WORLD BANK GROUP
Transport

MARITIME TRANSPORT

Strengthening the Pacific Blue Shipping Partnership

Synthesis report of

- *Governance framework,*
- *High-level baseline assessment,*
- *Zero-carbon transition plan, and*
- *Blended finance roadmap*

For official use only

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Preamble

This analytical work aiming at “Strengthening the Pacific Blue Shipping Partnership (PBSP)” was undertaken as part of the World Bank’s wider regional advisory services and analytics (ASA) “A Blue Transformation for Pacific Maritime Transport.

For transparency, it is important to note that this analytical work faced significant challenges in the research process. These included, for instance, the Covid-19 pandemic with the impossibility of in-person consultations and site visits, the unavailability or limited availability of governmental officials due to shifts in priorities, or the reassignment of consultants and related analytical responsibilities as the work evolved.

This analytical work aims to make a significant contribution to decarbonizing regional maritime transport in the Pacific. It strengthens the analytical foundation of the PBSP, it outlines potential key options (e.g., governance, technical, operational, or financial) to consider moving forward, and it provides a basis for discussion. However, given the challenges mentioned, it should not be considered as fully conclusive or exhaustive, and can benefit from existing complementary analytics by other experts as well as further research.

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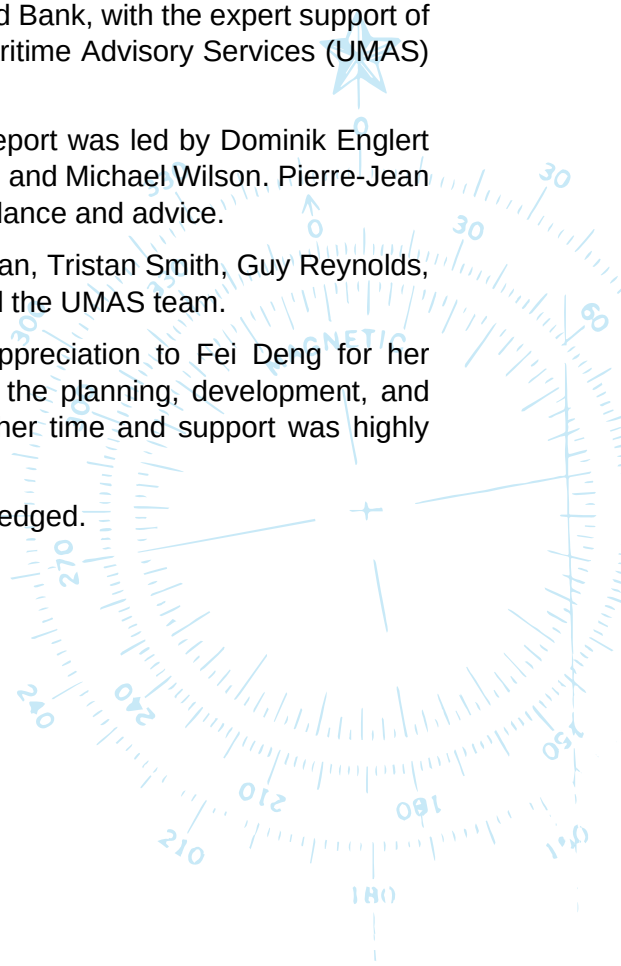


Acronyms

ASA	Advisory Services and Analytics
AIS	Automatic identification system
CAPEX	Capital expenditure
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CO_2	Carbon dioxide
GDP	Gross domestic product
GHG	Greenhouse gas
IMO	International Maritime Organization
MCA	Multi-criteria analysis
NAP	National Action Plan
NDC	Nationally Determined Contribution
OPEX	Operational expenditure
PBSP	Pacific Blue Shipping Partnership
PIC	Pacific Island Country
PID	Propulsion improving device
SMEs	Small and medium-sized enterprises
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WASP	Wind-assisted ship propulsion

1 Introduction

Pacific Island Countries (PICs) depend heavily on maritime transport for their economic development. Maritime transport is vital to enhance inclusive economic growth and social development by providing Pacific communities with reliable access to economic opportunities, services, and information. Safe, efficient, reliable, and affordable sea transport services in PICs are considered essential to basic economic and social functions and achieving national development plans. However, although maritime transport is critical to the region, it is also heavily reliant on fossil fuels making it a contributor to climate change and thereby the region's increasing risks from natural disasters and sea level rise. Therefore, if inclusive and sustainable development in the region is to be achieved, shipping must not only be safe, efficient, reliable, and affordable but also zero-carbon.

Today, the PICs' export structures are largely based on primary agriculture and fisheries resources, while fuels, foodstuffs, building materials, and transport equipment form the major imports. In terms of markets, Australia, New Zealand, North America, Japan, and Europe are the main export markets, with China, Australia, New Zealand, Singapore, Indonesia, the Republic of Korea, Japan, and Thailand representing some of the key import origins.

Given the crucial role of maritime transport for PICs, the World Bank has supported the Pacific region through its Blue Transformation for Pacific Maritime Transport Advisory Services and Analytics (ASA). This ASA has reviewed and recommended options for improved logistics efficiency and reduced transport costs in support of passenger transport, fisheries, domestic and import-export supply chains and tourism industries, improved maritime safety, enhanced resilience to climate change, pandemic crisis, and natural disasters, and improved green port/shipping initiatives, including the decarbonization of the PICs' domestic maritime transport sector.

This decarbonization component of the ASA has aimed at strengthening the Pacific Blue Shipping Partnership (PBSP) through targeted analytics and capacity development. The PBSP represents an ambitious country-driven initiative for large-scale blended finance investment to catalyze a multi-country transition to sustainable, resilient, and zero-carbon shipping. It is co-led by the Republic of the Marshall Islands and Fiji and currently includes six PICs as member countries (Fiji, Kiribati, the Republic of the Marshall Islands, Solomon Islands, Tonga, and Tuvalu[1]). At the third Climate Action Pacific Partnership Conference in 2019, the abovementioned PICs committed to establishing the PBSP in order to achieve a 40 percent decarbonization of domestic maritime transport by 2030, with full decarbonization of the sector in PBSP member countries by 2050.

Today, the domestic and regional maritime transport sector within the PBSP is characterized by various acute barriers to effective decarbonization efforts. This includes the prevalence in the domestic inter-island services of old, energy inefficient, and undermaintained vessels and a lack of supporting modern infrastructure, including some ports, and facilities for bunkering, shipbuilding, maintenance, and repair. On top of this, the entire region is also highly vulnerable to climate change impacts and the adverse impacts on social conditions, livelihoods, and employment that it brings, as outlined above.

[1] Vanuatu and Samoa are also associated with the PBSP, however this report focuses on the above-mentioned six countries.

Despite their high ambition in terms of climate action, it is not uncommon for PBSP member countries to struggle with limited resources and capacity to assess the impact that zero-carbon shipping will have on their broader development priorities. Research has shown that a further increase in the already high transport costs could occur from decarbonization measures thereby distorting trade patterns, increasing import prices, and ultimately affecting gross domestic product (GDP) and other socio-economic indicators. These potential impacts may disproportionally impact PBSP member countries due to rises in transport costs. These may have the potential to reduce the Pacific region's trade competitiveness further.

Currently, existing multilateral and bilateral support for ambitious climate action to PBSP member countries is almost exclusively focused on land-based activity. In contrast, the maritime transport sector's decarbonization by far has not received the same level of attention, and as such gaps exist between the current level of multi-country inbound infrastructure investment and what is needed to meet the PBPS decarbonization targets for 2030 and 2050.

This synthesis report summarizes the main findings and key recommendations from four complementary working papers that try to fill some of the knowledge gaps listed above, namely:

1. a **governance framework**[2] that proposes a governance structure for the PBSP taking into consideration its aims and needs,
2. a **high-level baseline assessment**[3] that establishes a greenhouse gas (GHG) emissions inventory for six PICs: Fiji, Kiribati, the Republic of the Marshall Islands, Solomon Islands, Tonga, and Tuvalu,
3. a **zero-carbon transition plan**[4] aiming at outlining the technical and operational pathways which could enable the PBSP to fully decarbonize domestic maritime transport by 2050,
4. a **blended finance roadmap**[5] that explores ways to fund the sector's energy transition.

This synthesis report together with the four working papers aims to strengthen the PBSP in terms of achieving its ambitious GHG emissions reduction targets for Pacific maritime transport by 2030 and 2050.

[2] World Bank. 2022. PBSP Governance Framework (working title).
[3] World Bank. 2022. High-Level Baseline Assessment (working title).
[4] World Bank. 2022. Zero-Carbon Transition Plan (working title).
[5] World Bank. 2022. Blended Finance Roadmap (working title).

2 Pacific Blue Shipping Partnership Governance Framework

Overview

Since the adoption of the United Nations Framework Convention on Climate Change's (UNFCCC) Paris Agreement, Pacific Island Countries (PICs) have submitted some of the most ambitious Nationally Determined Contributions (NDCs) globally. In addition, most PICs have advanced energy plans, sustainable development goals, and climate adaptation/resilience strengthening programs now well embedded across national policy frameworks. Following this tradition of high ambition, the Pacific Blue Shipping Partnership (PBSP), comprising several PICs, have committed to reducing greenhouse gas (GHG) emissions of their domestic maritime sector by 40 percent by 2030 and to fully decarbonizing the sector by 2050.

To achieve these ambitious climate targets, an unprecedented energy transition will be required. It demands a complete revolution in technology and a paradigm shift in fleet management and operations as well as appropriate financial investment and program delivery.

A bespoke governance solution has been developed that takes into consideration the region's specific priorities and demands (see Annex 1: Common priorities and needs of Pacific Blue Shipping Partnership member countries for details on common priorities and needs among PBSP countries). The governance solution presented as follows is intended to serve as a basis for discussion with the understanding that PBSP member countries may have alternative governance structures in mind, including but not limited to integrating this framework into a pre-existing regional institution. Likewise, the general use of language such as 'will' or 'should' is intended for illustrative purposes only with the understanding that PBSP member countries may wish to put a different legal weighting on the various solutions proposed.

Approach

In essence, PBSP represents a formal agreement between committed PICs that aims to achieve the following:

- accelerate progress towards a country-driven zero-carbon transformation of the PBSP member countries' interdependent domestic maritime transport sectors (including all relevant supporting sectors and services).
    - This should be aligned with the 2050 Strategy for the Blue Pacific Continent and the 2030 Agenda for Sustainable Development.
- reduce the overall GHG emissions attributable to the PBSP member countries' domestic maritime transport sectors by 40 percent by 2030.
- fully decarbonize each PBSP member country's respective domestic maritime transport sector by 2050.

To achieve these aims, PBSP member countries have agreed to:

- collaborate on setting national strategic policy and project priorities through National Action Plans (NAPs) that support the implementation of the PBSP and broader regional priorities;
- develop strategic, multi-sector and multi-stakeholder plans for the sustainable development of the PBSP member countries' maritime transport sectors.
    - This should be the primary framework for implementing the PBSP in accordance with country-driven priorities;
- maintain coordinated participation of all relevant public and private sector development partners to mobilize and align finance and capacity development for the PBSP;
- collaborate to build long-term in-country capacity and institutional strengthening to underpin the domestic maritime transition across the sector; and
- enable maximum synergy and efficiency between the development and implementation of NAPs and a single, combined, climate-finance investment program of sufficient scale to overcome previous financing barriers to fleet upgrades by coordinating and communicating effectively between all PBSP member countries.

