THE SOLOMON ISLANDS LONG-TERM LOW EMISSIONS DEVELOPMENT STRATEGY (LEDS)

The Solomon Islands Low Emissions Development Strategy (LEDS) is the result of many individual and team contributions from across government, community, and private sector. We thank all those who contributed to the development of this important long-term strategy.

The Climate Change Division of the Ministry of Environment, Climate Change, Disaster Management and Meteorology led policy development and supported the project throughout. Initiated in 2021 under Director Hudson Kauhiona, the strategy was completed in 2023 under Director Thaddeus Siota with the assistance of Henry Tufah, David Tufi, and William Nunufana.

The Steering Committee for the strategy development was made up from the following: Climate Change Division, MECDM (chair); Climate Resilience Finance Unit, Ministry of Finance and Treasury (MoFT); Ministry of Agriculture and Livestock; Energy Division, Ministry of Mines, Energy, and Rural Electrification; Solomon Power; Ministry of Fisheries and Marine Resources; REDD+ Unit, Ministry of Forestry and Research (MoFR); Ministry of National Planning and Development Coordination; Ministry of Infrastructure Development; Waste Management and Control Division, Honiara City Council; Solomon Islands Maritime Authority; Solomon Islands Chamber of Commerce and Industry; Environment Unit, Environment and Conservation Division, MECDM; Development Services Exchange.

The Global Green Growth Institute (GGGI) provided technical support for the development of the Solomon Islands LEDS. We thank the GGGI team of Katerina Syngellakis, Sakiusa Tuisolia, Daniel Munoz-Smith, Walter Reinhardt, Shenila Saniyog, Noim Uddin, Ashreal Prasad, Shreshtha Ragini, and Nancy Diamana.

The Regional Pacific NDC Hub provided financial support for the development of the Solomon Islands LEDS. The NDC Hub is financially supported through the Federal Ministry for Economic Cooperation and Development (BMZ) of Germany, the Department of Foreign Affairs and Trade (DFAT) of Australia, and the Ministry for Foreign Affairs and Trade (MFAT) of New Zealand.

Foreword

The development challenges for Solomon Islands are real. Our population is young and growing. Our population is spread over a large island chain in the South Western Pacific. Our economy is small and concentrated on forestry, fishing, and agriculture. We need infrastructure, employment, and training opportunities to meet the needs of our people now.

The policies and strategies we produce must meet present needs. This long-term strategy provides steps that we can take now that will benefit us in the short term, while building benefits in the long term too.

Our country has net negative emissions right now. We do not need a strategy to get to net zero. We need this strategy to keep us below net zero while we meet our development needs.

The Solomon Islands LEDS is for Solomon Islanders foremost. It benefits us through finding the necessary steps in key sectors. It identifies the enabling institutions we need to build to access, administer, and report on climate funding.

Over time, and through the strategy contained here, we hope to grow our economy sustainably and inclusively. I commend this strategy to you as the long-term pathway for Solomon Islands.

Honourable Stanley Festus Sofu
Minister for Environment, Climate Change,
Disaster Management and Meteorology

Table of Contents

List of Tables

List of Figures

© GGGI

Executive Summary

This Long-Term Low Emissions Development Strategy (LEDS) provides a vision and a pathway for Solomon Islands to achieve its national economic, environmental, and social goals over the long term. It is developed from within Solomon Islands, for the benefits for Solomon Islanders. This document also meets the Paris Agreement obligations on Solomon Islands to formulate and communicate long-term low greenhouse gas (GHG) emission development strategies.

This LEDS provides a pathway towards a low emissions, equitable and resilient development vision for Solomon Islands by 2050. The pathway is comprised of a 2050 vision, emissions pathway, and steps. The steps move Solomon Islands from a BAU pathway to the low emissions, equitable growth and resilience pathway.

The LEDS serves to complement and support existing short- and medium-term strategies such as the National Development Strategy 2016–2035, sector strategies such as the National Forest Policy 2020, as well as cross-cutting strategies such as the National Climate Change Policy. As the LEDS captures development opportunities across sectors and over the long term, it provides an opportunity to identify pathway actions with benefits across sectors, or over a longer period that might otherwise not feature in the short- and medium-term strategies. The LEDS will directly inform updates to Solomon Islands Nationally Determined Contributions under the Paris Agreement.

The 2050 vision for Solomon Islands guides the pathway and actions detailed in the Solomon Islands LEDS. The vision was developed through national consultations across government, private sector, community sector, and development sector between 2021 and 2023.

Solomon Islands aim to maintain net zero emissions across all sectors by 2050 with equitable economic growth and resilience.

Solomon Islands are estimated to be net negative emissions in 2022 as a result of its large tropical forest area. Forests cover 25 thousand km^2 of the national land area of 29 thousand km^2, or approximately 87 per cent of the country. The removal of carbon dioxide from the atmosphere by these forests currently exceeds the emissions generated by human activity.

Even with Solomon Islands achieving net zero already, all government, private and community sector stakeholders agreed to seek further emissions reductions from human activities. Eighteen steps from six emitting sectors were identified and prioritised to put Solomon Islands on a pathway to low emissions, equitable economic growth and resilience in line with the vision. A further four steps were identified for enabling institutions that span multiple sectors. All steps are outlined in Table 1.

Modelling of emissions pathways in energy, transport, livestock, agriculture, forestry and land use, and waste was used to identify the steps with the greatest emissions benefits.

Solomon Islands' forests are under pressure from logging and land use change, with the continuation of current trends, it likely to drive emissions into net positive over the long term though possibly beyond 2050. The single most impactful action to reduce emissions is to reduce the rate of forest log harvesting and implement sustainable forest management. If the log harvest rate returned to the sustainable level of 250,000 m^3 of logs per year, with accompanying reduction in forest loss and degradation, then the estimated emissions reduction is over 17 million tonnes of CO2-equivalent per year by 2050.

Expanding electricity access is an important policy priority for equitable economic growth but must be coupled with renewable energy generation to reduce emissions. If the 100 per cent electricity access target by 2050 is to be met with renewable energy then the additional new generation capacity is estimated at 87 MW solar and 92 MW hydropower, or equivalent from other sources such as geothermal or biofuels. The capital cost of electrification and renewable energy to 2050 under the LEDS pathway is estimated at USD 1.5 billion, in addition to the USD 500 million cost for the Tina River Hydropower Project in 2028 and the National Electrification Plan to

2032. Through electrification and renewable energy generation, the annual emissions savings from moving to a low emissions pathway is estimated at 126,000 tonnes of CO2-equivalent in 2050.

The transport and waste sectors remain a large proportion of GHG emissions for Solomon Islands to 2050 under both BAU and low emissions pathways. Vehicle standards and efficiency improvements, as well as introduction of electric vehicles and vessels, has the potential to reduce emissions by 253,000 tonnes CO2-equivalent in 2050 from the BAU pathway. The introduction of waste stream sorting facilities also has the potential to reduce emissions by 25,000 tonnes in 2050 compared with BAU.

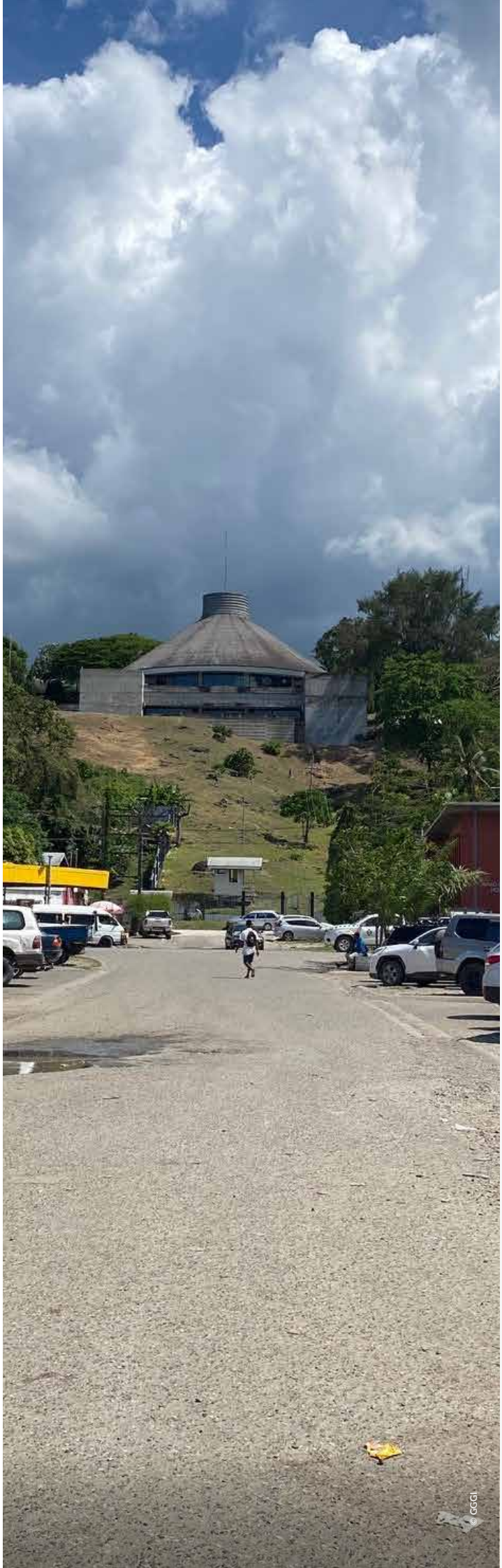
Livestock and agriculture do not currently contribute substantially to national emissions, though they may indirectly contribute through forest land conversion. The aspirations to improve sector productivity will benefit the community resilience as much as reduce emissions.

Over the long term to 2050, Solomon Islands will need to build enabling institutions to achieve its low emissions development vision. The LEDS identifies the need to build enabling institutions in four key areas:

- Consolidate climate and forest protection policy areas to better achieve emissions reductions goals.
- Develop a programme to enable participation in public and private carbon markets, including Article 6 transactions of the Paris Agreement.
- Establish National Climate Trust Fund to consolidate international assistance and financial reporting requirements.
- Establish institutional arrangement to independently measure and report emissions and emissions-related activity.

Solomon Islands are classified as a Fragile Conflict Afflicted State by the World Bank due to institutional and social fragility[1]. The challenges to public administration are multiple. Nevertheless, the proposal for bold changes to enabling institutions in this strategy reflect a genuine desire on the part of all stakeholders for climate action at national, regional, and international levels, and a sustainable pathway.

1 List available here: https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations.



The Solomon Islands LEDS is developed primarily using the publicly available data. As further data becomes available, and national circumstances change, the steps towards a low emissions, equitable growth and resilient future may or will change too. Further updates to the Solomon Islands LEDS may be made as circumstances change.

TABLE 1.

Summary of steps identified to transition Solomon Islands to a low emissions, equitable growth and resilient pathway

Energy
1.1 Increase renewable energy generation, particularly from hydropower and solar.
1.2 Mobilise international and domestic funds for rural electrification.
1.3 Establish a regulatory framework to enable Independent Power Producers (IPPs).
Transport
2.1 Improve land transport efficiency.
2.2 Introduce electric vehicles and charging infrastructure.
2.3 Improved measurement and efficiency of maritime transport.
2.4 Introduce zero emissions technology and infrastructure for maritime transport.
Forestry and land use
3.1 Reduce rate of forest clearing through tighter regulations on access or logging practice.
3.2 Increase forest area protected under the Protected Area Act 2010.
3.3 Community volunteer and private managed forest programmes.
3.4 Reafforestation programmes to replant degraded and previously logged areas with native forest.
3.5 Mangrove replanting and land reclamation for carbon conservation.
Agriculture
4.1 Support organic agriculture to avoid inorganic fertiliser use and Persistent Organic Pollutants (PoPs).
4.2 Improved agriculture practices and technology to improve resilience to climate change.
Livestock
5.1 Develop emissions target for livestock sector, to help guide national reporting of GHGs.
5.2 Stock genetics improvement
Waste management
6.1 Improve landfill infrastructure to better sort and process municipal solid waste.
6.2 Honiara faecal sludge treatment and regulations.
Enabling institutions
7.1 Consolidate climate and forest protection policy areas to better achieve emissions reductions goals.
7.2 Develop a programme to enable participation in public and private carbon markets, including Article 6 transactions.
7.3 Establish National Climate Change Trust Fund to consolidate international assistance and financial reporting requirements, and channel investment into needed areas including R&D.
7.4 Establish institutional arrangements and build capacity to independently measure and report emissions and emissions-related activity.

1.

The 2050 low emissions vision for Solomon Islands

The 2050 vision for Solomon Islands guides the pathway and steps detailed in Solomon Islands Long-Term Low Emissions Development Strategy (LEDS). The vision was developed through national consultations across government, private sector, community sector, and development sector between 2021 and 2023.

Solomon Islands aims to maintain net zero emissions across all sectors by 2050 with equitable economic growth and resilience.

The 2050 vision guides steps in a range of sectors that determine the emissions pathway for Solomon Islands. The important features of the 2050 vision are defined as the following:

- **Net zero emissions across all sectors:** Total national removals exceed total emissions.
- **Equitable economic growth:** Economic growth that benefits all and with equal access to economic opportunities.
- **Resilience:** Community continuity through economic and environmental shocks.

Though the focus on GHG emissions outcomes drives the LEDS, the inclusion of economic, environmental, and social goals in the 2050 vision means that the LEDS incorporates a wider range of concerns than solely GHG emissions. The economic, social, and environmental goals of the LEDS align with objectives of Solomon Islands National Development Strategy 2016–2035.

The five objectives of the National Development Strategy 2016–2035 are the following:

I. Sustained and inclusive economic growth.

II. Poverty alleviated across the whole of Solomon Islands, basic needs addressed and food security improved; benefits of development more equitably distributed.

III. All Solomon Islanders have access to quality healthcare and education.

IV. Resilient and environmentally sustainable development with effective disaster risk management, response, and recovery.

V. Unified nation with stable and effective governance and public order.

2. Context

2.1 PURPOSE OF SOLOMON ISLANDS LEDS

Domestic application

Within the domestic context, the Solomon Islands LEDS complements and supports existing short- and medium-term strategies for low emissions, equitable and resilient development. This includes the National Development Strategy 2016–2035, sector strategies such as the National Forest Policy 2020, as well as cross-cutting strategies such as the National Climate Change Policy.

As the LEDS captures development opportunities across sectors and over the long term, it provides an opportunity to identify pathway actions with benefits across sectors, or over a longer period that might otherwise not feature in short- and medium-term strategies. These actions and their communication into sector strategies are detailed where relevant.

Development of the LEDS allows the Solomon Islands Government to contribute to goals and objectives of preceding policies and strategies including:

- Mainstream climate change by raising awareness and understanding of government and non-government policymakers and the general public about climate change and its causes and consequences and build consensus to facilitate, coordinate, and implement climate change enabling activities. (National Development Strategy, 2016–2035)
- Build capacity of the Government, private sector, and other relevant institutions to undertake regular inventory of GHG emissions and sinks (removals), monitor emissions and removals, establish the national carbon balance, and prioritise emission reduction strategies and actions. (National Climate Change Policy, 2012–2017)
- MECDM to review sector strategies to ensure they cover the same or similar policy objectives, initiatives, activities, or programmes to ensure alignment between strategic and fiscal plans. (Climate Finance Roadmap, 2022)

International cooperation

Solomon Islands LEDS supports international climate action under the Paris Agreement. Through publication of the LEDS, Solomon Islands meets its obligations under Article 4, Paragraph 19, to formulate and communicate long-term low GHG emission development strategies.

To April 2023, 58 LEDS and LTS have been published on UNFCCC website.

Through communication of the ambition and pathway to maintain net zero for Solomon Islands, the Solomon Islands Government looks to other nations to develop credible pathways in line with the Paris Agreement to limit global warming. The Paris Agreement seeks to limit global warming to under 2° C, preferably less than 1.5 ° C, and to reduce emissions to net zero by 2050. To date, 194 states and the European Union have become signatories to the Paris Agreement.

The Solomon Islands Government, through the United Nations Framework Convention on Climate Change (UNFCCC), has communicated its ambitions for medium- and long-term emissions reductions. In the 2021 Nationally Determined Contributions, the Solomon Islands Government has committed to emissions reductions as shown in Table 2.

The scope of the 2021 NDC is the energy sector and forestry. The energy sector actions are renewable energy generation capacity expansion, with a list of unconditional and conditional projects, and energy efficiency through appliance regulation. The forestry sector actions include a forest inventory, introducing a sustainable logging policy, protecting forests above 400 m, increasing the proportion of terrestrial, coastal, and marine ecosystems with a protected area status.

TABLE 2.
Emissions reductions commitments contained in Solomon Islands 2021 Nationally Determined Contributions

Target year	Unconditional	Conditional
2025	14 per cent below 2015 BAU projection (reduction of 6,771 tCO_2-e)	27 per cent below 2015 (reduction of 55,347 tCO_2-e)
2030	33 per cent below 2015	45 per cent below 2015 (reduction of 246,794 tCO_2-e)
2050		Net zero emissions

2.2 SOLOMON ISLANDS NATIONAL CIRCUMSTANCES

Geographical profile

Solomon Islands is an archipelago of 997 islands in the south-west Pacific with a population of 721,455 in 2019[2] and a total land area of about 28,900 km^2 (2,890,000 hectares) spread over 1.34 million km^2 of ocean.

The country population is dispersed across 90 inhabited islands and has one of the lowest population densities (20.8 persons/km^2) and urbanization rates (about 17 per cent) in the world. Distances between islands are quite significant; the north-western Choiseul Island is approximately 1,500 km from the south-eastern Santa Cruz Islands. The population is divided not only by the ocean between islands, but also by mountainous terrain within most islands. The highest mountain ranges are in Guadalcanal and Malaita.

Climate profile

Solomon Islands, like many small island states, is facing increasing vulnerability from climate change and natural disasters. It is among 20 countries with the highest economic risk exposure to two or more geological, hydrological, and climatic hazards that include tropical cyclones, volcanic eruptions, earthquakes, tsunamis, landslides, floods, and droughts.

2 2019 Census provisional estimate. Final results yet to be released.

At the time of the LEDS development, the latest modelling for Solomon Islands[3] projects the likely changes to climate over the period of the LEDS (to 2050) as the following:

- Annual temperatures increase 0.8° to 2.1° C.
- Annual rainfall changes of -5 to +10 per cent.
- More heatwaves.
- More intense rainfall events.
- Greater tropical cyclone impacts.
- Sea level rise from 17 to 37 cm.

More than 80 per cent of Solomon Islanders reside in coastal areas. The preponderance of coastal settlement means a high national vulnerability to sea-level rise. Recent experience with natural disasters such as cyclones, floods, earthquakes, tsunamis, storm surges, and king tides have already displaced many coastal communities.

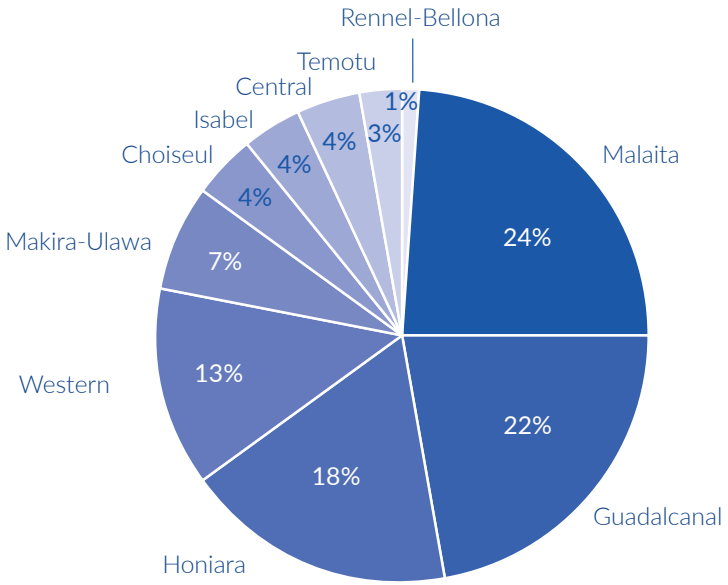
The majority of Solomon Islanders are reliant on subsistence farming and fishing, which also leaves communities vulnerable to weather, pest, disease, and natural disaster-related agricultural and fisheries losses. Incremental losses to livelihoods and subsistence mask the apparent widespread impacts climate change have already had on the population.

