P13	**Encourage Solar roof-top installation (integration with EVs):** Encourage solar roof tops installation for EV users and non-users through preferred net-metering tariffs, subsidies and easy connection from power Distribution co. Provide additional incentives on solar rooftops if integrated with EVs charging.	Supply

10	Charging infrastructure	PB6	**Absence of Public Charging infrastructure:** No public charging infrastructure established in Solomon Islands would disable the visibility of charging	P14A	**EV Charging infrastructure Subsidies and Incentives**: Encourage **industry and Distribution company participation** through attractive fiscal incentives (Capital/ interest/ tax/ electricity subsidies) on set-up of EV charging stations and services. Allow Distribution company to capitalise cost of setting and running minimum public charging stations (until market gets developed)	Demand
				P14B	**EV Charging Tariff revision:** Introduce preferential electricity tariffs for EV charging providers for them to access cheaper electricity. Also introduce Time of Use tariffs at night in residential and commercial building is to encourage overnight charging when there is low demand to reduce strain ion the current grid infrastructure (together with 100% smart meter deployment)	Demand
11	Ease of Charging	PB7	**unavailability of suitable and compatible charging infrastructure:** unavailability of the right charging infrastructure with compatible charging ports and accessories (Across different vehicle segments)	P15A	**EV Public Charging infrastructure Guidelines:** Develop guidelines for public charging infrastructure for right selection of fast charging options and right interoperability. Encourage home and office charging of EVs and facilitate easier new connection or existing sanctioned load revision. This will reduce dependence on public charging infra and waiting time thereof	Supply
				P15B	**EV Home and Office Charging infrastructure guidelines:** Develop new Building codes and guidelines for setting up appropriate charging infrastructure (specially for multi-storied residentials and offices). Include EV charging provision in new building plans.	Supply

5.4.5. Enabling Policies for Social barrier

Table 11 Social Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
12	lack of consumer awareness about EV technology	PB8	**EV Technology Unawareness:** Unawareness of new EV technology performance and lack of knowledge on benefits of EVs over ICEs	P16	**EV Awareness program for users (individual, fleet):** Design and conduct repeat public awareness programs on EVs benefits and support from Govt and local ecosystem, targeting fleet and Individual/private users.	Demand
13	Access to electricity	B9	**Lack of reliable power supply and other customer services by power DISCOMs company:** Lack of reliability and service quality related to new connection, uninterrupted, net metering, billing, collection, and others	P17	**Acceleration of power sector reforms:** Accelerate development of electricity grid network, power generation production capacity for 100% connections and 24x7 power for all.	Supply

Enabling Policies for Market Barrier

Table 12 Market Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
14	Prevailing Automotive Market	B10	**Current no EV demand:** 100% imported vehicles and mostly pre-owned ICEVs. Currently, no EVs in the country.	P18A	**EV Local assembly capital subsidy:** Encourage industry participation through attractive fiscal incentives (Capital/ interest/ tax subsidies) for local assembly of EVs and their sub-systems & components (including local value add of mining raw materials use in EVs)	Supply

				P18B	**ZEV Mandates for Dealers:** Develop ZEV mandate for automotive Dealers OEMs to sell EVs (minimum 20-30% of total vehicle sales)	Supply
				P18C	**EV Awareness program for Automobile Industry Suppliers:** Increased awareness programs to assist ICE suppliers to gradually shift to EVs (vehicle and its components) production and supply.	Supply
15	Dealership for EVs	PB9	**Very few vehicle dealers:** Only three major dealers in Solomon Islands are limiting the availability of different vehicle options and this trend is likely to continue in absence of more market competitors.	P19A	**EV (Vehicle, sub-system & components) Dealership Incentives:** Create growing demand for EVs through right policies, Incentives for dealership of EVs, sub-systems and components	Demand
				P19B	**EV Awareness program for dealers:** Design awareness programs to assist dealers know and appreciate EVs	Supply
16	Local Capacity Building in R&M for EVs	PB10	**No local expertise on EVs repair & Maintenance:** Currently no expertise present in country for EVs R&M services due to no related education, research and skill development.	P20	**Automobile and EV technology training and skill development**: Develop guidelines for OEMs and Dealers to partner with local institutions and build strong training and certification skill programs to build local expertise with EVs assemble, innovate, repairs & services, retrofitting, driving, etc.	Demand
17	Salvage value of EVs	B11	**No established secondary market/after market to support EVs:** No current market for EVs leading to unavailability of used EVs in the market (and used battery market).	P21	**Vehicle Scrappage/re-use mandates:** Establish scrappage / re-use mandate for different EV types and curb the use of vehicles after end of (20 years) life.	Supply