As the PBSP is a country-owned and -driven initiative, the activities and solutions developed and proposed under the PBSP must be in line with the needs and requests of the PBSP member countries as developed in their national energy and transport action plans, and PBSP member countries can decide on which actions to take. Furthermore, with the PBSP being a science-based partnership, any decisions made must be based on the best knowledge and analysis available at the time of the decision. The knowledge created for the PBSP member countries must be produced in an unbiased and independent way.

In addition, the work of the PBSP will be guided by the following principles:

- adhere to frequently cited key principles of the blue economy[6] in terms of regeneration, renewability, sustainability, ecosystem consideration, symbiosis, abundance, and autonomy;
- foster the development of a sustainable domestic and regional maritime transport capacity to:
    - operate safely and in a manner that supports national priorities and community needs;
    - respond to food security and other emergency issues;
    - provide a disaster relief fleet capable of being deployed in the PBSP member countries affected by natural disasters by waiving cabotage restrictions for these vessels;
    - develop capacity in the Pacific for and enhance knowledge on:
        - the blue economy in general and sustainable maritime transport in particular;
        - sustainable shipbuilding and maintenance shipyards;

[6] In the context of the PBSP, 'blue economy' refers to an economy based on the regeneration of ecosystems in a logic of abundance and autonomy. It draws inspiration from nature to take what is necessary and to function in symbiosis with it.

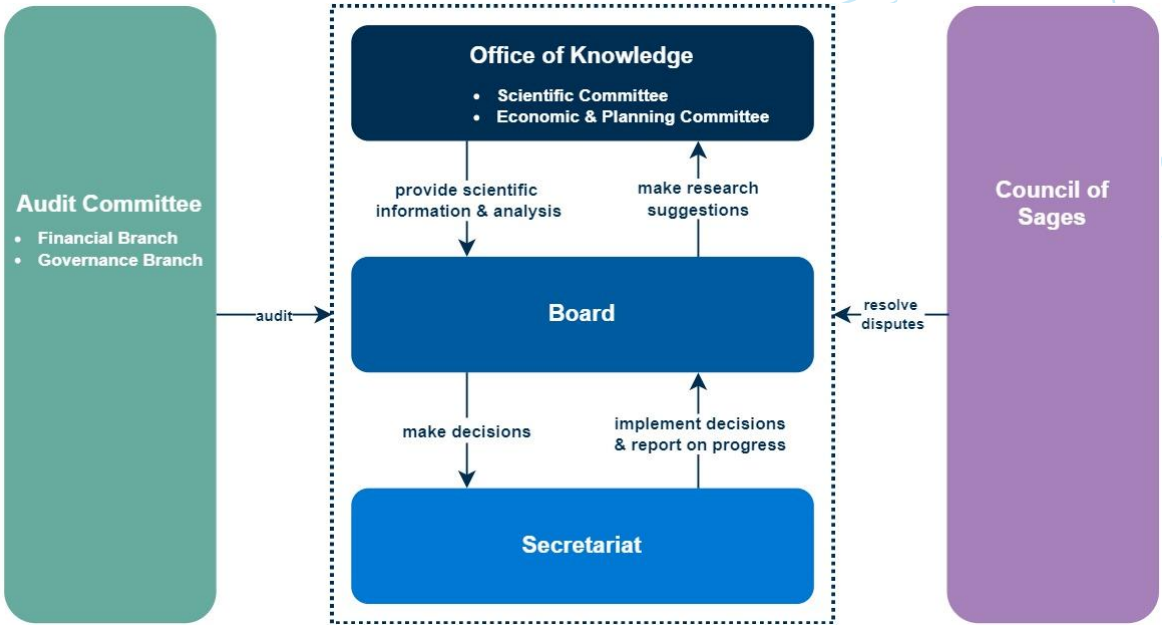
- the crewing and management of sustainable vessels.

- design anti-fragile systems that are not only robust and resilient to natural, economic, or political shocks, but that can even benefit from shocks.

Based on the above, the following outlines a potential governance structure of the PBSP taking into consideration its aims and needs (see Figure 1). It will cover:

- NAPs which set the overarching direction of the PBSP;
- The Board through which PBSP member countries can take collective decisions;
- The Secretariat which supports the Board and implements its decisions;
- The Office of Knowledge, composed of the Scientific Committee and the Economic & Planning Committee, which provides knowledge and scientific analysis to the Board;
- The Audit Committee which ensures transparency and accountability of the Board, the Office, and the Secretariat; and
- The Council of Sages which can be called upon to resolve persistent issues.

FIGURE 1: POTENTIAL PBSP GOVERNANCE FRAMEWORK



A corresponding draft founding charter for the PBSP can be found in Annex 2: Draft Founding Charter for the Pacific Blue Shipping Partnership.

The governance structure of the PBSP could be financed by grants from development finance institutions, climate funds (including the Green Climate Fund), and bilateral development agencies. The subsequent activities of the PBSP could also be funded by grants and/or concessional loans from these sources, and, where possible, complemented with private investments.

Setting directions: National Action Plans

One of the main building blocks of the PBSP are maritime NAPs that detail how each PBSP member country intends to contribute to the PBSP objectives, considering their unique national circumstances. Country-by-country NAPs that are tailored to each country's individual shipping needs and priorities, and that reflect each country's government structures and policy frameworks represent the base building block for establishing national capacity and identifying the national direction of change and priorities.

It is suggested that each country develops its own maritime NAP and that this contains at minimum the following information:

- A high-level target for domestic maritime GHG emissions reduction;
    - This national target should also be integrated into each country's NDC, thereby better enabling a country-wide economic transition plan and framework. A draft multi-country NDC for the maritime sector has been developed under this body of work and is outlined in Annex 3: Joint supplement to Nationally Determined Contributions under the Paris Agreement. PBSP member countries may consider submitting such a joint multi-country NDC on reducing GHG emissions from domestic shipping to the United Nations Framework Convention, thereby leading by example and providing a blueprint for other countries to follow suit.
- A national strategic pathway for achieving this target, including information on planned policy changes, as well as technological and financial requirements;
- Priority measures and priority projects needed to implement the NAP, including institutional strengthening; and
- Details of the national decision-making structure and stakeholder network for that country, including who is accountable for overseeing the implementation of activities and for achieving the overall target.

Many PBSP member countries have already developed NAPs. For example, the Republic of the Marshall Islands' NAP has been submitted to the International Maritime Organization (IMO) while others are working on the development of their plans or have requested NAP preparation assistance as priority projects in their national objectives.

Like NDCs, NAPs should be constantly evolving to adapt to changing circumstances, needs and priorities and be updated on a regular basis. This could, for example, be adjusted to coincide with the revision of NDCs which would support the integration of NAPs into the wider political context and embed them into existing national policies and strategic frameworks.

Making decisions: the Pacific Blue Shipping Partnership Board

The national governments of the PBSP member countries have overarching responsibility for setting the objectives of the PBSP and will oversee the implementation of PBSP-related decisions in accordance with the founding charter (see Annex 2: Draft Founding Charter for the Pacific Blue Shipping Partnership). It is suggested that a PBSP Board is established as the primary decision-making body of the PBSP. The Board will adopt the PBSP overarching strategy, discuss common strategic priorities for the PBSP over short-, medium-, and long-

term timescales, make executive decisions about the PBSP, and will assume ultimate responsibility for the policies and projects it adopts for the organization.

The Board will be composed of a delegate officially appointed by each PBSP member country. It will meet on a regular basis (at least every six months) and make decisions based on consensus.

The Board will be led by the Chair who will be initially proposed by the Republic of the Marshall Islands or Fiji as they currently co-chair the PBSP by common agreement. However, once the founding charter has been finalized and agreed upon, it is proposed that the Board delegates elect a Chair for a period of two years with the possibility of being re-elected once. The Chair is responsible for setting the agenda of meetings—with the possibility of delegates requesting additional agenda items to be included—, to ensure that all Board members had an opportunity to provide input into the discussion, and to obtain consensus decisions by the Board.

Every PBSP member country can nominate and appoint one delegate to the board who will then serve a term of five years. Funding partners and potentially other external organizations can obtain observer status and appoint an individual to become an observer. The inclusion of observers is expected to strengthen coordination between PBSP member countries and interested organizations and to enhance the technical capacity of the Board. Observers can participate in and make interventions during regular Board meetings, and submit documents, reports, and proposals that will be considered by the Board as it sees fit. The Board can reserve the right to hold closed session meetings (i.e., without observers) when required, for example, to discuss delicate subject matters.

To increase transparency and accountability of the Board, and to ensure that the Board takes the recommendations of the Office duly into consideration, the Board will release regular statements and accounts of their decisions. While the Board is free in its decisions and not beholden to the recommendations of the Office, it needs to provide a justification in those cases where decisions diverge from recommendations made by the Office.

Coordinating activities and executing decisions: the Secretariat

A Secretariat will be established to support the Board in its decision-making process and to subsequently implement the decisions taken by the Board. More specifically, the Secretariat will be responsible for, inter alia:

- organizing, facilitating, and hosting Board meetings;
- providing a focal point for communications with PBSP member countries and observer organizations;
- managing the PBSP finances and distributing budgets to the different PBSP bodies according to a specified distribution key/formula;
- identifying, developing, and coordinating PBSP activities, projects, and programs and supporting management thereof, including applying for project funding and facilitating and processing calls for proposals of potential investment projects;
- coordinating the implementation of the provisions within the Agreement, including the underlying PBSP governance framework and other relevant agreements concerning the PBSP member countries;
- maintaining a register of PBSP all projects and activities;
- compiling reports on the execution of Board decisions and distributing them to the Board ahead of their meetings;

- compiling reports on the progress of developing and implementing NAPs, based on information provided by PBSP member countries, and distributing them to the Board ahead of its meetings;
- organizing and facilitating data sharing between PBSP member countries;
- running and maintaining a PBSP website and publishing relevant information, research findings, and Board statements and decisions there;
- organizing public information and consultation events;
- coordinating responses to freedom of information requests; and
- providing other secretarial functions as requested by the Board.

The Secretariat will be headed by an appropriately qualified Director selected by the Office. The Director will be responsible for overall leadership of the day-to-day functioning of the Secretariat and liaison with the Board. The Director will also hire the staff needed to conduct the Secretariat's activities.

Producing knowledge: the Office of Knowledge

The PBSP is to be a science-based partnership. This entails that the decisions taken by the Board need to be informed and guided by the best available knowledge[7] and scientific analysis available. For the Board to have the necessary information to carry out its decision-making responsibilities, an Office of Knowledge (the Office) will be established at the inception of the PBSP. The Office will be responsible for providing the best scientific information and analysis available on any domains relevant to decarbonizing Pacific shipping.

To enable the Office to conduct independent and unbiased analyses, it needs to operate autonomously and independently from the rest of the PBSP governance framework, including the Board, and needs to be free to allocate its resources and structure its work according to its research agenda. It will be a knowledge-producing body, not a decision-making one, and cannot be held accountable for any decisions made.

The Office will consist of two advisory committees, namely the Scientific Committee and the Economic & Planning Committee, and they will operate under the direction of the Head of the Office. The Head of the Office is elected by the members of the Committees.

Between them, the two Committees will be responsible, inter alia, for:

- conducting applied research, economic and policy analysis, including related to the preparation and implementation of PBSP countries' NAPs;
- designing programs for different purposes, e.g., for educational purposes, strengthening institutions, and for strategic partnerships;
- undertaking environmental and/or regulatory impact assessments;
- developing (technological and financial) viability plans;
- preparing market studies;
- identifying data needs and gaps; and
- collating relevant data.