Population profile

Solomon Islands has the second youngest population in the Oceania region and a rapid population growth rate. Seven out of 10 Solomon Islanders are under 30 years old[4]. This presents challenges in providing education and health services and presents the risk of large cohorts of young people being without activities that will provide them with income-generating opportunities.

Using the provisional results of the 2019 Census, we find that 64 per cent of the national population is found on two islands: Malaita (24 per cent) and Guadalcanal (including Honiara, 40 per cent).

FIGURE 1.
Population distribution by province, as used in Solomon Islands LEDS (Source: Solomon Islands National Statistics Office 2019 Census Provisional Results)



3 CSIRO SPREP 2019 'NextGen' Projections for the Western Tropical Pacific: Current and Future Climate for Solomon Islands, https://www.rccap.org/uploads/files/78de13fb-77cb-40af-8639-ee48268518ba/Solomon%20Islands%20Country%20Report_Updated.pdf.

4 https://www.undp.org/pacific/publications/solomon-islands-youth-status-report-2018.

Economic profile

Solomon Islands is classified as a least developed country, as well as being classified as a Fragile and Conflict-Affected Situation (FCS) country. Solomon Islands rank 153rd out of 189 countries in the global Human Development Index (HDI) ranking, which is comparable to Papua New Guinea, but below the other countries of the Melanesian group (Vanuatu, 141st and Fiji, 98th). Based on the 2012–2013 Household Income and Expenditure Survey (HIES), about 12.7 per cent of the population of Solomon Islands lives below the basic need poverty line[5].

The COVID-19 pandemic outbreak had a severe impact on the economy. Real GDP growth declined to about -4.3 per cent in 2020 compared to 2.5 per cent in the pre-pandemic baseline, as a result of a decline in logging, mining, and fisheries exports, and a contraction in tourism. The sharp fall in growth has resulted in economic hardship, and there has been an increase in theft and crime, culminating in widespread looting during the November 2021 riots.

Travel restrictions and supply-chain disruptions have delayed infrastructure and mining projects and related activity. The 17th Pacific Games, to be held in November 2023, has provided an impetus for infrastructure construction around Honiara and may provide a boost to the local economy in the national capital province.

Government structure

Solomon Islands is an independent state with a Westminster-style government and constitution composed at independence from Britain in July 1978. An executive government is formed from elected members of Parliament, Parliament retains legislative powers, and independent judiciary and civil service administer justice and government operations respectively. Special features of Solomon Islands Constitution include the ability for Parliament to amend the Constitution, codified functions and collective responsibility of cabinet, and codified safeguards for individual rights to speech, worship, movement, and assembly.

The head of state is the King of England, and is represented in Solomon Islands by the Governor-General. The Governor-General acts on the advice of the Prime Minister and the cabinet. The Governor-General of Solomon Islands is elected by parliament.

The legislative functions are held by an elected Parliament of 50 members. Parliament is required to pass annual budget bills of appropriation.

The executive functions are held by the Prime Minister and nominated cabinet ministers from Parliament. The Prime Minister, elected by Parliament, chooses the other members of the cabinet. Cabinet members are assigned administrative responsibilities for ministries.

The constitution of Solomon Islands can be amended by the Act of Parliament. The most recent amendment to the Constitution was August 2022, for deferral of elections until after the Pacific Games in November 2023.

In addition to the national capital territory of Honiara, nine provincial governments of Solomon Islands are established by the *Provincial Government Act 1997*. The provincial governments are: Western, Isabel, Central, Guadalcanal, Malaita, Makira Ulawa, Temotu, Choiseul, Rennell and Bellona. The powers devolved to provincial government include property tax, local business licencing, agricultural land use, housing standards, fire protection, waste management, markets, and keeping of domestic animals. Provincial governments are primarily funded through the Provincial Fund. Provincial governments have powers to constitute Area Councils. The Honiara City Council is established under the *Honiara City Act 1999*.

5 https://www.statistics.gov.sb/statistics/demographic-statistics/household-income-and-expenditure-surveys.

3. Emissions pathways to 2050

3.1 EMISSIONS DRIVERS

For the purposes of estimating emissions, a simple BAU pathway was developed using population and economic growth as drivers of emissions. The application of population and economic growth to demand or output is shown in Table 3.

TABLE 3.
Where population and economy act as underlying drivers of demand growth in the emissions pathways developed for Solomon Islands LEDS

Demand or output type	Underlying driver of demand growth
> Residential energy demand	Population (People)
> Fuelwood demand	
> Road, sea, and air transport demand	
> Solid waste output	
> Waste water output	
> Commercial energy demand	Economy (GDP)
> Logging harvest output	No driver of growth modelled. BAU pathway maintains current level (2020 or latest available) to 2050.
> Rate of forest land use change	
> Livestock herd size	

The SPC Data for Development Solomon Islands Population to 2050 were used as a population projection[6]. The United Nations Statistic Division also provides a population projection to 2050; however, the SPC population projection more closely matched the 2009 and 2019 Census results. The SPC projected population growth rates over the coming decades are shown in Table 4 below.

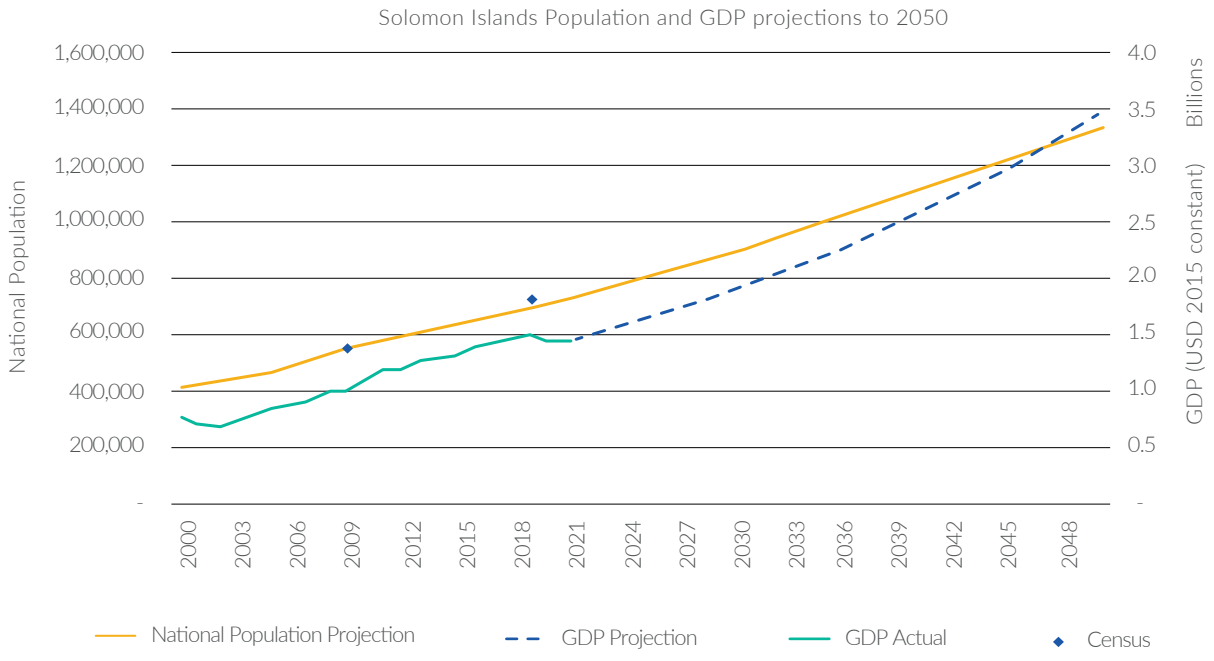
TABLE 4.
National population annual growth rates for decade periods to 2050

Period	Projected annual growth rate
2020–2030	2.1 per cent
2030–2040	2.0 per cent
2040–2050	1.7 per cent

The population distribution by province remains unchanged for the period 2020–2050 in both BAU and LEDS pathways. The population distribution is the provisional results of the 2019 Census, as shown in Figure 1 in the preceding section.

The economic growth projections for the period 2021 to 2050 used the long-term growth rate of Gross Domestic Product (GDP). The growth rate of GDP is 3.09 per cent per year for the period 2001 to 2021. The GDP growth rate of Solomon Islands is variable, which reflects resource-driven economy and conflict events such as ethnic tensions in 2000 and riots in 2021. The projected national population and the GDP for the period 2000 to 2050, including projections from 2021 are shown in Figure 2 below.

FIGURE 2.
Solomon Islands population and GDP projections to 2050 used in developing the BAU and low emissions development pathways (sources: SINSO, SPC Statistical Division, World Bank Statistics, author calculations)



6 Available here: https://sdd.spc.int/topic/population-estimates-and-projections.

3.2 BUSINESS AS USUAL (BAU) EMISSIONS PATHWAY

The BAU emissions pathway reflects the existing development pathway for Solomon Islands, including initiated or confirmed projects.

Energy sector

Within the electricity sector, the BAU emissions pathway includes the development of the Tina River Hydropower Project (15 MW operating from 2028), a range of rural solar-diesel projects are under development or to be installed, and no change to existing efficiencies of generation, transmission, and distribution will be experienced. The rate of electricity access remains unchanged from the latest available; see Table 5 below.

TABLE 5.
Electricity access rates in the BAU emissions pathway (source: 2009 Census)

Province	Rate of electricity access, as measured by proportion of households with a connection to the grid or mini-grids
Choiseul	4 per cent
Western	12 per cent
Isabel	6 per cent
Central	4 per cent
Rennel-Bellona	0 per cent
Guadalcanal	8 per cent
Malaita	3 per cent
Makira-Ulawa	4 per cent
Temotu	3 per cent
Honiara	64 per cent

The commercial and industrial energy intensity remains unchanged in BAU (Table 6). Residual Fuel Oil, also known as Heavy Fuel Oil (HFO), is excluded from the pathway to 2050 as historical consumption is sporadic and there is no known ongoing use.

TABLE 6.
Commercial and industrial energy intensities used in the BAU pathway

Commercial and industrial energy source	Estimate	Units	Calibration years
Electricity	0.0540	kWh/$GDP 2015	2010–2020
Diesel	0.0082	L/$GDP 2015	2000, 2005, 2010
Kerosene	0.0026	kg/$GDP 2015	2000, 2005, 2010
LPG intensity	0.0005	kg/$GDP 2015	2005, 2010–2018

The projected emissions from the energy sector, including transport, are estimated using the LEAP software. The LEAP model demand elements include residential sector, commercial sector, and transport. A summary of the estimates developed for and from the energy sector modelling are shown in Appendix 3. The estimated energy demand (in petajoules, PJ), emissions (in CO2-e and PM2.5) are shown in figures below.

FIGURE 3.
BAU energy demand

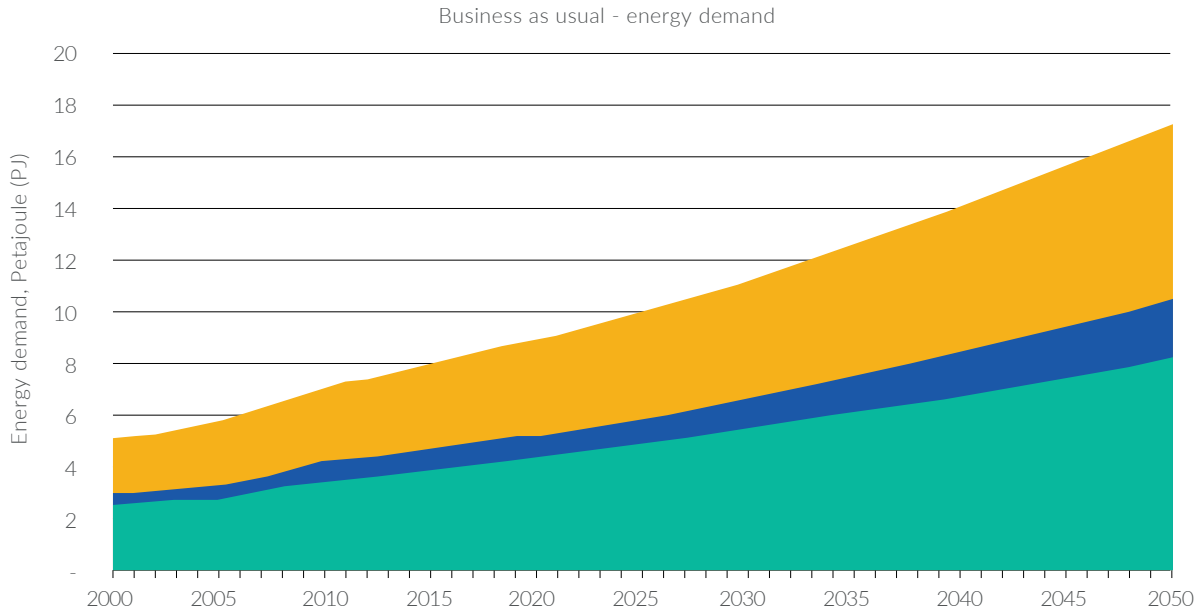


FIGURE 4.
BAU GHG emissions in CO2-equivalent. The commencement of Tina River Hydropower Plant in 2028 reduces the national emissions from electricity generation

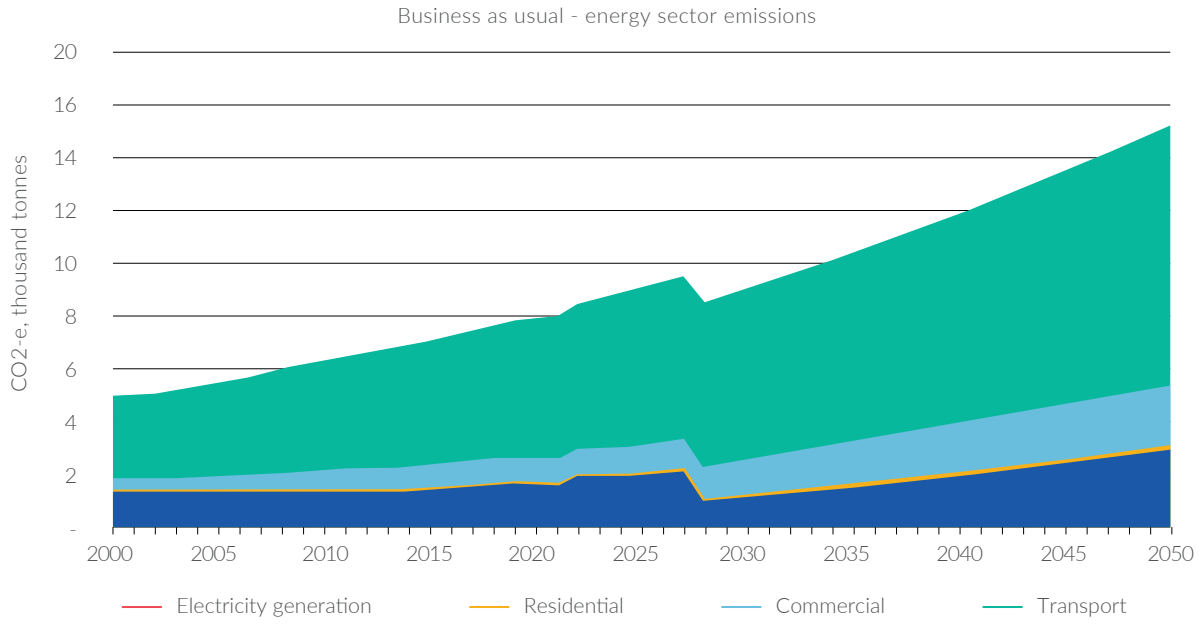
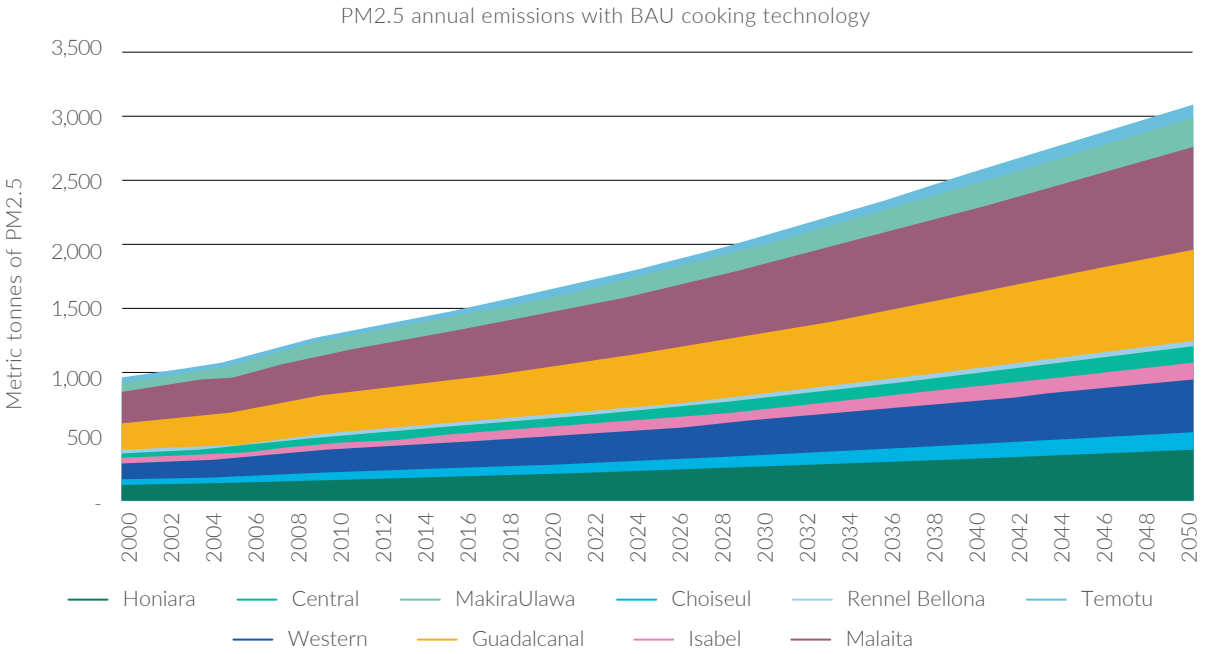


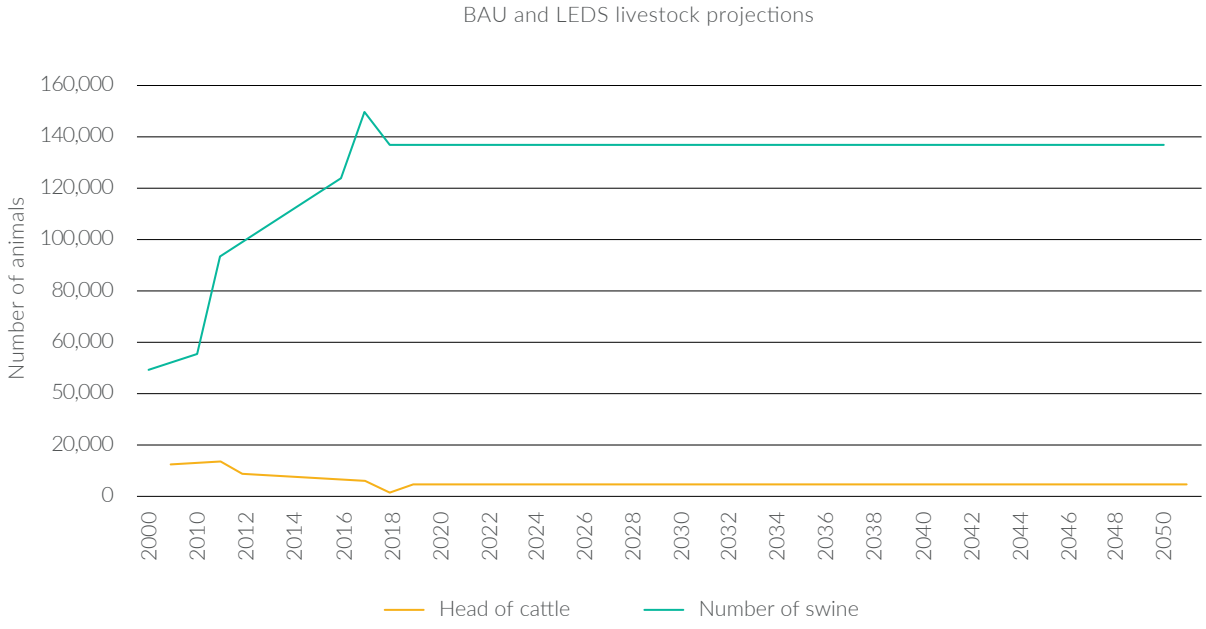
FIGURE 5.
BAU pollutant emissions in PM2.5



Livestock sector

Under the BAU pathway, the livestock sector production and emissions are held constant from the latest available data (2018) to 2050. The same livestock herd sizes are used for BAU as the low emissions pathway.