5.4.6. Enabling Policies for Regulatory and Policy Barrier

Table 13 Regulatory and Policy Barrier with Potential Policy Option

BL1#	Barrier	BL2#	Sub - Components of Barriers	P#	Potential Policy Interventions	Demand / Supply Side
18	Vehicle Standards & Classification	B12	**Un-defined Vehicle Standards for both Pre-owned and New:** No defined vehicle standards (like off-shore inspection for pre-owned vehicles; vehicle emission EURO standards for pre-owned and new)	P22	**Vehicle emission standards (new & pre-owned ICE vehicles):** Develop/Adopt and enforce fuel emission standards for new and pre-owned vehicles (for imports and local production; and for first time registration and repeat use)	Supply
19	Import Taxation on Vehicles	B13	**No differential import duties for new vehicles:** Currently same import taxation structure of 10-15% applies to pre-owned and new vehicles. (10% - Light to medium duty passenger and commercial vehicles, 15% - Heavy passenger and commercial vehicles)	P23A	**Exemption of Import duties on EVs:** Exempt import duties on EVs (new, pre-owned and retrofits) that meets defined quality and safety standards	Demand
				P23B	**Exemption of Import duties on EV sub-systems and Raw materials:** Exempt import duties on EVs raw materials (like cells), sub-systems (EV batteries, chargers, motors etc.), ***CKD kits*** for 5 years till local ecosystem is developed	Demand
20	Fuel Standards	B14	**Lower fuel standards:** Current low/no fossil fuel standards in the country. Fuel with Sulphur content of 500 ppm i.e., EURO: 2 fuel is being used in the country	P24	**Fuel standards revision:** Develop and enforce stricter fossil fuel standards (including petrol, diesel, gas) and their compliance. The fuel standards and vehicle emission standard to be revised and enforced in coordination.	Supply
21	Vehicle	B15	**No vehicle scrappage policy**: Currently no scrappage policy in Solomon Islands leading to uncontrolled practices of vehicle scrappage	P25	**Vehicle Scrappage/re-use mandates:** Establish scrappage mandate for different ICE vehicle types and curb the use of vehicles after end of (20 years) life. Other mechanism could be, allowing vehicles retrofit (with fitness test) to EVs.	Supply

Annexure

Annexure: 1 Vehicle registration and licensing fees

Table 14 Vehicle registration and licensing fees in Solomon Islands

Fees and Payments	Amount (Solomon Dollar $)	Duration
Vehicle registration certificate		
Reprinted vehicle registration certificate	$10	Each
Vehicle license plate	$200	A Pair
Vehicle inspection fee	$138	Each
All retests	$138	Each
Vehicle license		
(a) Heavy public service vehicle (More than 26 seats)	$860	3 months
(b) Light public service vehicle		
i. Light Buses (up to 12 seats)	$344	3 months
ii. Light Buses (13- 26 seats)	$516	3 months
iii. Taxies	$344	3 months
iv. Other including rentals	$344	3 months
(c) Heavy Goods vehicle		
i. More than 7.5 tons, unladen	$6875	1 Year
ii. Tracked Vehicles	$6875	1 Year
(d) Light Goods vehicle		
i. Up to 3.5 tons, unladen	$1375	1 Year
ii. More than 3.5 tons but not exceeding 7,5 tons, unladen	$2750	1 Year
(e) Motor Tractors	$413	1 Year
(f) Trailers	$344	1 Year
(g) Private Motor Cars		
i. Up to 2000 cc	$825	1 Year
ii. Over 2000 cc	$1375	1 Year
(h) Invalid Carriages	Nill	
(i) Motorcycles		
i. Up to 250 cc	$206	1 Year
ii. Over 250 cc	$344	1 Year

Table 15 Vehicle driving licensing fees in Solomon Islands

Fees and Payments	Amount (Solomon Dollar $)	Duration
Provisional Licence		
(a) New	$30	3 months
(b) Renewal	$30	3 months
(c) Reprint/ Replacements	$50	Each
Full Driving License		
(a) New- all Class	$103	1 Year
	$278	3 Year
	$438	5 Year
(b) Renewal - all Class	$103	1 Year
	$278	3 Year
	$438	5 Year
(c) Reprint/ Replacements	$50	Each

Annexure: 2 List of Stakeholders for identification of priorities for eMobility

Workshop held on 31 March 2022

Name	Gender	Organisation	Designation
Barnabas Bago	Male	MEDM / PMCU	NPC
Chris Wagataro	Male	MoFR	REDD+ Officer
Amolol Augwaroa		MOFR	REDD+ Officer
Matthewl Wats		MNPDC	CPO
Michael Happio	Male	MECD	CFA
Cyril Rachman	Male	SINU	
Carlos Sosu		Solomon Power	Planning Engineer
Simalma N		SICCU	MSO
Elisabeth	Female	Tasane B Community	
Veiva Puleka		MECDM	PCO
William Nunutana	Male	MECDM	CCD
Marlchom Zion Row	Male	MECDM	SCCO
Thaddeus Siota		MECDM	DDCCD
Allen K Ofea		SIMA	PO/EPS
David Ol		Pats	SPO
Ronald I		SI Ports	SPO
Rex Solo		IOM	PO
Ashley V			
Westa Takaro		SI Ports Authority	Accountant
Lizzie Teg		Ministry of Lands	Lands officer
Elmar R		Ministry of Lands	Lands officer
Don B			
Nelly K		MECDM	CFO
Moses P		KGA	
Yuyun Q		Pac Sol	Principal Planner
Nancy R		MECDM	TNA / SPO
Elmah P		LLSI	
Malachi B		CCD	
John K		Pacific Casino Hotel	Electricial Supervisor
James S		GPPOL Community	
Lorimu T		GCSI	CC
Chanel Iroi		MECDM	DST

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