[7] In the context of the PBSP, 'knowledge' refers to any form of knowing, including—but not limited to—technical, scientific, economic, and in particular traditional knowledge.

The Office's specific research agenda will be decided by the Office Head based on what they deem most important. In setting the research agenda, the Office Head will consider specific research requests by the Board.

Reports produced by the Office and its Committees should contain recommendations to the Board, be transparent and publicly accessible. To foster a deeper understanding of their work and allow for questions to be asked, the Board can request the Office to present its reports and recommendations.

To provide the best scientific analysis possible, the Office may request data from PBSP member countries, and the latter will need to accommodate these data requests to the best of their ability. The data will remain under the ownership of the PBSP member countries and will not be made public if requested by the PBSP member countries.

Members of the Scientific Committee and the Economic & Planning Committee are appointed or contracted based on their proven technical knowledge and its relevance for the Pacific following a competitive selection process by independent recruitment agencies with a good understanding of the Pacific. It is likely that the Committees will be composed of naval architects, marine engineers, shipbuilders, -designers, -owners, -operators, economists, political scientists, planners, analysts, and development/climate finance experts.

While experts can be recruited internationally, it will be essential that the Committees also possess local knowledge and expertise. This will ensure that solutions, recommendations, along with specific projects and how their performance is reviewed, are more sensitively evaluated. It will also assure that specifically local expertise and experience in sustainable shipping are taken into consideration. This relates, for instance, to the traditional knowledge of building ships in the Pacific that rely on wind-assisted ship propulsion. It will furthermore reduce the risk of blindly applying solutions developed in high-income countries to low- or middle-income countries where such solutions may not necessarily be suitable or appropriate.

Ensuring accountability and transparency: the Audit Committee

To ensure strong accountability and transparency of the PBSP activities and spending, an Audit Committee will be established on a non-permanent basis. It will consist of a Financial and a Governance Branch.

Under the Financial Branch, an external and independent auditor approved by the Board will provide a transparent report on the financial accounts of all PBSP bodies on an annual basis. The report will detail the account keeping, financial records, payments, asset keeping, and liabilities of all PBSP bodies.

Under the Governance Branch, every two years, three external and independent auditors will provide a governance report on all PBSP bodies with the aim of surfacing pertinent governance issues, including those related to non-financial benefits, the interaction between the PBSP bodies and interactions between the PBSP and external organizations.

Other transparency and accountability mechanisms

In addition to the work of the Audit Committee, the PBSP will make the Board meeting statements and Board decisions—alongside any justifications thereof—publicly accessible in their unedited forms. Furthermore, interested individuals may request access to other

information and data which the PBSP will need to respond to and disclose the requested information and data, as long as it does not contain sensitive information.

All members, staff, and contractors of the PBSP must disclose any potential conflict of interest. This refers to a situation where an individual or the entity for which they work, whether a government, business, media outlet, or civil society organization, is confronted with choosing between the duties and demands of their position and their own private interests.

Resolving disputes: the Council of Sages

Every organization can encounter conflict among its members or between its members and externals. In many cases, these conflicts can be resolved internally or through dialogue with the respective external parties. However, in cases where this proves impossible, the Council of Sages can be called to help resolve any persistent difficulty both internal to the PBSP but also externally in the PBSP's relationship with others.

The Council of Sages is a non-permanent body of the PBSP which will consist of one Sage per PBSP member country. Each Sage will be appointed based on their demonstrated community leadership for justice and equity. The decision on whom to appoint will lie with each PBSP member country.

The Head of the Office, the Director of the Secretariat, and any member of the Board can refer a difficulty to the Council by simple request. If employees have concerns about misconduct and either cannot report these to their superiors or the latter have failed to effectively act on their concerns, employees may also report to the Council. Any issues reported to the Council must be treated confidentially so that nobody issuing a report may experience negative repercussions from it.

When a concern has been reported, the Council will meet and decide on the issue at hand within four months. It will resolve the issues presented by consensus based on what is considered just and equitable, considering the principles of the blue economy and the interest of the community of the Pacific as a whole.

A PBSP governance mechanism outlined in this document should be considered and discussed to gauge whether it presents a viable way forward, identify what improvements should be made, and weigh the opportunities, challenges, and risks of integrating it into an existing institution versus creating a new organization.

3 High-Level Baseline Assessment

Overview

To achieve the decarbonization targets of the Pacific Blue Shipping Partnership (PBSP), accurate and reliable data needs to be collected to set a baseline and enable transition planning. The PBSP made first steps towards such a baseline by developing an initial shipping inventory. This initial shipping inventory outlined baseline estimates for fuel consumption and greenhouse gas (GHG) emissions. However, there were still significant limitations to the inventory, such as limited data availability, particularly for domestic sea transport predominately served by small artisanal crafts, which made it challenging to develop any effective transition plan based upon it.

This section provides a revised approach to overcome these limitations and therefore estimate baseline fuel consumption and GHG emissions more accurately and reliably than initially done. The following sub-sections outline this revised approach, explains the scope of the database, and presents key findings of this baseline assessment, broken down by domestic shipping and international shipping between the six Pacific Islands Countries (PICs) studied.

Approach

The initial shipping inventory developed by the PBSP was very valuable in providing initial insights into the profile of shipping fleets and the scale of GHG emissions. However, it also identified some significant limitations of the estimates which were based on automatic identification system (AIS) data. For instance, AIS data does not cover ships with sizes less than 300 gross tonnage as well as cargo ships below 500 gross tonnage that serve domestic voyages. Moreover, the dataset only covers four ship types—bulk carriers, containerships, oil tankers, and general cargo ships—which may not necessarily represent the wider variety of ship types that are used across the Pacific region.

Therefore, this high-level baseline assessment attempts to build on the previous work to address the limitations identified. As its base data, this assessment uses primary data sources and national documents for domestic and international vessels to develop an inventory database for the following six PICs: Fiji, Kiribati, the Republic of the Marshall Islands, Solomon Islands, Tonga, and Tuvalu. The database records the characteristics of each individual ship that is relevant for estimating the ship's fuel consumption and GHG emissions during the year 2019.[8] The dataset covers domestic and international ship registries for six PICs and is broken down into domestic and international ships, 25 ship types, and three engine types.

Where information was missing or incomplete, regression models were used to estimate fuel consumption and GHG emissions. This methodology was consistent with that applied in the internationally recognized Fourth International Maritime Organization (IMO) GHG Study (2020).[9] Details on the methodology and models used can be found in the complementary World Bank working paper "High-Level Baseline Assessment (working title)".

[8] It must be noted that the accuracy of 2019 data varies from country to country depending on recent surveys and exercises to identify the domestic fleet firsthand. Tonga's data also needs to be read with caution as it is based on information prior to the 2022 volcanic eruption.
[9] International Maritime Organization. 2020. Fourth IMO Greenhouse Gas Study.

It must be noted that data gaps still exist within the database. For example, due to limited trade data availability for countries in the Pacific region, the database still only contains data for intra-island shipping between Fiji and the other five PICs.

Key findings

Domestic shipping

In 2019, domestic shipping in the six PICs—i.e., journeys departing and arriving within the same country—emitted 580,493 tons of carbon dioxide (CO_2) emissions. Most of these emissions were generated by Fiji, followed by the Solomon Islands, which is in line with prior expectations given the size of the shipping fleet in both nations, see Figure 2 and Figure 3.

Likewise, at the country level, CO_2 emissions among PICs strongly correlate with the population and gross domestic product (GDP) figures of the countries. Fiji and Solomon Islands have the highest GDP and population amongst the countries within this high-level baseline assessment, they also emit the highest CO_2 emissions and account for the majority of domestic shipping emissions among the six PICs.

FIGURE 2: OVERVIEW OF SHIP NUMBER AND TYPE AMONG SIX PICS

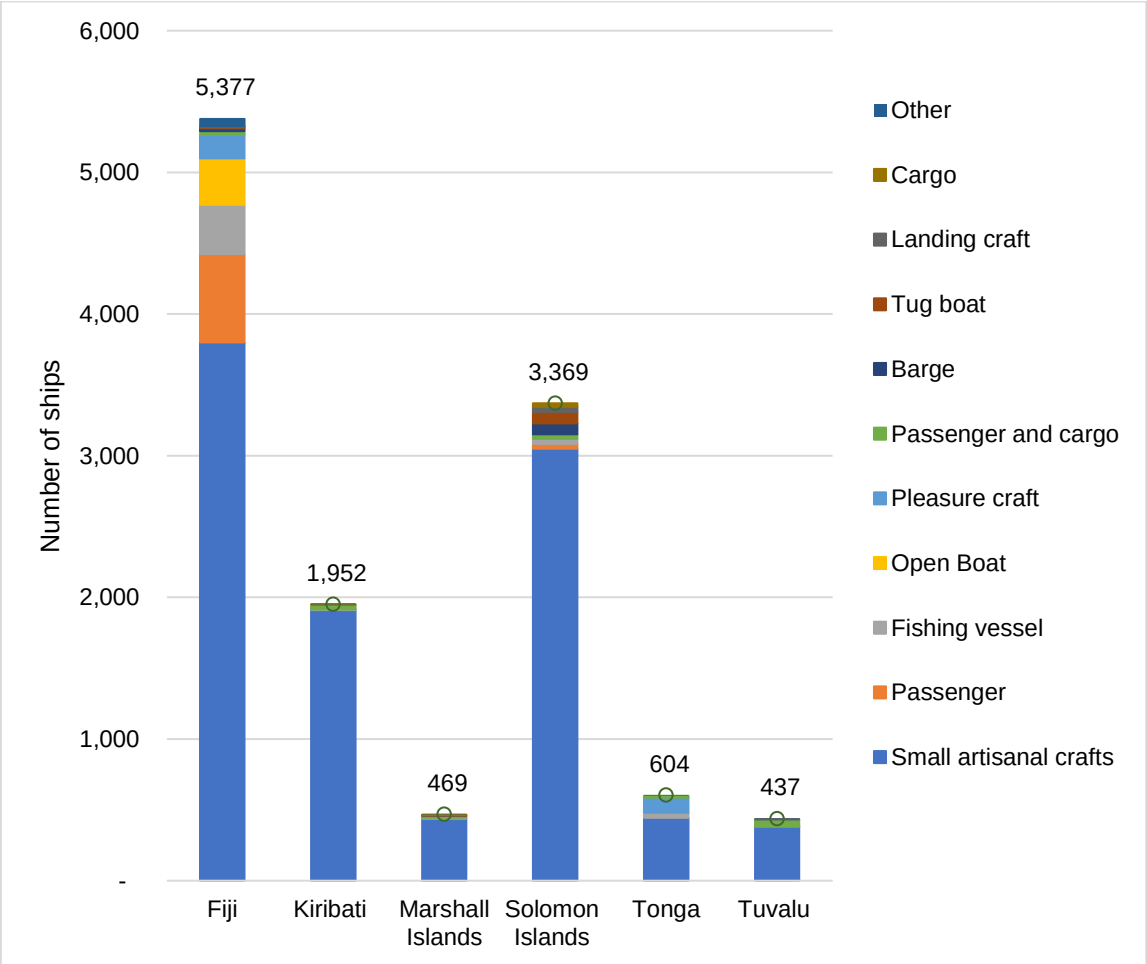
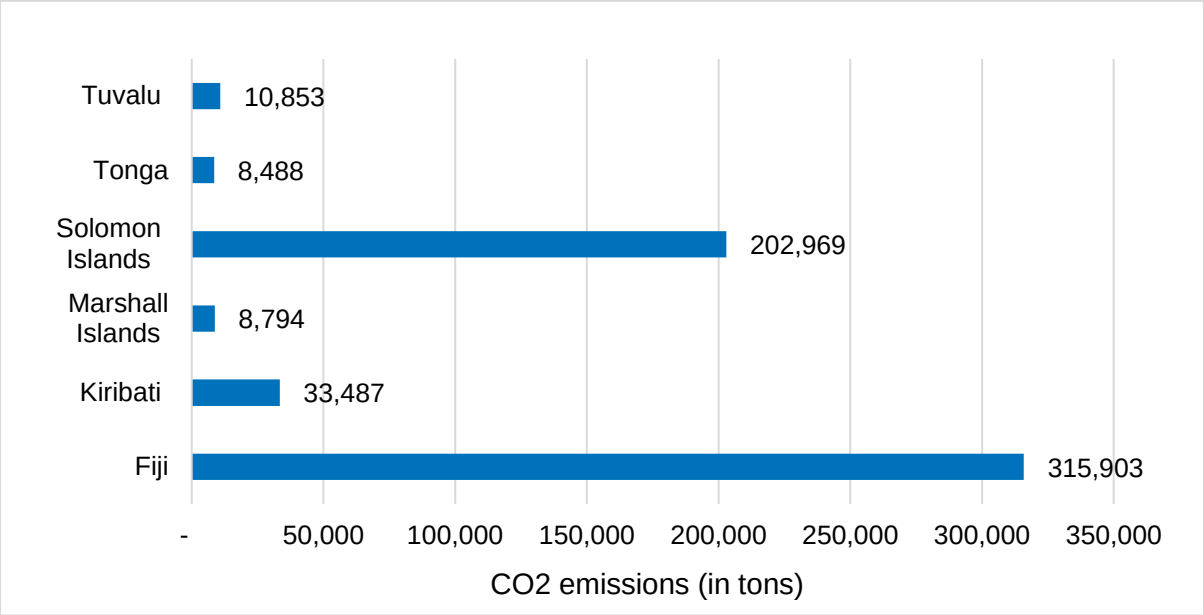