FIGURE 6.
Solomon Islands livestock herd size projections to 2050. Data up to 2018 are the estimates used in previous greenhouse gas inventory calculations



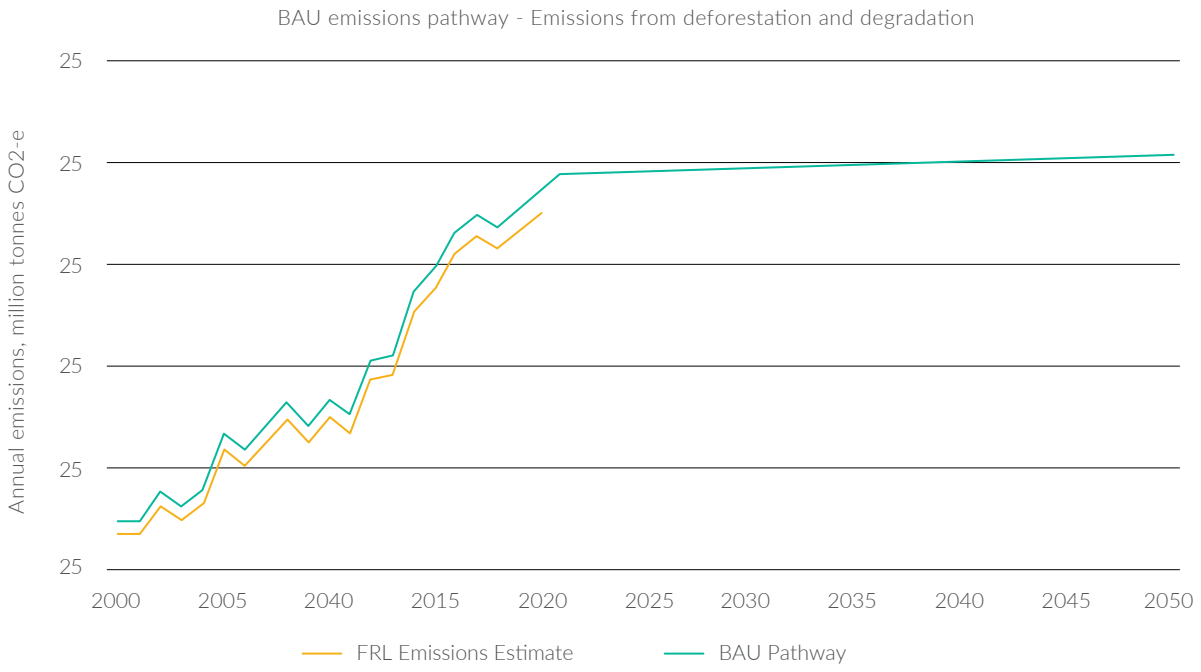
Agriculture forestry and land use

Solomon Islands LEDS benefits from the development of the national Forest Reference Level (FRL) for REDD+ activities in 2019. The FRL provides a detailed analysis of drivers of deforestation and forest degradation, as well as estimates for the years 2001–2017 and projections for 2018–2021.

Under the BAU pathway, the rates of deforestation and degradation are held constant at the most recent available data point (2021) through to 2050 (Figure 7). The largest cause of forest degradation is logging. In 2017, the log harvest reached 3.4 million m^3 and impacted about 70,000 hectares of forest land (about 50 m^3 log harvest per hectare impacted).

FIGURE 7.

Emissions from forest loss and degradation in the BAU pathway. The BAU emissions pathway estimate is slightly higher than the Forest Reference Level (FRL) due to the separate estimation of emissions from fuelwood in this study



Waste sector

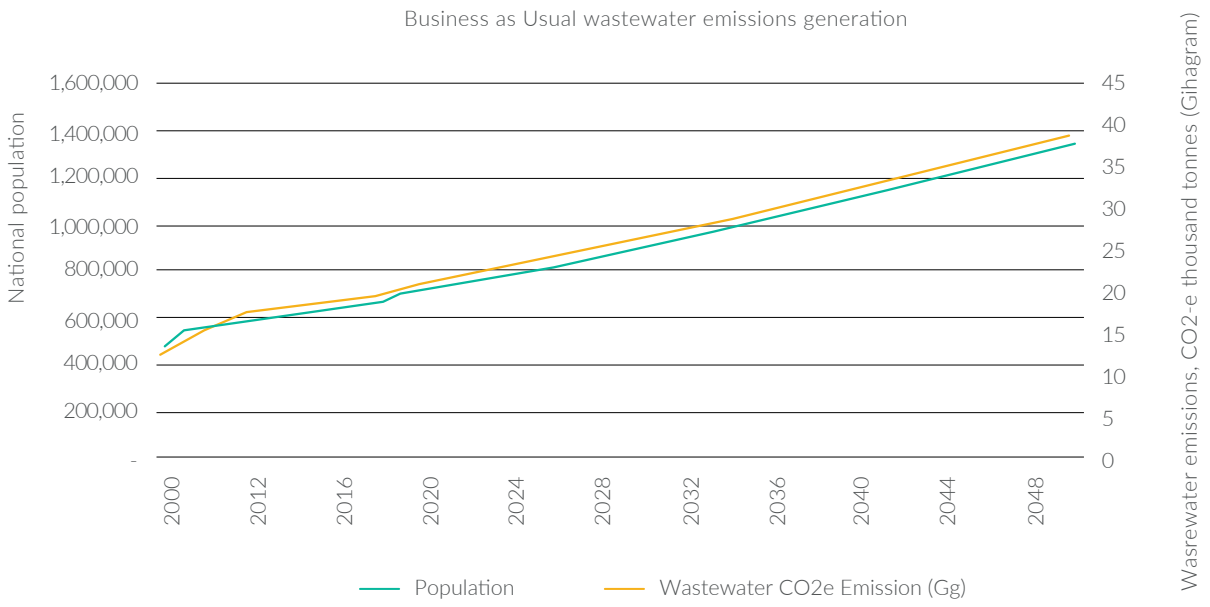
The waste sector emissions include methane from municipal solid waste (MSW) and methane and nitrous oxide from wastewater treatment.

The BAU pathway assumes that solid waste is generated at a constant rate of 0.97 kg per person per day, in keeping with estimates of Honiara waste generation[7]. The waste composition and treatment are projected to stay constant to 2050.

Emissions from wastewater disposal are modelled using a bespoke model built on IPCC 2006 parameters. The key driver for emissions in the BAU pathway is population growth (Figure 8).

7 Data Source: Solid Waste Management Plan (2018–2027); HCC (2019).

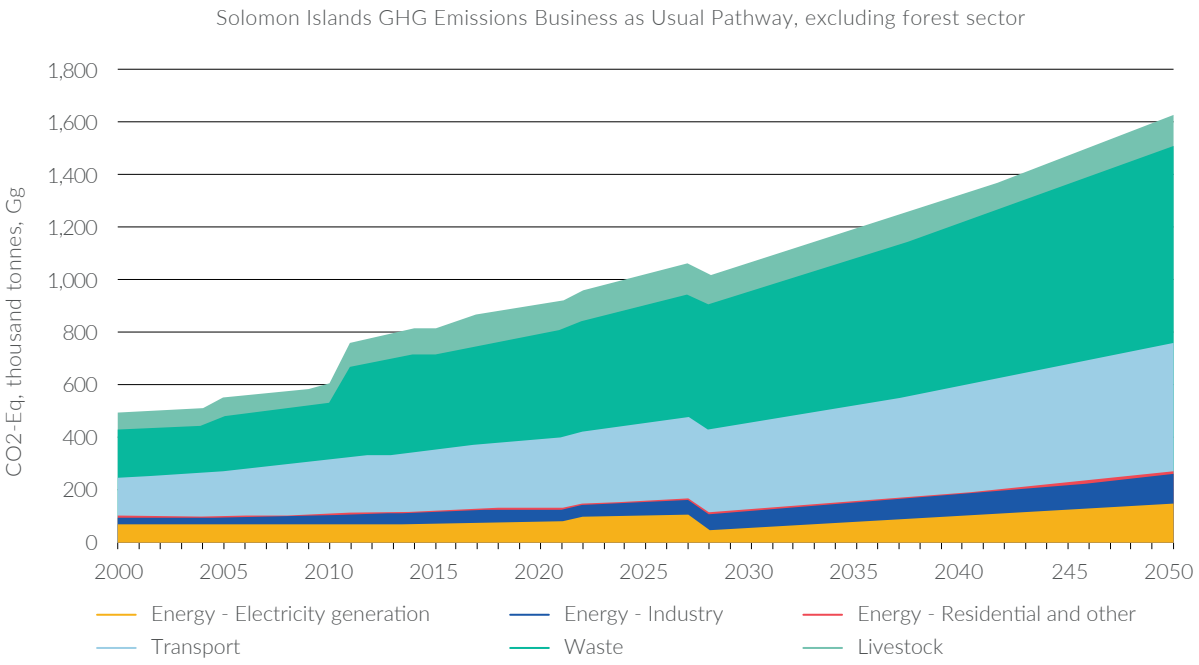
FIGURE 8.
Emissions from wastewater treatment and national population



BAU total emissions and net emissions.

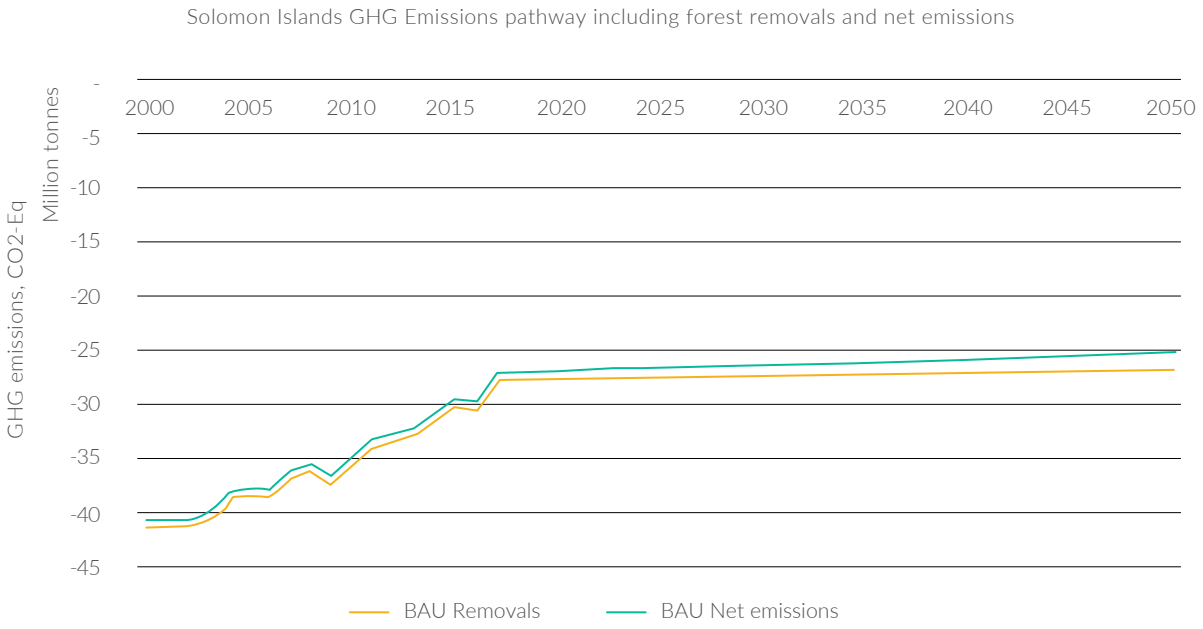
Under the BAU pathway, the national emissions grow from 900,000 tonnes CO2-e in 2020 to 1,627,000 tonnes CO2-e in 2050 (Figure 10). In absolute terms, the largest increases in emissions are seen in the transport and waste sectors, respectively. These are driven by population growth.

FIGURE 9.
BAU emissions across all emitting sectors. The commencement of the Tina Hydro Plant in 2028 reduces the national emissions from electricity generation



The net emissions of Solomon Islands include emissions from forest degradation and land conversion as well as removals (withdrawals) of carbon from the atmosphere through forest growth. These removals significantly outweigh the emissions from human activities. On current measures, the net emissions balance of Solomon Islands is 27 million tonnes CO_2-equivalent removals from the atmosphere (Figure 10).

FIGURE 10.
Solomon Islands BAU net emissions with inclusion of forest carbon removals



3.3 LOW EMISSIONS DEVELOPMENT PATHWAY

The low emissions development pathway was developed in line with the 2050 vision for Solomon Islands:

Solomon Islands aims to maintain net zero emissions across all sectors by 2050 with equitable economic growth and resilience.

This section presents the low emissions development pathway as for the emissions from each sector and collectively as well. The detailed actions in each sector are described in the subsequent section, as it is through the actions in each sector that the emissions trajectory is changed.

Low emissions pathway total and net emissions

Under the low emissions pathway, Solomon Islands total emissions peak in 2050 and are driven by increasing waste sector emissions. Waste sector emissions include emissions from municipal solid waste, as well as wastewater treatment. In the BAU development pathway, waste emissions comprise about 44 per cent of emissions throughout the period. In the low emissions development pathway, waste sector emissions start at 44 per cent and grow to almost 60 per cent of total emissions by 2050 (see Figure 11).

FIGURE 11.

Composition of Solomon Islands emissions in the low emissions development pathway

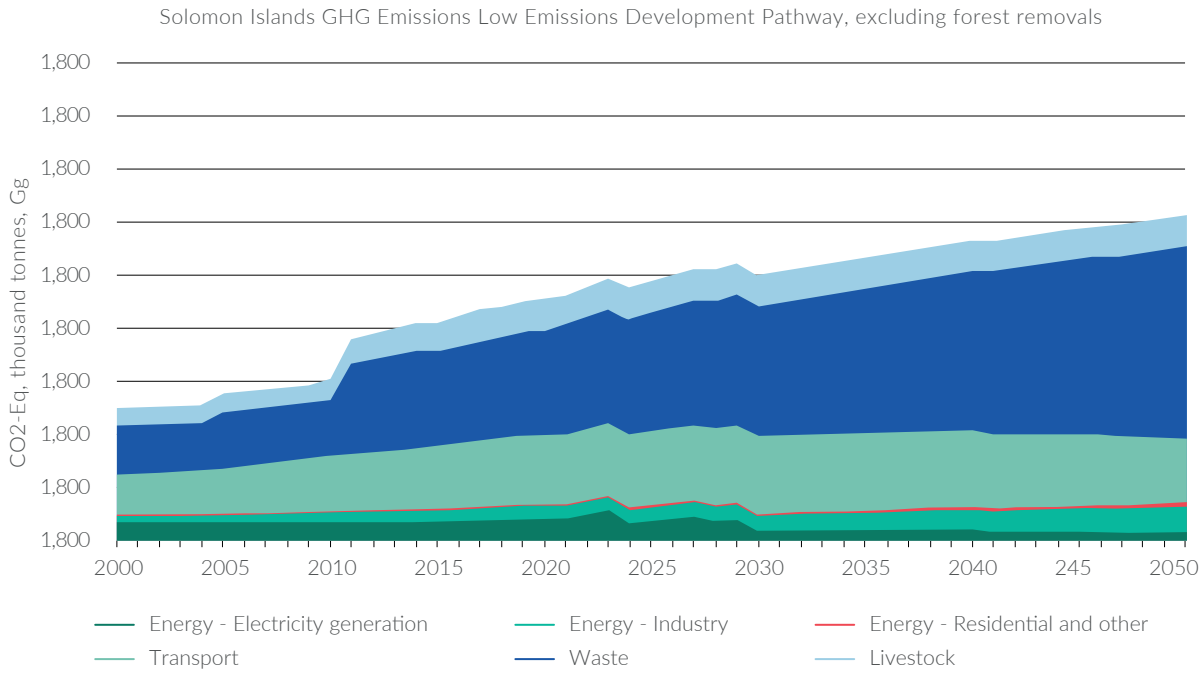
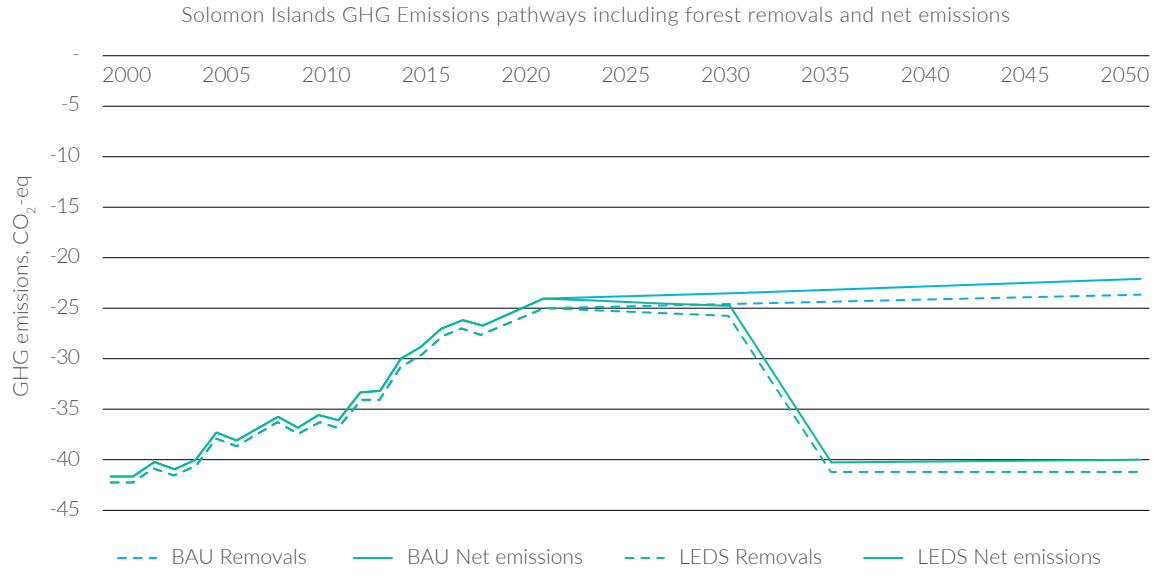


FIGURE 12.

The BAU and low emissions development pathways for forestry removals and the net emissions including forestry removals



Of all the actions taken to reduce emissions, the actions that reduce forest degradation and loss will have the greatest impact on Solomon Islands net national emissions. The total estimated emissions under the BAU pathway from energy, transport, livestock, and waste sectors is 1.6 million tonnes of CO_2-equivalent global warming potential. Also, of the actions identified in the LEDS, those which reduce the rate of forest loss and conversion can potentially reduce emissions (increase removals) by 17 million tonnes CO_2-equivalent per year. All the other actions to reduce emissions identified in the LEDS have the capacity to reduce annual emissions by 405,000 tonnes of CO_2-equivalent in the year 2050 compared to BAU.