FIGURE 3: CO_2 EMISSIONS FROM DOMESTIC SHIPPING AMONG SIX PICS



Across the six PICs, journeys departing and arriving within the same country from small artisanal crafts, passenger ships and tugboats account for over 50 percent of domestic shipping CO_2 emissions. The highest share of CO_2 emissions is generated by small artisanal crafts (21 percent) and passenger ships (21 percent), followed by tugboats (11 percent), and fishing vessels (10 percent), see Figure 4. This pattern also holds true when GHG emissions are examined at the country level where small artisanal crafts, passenger ships, and fishing vessels represent major contributors to CO_2 emissions and consume most fuel across the countries (Figure 5).

FIGURE 4: SHARE OF CO_2 EMISSIONS FROM DOMESTIC SHIPPING BY SHIP TYPES

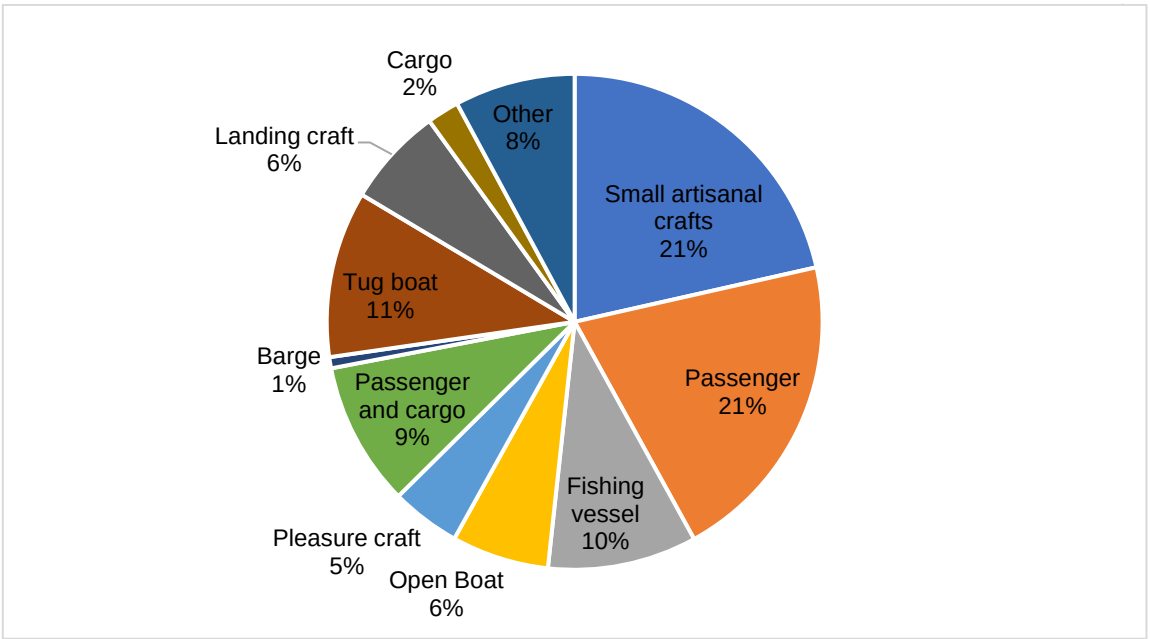
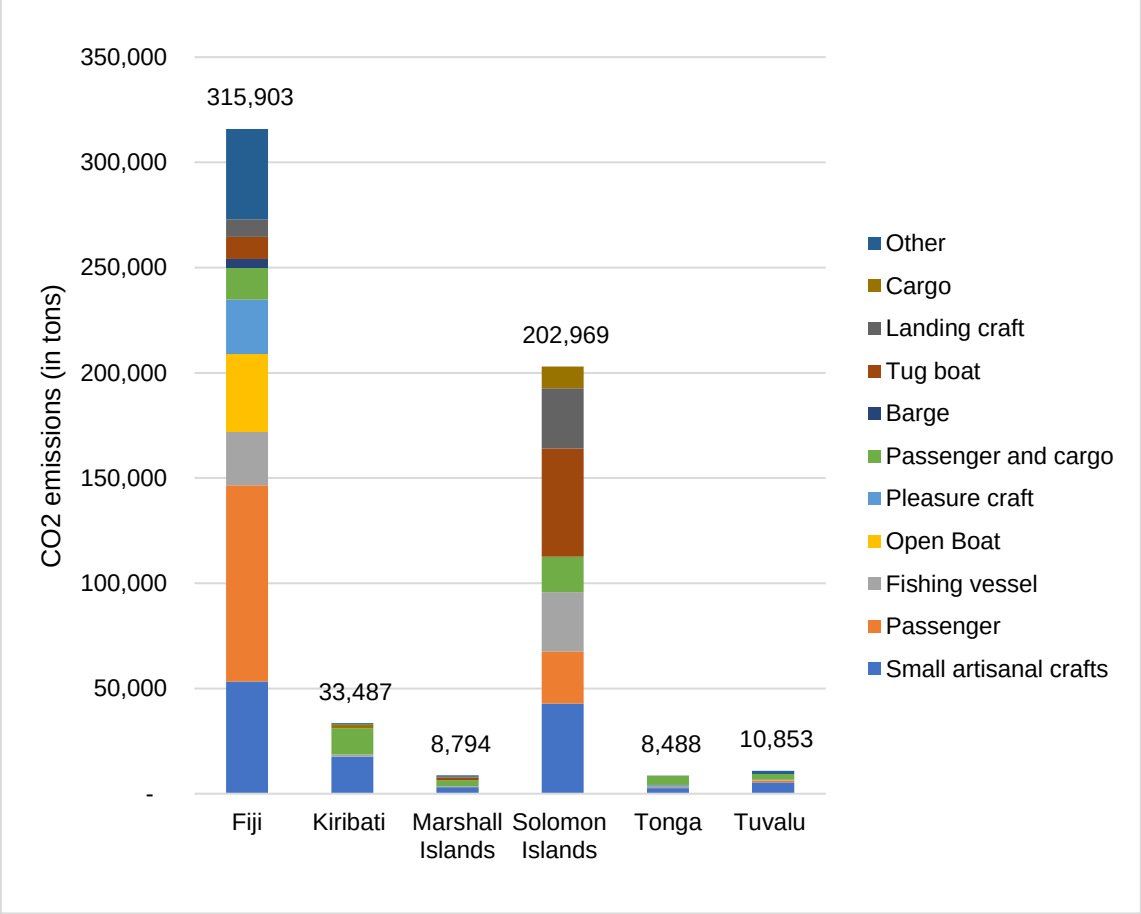
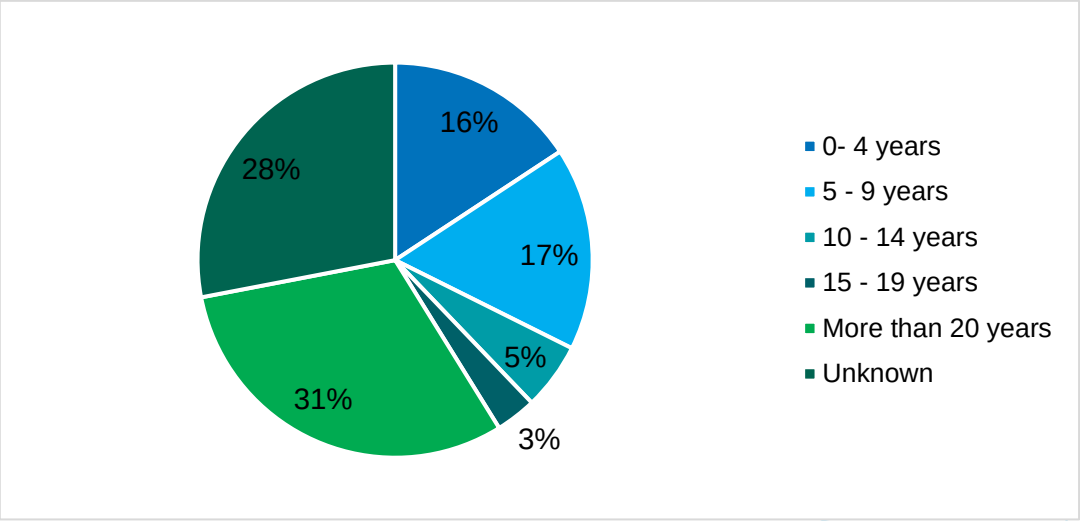


FIGURE 5: ANNUAL DOMESTIC SHIPPING CO_2 EMISSIONS FROM PICS BY SHIP TYPE



The database also reveals that ships which are 20 years or older are major contributors of GHG emissions (31 percent), followed by ships between five to nine years (17 percent), and between zero to four years (16 percent), see Figure 6. Note that a high fraction of the GHG emissions (28 percent) is emitted by ships without age data, which makes a fully robust assessment of the emission profile based on ship's age difficult. Nevertheless, the emissions profile from available data reconfirms the general understanding that old ships typically have lower fuel efficiency than younger ships.

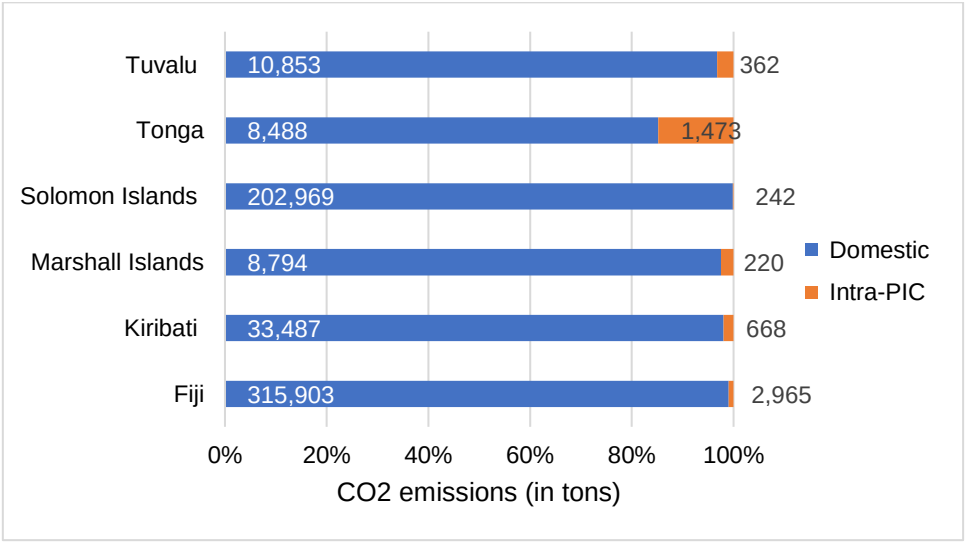
FIGURE 6: SHARES OF CO_2 EMISSIONS FROM DOMESTIC SHIPPING BASED ON SHIP AGE



Intra-island shipping

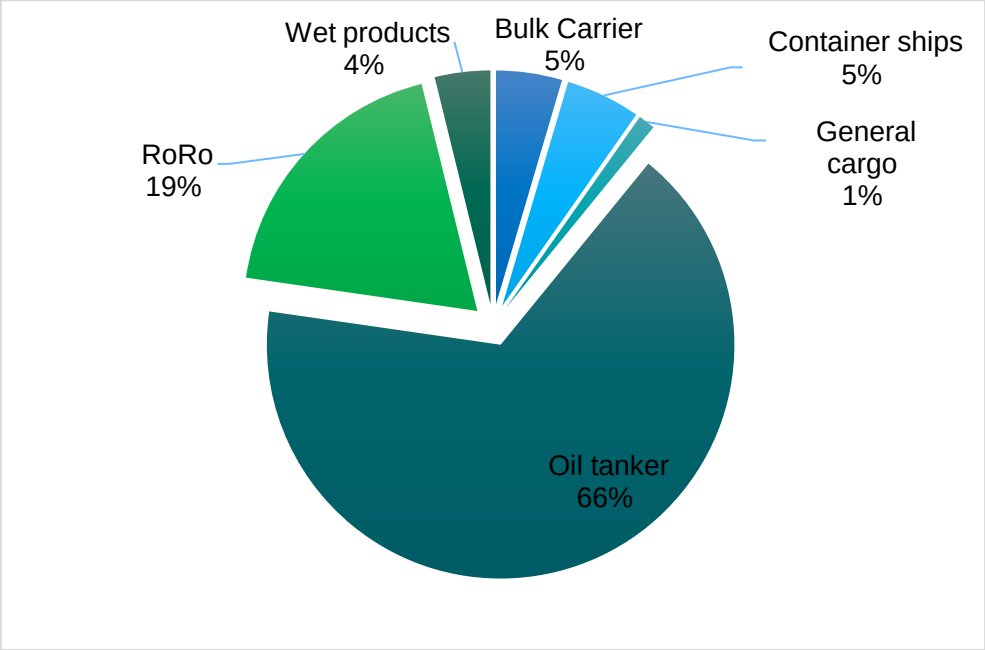
Estimations on CO_2 emissions generated on international voyages were calculated based on bilateral trade data obtained from the UN COMTRADE database. However, these estimates should be treated with caution as—due to limited trade data availability—the intra-PIC shipping dataset only comprises CO_2 emissions generated on routes between Fiji and the other five PICs included in this high-level baseline assessment. This means that data on GHG emissions generated between the other five PICs (excluding Fiji) was not included. This data shows that in 2019, ships operating internationally between the six PICs emitted 2,966 tons of CO_2. This is only a fraction of the PICs' domestic shipping emissions. Figure 7 shows that with the exception of Tonga, intra-PIC emissions account for (often much) less than five percent of their shipping emissions.

FIGURE 7: COMPARISON OF CO_2 EMISSIONS FROM DOMESTIC AND INTRA-PIC SHIPPING



CO_2 emissions from intra-PIC shipping are dominated by oil tankers which account for up to 66 percent of total GHG emissions. Roll-on and roll-off ships represent the second highest emission contributor with 19 percent of the total emissions, see Figure 8. These GHG emissions shares reflect the trade characteristics and types of commodities most commonly shipped between the Pacific countries with oil or fuel products being at the top of the list.

FIGURE 8: SHARES OF CO_2 EMISSIONS FROM INTRA-PIC SHIPPING BY SHIP TYPES



It is likely that even if the dataset included data for shipping between all six PICs, the share of intra-PIC shipping emissions would still be smaller than that for domestic shipping CO_2 emissions. Firstly, domestic shipping in the PIC which includes both cargo and passenger transport has generally higher activity than intra-PIC shipping. Secondly, ships serving intra-PIC routes are typically cargo ships with significantly higher economies of scale, which in turn, offers higher fuel efficiency per cargo transported between the PICs.

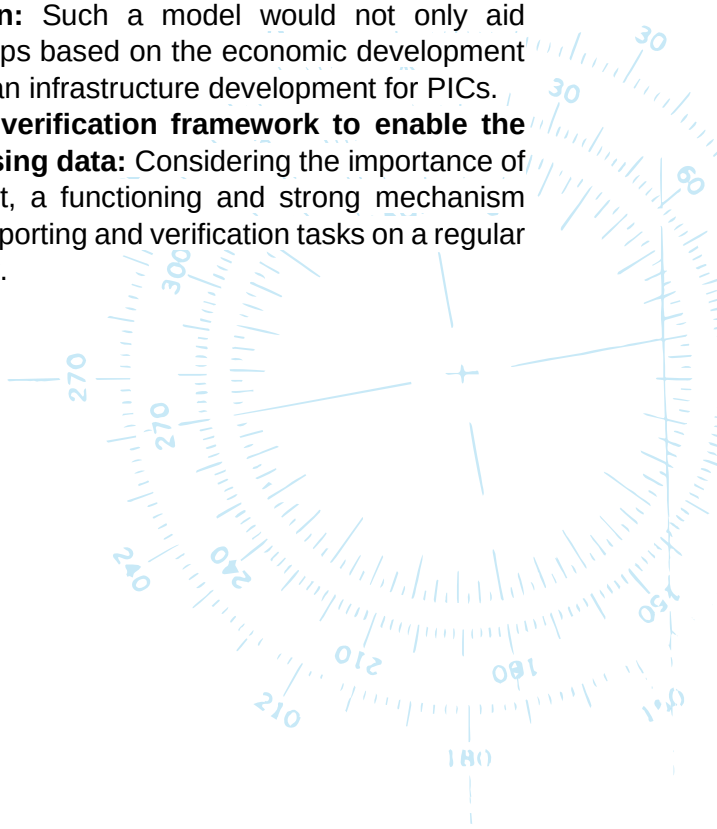
Recommendations

To ensure that any transition plan or any other future strategic work undertaken by the PBSP are accurate and well-informed, it is recommended that the accuracy and reliability of the revised shipping inventory from which the fuel consumption and GHG emissions are derived is to be strengthened further. This can be achieved by:

- **Regularly monitoring and registering international and domestic ships:** This would enable reliable and up-to-date ship registers to be easily accessible, thereby allowing for an even more accurate estimation of GHG emissions from both international and domestic shipping.
- **Establishing a commodity flow database for estimating national freight transport volumes and costs:** This would enable a more accurate estimation of intra-island

shipping and hence allow for better-informed strategic forecasts and planning for shipping infrastructure. Specifically, within the context of GHG estimation and mitigation, complete origin and destination data, ideally for different modes and commodities and their transport costs will be invaluable to analyze the impact of climate policy measures such as taxes and subsidies on GHG emissions and PBSP member countries' economies.

- **Establishing a transport demand model to predict future expansion of vessel stocks, activities, and fuel consumption:** Such a model would not only aid estimation of future GHG emissions from ships based on the economic development of a country, but it would also be useful to plan infrastructure development for PICs.
- **Setting up a monitoring, reporting, and verification framework to enable the systematic and efficient collection of missing data:** Considering the importance of monitoring the progress of GHG abatement, a functioning and strong mechanism would be beneficial to carry out monitoring, reporting and verification tasks on a regular basis such as annually or at least bi-annually.



4 Zero-Carbon Transition Plan

Approach

The proposed Zero-Carbon Transition Plan is based on the same GHG abatement measures and timings across all PBSP nations. These are distinguished by ongoing/instant, short-term and long-term measures. Even though the measures and their timings are assumed the same across the PBSP member countries, countries may still have different GHG emissions savings opportunities for each abatement measure. For example, the GHG abatement potential of wind-assisted ship propulsion (WASP) technologies in PBSP member countries closer to the equator with lower wind resources (e.g., Kiribati) may be less attractive than in countries with higher wind resources (e.g., Fiji). Furthermore, the individual country's policy and roll-out of supporting mechanisms will influence how effective and how well adopted each abatement measure will be. Ongoing collaboration across the PBSP member countries will also be key to achieve economies of scale and develop inter-country trade and knowledge-sharing opportunities surrounding each abatement measure. Details on the methodology can be found in the complementary World Bank working paper "Zero-Carbon Transition Plan (working title)".

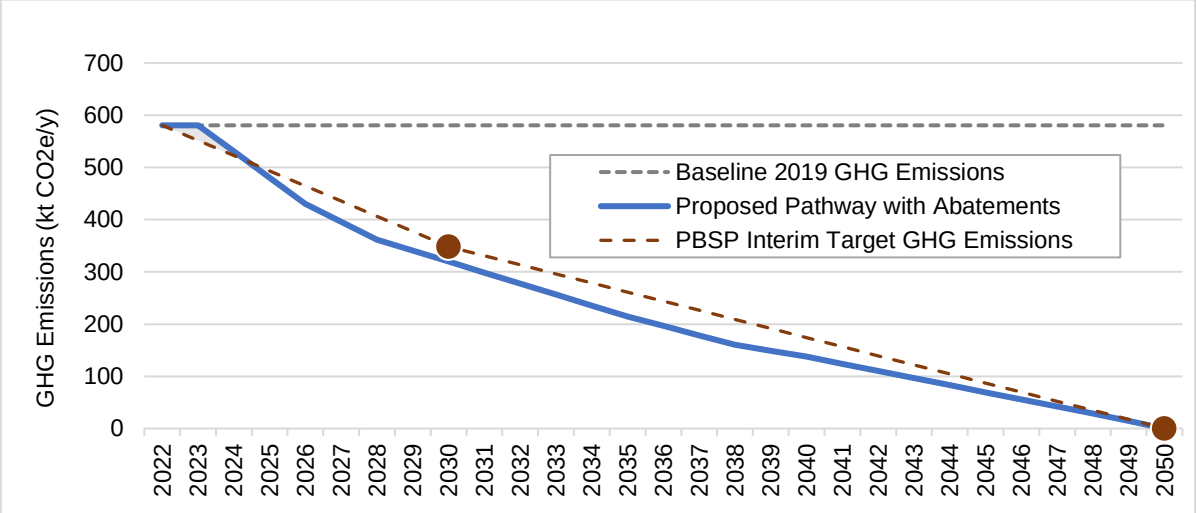
Furthermore, the Zero-Carbon Transition Plan should not be considered in isolation from other sectors, particularly given the competing needs of land for agricultural production and renewable energy generation. The goal is to achieve self-sustaining value chains and minimize the reliance on energy imports from outside the Pacific Island Countries (PICs).