Even in the BAU scenario, with constant rates of forest loss and degradation, the estimated forest removals are 23 million tonnes CO_2 in 2050. Under the BAU scenario, Solomon Islands starts from a position of large net negative emissions (due to large forest areas), but over time the balance approaches net positive. With the forest area estimates and carbon removal methodology used, projection forward of human emissions, Solomon Islands will still be net negative in 2050 under a BAU development pathway. There are some uncertainties about this position including the possibility of revised and lower estimates of forest sector removals and potential large-scale degradation of forest areas from climate-related shocks or human activities (such as forest fires).

© GGGI

4. The low emissions, equitable growth and resilience pathway

4.1 ENERGY SECTOR

The ambition for the energy sector, as indicated in the vision statement, is for low emissions, equal benefit, and strong communities. For Solomon Islands, the long-term pathway towards equal benefit and strong communities means improving access to energy from the current low levels.

Electricity access is strongly correlated with economic growth and human development[8]. Electricity access enables education and income generation, and improves health services and access. Electricity access benefits women, youth, children, and those in marginal groups.

Solomon Islands has one of the youngest populations in the Pacific. At the 2009 Census, 41 per cent of the national population were aged 14 or younger and 60 per cent of the population was aged 24 or younger. A much greater rate of electricity access is needed to provide the education and health services and economic opportunities for this growing population.

The Solomon Islands Government has several objectives, policies, programmes, and projects that aim to increase electricity access. The Energy Division of the Ministry of Mines, Energy, and Rural Electrification administers the *Electricity Act 1969* and is responsible for the National Energy Policy 2019. The Energy Division of the Ministry coordinates several rural electrification projects with development partners including the World Bank, Asian Development Bank (ADB), and the Australian Government-funded Solomon Islands Infrastructure Programme (SIIP).

Through technical assistance from the ADB and the Japan International Cooperation Agency (JICA), the Energy Division has completed a review of the *Electricity Act 1969*, and developed national electrification strategies and implementation plans. The ambitions for electricity access are shown in Table 7.

8 Stern, D., Burke, P. & Bruns, S., 2017. The Impact of Electricity on Economic Development: A Macroeconomic Perspective, EEG State-of-Knowledge Paper Series.

TABLE 7.
Solomon Islands Government electricity access and renewable energy targets

	Current level*	Target	By
Solomon Islands National Energy Policy, 2019			
Urban electricity access (% households inside Honiara)	64%	80%	2025
Rural electricity access (% households outside Honiara)	4.9%	40%	2025
Improve energy efficiency and conservation in all sectors		10%	2030
Share of renewable energy for electricity generation in urban and rural areas	1%	50%	2035
Electricity access nationally	16%	100%	2050
Renewable Energy Road Map, 2021			
Renewable energy generation for the Honiara grid	2%	100%	2030
Energy access for Honiara	64%	100%	2050

*Current estimates based on the 2009 Census national population distribution, 2012 Household Income and Expenditure Survey, and Solomon Islands Electricity Authority 2021 Annual Report

In the BAU pathway for Solomon Islands these ambitious targets are not met. However, in the low emissions development pathway these ambitious targets are met.

To project energy and emissions to 2050 in line with the vision, estimates of the energy demand from commercial, industrial, government, and residential sectors are needed.

The commercial, industrial, and government energy demand to 2050 was projected using the energy intensities estimated from preceding years. The energy intensity of the GDP values is shown in Table 8 below. The efficiency goal in the National Energy Policy is modelled in the low emissions pathway by reducing the energy intensity by 10 per cent.

TABLE 8.
Energy intensity of commercial, industrial, and government sectors

Energy source	BAU intensity	Units	Estimate years
Electricity	0.0540	kWh/$GDP 2015	2010–2020
Diesel	0.0082	L/$GDP 2015	2000, 2005, 2010
Kerosene	0.0026	kg/$GDP 2015	2000, 2005, 2010
Residual Fuel Oil intensity	0.0000	kg/$GDP 2015	2005, 2010–2018
LPG intensity	0.0005	kg/$GDP 2015	2005, 2010–2018

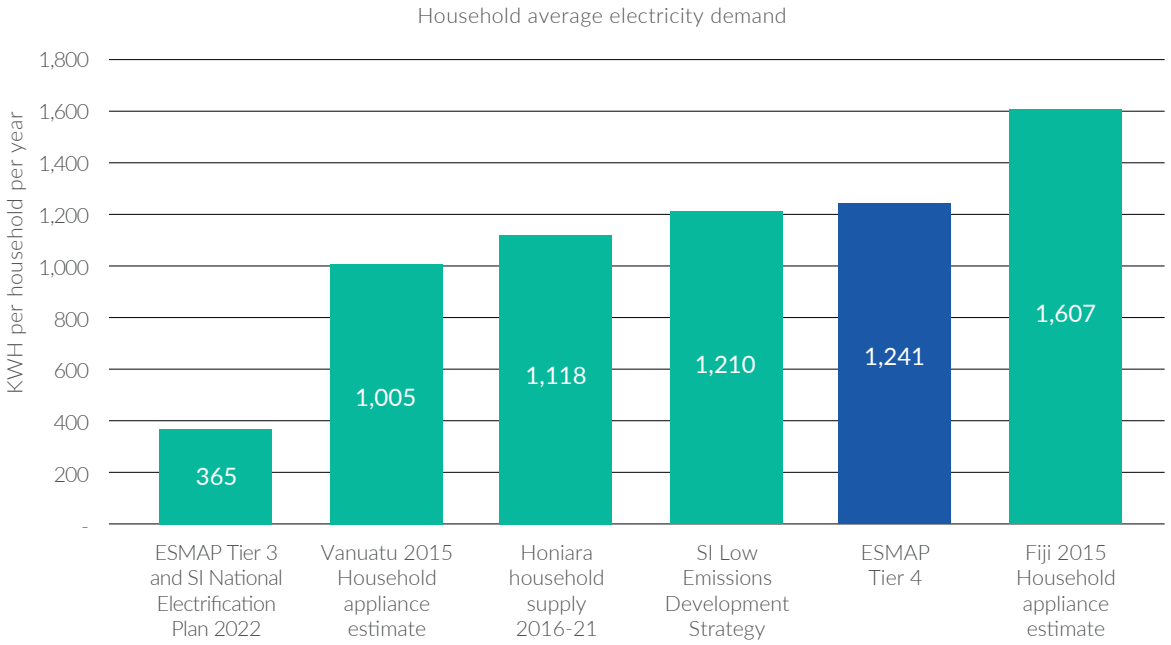
Residual Fuel Oil (RFO) use was not modelled in the SI LEDS. Although there are sporadic recorded imports of RFO, the commercial or industrial users of RFO are unknown and the quantity of use is small. RFO is not used in electricity generation.

Residential sector energy demand for Solomon Islands was estimated using census data on technology use and estimates of associated energy use.

For electricity demand, household electricity demand was estimated using census data on lighting type and appliance ownership rates, and together with lighting and appliance energy use, an estimate of average household electricity demand was calculated as 1,210 kWh per household per year. A range of alternative estimates were derived from the World Bank Energy Sector Management Assistance Programme (ESMAP)[9], Solomon Islands Electricity Authority supply averages[10], and appliance energy consumption estimates from neighbouring countries of Vanuatu and Fiji[11].

Coconut oil is not currently used as an electricity generation fuel source in Solomon Islands. It has the potential to be used as part of the fuel mix, and may be used as the backup fuel source for solar-diesel generation sets. Solomon Islands has extensive history and high levels of production of copra but has not developed the production capacity and institutional arrangements for grid-scale use of coconut oil as a fuel source. The successes of the Government of Vanuatu and UNELCO to use coconut oil in its electricity grid could be replicated in Solomon Islands.

FIGURE 13.
Household average electricity demand estimates from Solomon Islands and abroad



9 ESMAP Technical Report 008/15, 2015, available here: https://documents1.worldbank.org/curated/en/650971468180259602/pdf/105054-ESM-P148200-ADD-SERIES-PUBLIC-FINAL-ESMAP-Beyond-Connections-TR008-15-optimized.pdf.

10 SIEA annual reports available here: https://solomonpower.com.sb/annual-reports/.

11 GWA 2015 Energy labelling and minimum energy performance standards for appliances and lighting, available here: https://prdrse4all.spc.int/sites/default/files/energy_labelling_and_minimum_energy_performance_standards_for_appliances_and_lighting-impacts_in_ci.fj_.ki_.sa_.to_.va_.pdf.

Generation capacity

The current generation capacity within Solomon Islands is estimated at 45.91 Megawatts (MW), of which Solomon Islands Electricity Authority (SIEA, otherwise known as Solomon Power) generators at Honiara and Lungga power stations account for 32.7 MW.

To meet the target of electricity access to 2032, the estimated generation capacity expansion in Solomon Islands National Electrification Plan includes 9.5 MW in Diesel, 33.6 MW in Solar PV, and 123.5 MWH in battery storage, as well as a 443 km of grid extension. The capital expenditure required to achieve the ambitions of the is estimated at USD 273 million over 10 years (2022–2032) excluding the Tina River project.

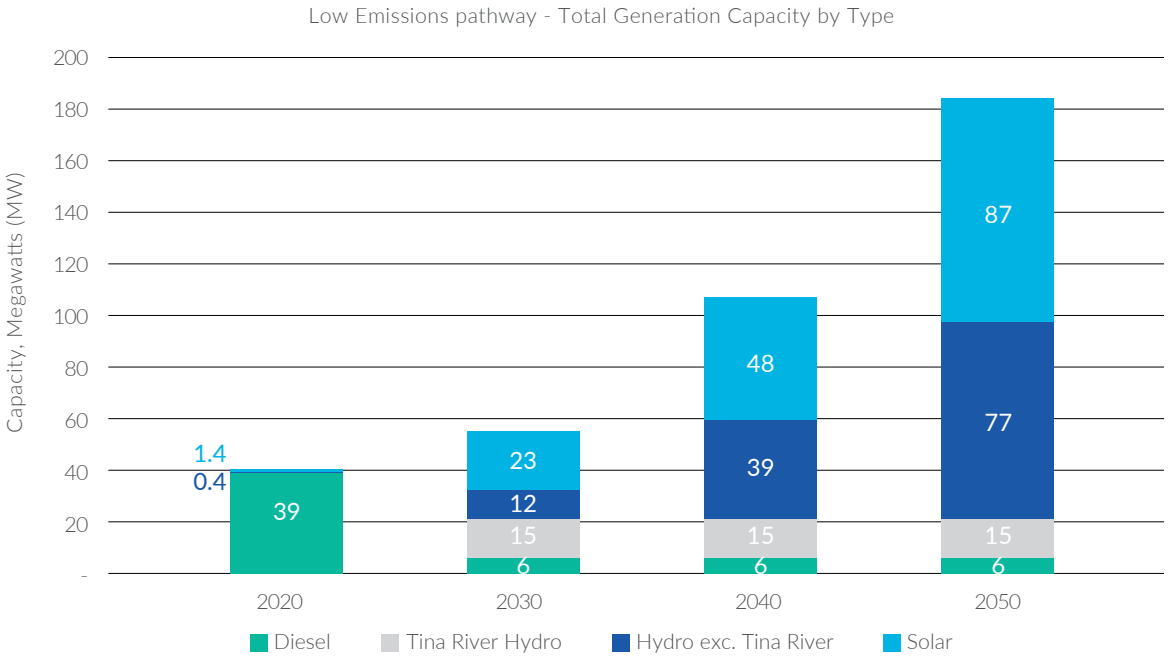
The Tina River project is the largest renewable energy project under development in Solomon Islands. The size of the hydropower system is 15 MW with an annual output expected at 76.9 GWH. The cost of the hydropower plant, access roads, transmission line, and institutional capacity building is budgeted at USD 241.8 million[12]. The capital cost of this system is USD 16 per Watt capacity installed. Over an economic lifetime of 30 years and real annual operating costs of USD 1.7million, the unit cost of electricity supplied would be USD 0.13 per kWh, about a quarter of the current retail price of electricity.

Geothermal energy sources are not modelled in the Solomon Islands LEDS. Geothermal resources have been identified at several sites (Savo Island, Paraso, Simbo, and Tinakula) but the design, connections, costs, and electricity offtake market do not appear to have advanced beyond concept level. The information contained in the Solomon Islands LEDS, including long-term electricity demand projections, may assist to assess geothermal project developers.

Expanded electricity generation will be needed to meet the ambitions of Solomon Islands National Energy Policy beyond the Tina River hydropower project and the National Electrification Plan 2022–2032. In the low emissions pathway, electricity demand is driven by growing electricity access and changing technology in the residential sector, economic growth in the commercial, industrial, and government sectors, and increased electrification of transport.

The estimated capacity additions to meet the growing demand through renewable energy is 87 Megawatt (MW) solar and 92 MW hydropower by 2050 (Figure 14). This estimate is developed on the basis of equal additions of both renewable energy sources after current pipeline of projects, which weights towards solar, has been delivered. This estimate includes retirement of 33 MW end-of-life diesel generation capacity to achieve 100 per cent renewable energy for Honiara. The addition of 15 MW provided by Tina River Hydropower Project from 2028 is shown separately in Figure 14.

FIGURE 14.
Estimated generation capacity to 2050 under the BAU and low emissions pathways



12 GCF 2020 Annual Performance Report for FP044: Tina River Hydropower Development, available here: https://www.greenclimate.fund/sites/default/files/document/fp044-annual-performance-report-cy2020-disclosable.pdf.

The challenge for Solomon Islands low emissions development is to develop renewable energy generation capacity to meet electricity demand. The current Solomon Islands Nationally Determined Contributions (NDC) identifies many renewable energy generation projects as unconditional and conditional commitments. Several donors-funded projects from ADB, Australia and New Zealand are funding household-, community-, and grid-scale solar and hydropower projects across the country.

There is opportunity for Solomon Islands to replicate the rural electrification programmes of Fiji[13] and Vanuatu[14] that use both international and domestic capital to seed a self-funding programme. For both Fiji and Vanuatu rural electrification funds, the management and funding of these programmes is independent of both utilities and departments of energy.

The scale of project planning, both generation capacity and expenditure, will need to increase significantly to achieve the goals of electrification and renewable capacity. The current pipeline of hydropower projects is 15 MW Tina Hydro and 10 MW across 16 smaller sites, and the pipeline of solar projects is 5.2 MW. The scale of hydropower project planning will need to more than triple and the scale of solar project planning will need to increase more than tenfold to achieve the electrification goals with renewable energy by 2050.

The estimated capital expenditure to achieve the electrification goals to 2050, by using the capital costs of Tina Hydro and the National Electrification Plan (solar, battery, and diesel), we can estimate the installed capacity costs of USD 16.12 per Watt (W) for hydro and USD 6.33 per W for solar battery installed capacity and distribution. Applying these unit costs to additional required capacity indicates capital expenditure of USD 1.5 billion, in addition to the USD 0.5 billion expenditure estimate on Tina River Hydro and Solomon Islands National Electrification Plan. Savings and efficiencies would likely reduce the capacity costs generation towards the global averages for hydropower and solar of USD 2.13 and USD 0.86 per Watt installed capacity[15].

Given the significant expansion of generation capacity required to meet the ambitious electrification targets, the Solomon Islands Government has commenced an institutional reform process to separate regulation and licencing from SIEA operations and enable Independent Power Producers (IPPs).

The current regulatory framework for electricity generation and supply is established through the *Electricity Act 1969* and subsidiary regulations. The Act establishes Solomon Islands Electricity Authority as the monopoly supplier of electricity and operator or licenser of electricity generation. The legislation prescribes that every private use generator above 50 kW and all hotel and resort generators are required to receive a licence and pay an annual licence fee to SIEA.

Enabling IPPs to develop, build, own, and operate electricity supply provides a greater range of project proponents to develop the needed generation capacity at lower cost. Reforming the *Electricity Act 1969* to remove the licencing requirement by SIEA would enable growth of independent power generation to meet the growing electricity demand. This LEDS step is shown below.

LEDS step	Outcome measured by	Target
1. Energy		
1.1 Increase renewable energy generation, particularly from hydropower and solar.	Proportion of electricity generated by renewable sources.	A total of 50 per cent by 2035, in line with the SI National Energy Policy.
1.2 Mobilise international and domestic funds for rural electrification.	Establishment of a rural electrification programme and fund.	Legislation passed and funding mechanism operational by 2035.
1.3 Establish regulatory framework to enable Independent Power Producers (IPPs).	Legislative reform to establish independent economic and technical regulation and licencing of supply.	Updated legislation by 2030.

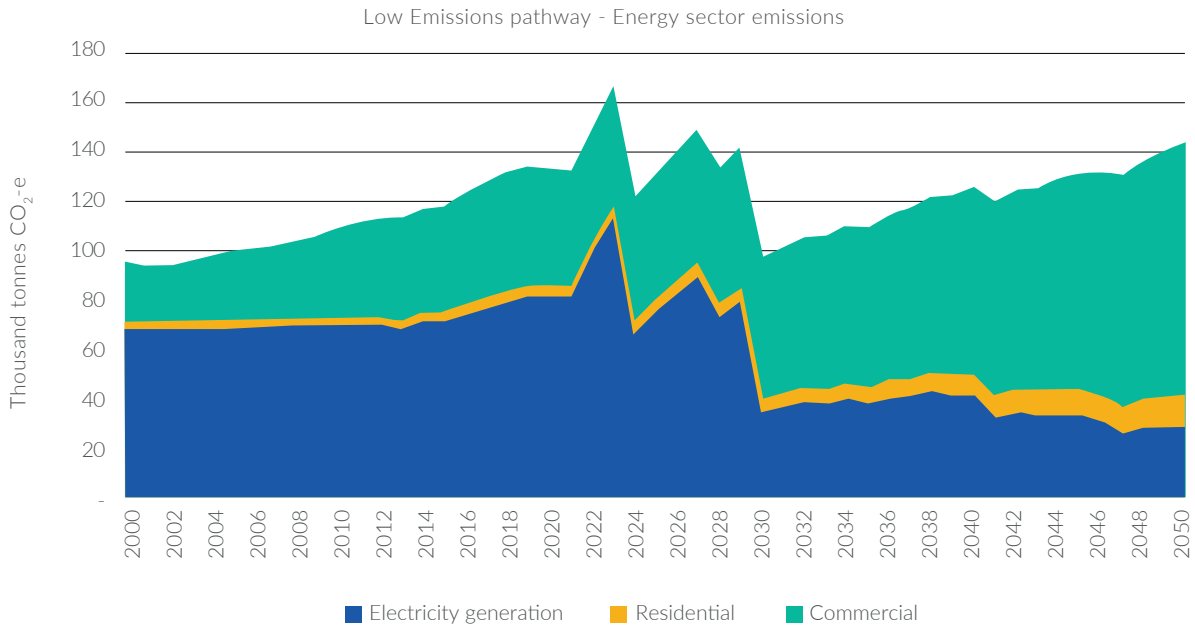
13 Fiji Rural Electrification Fund: https://fijiclimatechangeportal.gov.fj/publication/climate-finance-infographic/.

14 Vanuatu National Green Energy Fund: https://doe.gov.vu/index.php/ngef/reports/23-ngef#.

15 IRENA Renewable Power Generation Costs 2021, here: https://www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021.

The low emissions pathway of the energy sector, excluding transport, is shown in Figure 15 below. The impact of LEDS actions is a reduction of 126,000 tonnes of CO_2-e per year in 2050 compared with BAU development.

FIGURE 15.
Annual GHG emissions from energy sector in the low emissions pathway



4.2 TRANSPORT SECTOR

Access to transportation of goods and services is essential to support the equitable development and strong communities in Solomon Islands. As the population and economic resources are spread across many islands and a large ocean area, there are a mix of road, maritime, and air transport considerations for Solomon Islands.

The current NDC does not include ambitions for reducing emissions from transport. Emissions from transport currently contribute almost 30 per cent of national emissions excluding forestry and land use.

There are emerging efforts to reduce emissions from land transport through low carbon technologies. Through the Climate Technology Centre and Network (CTCN), the Solomon Islands Government has developed an Electric Mobility Policy and Roadmap and undertook prefeasibility testing of electric buses for Honiara[16].