Overview

This section outlines plausible technological and operational pathways that the Pacific Blue Shipping Partnership (PBSP) could envisage as immediate, short-term, and long-term measures to achieve its GHG emissions reduction goals. The analysis is based on the outcomes of the previous section's High-Level Baseline Assessment and is adapted for the types of ships and routes associated with the region.

Several greenhouse gas (GHG) emission measures potentially applicable to the PBSP member countries' fleet have been assessed using a Multi-Criteria-Analysis (MCA). Based on this MCA, a possible 2050 decarbonization pathway has been developed, which is hereafter referred to as 'Zero-Carbon Transition Plan'. It factors in a range of criteria including the maturity of technology, socio-economic drivers, and the local readiness of each GHG abatement measure. Given the evolving nature of several abatement measures, the Zero-Carbon Transition Plan proposed in this report should be reviewed and updated periodically (e.g., every two to five years). Using data from the High-Level Baseline Assessment, a model has been developed to inform the potential GHG emissions reductions and costs for each abatement measure for each country and for the region as whole. Figure 9 shows the emissions trajectory under the Zero-Carbon Transition Plan, illustrating that this plan would not only meet, but even slightly exceed the emissions reduction targets of the PBSP.

FIGURE 9: GREENHOUSE GAS EMISSIONS TRAJECTORY UNDER THE ZERO-CARBON TRANSITION PLAN



Key findings

From the assessment of potential GHG abatement measures and the modeling of a decarbonization pathway, several key findings can be identified.

Ongoing/instant and short-term GHG abatement measures

Operational measures in ship operations

Ongoing/instant and short-term (2023–2030) abatement measures seek to address immediate challenges in technical vessel designs, logistics, marine infrastructure, and data gathering by improving operational efficiencies. They include improved maintenance programs, demand-supply management, data systems, supporting infrastructure, WASP retrofitting[10], engine derating, propulsion improving devices (PIDs), blended biofuels, and motor switching.

If successfully implemented, these ongoing/instant and short-term GHG abatement measures have the potential to achieve 40 percent GHG emissions reductions by 2030 and will 'buy' time for long-term abatement measures involving electrification and green e-fuels to mature. This is clearly illustrated in Figure 10 which shows the contribution of, in particular, operational efficiency measures and WASP retrofitting in reducing GHG emissions by more than 40 percent by 2030.

It is also possible that due to these measures the fossil fuel import dependence could be reduced by around 40 percent in the same period. This would result in significant savings to the economies of the PBSP member countries in terms of imports. However, as fuel expenses reduce due to improved efficiencies, there is also a risk that operators will consume more fuel based on the savings achieved (i.e., the so-called "rebound effect"[11]).

[10] It must be noted that the benefits associated with WASP technologies are location specific as they are dependent on local wind conditions. This means that WASP solutions will need to be hybrid technologies in their approach, based on trialing/proof of concepts in each PBSP member country.
[11] University Maritime Advisory Services. 2019. Reducing the Maritime Sector's Contribution to Climate Change and Air Pollution. Available at:

Land-based infrastructure

Operational measures, especially maintenance and retrofitting, are critically dependent on slipways and ship lifts in the region. A high-level check of the slipway capacity across PBSP countries has indicated a significant shortfall of slipways across the PBSP member countries. Therefore, it is recommended to prioritize initial investment in these facilities and systems and to implement a rigorous three-to-five-year maintenance cycle. Furthermore, a more detailed understanding of the capability and condition of existing slipway assets is needed to determine the extent of additional investment required. Further integration of landside logistics with freight route efficiency measures such as warehousing, information systems, and electronic data visibility may also be beneficial.

Biofuels

The analysis has identified that blended biofuels could play a temporary role in the decarbonization of maritime transport within the PBSP member countries (see Figure 10). However, it must be noted that there are various risks associated with the large-scale use of biofuels. They include, among other things, competition with local food supplies as well as continued dependence on imports where there are shortfalls in local production. It will be critical that potential conflicts with food production on arable land are well managed.

It is estimated that a regional amount of 1,500 tons of coconut oil as a 20 percent blend in total of 7,500 tons of blended fuel could be produced locally to reduce GHG emissions. This would require the redirection of five to ten percent of existing coconut oil exports to maritime transport within the region. At the same time, this could offer an opportunity for PICs such as the Solomon Islands, Papua New Guinea, and Vanuatu to enhance their exports as they could become the primary suppliers of coconut oil to other PICs.

After blended biofuel will be phased out, conservatively the remaining coconut used to blend could play a minor role as a 100 percent (i.e., non-blended) biofuel without creating a need for additional imports at higher costs or massively invest in growing and processing by the PICs for biofuel use versus more lucrative value-added uses.

Long-term GHG abatement measures

Electrification and green e-fuels

Long-term (2031–2050) GHG abatement measures are likely to include a mix of electrification, and green e-fuels which include liquid hydrogen, liquid ammonia and methanol produced using renewable energy. As shown in Figure 10, the uptake of electrification and green e-fuels increases continually from 2031 and contribute to achieving full decarbonization of the domestic maritime fleet by 2050.

These measures will need to be reviewed and confirmed following an implementation assessment of ongoing/instant and short-term abatement measures over the next two to three years, and a review of the mix of solutions best suited and available to PBSP member countries in 2030–2050. The proportion of fleet electrification compared to green e-fuels will depend on the outcome of local pilot programs, technology development and maturity,

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/816020/potential-role-targets-economic-instruments.pdf

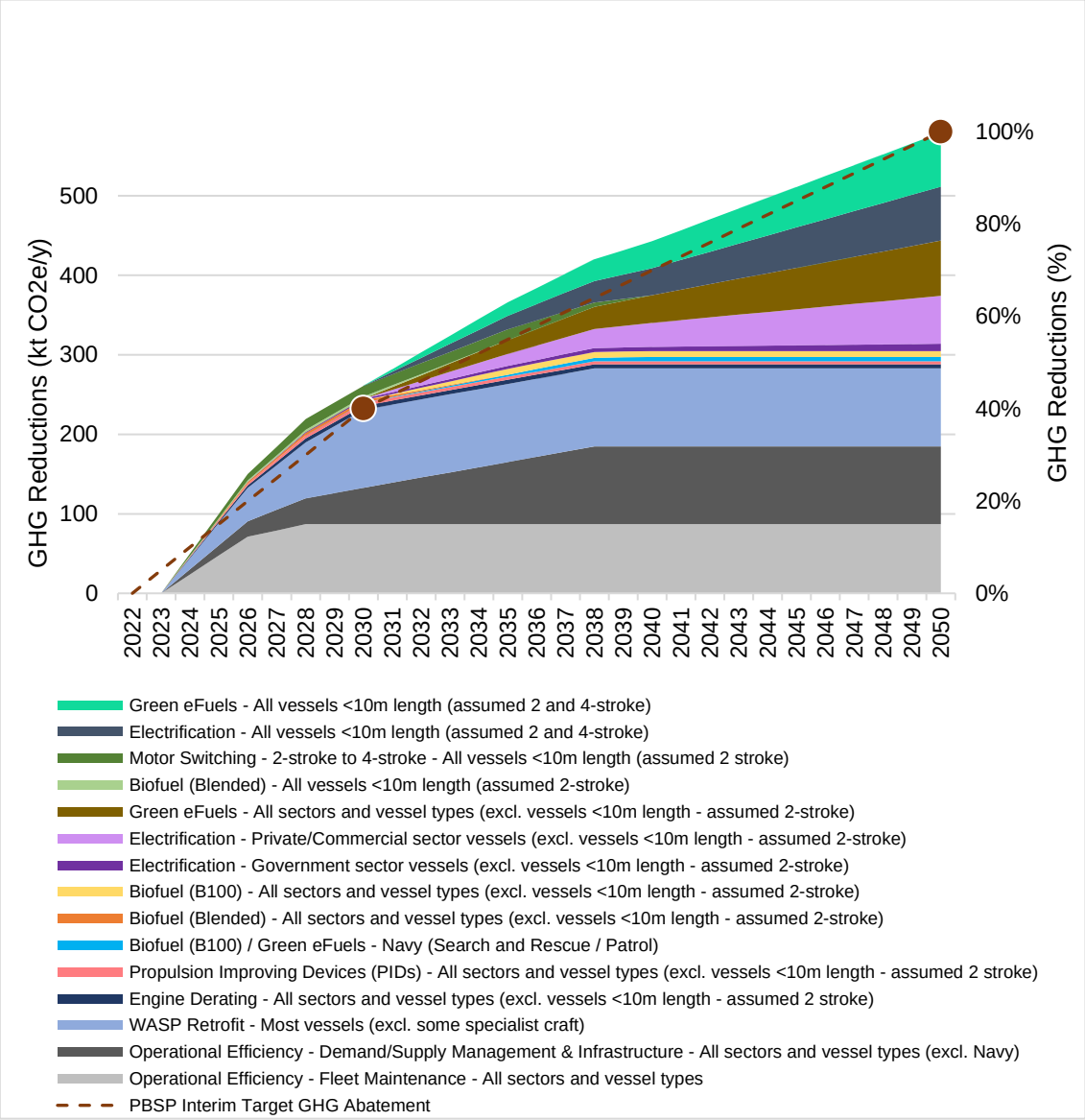
development of supporting infrastructure, and overcoming e-fuels handling and storage concerns.

The uptake of long-term GHG abatement measures will require the establishment of long-term alternative green e-fuel supplies including all supporting infrastructure. As such, these measures require decisive underlying policy with sufficient lead times to enable effective roll-out. It is recognized that in some PBSP member countries, several major constraints and barriers may hinder the uptake of some of these GHG abatement measures. This could, for example, happen due to the absence of an integrated energy policy, the lack of development of alternative local renewable electricity supply, limited funding, and limited technical and labor capacity. Therefore, any long-term GHG abatement measures cannot be considered in isolation from the broader national challenges and must be implemented in an integrated manner.

For those future measures that involve green e-fuels and require large-scale industrial facilities and large investments into production capacities, it would be advisable for PBSP member countries to monitor developments in the Pacific-Rim area (i.e., plans in Australia/New Zealand, Papua New Guinea, Asia, and North America) with regard to the likelihood and opportunity of PICs obtaining early, guaranteed supply at affordable prices of these types of future green e-fuels. One way could be to link a local trial (proof of concept) of a technology to an existing pilot supply from overseas to also test future supply chains and local infrastructure needs.

A few GHG abatement measures involving new technologies and/or alternative fuels are still globally emerging with proof of concepts (pilots) underway. This implies that in the longer term (post-2030), one or more current abatement measures with future potential may still emerge as leaders in the long-term mix of abatement measures and transition pathways. Alternately, some of the currently proposed GHG abatement measures may become less prominent as whole-of-system/national network, cost, and economic performance become better known by 2030.

FIGURE 10: UPTAKE OF GHG ABATEMENT MEASURES UNDER THE ZERO-CARBON TRANSITION PLAN



In any case, it is important to ensure that some GHG abatement measures are phased in and out in coordination with other GHG abatement measures to minimize redundancy and waste of funds. For example, there is a clear need to identify which existing vessels should be retrofitted or which should be scrapped and replaced with purpose-built new builds (running electric or green e-fuel). Likewise, investments will need to be made in GHG abatement measures that are compatible and complementary to each other.