Land transport is currently estimated to use close to 60 million litres of diesel and 40 million litres of petrol (gasoline) per year. The stock of vehicles on the roads and their usage is unknown as many of the vehicles are unregistered and many of the roads outside of Honiara are logging access roads. With representative vehicle efficiencies (Table 9), the transport demand per capita can be estimated and projected forward to 2050 (Figure 16).

For maritime transport, Solomon Islands has called on the IMO for high ambition reductions of emissions from international shipping and for an equitable transition of

16 CTCN workshop report, August 2022, available here: https://www.ctc-n.org/system/files/dossier/3b/Final%20Wksp%2029%20Aug%20Rev%2031%20Aug.pdf.

international shipping to a sustainable and zero-GHG emission future. At the Fourth Pacific Regional Energy and Transport Minister's Meeting in 2019, Solomon Islands agreed to work towards reducing GHG emissions from domestic shipping by 40 per cent in 2030 and 100 per cent in 2050, and to adopt Pacific Ports 2030-2050, a vision of Resilient, Green and Clean Ports in the Pacific. In addition, Solomon Islands is a partner country of the Pacific Blue Shipping Partnership (PBSP). The Solomon Islands Maritime Authority has embarked on a rapid assessment of opportunities to reduce emissions from the maritime sector. This rapid assessment will inform the development of a national action plan for the maritime sector, which may also include emissions from port operations (which come under land transport or electricity sector emissions).

Similar to land transport, sea transport demand has been projected to 2050 using population projections and the estimates of vessel usage per capita. The demand basis used in the projections are shown in Table 10.

TABLE 9.
Fuel efficiency of representative vehicle stock used in this study

Mode	type	value	units	Source
Land vehicle	Diesel	11.8	L/100 km	Fuel use of Ford F-150, selected as representative vehicle
Land vehicle	Petrol	12.6	L/100 km	Fuel use of Toyota Tacoma (Hilux), selected as representative vehicle
Sea ship	Diesel	83.3	Litres/hour	Estimate, based on industry consultation
Sea boat	Petrol	16.4	Litres/hour	Average fuel consumption 15–50HP 2-stroke and 4-stroke outboard motors
Small plane	Avgas	90.0	Litres/hour	Fuel use of Britten-Norman Islander, selected as representative plane used in Solomon Islands
Large plane	Jet Kerosene	531.1	Litres/hour	Estimate for Solomon Airlines fleet

TABLE 10.
Transport demand per capita used in the projections of transport demand

Mode	Fuel type	value	units
Land vehicle	Diesel	695	km / capita
Land vehicle	Petrol	308	km / capita
Sea ship	Diesel	0.093	hours / capita
Sea boat	Petrol	0.192	hours / capita
Small plane	Avgas	0.001	hours / capita
Large plane	Jet Kerosene	0.012	hours / capita

FIGURE 16.
Demand projection for land transport.

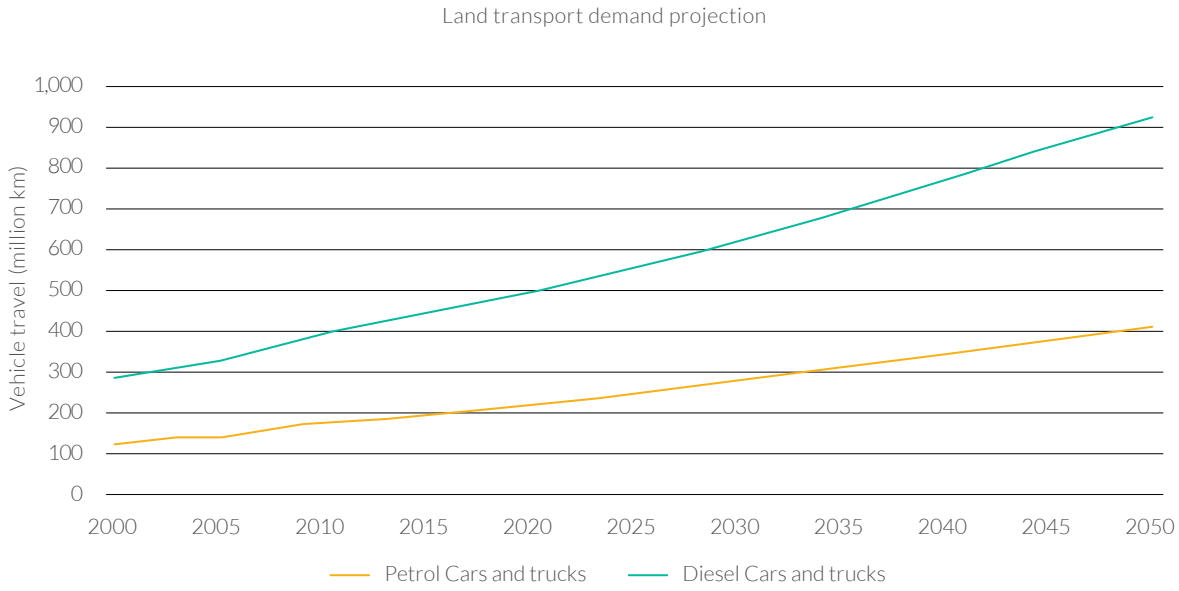
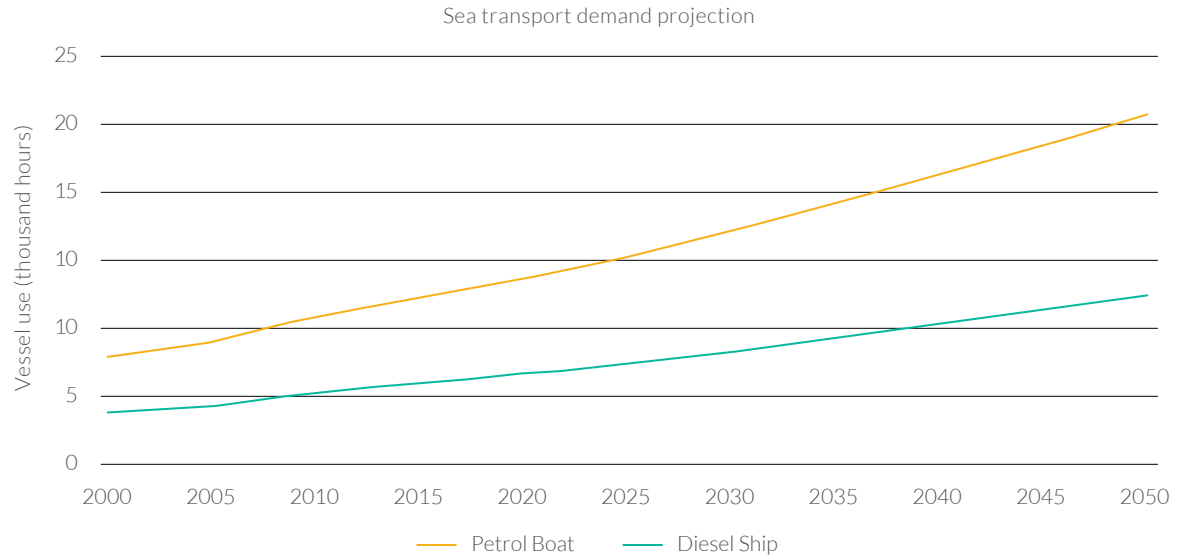


FIGURE 17.
Demand projection for sea transport.



Under the low emissions pathway, the vehicle fuel efficiency increases from 2022 through stock change, and from 2030, electric vehicles and vessels enter service in Solomon Islands.

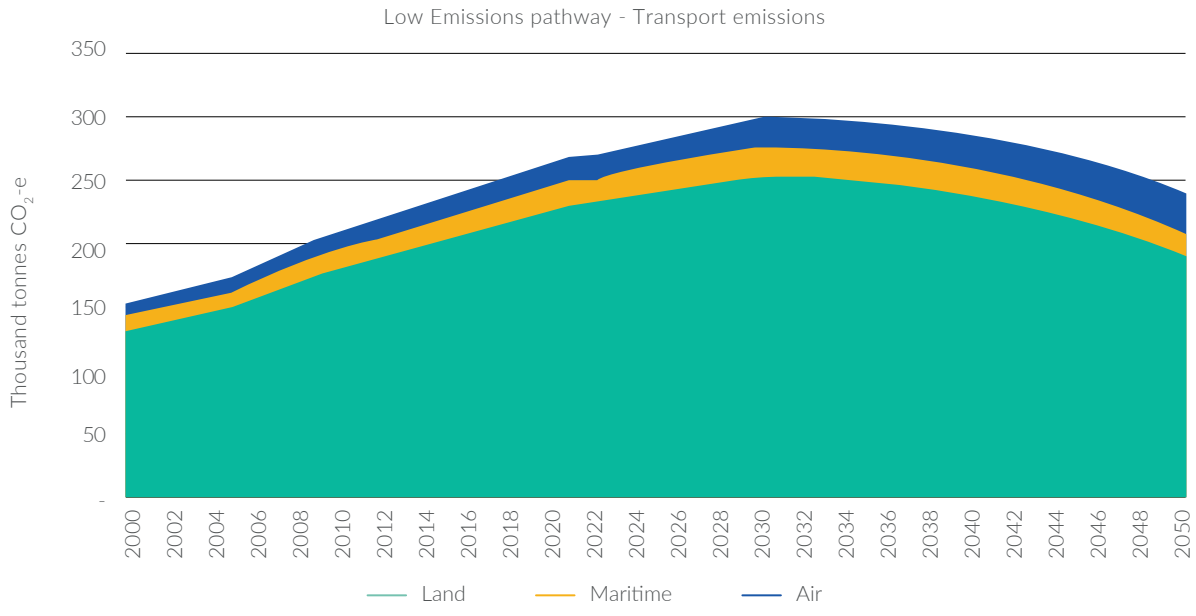
Solomon Islands imports almost all transport technology, such as cars, trucks, ships, outboard motors. There will be a natural increase in the efficiency of second-hand vehicles and vessels arriving in Solomon Islands due to efficiency gains in the stock of source markets (Australia, New Zealand, Singapore). Through improved border controls and inspections, Solomon Islands can accelerate the transition to more efficient vehicles through introducing minimum standards of vehicles and vessels.

Through the assistance of donors, the Solomon Islands Government is developing transport infrastructure plans and policies. These long-term plans should consider the needs to supply electricity to vehicles and vessels. It can be difficult to retrofit charging stations and high voltage electricity supply to ports and bus stations. Furthermore, as efforts to develop institutional framework for Independent Power Producers progress, so too should the development of physical infrastructure to allow an independent supply of electricity to vehicles and vessels. There are benefits from using vehicle and vessel batteries to stabilise electricity grids, particularly as a greater proportion of renewable energy generation: an average electric vehicle battery might store four or more times the electrical energy of an average household-sized battery.

LEDS step	Outcome measured by	Target
2.Transport		
2.1 Improve land transport efficiency	Introduce standards system for second-hand vehicle imports and tax on inefficient vehicles.	Standards and verification system operational from 2030.
2.2 Introduce electric vehicles and charging infrastructure	Introduce electric vehicles and charging infrastructure in Honiara.	Electric vehicles and charging infrastructure available in Honiara from 2035.
2.3 Improved measurement and efficiency of maritime transport	Measurement of fuel use and emissions of domestic shipping.	Domestic shipping operations and fossil fuel use measured and reported by 2030.
2.4 Introduce zero emissions technology and infrastructure for maritime transport	Use of zero emissions vessels and charging infrastructure for domestic shipping.	Zero emissions vessels meet 50 per cent of domestic maritime transport demand by 2050.

The low emissions pathway of the transport sector, is shown in Figure 18 below. The impact of LEDS actions is a reduction of 253,000 tonnes of CO_2-e per year in 2050 compared with BAU development.

FIGURE 18.
Emissions from the transport sector in the low emissions pathway



4.3 FORESTRY AND LAND USE

Solomon Islands is a high forest area country. Forest land cover of 87 per cent or 25,223 km^2 was recorded in 2020[17]. This is a benefit for the carbon sequestration potential of forests, but also a challenge for developing regional economies without forest encroachment or losses and subsequent emissions.

Solomon Islands is a biodiversity hotspot for forests, with an estimated 4,500 species of plant of which 3,200 are native. Of the 163 species of bird, 69 are endemic to Solomon Islands. The National Biodiversity Strategic Action Plan 2016–2020 included targets for 10 per cent terrestrial and inland water, and 15 per cent of coastal and marine areas are protected under the *Protected Area Act 2010*, up from the estimated 5 per cent and 6 per cent, respectively. Financial support for protected area management will be through the Protected Area Trust Fund, which is established under the Act.

The forestry sector is a large economic driver for the country. Forest products account for about 65 per cent of exports, licences provide around 20 per cent of government revenue, and the logging industry provides 20 per cent of total employment[18]. The payments of royalties can provide valuable revenue to rural communities with limited alternative sources of income, infrastructure, or services. The *Forest Resources and Timber Utilisation Act 1970* currently stands as the *Forest Resources Act 1999*, while passed by Parliament, was not Gazetted.

The National Forest Policy 2020 seeks to balance the competing requirements to reduce unsustainable logging and safeguard ecosystem services while supporting forest industries and economies. The national forest policy included an estimated sustainable level of logging at 250,000 m^3 per year, which is far exceeded by the current rate of logging, over 3,000,000 m^3 per year in 2018.

The economic impact of reduction in the log harvesting rate can be compensated by increasing the value addition of forest products within Solomon Islands. Reducing the rate of logging by 90 per cent and milling and machining the timber into an export product such as decking or floorboards will increase the value of exports well beyond the current value of round log exports. Further information is provided in Appendix 1.

Reducing logging to sustainable levels is a priority for Solomon Islands. Solomon Islands Nationally Determined Contributions (2021) include the following:

- Solomon Islands is committed to undertake a multi-purpose national forest inventory over the next few years. This will provide the basis for forest monitoring and informed decision-making to improve forest management and research.
- Solomon Islands intends to implement the Sustainable Logging Policy 2018.
- Quantify forest carbon sequestration and protect forest above a 400-meter contour.
- Protect at least 20 per cent of the terrestrial and inland water; 15 per cent of coastal and marine areas enabling an ecological, representative and well-connected system of protected area in the country, as provided in The National Biodiversity Strategic Action Plan 2016–2020.

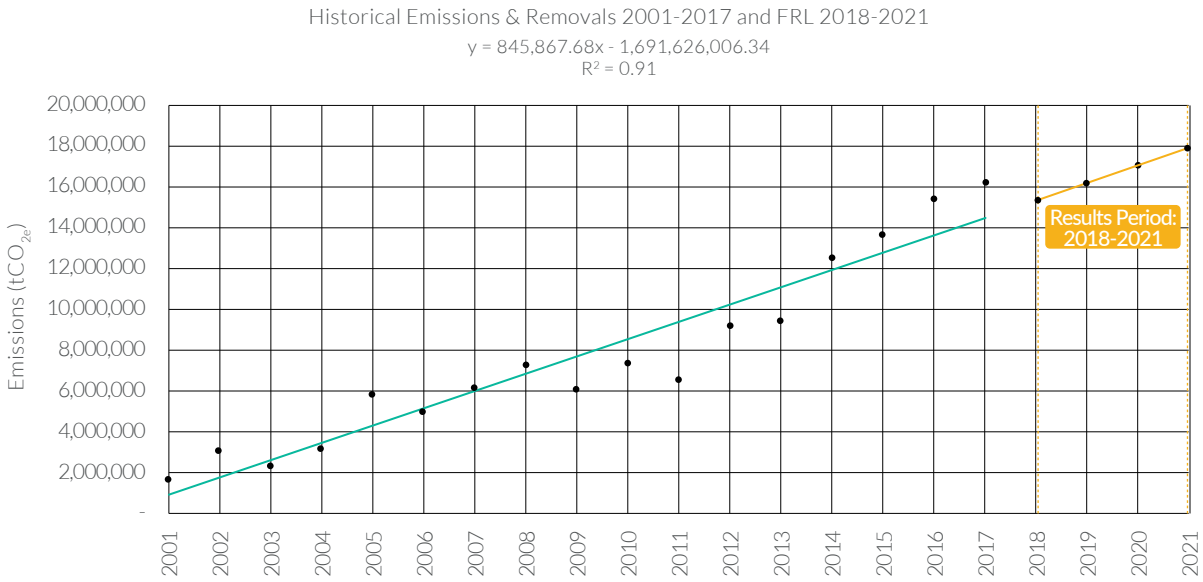
The Solomon Islands Government developed and submitted to UNFCCC its National Forest Reference Level in 2019 in order to assess domestic policy effectiveness, demonstrate commitment to reduced emissions, and to qualify for results-based payments under REDD+ framework. The Forest Reference Level estimated emissions growing at a steep trend as forest loss and disturbance, primarily from logging, caused emissions (see Figure 19).

17 FAO estimate 2021, available here: https://www.fao.org/faostat/en/.

18 National Forest Policy 2020 available here: https://www.mofr.gov.sb/documents/LegislationAndRegulation/SI%20National%20Forest%20Policy%202020.pdf.

FIGURE 19.

Emissions from deforestation and forest degradation (Source: Solomon Islands Forest Reference Level, 2019)



The emissions levels submitted in the FRL are those emissions caused by deforestation and forest degradation. However, with the large forest area for Solomon Islands (over 80 per cent of the landmass), the carbon removals from existing forests are estimated to outweigh the emissions from the deforestation and degradation.

Stakeholders voiced concern that under the BAU scenario, a high rate of timber harvest in the short term leads to a steep decline in harvests later, as commercially viable resources are exhausted. Alternatively, timber harvest could stay high as timber resource prices increase the area where commercial extraction is viable. With high uncertainty of the future area of forest degradation and loss under the BAU pathway, the emissions from forest loss is estimated to continue at current levels.

Through consultation on the LEDS, stakeholders have emphasised the goals and targets in the National Forest Policy. The LEDS steps are the following:

LEDS step	Measured by	Target
3. Forestry and land use		
3.1 Reduce rate of forest clearing through tighter regulations on access or logging practice.	Cubic meters of harvested logs.	250,000m^3 by 2035
3.2 Increase forest area protected under *Protected Area Act 2010*.	Lowland, hill, and montane forest area under *Protected Area Act 2010*.	20 per cent by 2035
3.3 Community volunteer and private managed forest programmes.	Establishment legal framework for community and private forest management.	Legislation by 2035
3.4 Reafforestation programmes to replant degraded and previously logged areas with native forest.	Operating reafforestation programme.	Programme operational by 2035
3.5 Mangrove replanting and land reclamation for carbon conservation.	Operating programme for mangrove replanting and carbon measurement.	Programme operational by 2035

The BAU emissions from deforestation and degradation are shown in Figure 20, and the low emissions pathway of the agriculture, forestry and land use sector, after forest carbon withdrawals is shown in Figure 21 below.

The impact of LEDS actions are reduced emissions (increase in removals) of 17.5 million tonnes of CO_2-e per year in 2050 compared with BAU development.

FIGURE 20.