Recommendations

The proposed next steps for the technical aspects of the decarbonization pathway include:

- **Further monitor and review relevant pilot studies and conduct additional regional specific pilot studies**, e.g., on WASP, ammonia fuel/hydrogen/electric craft/ charging and storage/handling and identify the next steps to allow for expansion and commercialization of these technologies.
- **Identify specific training needs and delivery requirements for GHG abatement measures**, including for improved fleet maintenance, WASP retrofit, engine derating and PIDs, biofuel production, electrification, and green e-fuels.
- **Further refine the MCA process** considering social and economic aspects, along with any new and emerging developments.
- **Enhance the understanding of the viability of the different technical GHG abatement measures in the PBSP member countries** by also assessing factors such as likely wind conditions for WASP, land availability to install solar panels, the size of the port area required for infrastructure, and availability of means and routes to deliver equipment, materials, and fuels to the PBSP member countries.
- **Infrastructure and information systems:** A survey of routes is required to enable safe and efficient navigation along with a detailed inventory of vessel maintenance facilities and slipway conditions and capabilities.
- **Pathway iteration:** Continually review, update, and adapt the pathway at a country level to account for the different policy settings and technology developments. This is best undertaken centrally so that the PBSP's climate targets for the Pacific region are achieved.

5 Blended Finance Roadmap

Overview

The Zero-Carbon Transition Plan, outlined in the previous section, presented a technical pathway for Pacific Blue Shipping Partnership (PBSP) member countries to achieve zero-carbon emissions in the domestic maritime sectors by 2050.

This section presents a corresponding Blended Finance Roadmap and discusses the investment required in the 'immediate term' (2023–2027) and the 'near term' (2028–2032) along with possible funding options.

Approach

The preliminary capital expenditures (CAPEX) and operational expenditures (OPEX) estimates[12] set out in this section are based on assumptions and judgments detailed in the World Bank's complementary working paper "Blended Finance Roadmap (working title)". The analysis focuses on the known domestic vessel fleets of the PBSP member countries along with immediately associated maritime infrastructure and provides estimates for more detailed work to be based on. It utilizes publicly available information on the energy resources or the technological upstream components required at the country level. This short review allows for input into a rapid assessment of the financial needs related to the identified GHG abatement measures in the PBSP member countries. Details of the methodology and additional data used can be found in the complimentary report titled 'Blended Finance Roadmap'.

All cost-related information is presented in United States Dollars (USD) (per 2022) based on information retrieved from a range of sources and countries as best applicable to the PBSP member countries. No allowance for price escalation, inflation, or price reduction due to technological and market maturity has been made. Present values are discounted at an annual rate of seven percent to an assumed PBSP GHG abatement project start year of 2023.

Key findings

Funding requirements

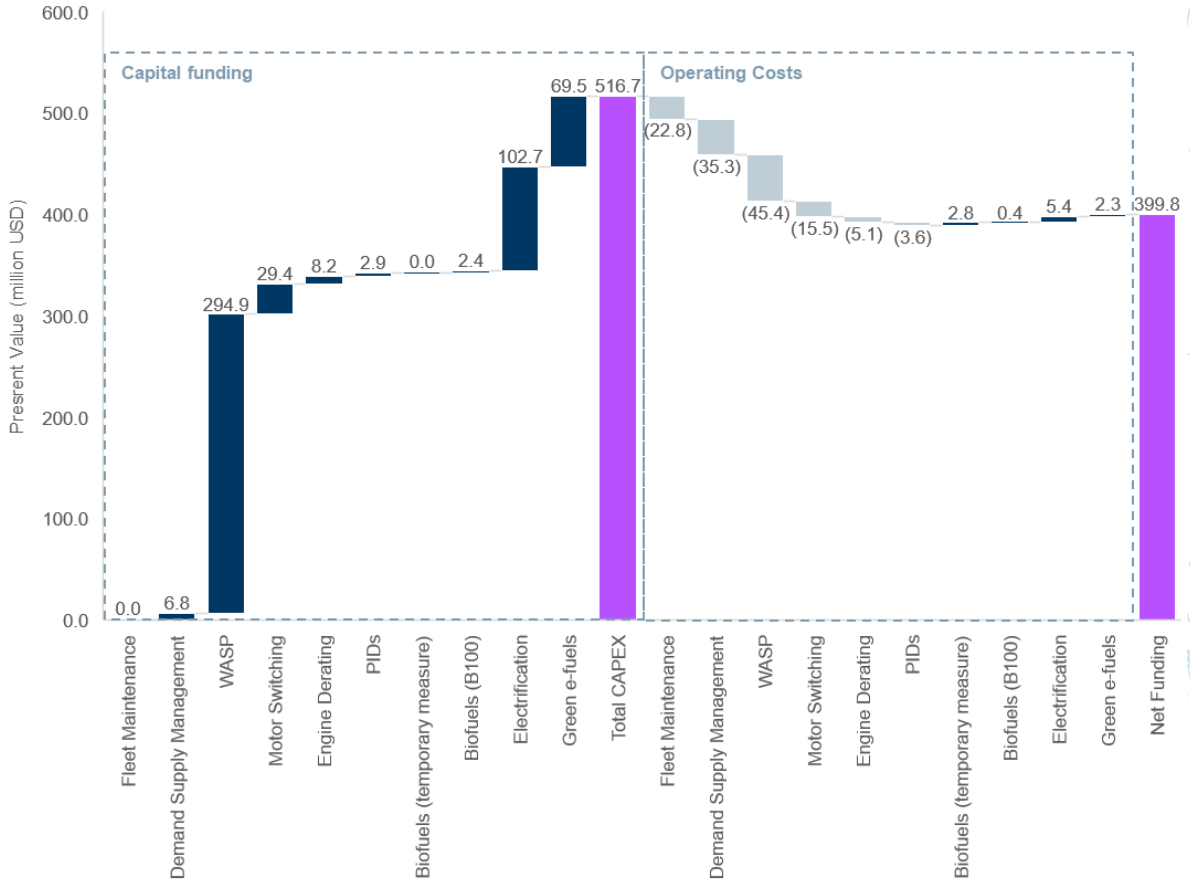
The analysis finds that the total CAPEX for all GHG abatement measures from 2023 to 2027 is approximately USD 214 million, delivering a net OPEX saving of USD 42 million. The total CAPEX for all GHG abatement measures in 2028–2032 amounts to USD 302 million, delivering a net OPEX saving of USD 75 million.

Most of the CAPEX required between 2023 and 2032 is for wind-assisted ship propulsion (WASP) (USD 294.9 million), followed by electrification (USD 102.7 million) and green e-fuels (USD 69.5 million). The modeling forecasts that this level of investment would correspond to a reduction in operating costs of USD 116.8 million over the same period. Here, the biggest cost savings come from WASP technologies (USD 45.4 million) and demand-supply management (USD 35.3 million), whereas the largest operating costs come from electrification

[12] The estimates are strategic level Class 5 Order of Magnitude estimates defined in the AACE International Cost Estimate Classification System with an expected accuracy range of -20 percent to -50 percent (Low) and +30 percent to +100 percent (High). They are intended to screen abatement options and identify potential funding sources as part of the Blended Finance Roadmap. They are not suitable for budgetary purposes.

(USD 5.4 million) and biofuels (USD 3.2 million). Considering both capital and operating expenditures as well as savings, the net costs for the presented PBSP technical pathway over a 10-year horizon amount to a minimum of USD 399.8 million. Figure 11 below provides a waterfall analysis of the CAPEX investments and OPEX cost-saving by abatement measure.

FIGURE 11: CAPITAL AND OPERATING COST REQUIREMENTS FROM 2023 TO 2032



Source: Based on data from the Zero-Carbon Transition Plan (working title).
The following abbreviations were used: WASP: wind-assisted ship propulsion; PIDs: propulsion improving devices; Biofuels (B100): 100 percent biofuels, i.e., non-blended.

The role of blended finance

Blended finance is the strategic use of development finance to lower the cost of capital and mobilize additional finance support to realize projects that could otherwise not be delivered through traditional financing. This is typically applied to first-mover projects to demonstrate the viability of new projects and reduce the perceived market risk, thereby incentivizing and growing the number of public and private market participants through a more favorable and sustainable investment landscape.

While the PBSP member countries would clearly benefit from mobilizing commercial finance, it is rather likely that public grants and public concessional finance will be the main source for funding the decarbonization of the Pacific shipping sector in the immediate and near term because:

- Today, subsidies are already at times provided to ensure vessels service the routes that are uneconomical.
- Although the Zero-Carbon Transition Plan indicates savings in operating costs, the scale of the sector is such that the commercial sustainability of these projects will be limited and subject to external factors, which will determine if commercial financing can be accessed.
- The nascent stage of low- and zero-carbon shipping requires market development before any pipeline investment can be developed.
- The fast-evolving technology in this space presents a risk of short investment lives, adversely impacting the return on investments from those projects.

Key actors and funding instruments

A mapping exercise identified the following actors as potential key funders: national governments, donor governments, development partners, philanthropic funds, national and regional development banks, commercial banks, institutional investors, and retail investors.

A review of the relevant funding instruments and their applicability to the PBSP is shown in Table 1.

TABLE 1: APPLICATION OF FUNDING INSTRUMENTS TO PBSP INVESTMENT PROJECTS

Funding instrument	Potential application in PBSP
Grants	Grants will play a critical role in the deployment of the PBSP technical pathways and are likely to be among the main funding instruments over the next ten years.
First loss, guarantees	Could be used to mitigate off-taker risk in the deployment of a fleet of new vessels, if they were centrally owned and chartered, or for vessel maintenance contracts. First loss capital or guarantees will be critical in the longer term for the maritime shipping sector as opportunities start to become commercially viable with institutional investors starting to consider them for their portfolios.
Outcome funding, impact linked finance, impact bonds	Limited to transactions where the impact can be clearly specified. This could be the financing of vessels or facilities that have clear GHG emissions reduction targets.
Concessional financing and subordinated debt	This will be best suited to initiate the deployment of measures that have a clear impact but are lower than market returns. It is well suited to early movers who have more technical knowledge and insight into how the maritime shipping market will develop. For example, this may include upgrading, repairs, and maintenance of vessels, the deployment of wind-assisted ship propulsion technologies, or electrification infrastructure.
Market rate debt and equity	Maritime transport in the Pacific presents some significant commercial barriers to mainstream finance participation and is most likely to flow into projects that either already present commercial sustainability, or where other instruments have already funded the proof of concept and financed the research and development, pilot testing, and market development supporting the business concept. The scope for this form of funding is therefore limited, and only potentially viable in the later stages of deployment.

Funding instrument	Potential application in PBSP
Revenue-raising market-based measure	The International Maritime Organization (IMO) is currently considering the implementation of a revenue-raising market-based measure as part of its plan to reduce GHG emissions from international shipping. A small share of the potential carbon revenues raised—the World Bank refers to potential USD 40-60 billion annually[13]—could be sufficient to meet the funding needs of PBSP member countries. However, currently, it is still unclear whether such a measure will be implemented and how potential carbon revenues raised would be used.

It is especially the last-named funding instrument, carbon revenues from a revenue-raising market-based measure applied by the IMO to international shipping, which could become a true game changer given the orders of magnitude of financing potentially becoming available. However, in light of the political uncertainties related to the adoption of such a policy measure, it is not yet specifically listed as a recommended funding instrument in the following (although it would obviously apply to all GHG abatement measures under consideration).