BAU emissions from deforestation and forest degradation

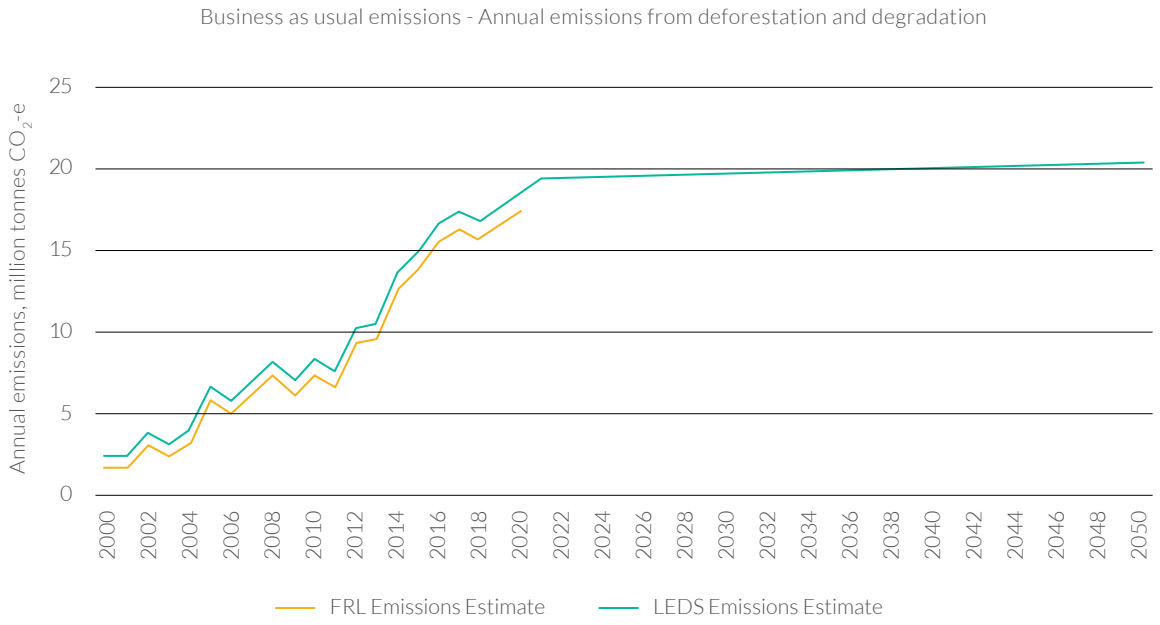
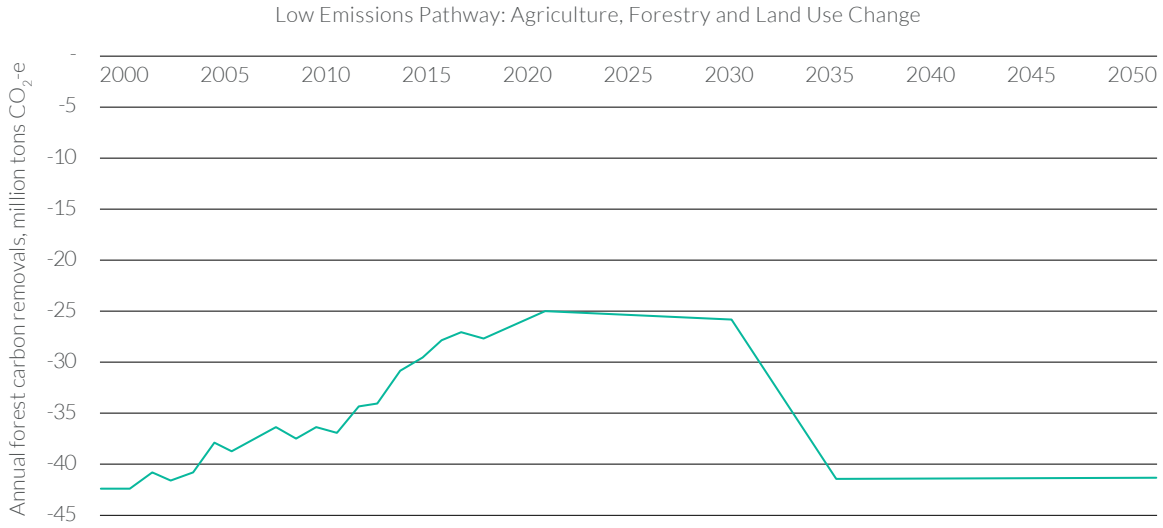


FIGURE 21.

Emissions from agriculture, forestry and land use sector in the low emissions pathway



4.4 AGRICULTURE

Under the IPCC methodology for GHG emissions reporting, agriculture is responsible for emissions where forest clearing and conversion occurs, and where fertilisers are applied, and flooding and draining land. The application of synthetic or organic fertilisers that increases the nitrogen content of the soil will, in turn, increase emissions of nitrous oxide (N2O). Organic fertilisers include manure, in which case, the emissions from manure management may be included in the livestock emissions estimates.

For Solomon Islands emissions from agriculture, the conversion of forest land to cropping is covered in the preceding section on forest management. The available data sources for Solomon Islands indicate low or sporadic imports of inorganic fertiliser. There is limited evidence of flood irrigation and large-scale swamp drainage for agriculture. In keeping with the greenhouse gas inventory supplied by Solomon Islands in National Communications, the emissions from agriculture are not estimated in the LEDS.

Though emissions from agriculture are not directly estimated in the LEDS, there were transition steps for Solomon Islands agriculture that were identified through the LEDS process. These steps target community resilience and are aligned with Solomon Islands Agriculture Sector Growth Strategy and Investment Plan (ASGSIP) 2021–2030. The ASGSIP contains a much larger range of actions that support community resilience beyond these identified in the LEDS. The alignment of LEDS and ASGSIP supports recognition of the agriculture sector as essential for community resilience.

These LEDS steps are shown below.

LEDS step	Measured by	Target
4. Agriculture		
4.1 Support organic agriculture to avoid inorganic fertiliser use and Persistent Organic Pollutants (POPs).	Imported inorganic fertiliser and agricultural chemicals.	Low imports maintained through to 2050.
4.2 Improved agriculture practices and technology to improve resilience to climate change.	Agricultural production levels.	Increasing production levels over time, despite changing climate.

4.5 LIVESTOCK

Livestock emissions are generated through enteric fermentation and release of methane, as well as livestock manure which releases methane and nitrous oxide. The animal type, the herd size, climate and production type determine the size of emissions from the livestock sector.

FAO data on the livestock production provide herd sizes for cattle and swine (pig) but not for horses, goat, or poultry. There are significant populations of chickens in Solomon Islands in association with the village and subsistence livelihoods, but there are no commercial scale poultry operations. Of the cattle and swine herd sizes, there is a predominance of swine (pig) which reflects cultural value as much as a source of protein.

The ambitions of Solomon Islands Agriculture Sector Growth Strategy and Investment Plan (ASGSIP) 2021–2030 include growing herd sizes for cattle, pig, and poultry through support for both small-holder and commercial scale production and Public-Private Partnerships (PPPs). The desirable commercial scale of production and the emissions level were not specified in the ASGSIP.

To project livestock production to 2050 in the BAU and low emissions pathways, the latest available herd sizes are extended in time. The herd size projections are shown in Figure 6.

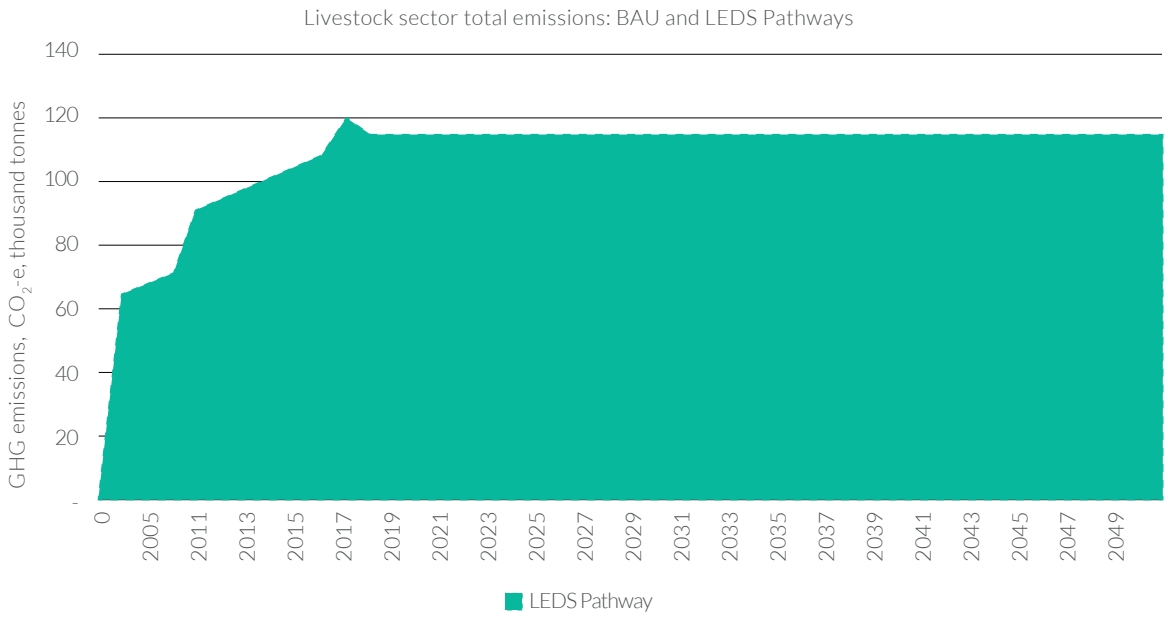
Through consultation on the low emissions development strategy, stakeholders identified several actions to prepare the livestock sector for GHG emissions reporting and reductions. The actions are identified below.

LEDS step	Measured by	Target
5. Livestock		
5.1 Develop emissions target for livestock sector, to help guide national reporting of GHGs.	Emissions target included in livestock strategy.	Emissions target included in the subsequent livestock strategy from 2030.
5.2 Stock genetics improvement.	Breeding herds established and maintained.	Two breeding herds established by 2030.

Improving stock genetics has the potential to improve growth factors for stock and reducing the methane emissions per head of stock. Coupled with improved production systems, such as adequate water and fodder, these improvements would reduce the emissions from the livestock sector while maintaining the same herd size. Any plans to enlarge the herd size should be incorporated into the ambitions to reduce net national emissions as well.

The low emissions pathway of the livestock sector, is shown in Figure 22 below. The impact of LEDS actions is 80 tonnes of CO_2-e per year in 2050 compared with BAU development.

FIGURE 22.
Emissions from the livestock sector in the low emissions pathway



4.6 WASTE SECTOR

Concerns for the waste sector primarily focus on human health risk and contamination from limited collection systems and poor-quality infrastructure and undesirable siting. The emissions from solid waste generation and management and waste water generation and management are additional areas of national concern.

There are synergies in addressing the issues of waste collection and management. Better waste streaming and processing both reduces contamination and emissions.

The current National Waste Management and Pollution Control Strategy 2016–2026 puts forward a holistic approach to waste management that includes institutional and infrastructure building, capacity building and financing to address major challenges of land availability for landfills, limited financial resources, limited human resources, poor coordination, limited awareness and poor collection systems.

Stakeholders have put forward transition steps towards a low emissions pathway for Solomon Islands as below:

LEDS step	Measured by	Target
6. Waste management		
6.1 Improve landfill infrastructure to better sort and process municipal solid waste.	Establishment of a new waste management facility for Honiara.	Relocation from Ranadi to a new improved facility by 2035.
6.2 Honiara faecal sludge treatment and regulations.	Faecal sludge treatment and regulations.	Establishment of faecal sludge treatment facility and supporting regulations for Honiara by 2035.

Reducing the organic components of municipal solid waste through better sorting and processing would reduce emissions from landfill. The existing waste surveys indicate that kitchen and garden waste constitute about 60 per cent of solid waste in Honiara, about 1 kg per person per day on average. The low emissions pathway put forward in this strategy seeks to reduce that volume and share to 44 of 0.67 kg per person per day (see Figure 23 below).

The low emissions pathway of the waste sector is shown in Figure 24 below. The impact of LEDS actions is a reduction of emissions of 25,000 tonnes of CO2-e per year in 2050 compared with BAU development.

FIGURE 23.
Composition of municipal solid waste for BAU and low emissions pathways

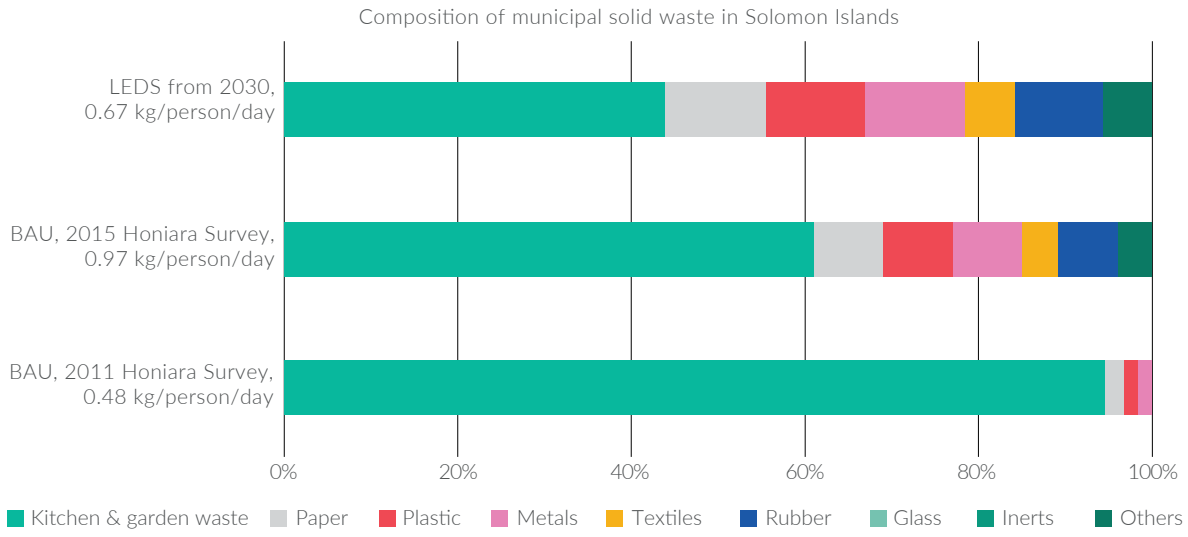


FIGURE 24.
Emissions from the waste sector in the low emissions pathway

4.7 VULNERABILITY AND RESILIENCE TO CLIMATE CHANGE IMPACTS

The 2050 vision for Solomon Islands identified in this strategy includes resilient communities. Though there are economic and social considerations for resilience, this section focuses on climate change impacts on communities and their resilience.

Solomon Islands communities have a high exposure to climate change related impacts, in the form of cyclones and sea level rise. The projected climate scenarios for Solomon Islands indicate that the period to 2050 will see more extreme cyclones and sea level rise. More than 80 per cent of Solomon Islanders reside in coastal areas and are exposed to flooding, storm surges, and king tides. Already some communities have been displaced.

Solomon Islands National Adaptation Programmes of Action (2008) identified priority activities in agriculture, water supply and sanitation, human settlements, human health, coastal protection, waste management and infrastructure development.

From 2013, the Solomon Islands Government has undertaken vulnerability assessment and supported efforts to enhance adaptive capacity. Vulnerability assessment is complex, and while recognised at a national level, the provincial and local community level vulnerabilities and needs may be a more appropriate scale. Through Solomon Islands Integrated Vulnerability Assessment (IVA), the Solomon Islands Government has worked with regional and international partners to undertake assessments in a range of provinces and communities[19].

The 2021 Nationally Determined Contributions identified a range of priority activities in adaptation, including:

- Developing a National Adaptation Plan to address climate change over the short, medium, and long term. The NAP shall address long-term adaptation to climate change and short-term disaster risk reduction in relation to climate variability and included in an implementation plan.
- Integrate traditional knowledge into vulnerability, adaptation, and disaster risk reduction assessments.
- Expand the national census data gathering to obtain information on extreme events, vulnerability, and adaptation.
- Mainstreaming vulnerability, adaptation, and disaster risk reduction across public, private, and community sectors.
- Develop a coordinated and geo-referenced national information system to information vulnerability, adaptation, and disaster risk reduction.
- Implement ecosystem-based vulnerability assessments and protected areas legislation.
- Vulnerability and risk reduction assessments for Honiara and other town centres, as well as rural centres.
- Revise environmental laws and impact assessments to integrate climate change.
- Mainstream gender and youth considerations into vulnerability, adaptation, and disaster risk reduction.
- Develop a community/human relocation guidelines and assessment tools, build capacity and implement relocation of communities as an adaptation action where and when necessary.
- Strengthen capacity of Solomon Islands Meteorological Services and National Disaster Management Office to provide appropriate field instrumentation and early warning systems with special focus on regions in the country more vulnerable to extreme climate events.
- Promote and implement community-based programmes and actions within a cooperative framework to strengthen social capital, skills, and resilience as an adaptation strategy.
- Implementation of Solomon Islands National Ocean Policy.

19 Sites include Choiseul, Temotu, East Malaita, and Reef Islands.

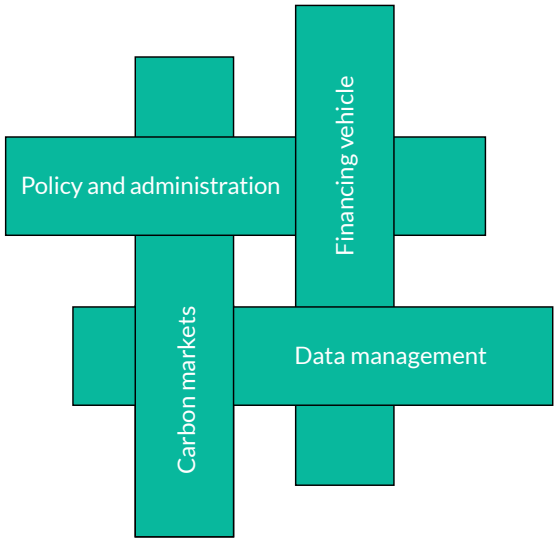
Over the long term and as envisaged by the LEDS, the mainstreaming of vulnerability and resilience concerns into different sector policies will be essential to plan for a resilient future. The published work programme on adaptation, as detailed in the NDC, provides a strong basis for the Solomon Islands Government to incorporate vulnerability, adaptation, and resilience concerns into sector and national policies.

4.8 ENABLING INSTITUTIONS: STRENGTHEN POLICY AND ADMINISTRATION THROUGH CONSOLIDATED FOREST PROTECTION AND CLIMATE POLICY

Four enabling institutions are identified as essential to achieve the vision and guide the pathway for Solomon Islands Low Emissions Development Strategy. These four enabling institutions weave together many enabling actions across sectors and support long-term development (see Figure 25 below). The four enabling actions are the following:

- Strengthening policy and administration through consolidated forest protection and climate policy.
- Fostering carbon markets to generate revenue from intact forests.
- Channelling international climate finance through a climate change trust fund.
- Build data management and reporting capability to support domestic policy and international transparency obligations.

FIGURE 25.
The four enabling institutions mutually supporting the long-term development pathway of the Solomon Islands



Starting with policy and administration, it is essential that government policy coordination and public administration are improved to support the transition to a low emissions pathway for Solomon Islands. Coordination gaps and low administrative capacity impacts policy coherence, project development and management, and public financial management and transparency.

The 2022 Climate Finance Roadmap noted several challenges for institutional coordination and delivery, including:

- Capacity to manage and coordinate existing projects.
- Reporting and tracking climate-related activities and funds already mobilised.
- Diversion and splintering of effort across multiple departments and at multiple government levels.
- Following procedures to access international climate fund requirements.

Transition to a low emissions, equitable and resilience pathway requires coordinated action and support for delivery from the Solomon Islands Government, donors, and development partners. As noted in the NDC, Solomon Islands seeks assistance with financial resources, technology, and capacity building to achieve its conditional commitments.

Over the long term, the Solomon Islands Government will achieve greater effectiveness and realise efficiencies of administration if it were to concentrate government resources towards areas of greatest need and impact. In this case, consolidating forest conservation policy and climate policy would concentrate resources on the single largest driver of emissions.

Consolidating areas of common policy responsibility into one body or portfolio assists coordination and coherence. In the case of Solomon Islands, climate change policy and forestry area policy should be combined, as the forestry outcomes are the biggest drivers of emissions. Forestry industry policy and rural economy may be better separated from forest area policy and forest protection, due to conflicting incentives. Current forest industry policy reflects the priority of economic harvesting of forests for revenue, employment, and exports, which can conflict with other priorities for forest protection and conservation.

Stakeholders supported the integration of the forest conservation policy and climate policy, as it aligns reporting of national greenhouse gas inventories and forest sector emissions, through national communications (NC) and reporting on Forest Reference Level (FRL). The FRL undergoes a technical assessment process by the UNFCCC secretariat and it is Solomon Islands official forest emissions estimate. The forest sector removals estimated in the FRL and the NCs need to be consistent. Integration of forestry conservation and climate policy will ensure that resources for measurement and reporting are directed towards the areas of highest impact.

Additional assistance to administration should be given through legislating functions and providing sufficient staffing to fulfil functions. Well-crafted legislation provides a strong foundation for regulatory activities such as permits or licencing, particularly where strong interests and incentives challenge policy. Sufficient staffing is needed to fulfil obligations, though core staff may be complemented through project-funded staff. The support and participation of key ministries and agencies such as the Public Service Commission, Ministry of Public Service and Office of the Prime Minister will be needed to deliver this change.

Looking outside of Solomon Islands, there are several alternative models for marshalling government resources to deliver climate and forestry policy coordination and coherence:

- Establishment of a ministry, department, or agency which incorporates climate and forest protection policy responsibility (as seen in Papua New Guinea, Indonesia, Brazil).
- Establishment of a coordination mechanism in law between climate and forest policy (as in Vanuatu, Fiji).
- Establishment of an independent climate regulator which reports both climate and forest policy outcomes (as in Australia, New Zealand)

Case study of concentrating government resources:

Climate Change Development Authority (CCDA), Papua New Guinea

The Climate Change Development Authority (CCDA) was established in 2016 and superseded the Office of Climate Change and Development (2010–2016). The establishment, purpose, functions, and powers were established through the *Climate Change (Management) Act 2015*[20].

The CCDA was established for the following purposes:

- Promote the management and sustainable development of climate change mitigation and adaptation actions.
- Implement any relevant obligations of the State under applicable rules of International Law and agreements related to climate change.
- Act as PNG's Designated National Authority (DNA) for the purposes of the Paris Agreement and any such other or subsequent arrangements or agreements made under the Paris Agreement, and related purposes. Under these arrangements, CCDA is the DNA for the issuance of Host Country Letter of Approval for all projects and activities related to Carbon Trading or any form of Carbon Offset Projects.
- Establish and administer trust funds that facilitate the control and distribution of the received benefits and levies.

The four divisions of the CCDA are the following:

- REDD+ and Mitigation.
- Adaptation and Projects.
- Measurement Reporting and Verification (MRV) and National Communication (NC).
- Corporate Services.

By combining REDD+ and mitigation policy areas, CCDA integrates forestry into PNG's sustainable development ambitions.

20 Climate Change (Management) Act available here: https://policy.asiapacificenergy.org/sites/default/files/Climate%20Change%20%28Management%29%20Act%202015.pdf.

Given the circumstances affecting Solomon Islands, with high impact of forest policy administration on climate outcomes, the greatest benefit may be achieved from the first option of integrating forestry conservation policy with climate policy. Furthermore, the establishment of a separate authority or agency for climate and forestry policy provides an opportunity to pursue clearer goals than would otherwise be the case in blended ministries with competing priorities.

Consultation through the LEDS development process

Through consultation with stakeholders, the following action is identified to assist Solomon Islands to achieve the vision and pathway of the LEDS.

LEDS step	Measured by	Target
7. Enabling Institutions		
7.1 Consolidate climate and forest protection policy areas to better achieve emissions reductions goals.	Establishment of a Climate Change and Forest Area Authority or equivalent.	Authority established by 2030.

4.9 ENABLING INSTITUTIONS: CARBON MARKETS

The establishment of carbon markets, particularly forest carbon markets, has the potential to channel resources and revenue to support the low emissions pathway. In particular, forest carbon markets can generate revenue for local communities while leaving forest and mangrove ecosystems left intact.

Voluntary forest carbon projects exist already in Solomon Islands, with the Babatana Project along Kolombangara River, South Choiseul[21]. Unlike forest felling and milling licences, the Solomon Islands Government does not currently licence and earn revenue from forest carbon credits.

Solomon Islands NDC states that it intends to participate in the international carbon markets, particularly under Article 6 of the Paris Agreement. Article 6 of the Paris Agreement allows countries to trade carbon credits in order to meet international commitments, particularly to net zero emissions by 2050.

At the time of LEDS development, parties to the Paris Agreement are developing the mechanism for international trade under Article 6. This includes the rules, modalities, and procedures. There is some international interest in crediting the carbon credits created under the Kyoto Protocol Clean Development Mechanism (CDM), though Solomon Islands did not establish any projects under the CDM with any Certified Emissions Reductions (CER).

Solomon Islands is a potential seller of carbon credits under Article 6 or other type of carbon trading. The large forest area can remove substantial volumes of carbon dioxide, well beyond the emissions that are generated from human activities. The value of forests *in situ* (where they are, without destruction) can be realised in the form of cash payments through carbon trading. Cash from carbon trading may form part of the solution to excessive logging and forest loss.

Establishing a carbon market unit may provide the necessary resources for Solomon Islands to develop blue carbon opportunities. Blue carbon opportunities may arise from sea grass, mangrove, seaweed, and deep ocean sequestration. A carbon market unit may assist with setting up other forms of nature-based transactions such as debt-for-nature swaps and results-based payments.

The value of the carbon credits sold by Solomon Islands, whether in private transactions or between

21 Nakau programme website here: https://www.nakau.org/babatana-solomon-islands.html.

countries through Article 6 transactions, will depend on the integrity of the credits sold. Integrity of carbon credit reflects the permanence of carbon removal, the verified and quantified carbon removal, the supporting institutional arrangements, and the social and environmental safeguards. These institutional arrangements and systems will need to be in place, and supported by legislation, to maximise the integrity and value of any carbon credits sold by the Solomon Islands Government or project proponents.

Industry advice received during consultation for the LEDS indicated that, in the absence of policy and institutional framework, there would be no development of carbon markets in Solomon Islands. Forest carbon sites may receive protection through the Protected Area Act 2010, but the requirements on landowners may be so onerous as to discourage participation in voluntary markets. In the absence of forest carbon value, landowners will continue to drift towards logging as a revenue source and community development pathway.

LEDS step	Measured by	Target
7.2 Develop programme to enable participation in public and private carbon markets, including Article 6 transactions.	Establish carbon market unit within the Government, enabling legislation, policy, and a market development plan.	Unit established by 2030.

© GGGI

4.10 ENABLING INSTITUTIONS: FINANCING

Substantial international and domestic finance and investment will be needed to meet Solomon Islands ambitions for low emissions development.

In 2022, the Solomon Islands Government developed a climate finance roadmap[22] and established a National Climate Finance Steering Committee and secretariat[23]. The committee is co-chaired between the Permanent Secretaries of MECDM and MoFT. The Secretariat is established in MECDM and MoFT. The National Climate Finance Steering Committee's role includes advising and coordinating with major multilateral and bilateral climate and environment funds, whose resources are needed to support the low emissions and resilience development of Solomon Islands.

Financing Solomon Islands response to climate change includes both mobilising more funding from international sources as well as managing and accounting the existing funding in an efficient and transparent manner. To that end, the 2021 Nationally Determined Contributions (NDCs) included a range of measures to provide training and establish systems to meet donor requirements. International experience with implementing climate actions in NDCs shows that multiple government ministries and line agencies will need support for public financial management[24]. The increasing overlap between sectors, such as forestry and climate change, or energy and transport, will necessitate involvement of two or more ministries for larger projects. Global estimates of inefficiencies in public investment management of infrastructure projects indicate a loss of about a third of public funds through poor financial management[25].

© GGGI

22 Roadmap: https://solomons.gov.sb/wp-content/uploads/2022/12/UNDP-Solomon-Is-Roadmap-for-Improving-Access-to-Climate-Finance-and-Public-Spending-2022-2027-HRv1-web.pdf.

23 Committee: https://solomons.gov.sb/solomon-islands-climate-finance-steering-committee-agrees-on-key-processes-to-access-gcf-funds-and-other-multilateral-environment-funds/.

24 See Bird (2017): https://cdkn.org/sites/default/files/files/National-budgeting-for-NDCs_web.pdf.

25 See Schwartz et al 2020 Well Spent: How Strong Infrastructure Governance Can End Waste in Public Investment here: https://www.imf.org/en/Publications/Books/Issues/2020/09/03/Well-Spent-How-Strong-Infrastructure-Governance-Can-End-Waste-in-Public-Investment-48603.

The Solomon Islands Roadmap for Improving Access to Climate Finance and Public Spending (2022) developed an action plan for a Climate Finance Resilience Unit within the MoFT. Actions were framed around three pillars, with an eventual outcome of establishing the CFRU on a sustainable basis from recurring government funds. The three pillars were: access to finance, improving resource management, and transparency and accounting.

While the Climate Finance Roadmap sets out worthwhile actions to meet the identified short-term needs of climate finance access, over the long term it may be prudent to establish a national climate trust fund as a specialised vehicle for international climate finance. A national climate change trust fund will likely better meet the three pillars of actions identified in the Climate Finance Roadmap than the BAU approach of managing within existing legislation, institutions, policies, and public financial management information systems (see Table 11 below). In the near term, implementing the actions in the Climate Finance Roadmap will assist Solomon Islands to improve access to climate finance.

TABLE 11.
Comparison of BAU pathway and long-term LEDS pathway to meet the needs of improving climate finance access for Solomon Islands, as identified in the 2022 Roadmap

2022 Climate finance roadmap pillar	BAU pathway of managing within existing institutions and processes	Long-term LEDS pathway, developing a Climate Change Trust Fund and new processes
Pillar 1 – Access to finance, and in particular accreditation with GCF and other global funds.	Seek GCF accreditation of three entities (MoFT, Transport Fund, Development Bank of Solomon Islands) using their existing public financial management systems.	Conceive and establish a specialised fund for the purpose of accessing and consolidating climate finance from international funds and donors, while providing a robust system for domestic climate action with the ability to finance government, community, and private sectors.
Pillar 2 – Improving resource management, in particular the alignment of expenditure with climate priorities and climate budget tagging.	Update the Government Financial Management Information System to include climate finance expenditure tagging, with accompanying training for relevant government personnel. Climate budgets produced as needed.	Robust financing vehicle with statement of income and expenditure which can all be tagged 'climate' unless by exception, and which must report annually in alignment with the Government budget cycle.
Pillar 3 – Transparency and accountability, in particular the accountability to Parliament, auditors, and citizens.	Climate project expenditure consolidated with recurrent budget expenditure, unless additional reporting requested.	Trust fund may be required to table annual report to Parliament for scrutiny.
Cross cutting: Governance, coordination and M&E, particularly coordination and awareness raising.	Voluntary participation of departments and donors in coordination by the Climate Finance Resilience Unit.	A National Climate Change Trust Fund in legislation, and providing a common national climate financing vehicle known to government, donors, and development partners.

The Solomon Islands Government has previously stated intent to develop a Climate Trust Fund[1], or test the feasibility[2], although the policy and legislation have not been developed to a stage of publication. A range of models of climate funds exist and may be tailored to suit the context of Solomon Islands[3]. The Constitution of Solomon Islands permits the establishment of Special Funds (s100) outside of the Consolidated Revenue Fund, and existing funds include the Protected Areas Trust Fund and the National Forest Trust Fund. There may be lessons to be found in the experience within Solomon Islands and abroad, such as the establishment of the Micronesia Conservation Trust[4].

The donor support and international requirements for funding a trust fund remain to be assessed. These requirements include the governance arrangements, project appraisal processes, reporting capability and processes, and environment and social safeguards. Meeting these requirements is a challenge for a newly established trust fund, but it may be a lower challenge than for an existing government ministry or agency to meet international requirements. The requirements of donors and multilateral funds should be considered as part of the design and feasibility testing of a trust fund.

The trust fund should be able to invest in applied research and development of the low emissions pathways for Solomon Islands, as well as priority sectors for emissions mitigation and adaptation. Research and development can be sector driven, such as climate-resilient agriculture, or cross-sectoral, such as climate-resilient food systems. Potential focus areas for applied research and development include domestic low emissions energy sources, low emissions transport, low emissions industrial technology, climate-resilient agriculture, and adaptation practices.

LEDS step	Measured by	Target
7.3 Establish National Climate Change Trust Fund to consolidate international assistance and financial reporting requirements, and channel investment into needed areas including R&D.	Establishment of fund with enabling legislation.	Fund established by 2030.

26 Solomon Islands NDC 2021.

27 Solomon Islands Climate Change and Disaster Risk Finance Assessment, 2017.

28 See Irawan, et al. (2012). Budgeting for NDC action: Initial lessons from four climate-vulnerable countries, here: https://www.climatefinance-developmenteffectiveness.org/sites/default/files/publication/attach/UNDP_National_Climate_Fund_2012_Web.pdf.

29 Micronesia Conservation Trust had over USD 24 M in assets and disbursed over USD 5 M in grants in 2019, available here: http://www.ourmicronesia.org/.

4.11 ENABLING INSTITUTIONS: DATA MANAGEMENT

Over the long term to 2050, the Solomon Islands Government must build institutions, systems and processes for data management on climate change related concerns, such as emissions and emissions-generating activity, carbon rights and registries, climate vulnerability and resilience assessments.

In addition to the GHG emissions inventory, emissions-generating activity data are needed to qualify for activity- or results-based payment schemes under major international frameworks (such as REDD+, Kyoto, and Paris Agreements) as well as bespoke framework agreements that Solomon Islands may wish to develop or join (such as the Indo-Pacific Carbon Offset Scheme[30]).

Already the Solomon Islands Government has committed to developing a long-term programme for Monitoring, Reporting, and Verification (MRV), which will assist Solomon Islands to meet its UNFCCC obligations for enhanced transparency[31]. In addition to meeting the UNFCCC enhanced transparency framework by 2024[32], the MECDM and MoFR have work programmes, which include establishing or maintaining large databases with geospatial elements: national forest inventory, forest logging licences, integrated vulnerable analysis, and community solar schemes.

Furthermore, to establish carbon trading at a project, national, or international scale, will require robust carbon accounting and reporting systems. These may be managed by national statistical agencies or specialised units within different ministries. This long-term action is detailed below.

LEDS step	Measured by	Target
7.4 Establish institutional arrangements to build local capacity to independently measure and report emissions and emissions-related activity.	Establishment of a dedicated unit with enabling legislation.	Unit established by 2030.

30 https://www.dcceew.gov.au/climate-change/international-commitments/indo-pacific-region.

31 Solomon Islands NDC 2021.

32 UNFCCC ETF, available here: https://unfccc.int/Transparency.

5.

Summary of steps towards Solomon Islands low emissions, equitable and resilient pathway

The pathway to low emissions, equitable and resilient future for Solomon Islands is comprised of a vision, emissions estimates and steps. The strategy serves to complement and support existing short- and medium-term strategies such as the National Development Strategy 2016–2035, sector strategies such as the National Forest Policy 2020, as well as cross-cutting strategies such as the National Climate Change Policy.

The 2050 vision for Solomon Islands has guided the development of the emissions pathway and steps. The vision includes net zero emissions across all sectors through to 2050 with equitable growth and resilience.

Solomon Islands aims to maintain net zero emissions across all sectors by 2050, with equitable economic growth and resilience.

Steps must be taken to put Solomon Islands onto a low emissions, equitable and resilient pathway. There is 20 steps identified in the Solomon Islands LEDS (see Table 12 below). Some steps can be taken in the short term, and have already been taken through sector policies and programmes. Other steps are identified here and must be taken over the long term.

The steps with the largest impact on emissions are those that reduce forest loss and degradation from logging (Steps 3.1 and 3.2). The reduction in logging to a sustainable level of 250,000 m^3 per year, and a transition to a more sustainable industry basis with greater value-addition, is recommended in National Forest Policy 2020. To successfully realise this change asks for actions from government, industry and development partners, including government legislative and administrative changes to enable data gathering, carbon market development and financing structures.

Sustainable forest management and reduced timber harvesting has the potential to reduce emissions by over 17 million tonnes of CO2-equivalent by 2050, far outweighing the 0.4 million tonnes from energy, transport, waste, and livestock sector's changes (see Figure 26).

Through this LEDS, further opportunities for low emissions, equitable and resilient development are identified. These LEDS steps are to be incorporated into sector strategies, and further tailored to sector constraints. As an overarching and long-term strategy, the LEDS provides directions towards a sustainable pathway while respecting the policy domains and technical analysis needed for implementation planning in each sector. For example, the LEDS has identified opportunity to better integrate emissions considerations into the livestock sector strategy (Step 5.1).

This LEDS recommends building enabling institutions to support the transition to sustainable forest management and a reduction of harvesting, as well as facilitating actions in other sectors. The alignment of interests and mutual dependence between climate policy and forest area management gives further opportunities to integrate government functions in a single organisation. The proposed Climate Change and Forest Area Authority, plus accompanying Climate Change Trust Fund, would establish a strong legal basis and government administrative arrangements to support data management, carbon markets access, climate finance mobilisation, and coordination within the Government.

Establishing these enabling institutions requires actions across multiple sectors and policy domains. Further thoughtful and detailed planning support is needed to start building these important institutions. Appendix 2 provides next steps in implementation planning for enabling these institutions.

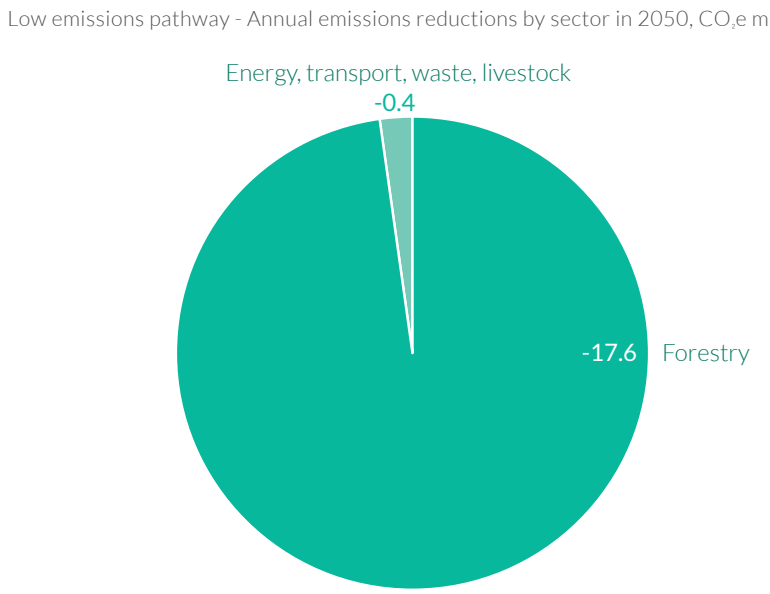
TABLE 12.

Summary of steps identified to transition Solomon Islands to a low emissions, equitable growth and resilient pathway

1. Energy
1.1 Increase renewable energy generation, particularly from hydroelectricity and solar.
1.2 Mobilise international and domestic funds for rural electrification.
1.3 Establish a regulatory framework to enable Independent Power Producers (IPPs).
2. Transport
2.1 Improve land transport efficiency.
2.2 Introduce electric vehicles and charging infrastructure.
2.3 Improved measurement and efficiency of maritime transport.
2.4 Introduce zero emissions technology and infrastructure for maritime transport.
2.5 Improve efficiency and technology of domestic shipping
3. Forestry
3.1 Reduce rate of forest clearing through tighter regulations on access or logging practice.
3.2 Increase forest area protected under Protected Area Act 2010.
3.3 Community volunteer and private managed forest programmes
3.4 Reafforestation programmes to replant degraded and previously logged areas with native forest.
3.5 Mangrove replanting and land reclamation for carbon conservation.
4. Agriculture
4.1 Support organic agriculture to avoid inorganic fertiliser use and Persistent Organic Pollutants (PoPs).
4.2 Improved agriculture practices and technology to improve resilience to climate change.
5. Livestock
5.1 Develop emissions target for livestock sector, to help guide national reporting of GHGs.
5.2 Stock genetics improvement.
6. Waste management
6.1 Improve landfill infrastructure to better sort and process municipal solid waste.
6.2 Honiara faecal sludge treatment and regulations.
6. Enabling institutions
7.1 Consolidate climate and forest protection policy areas to better achieve emissions reductions goals.
7.2 Develop a programme to enable participation in public and private carbon markets, including Article 6 transactions.
7.3 Establish National Climate Change Trust to consolidate international assistance and financial reporting requirements, and channel investment into needed areas including R&D.
7.4 Establish institutional arrangements and build local capacity to independently measure and report emissions and emissions-related activity.

FIGURE 26.

Emissions reductions from reduced forest degradation and loss far outweigh the emissions reductions actions in other sectors



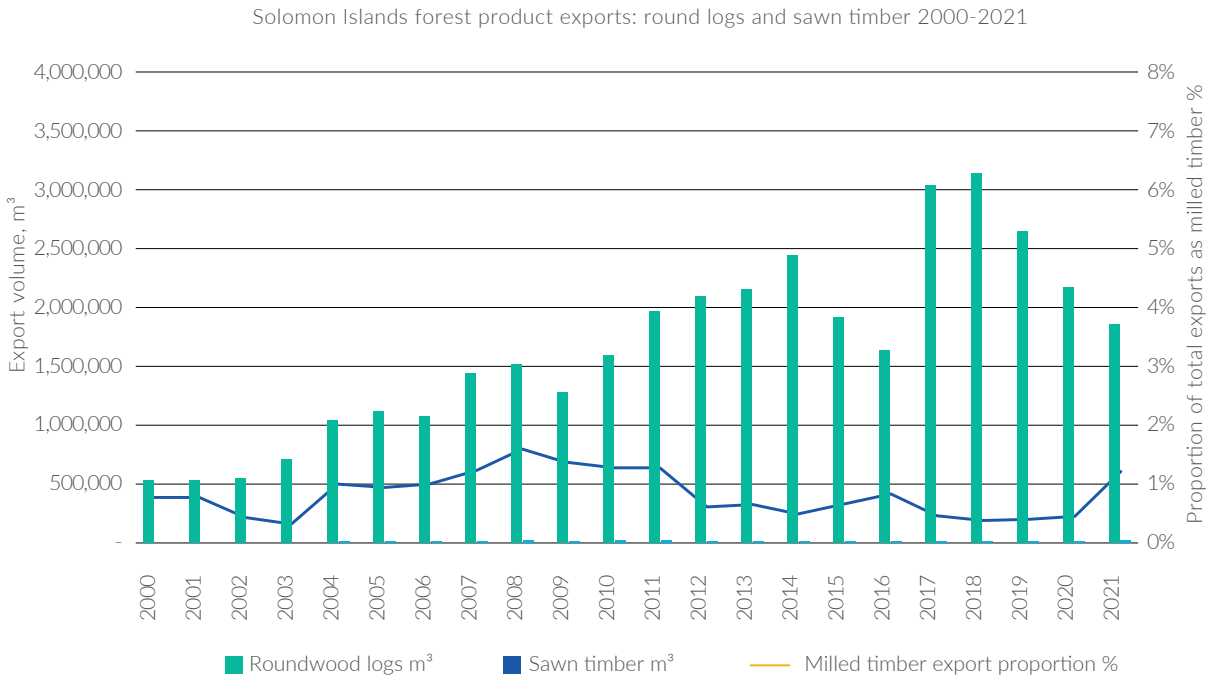
Appendix 1. Solomon Islands Forest Industry: Capturing greater value from lower volumes

The forest industry is a large contributor to government revenue and local economies. Logging permits and licencing revenue has accounted for 15–20 per cent of government revenues and 60–70 per cent of foreign earnings[33].

The vast majority of Solomon Islands' forest industry exports, in both value and quantity, are unmilled round logs.

Over the past 20 years, the volume of unmilled round logs exported has increased from approximately 500,000 m^3 to as high as 3,140,000 m^3 in 2018. Over the same period, the export of sawn timber has increased from 4,000 m^3 to 22,000 m^3. The proportion of timber export volumes as sawn timber has remained under 2 per cent, at an average of 0.8 per cent (see Figure A1.1 below).

FIGURE A1.1.
Solomon Islands forest product exports 2000–2021 (Source: FAO Statistics)



33 SI National Forest Policy 2020, available here: https://www.mofr.gov.sb/documents/LegislationAndRegulation/SI%20National%20Forest%20Policy%202020.pdf.

In a BAU pathway, Solomon Islands continue to harvest and export timber at high rates, with low levels of timber milling in the country. Log harvesting brings with it a promise of development, namely through construction of roads, schools, churches, and other infrastructure and community facilities[34].

Yet the value of forest products currently exported remains low. The value of round logs ranges from SBD 150–2,000 (USD 18–275) per m^3, depending on the grade. The value of sawn timber is higher, around SBD 6,000 (USD 720) per m^3 and up to SBD 12,000 (USD 1,440) per m^3 for rosewood and sought-after species. The costs of milling are low, particularly with portable mills, which means a great amount of export profit is not being captured within the country.

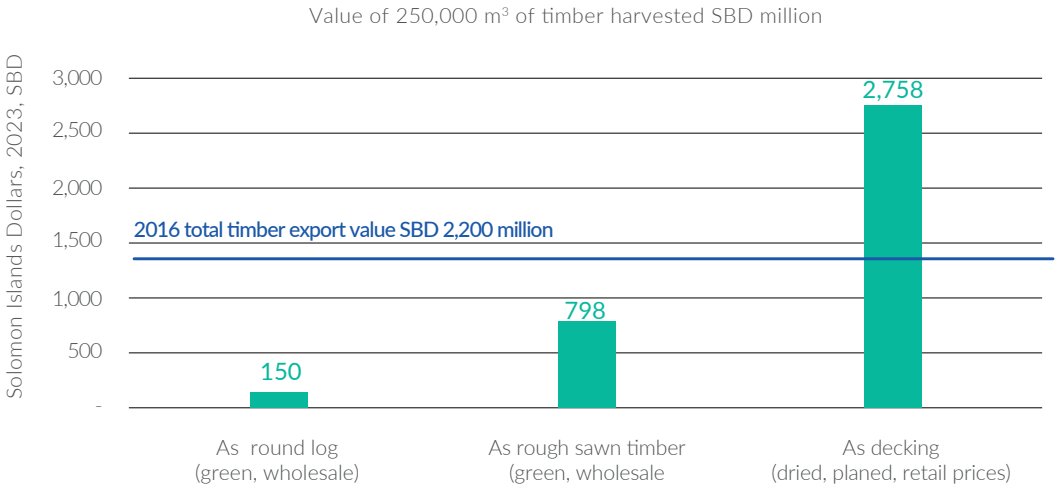
The transition to a sustainable harvest level at current forest industry practices would be highly challenging for both government and forest-industry dependent economies. Should Solomon Islands reduce harvesting to a sustainable rate of 250,000 m^3 per year and continue to export predominately round logs, the total value of forest product exports might shrink to as little as SBD 150 million (USD 18 million). This would be a substantial reduction in forest product export value of over 90 per cent from SBD 2.2 billion (USD 264 million) in 2016.

In a low emissions development pathway, with industry development of milling, legality assurance, and quality control, there is potential to harvest a much lower volume of timber while also growing the value of exports.

The value increase from timber processing into finished form, such as decking and floorboards, can increase the value of exports while simultaneously reducing the rate of forest product harvesting. It is also pertinent to know that the value of finished timber products such as decking and floorboards can be 50 times the value of round logs. Even after the conversion losses of 46 per cent to 64 per cent, the value of a sustainable harvest of timber that is milled and machine to grade has the potential to increase the value of exports from the forestry sector from SBD 2.2 billion to over SBD 2.7 billion (see Figure A1.2 below). The profits retained in the country will depend on the costs of milling and export.

FIGURE A1.2.

Value of 250,000 m3 of harvested timber as round log, rough sawn timber, and finished decking (Sources: Prices from industry consultation, UNECE for conversion efficiency factors of roundwood to sawn timber[35])



34 Minter, et al. 2018, provides case studies available here: https://pacific-data.sprep.org/system/files/From%20happy%20hour%20to%20hungry%20hour_logging%2C%20fisheries%20and%20food%20security%20in%20Malaita%2C%20SI.pdf.

35 UNECE, p. 16, Non-conifer conversion factor round wood to sawn wood and dried planed wood, available here: https://unece.org/fileadmin/DAM/timber/publications/DP-49.pdf.

The Solomon Islands Government and industry are already taking actions to increase the value addition for forest products. Standard export licence conditions include the requirement to mill at least 8 per cent of actual felled timber, but regulation and enforcement remains lacking and ineffective. The National Forest Policy 2020 sets out an ambitious agenda for forest industry development through the Forest Economics and Marketing Strategy. Industry cooperation programmes such as the Value-Added Timber Association (VATA), will assist to connect small timber lots with mills and marketing.

Further intensification of industry support is needed if transition to a lower harvest volume is to be achieved without a reduction in government revenues and export value. There are currently no working sawmills in the country that are capable of drying and producing decking, floorboards, or similar high value milled timber products. Solomon Islands forest industry could expand into other value-added timber products like furniture, plywood, medium density fibreboard (MDF), and glue laminated timber, woodchips and shavings, as well as expanded sustainable plantation timber production, and expanded complementary industries such as eco-tourism and biofuel. Development partner assistance will be needed with technology imports and training, parts, and service support, skills development and regulation. The National Forest Policy 2020 sets out a broad agenda for industry development.

Regulatory action may be needed to support industry transition away from log exports towards sawn timber and value-added products. Strong regulatory action such as a ban on round log exports could be implemented and enforced within existing monitoring regimes, while learning from its successful introduction in Indonesia[36]. Increasing the minimum percentage milling requirement, which is currently set at 8 per cent, may be ineffective without increasing the permitting and enforcement systems.

36 The Government of Indonesia log export ban from 1985 and reiterated in subsequent decades, available here: https://agris.fao.org/agris-search/search.do?recordID=US202100084723 and https://www.itto.int/news_releases/id=2610000.

Appendix 2. Implementation of enabling institutions

The implementation of enabling institutions for Solomon Islands LEDS is expected to take five years and cost approximately USD 3 to 5 million.

The process of implementation of enabling institutions will take several years, particularly as legislative change is needed. The key steps in this process are the following (see Figure A2.1 below):

I. Secure government and stakeholder support for institutional change.

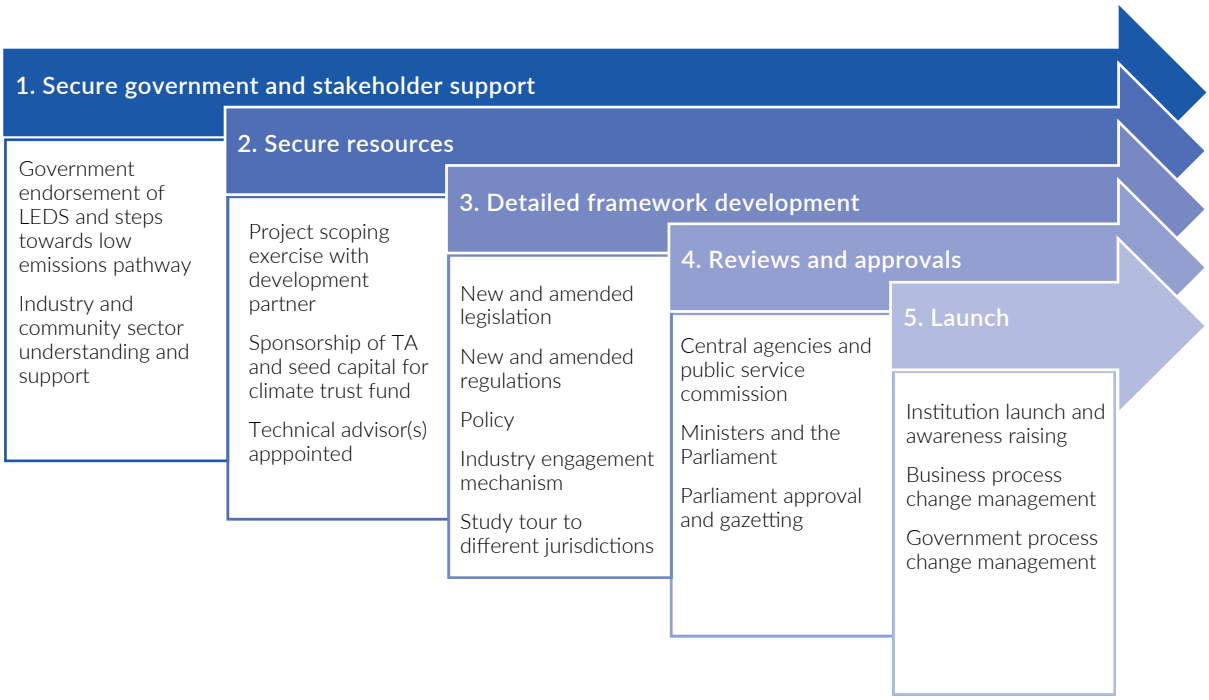
II. Secure resources to develop an institutional framework.

III. Detailed framework developed and tested.

IV. Reviews and approval by civil service, ministers, and the Parliament.

V. Launch of new institutions and transition of business and government processes.

FIGURE A2.1.
Key steps in implementing the enabling institutions of Solomon Islands LEDS.



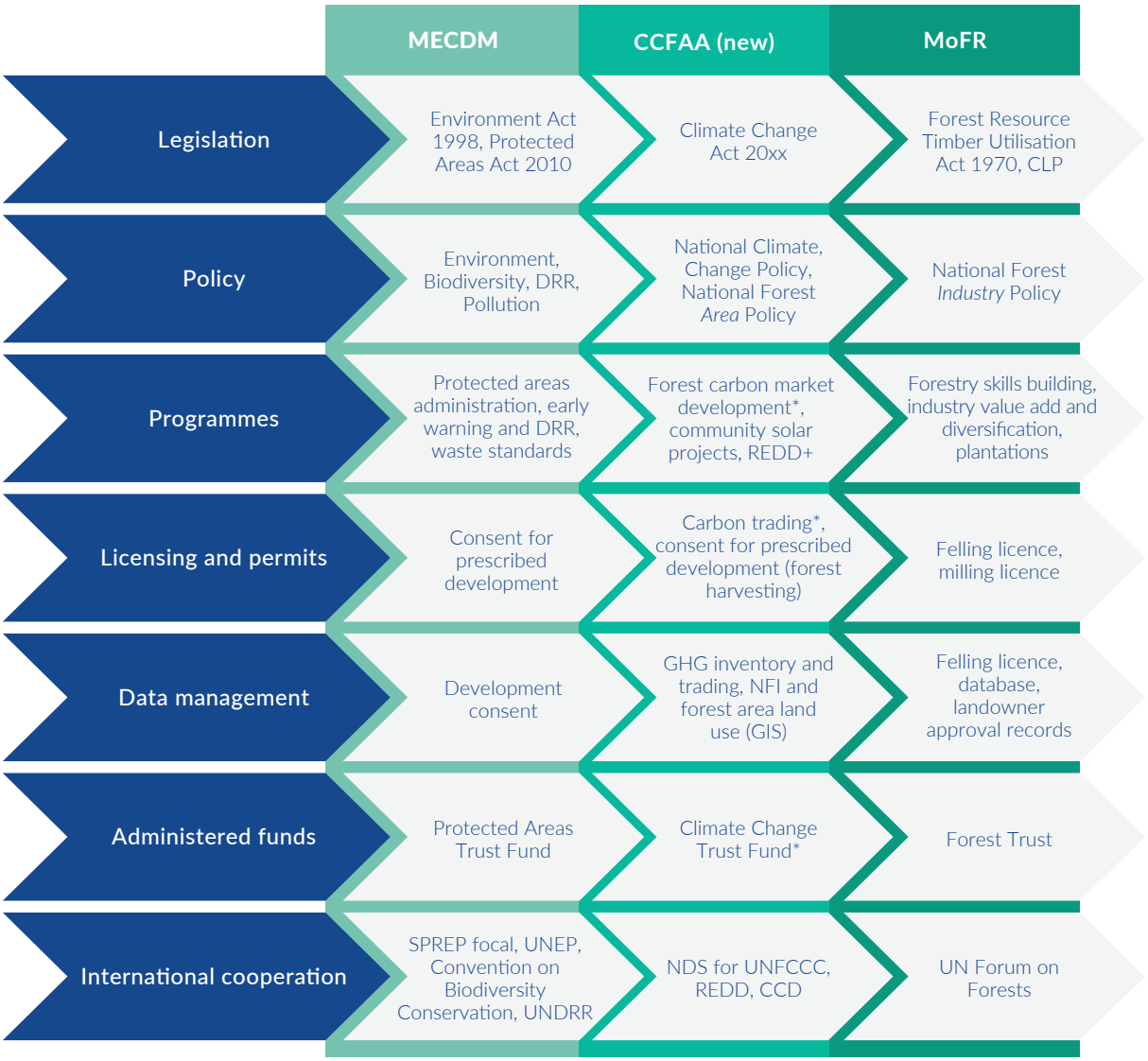
When securing government support, recognition should be given to the role of the Public Service Commission and Ministry of Public Service. These institutions are central to public administrative planning and transformation.

Through the LEDS development process, some of the key features of the new enabling institutions have been identified. The Climate Change Trust Fund should be established with international climate finance access in mind. The data management unit should be established to enable carbon trading.

For clarity on transition and business processes, it is important to recognise which responsibilities and functions will be moved to the proposed Climate Change and Forest Area Authority (CCFAA) and which are to stay with MECDM and MoFR. Figure A2.2 below provides an initial design of legislation, policy, programmes, and functions of MECD, CCFAA and MoFR after implementation.

FIGURE A2.2

Initial design of MECDM, CCFAA and MoFR after implementation, with respective legislation, policy, and functions. Items with an asterisk* are new functions and programmes enabled by legislation.



*New functions and activities enabled by legislation and institutional change

The proposed enabling institutions are related to each other. They establish a new policy and administrative architecture, data management, funds administration, and international cooperation. The implementation of each of the enabling institutions should be reflected in the design of others. For example, the establishment and design of a Climate Trust Fund should be reflected in the functions and powers of the Climate Change and Forest Area Authority.

Appendix 3. Additional data

Additional data is provided here to support continued analysis and to assist future project proposals and investment decisions.

TABLE A3.1.
Electrification rate in the LEDS pathway

	2009 Census	2025	2050
Choiseul	4%	39%	100%
Western	12%	47%	100%
Isabel	6%	41%	100%
Central	4%	39%	100%
Rennel-Bellona	0%	35%	100%
Guadalcanal	8%	43%	100%
Malaita	3%	38%	100%
Makira-Ulawa	4%	39%	100%
Temotu	3%	38%	100%
Honiara	64%	80%	100%
Average – rural	4.9%	40%	
Average – urban	64%	80%	

TABLE A3.2.
Solar and Hydropower combined generation capacity by province in LEDS pathway

Generation capacity by province (MW)	2020	2030	2040	2050
Honiara Guadalcanal (combined)	33.8	34.4	77.4	138.4
Central	0.5	1.8	1.8	2.8
Choiseul	0.4	1.7	2.7	3.7
Isabel	0.3	1.4	2.4	3.4
Makira-Ulawa	0.3	1.9	3.9	4.9
Malaita	1.3	6.5	10.5	17.5
Rennel-Bellona	-	1.3	1.3	1.3
Temotu	0.3	1.6	1.6	2.6
Western Province	3.6	4.9	5.9	9.9
Total:	40.4	55.3	107.3	184.3

Table A3.3. Transport demand in the BAU and LEDS pathways

Vehicle or vessel type	Unit	2020	2030	2040	2050
Diesel vehicles	million km	495	620	770	927
Petrol vehicles	million km	219	275	341	411
Total land transport:	million km	714	895	1,112	1,338
Diesel vessels (ships)	thousand hours	66	83	103	124
Petrol vessels (small boats)	thousand hours	137	171	213	256
Total maritime transport:	thousand hours	203	254	316	380


TO·LEAD·IS·TO·SERVE