Based on alignment of characteristics around risk, timing and return, the most appropriate funding instruments were identified for each of the GHG abatement measures included in the Zero-Carbon Transition Plan. This is summarized in Table 2.

TABLE 2: GHG ABATEMENT MEASURE FUNDING

GHG abatement measure	Regional funding need, 2023–2032 (Present value USD million):		Recommended funding instruments	Potential funding actors	Potential implementing entities
	CAPEX	OPEX			
Fleet maintenance	0.0	(22.8)	– Fiscal incentives – Grants – Owner investment (maybe gradual and not incomplete)	– National and donor governments – development partners – Later ship owners with fiscal incentives	– Ship owners – infrastructure owners
Demand / supply management and infrastructure	6.8	(35.3)	– Grants – Potential to transition to owner funded once benefits are evident	– National and donor governments – development partners – Later commercial banks	– Governments
Wind-assisted ship propulsion retrofit	294.9	(45.4)	– Grants for pilot testing – Grants or other direct financial incentives (concessional interest rates, loans, or lease schemes) – Outcome funds with guarantees	– National and donor governments – development partners – Philanthropic funders – Later development, commercial and/or institutional banks	– Governments – Small and medium-sized enterprises (SMEs)
Motor switching	29.4	(15.5)	– Grants – Potential for private sector participation by	– National and donor governments – Development partners	– Ship owners with fiscal incentives

[13] World Bank. 2022. Carbon Revenues from International Shipping: Enabling an Effective and Equitable Energy Transition

GHG abatement measure	Regional funding need, 2023–2032 (Present value USD million): CAPEX	OPEX	Recommended funding instruments	Potential funding actors	Potential implementing entities
			way of subsidized motor replacements	– Later also SMEs	
Engine derating	8.2	(5.1)	– Grants – Impact funding – Fiscal measures	– National and donor governments – development partners – Later also SMEs	– SMEs – Ship owners with fiscal incentives
Propulsion improvement devices	2.9	(3.6)	– Grants – Potential to transition to owner funded once benefits are evident – Loans and grants to provide the infrastructure needed to effect the change	– National and donor governments – development partners – Later also SMEs	– SMEs – Ship owners with fiscal incentives
Biofuels (blended)	0.0	2.8	– Production and fuel subsidies – Accelerator programs for CAPEX investments	– National and donor governments – Development partners – Philanthropic funding – Later also SMEs	– Governments – Ship owners with fiscal incentives
Biofuel (B100, non-blended)	2.4	0.4	– Production and fuel subsidies – Accelerator programs for CAPEX investments – Debt financing or concessional loans for vessel retrofitting and purchase.	– Donor governments – Development partners – Later also commercial banks and national governments	– Governments – Ship owners with fiscal incentives
Electrification	102.7	5.4	– Commercial asset impact schemes – Credit guarantee schemes	– Donor governments – Development partners – Philanthropic funds – Later also commercial banks	– Governments – SMEs – Infrastructure owners – Ship owners with fiscal incentives
Green e-fuels	69.5	2.3	– Development partners grants and technical assistance for trials – Possible commercial funding for fuel production as production costs decline – Concessional capital and guarantees to encourage private sector involvement	– Donor governments – Philanthropic funds – Later also commercial banks, national governments, and development partners	– Governments – SMEs – Infrastructure owners – Ship owners with fiscal incentives

Source: The information on CAPEX and OPEX for the abatement measures is based on the Zero-Carbon Transition Plan (working title).

Recommendations

Several action areas have been identified to enable the effective implementation and financing of the Zero-Carbon Transition Plan. These include continued policy advocacy, focused discussions with funding partners, a detailed review of the infrastructure requirements, and specifying the technical requirements for vessels (particularly donor vessels) and retrofit technologies, summarized as follows:

- **Discussions with funding partners:** A coordinated approach to communicating with funders to capitalize on available funding and ensure that funding is pooled and targeted at achieving PBSP climate targets.
- **Vessel procurement:** Develop standardized specifications for vessel procurement to ensure that minimum standards are met that support the achievement of the PBSP climate targets as well as coordinated vessel deployment and disposal across all PBSP member countries.
- **Vessel maintenance scheduling:** Schedule maintenance across all PBSP member countries' fleets to promote efficient use of infrastructure and consider centralizing maintenance hubs.
- **Performance monitoring assessment:** The PBSP will need to promote transparency, data availability, and knowledge sharing to continue the active collaboration between governments, multilateral development banks, development finance institutions and the private sector. To track funding impact, key performance indicators need to be integrated into funding agreements and projects will need to allocate sufficient resources for monitoring and evaluation.
- **Policy advocacy:** National policies need to be aligned with the long-term enablers of maritime transport featuring prominently in national transport, environment, and climate policies. This may include appropriate legislative changes to implement the necessary financial and fiscal incentives that foster the achievement of the PBSP's GHG emissions reduction targets.

Additional areas for further work have been identified to support the zero-carbon transition of the maritime transport sector in PBSP member countries in the long term:

- **Carbon revenues:** PBSP countries should continue supporting the implementation of revenue-raising market-based measures to reduce GHG emissions from international shipping. The scale of potential carbon revenues would be a true game changer for financing the PBPS's transition towards zero-carbon shipping. Yet, since it remains unclear whether IMO member states will adopt such a revenue-raising market-based measure or how potential carbon revenues would eventually be used, alternative funding opportunities discussed in this section need to be pursued in parallel.
- **Alignment with national plans:** National governments in PBSP countries have made sustainable maritime transport a priority. There should now be a focus on capturing maritime-related targets within PBSP member countries' Nationally Determined Contributions (NDCs) and strategic plans to ensure an economy-wide approach is taken. A draft multi-country NDC for the maritime sector has been developed in Annex 3: Joint supplement to Nationally Determined Contributions under the Paris Agreement.
- **Extended role of commercial finance:** The initial funding is designed to focus on early-stage proof of concept and trials. This will identify any potentially bankable

projects, whilst financing the market formation and an enabling environment to promote sector innovation and growth. For long-term success, it is critical that the measures are locally led. There should be a focus on encouraging investment by local institutional investors and financial institutions over the long term. The financial components ideally need a mix of concessional and commercial funding at different stages of the project. Quantified studies of the costs and returns over time will be required to understand revenue streams and the long-term evolution of any commercial investment.

- **Facilitation of involvement of small and medium-sized enterprises (SMEs):** SMEs could play a critical role in achieving the technical transition pathway whilst enabling PBSP member countries' economies to prosper. Fewer commercial finance options exist for SMEs but participation in commercial operations is likely to increase in the longer term as opportunities spin-off from the maritime sector transition. There should be a focus on understanding how green or blue funding strategies are being adopted in other sectors and how these can be used to promote SME involvement in the PBSP.
- **Capacity development:** For maritime transport to deliver investable opportunities, it will require market formation, capacity development and training, and the development of supporting infrastructure as well as specific capacity development in the operation and maintenance of the new vessel propulsion systems.

6 Conclusions

This final section presents overall key recommendations to the Pacific Blue Shipping Partnership (PBSP) as concluded from the analysis above.

Discussing the PBSP governance

A possible PBSP governance framework, as suggested in this document, could be considered. This possible framework can serve as the basis for further discussions regarding the governance of the PBSP. Amongst others, these discussions should gauge whether creating a new institutional structure, i.e., regional organization, may be really necessary or whether such a PBSP governance framework could be embedded in or attached to existing institutional structures in the Pacific.

In this context, the key role of the Office needs to be emphasized again. PBSP member countries should identify what further changes and improvements could be made to the current draft governance framework and weigh the merits and disadvantages of integrating this governance role into an existing institution versus creating a new organization.

Incorporating the PBSP's climate targets in NDCs

National governments in PBSP countries have made sustainable maritime transport a priority. There should now be a focus on capturing maritime-related targets within countries' Nationally Determined Contributions (NDCs) and strategic plans to ensure an economy-wide approach is taken. This includes mainstreaming the identified abatement measures into these plans and providing training for local operation of these measures. A possible way forward is to submit a joint multi-country NDC to the United Nations Framework Convention on Climate Change on behalf of all PBSP member countries.

Setting up a GHG monitoring system

By collating data from a variety of sources and using regression models to fill in data gaps, the High-Level Baseline Assessment has made great strides in fostering a better understanding of the domestic maritime emissions of PBSP member countries. However, the estimates' accuracy could still be enhanced further if the availability and reliability of the underlying data were improved.

It is therefore recommended to set up a monitoring, reporting, and verification framework that enables the collection of missing data in a systematic and efficient manner. This could involve local experts designing surveys, developing a data collection system and implementing it. This will ensure that greenhouse gas (GHG) emissions produced in the Pacific can be reliably tracked and will assist with monitoring whether the PBSP's climate targets are being reached.

Boosting ongoing/instant and short-term GHG abatement measures

The analysis has identified that operational measures could reduce GHG emissions by up to 40 percent by 2030. These measures can be immediately implemented or enhanced as long as the appropriate funding mechanisms are put in place to support their uptake.

Preparing for long-term GHG abatement measures

Long-term GHG abatement measures, such as electrification and green e-fuels, are yet to be successfully demonstrated as viable options for the region. Therefore, it is recommended that relevant pilot studies are monitored and reviewed, and additional regional-specific pilot studies are conducted (e.g., on wind-assisted ship propulsion (WASP), ammonia fuel/hydrogen/electric craft/charging and storage/handling). This will allow identifying the next clears steps enabling the expansion and commercialization of these technologies.

To better understand which technologies are well adapted for individual PBSP member country needs, a country-specific technical GHG abatement measure analysis should be undertaken. This could consider, for example, the country's likely wind conditions for WASP, land availability to install solar panels, the port area required for infrastructure, and the availability of means and routes to deliver equipment, materials, and fuels to the islands.

Improving the coordination of development funding

Development partners should enhance coordination to ensure that the viability of pilot projects in PBSP member countries is maximized and efforts are not duplicated. More importantly, this will make sure that the PBSP member countries' limited capacity is effectively used. It will also enable the identification of short-term and long-term financing options (e.g., subsidies, grants, loans, etc.) that suit the corresponding GHG abatement measure and the circumstances of the region.

Pursuing the opportunity of a market-based measure at the IMO

The funding needs for the PBSP's transition towards zero-carbon shipping are considerable. Given the often-challenging commercial viability of Pacific maritime transport, it is rather likely that a large share of this funding may need to come from public sources which are generally very constrained. A revenue-raising market-based measure adopted by the International Maritime Organization (IMO) and applied to international shipping could raise significant amounts of climate and development finance. Even a small share of these potential carbon revenues could be sufficient to cover the PBSP's funding needs for the transition towards zero-carbon shipping.

Mobilizing extended commercial finance

The initial funding is designed to focus on early-stage proof of concept and trials. This will identify any potentially bankable projects, whilst financing the market formation and an enabling environment to promote sector innovation and growth. For long-term success, it is critical that the measures are locally led. There should be a focus on encouraging investment by local institutional investors and financial institutions over the long term. The financial components ideally need a mix of concessional and commercial funding at different stages of the project. Quantified studies of the costs and returns over time will be required to understand revenue streams and the long-term evolution of any commercial investment.

WORLD BANK GROUP
Transport

Annexes

Annex 1: Common priorities and needs of Pacific Blue Shipping Partnership member countries

This annex provides valuable background information on the common priorities and needs of Pacific Blue Shipping Partnership (PBSP) member countries for accelerating sustainable development and a zero-carbon transformation of the maritime transport sector.

Background

Through the Pacific Blue Shipping Partnership (PBSP), the Governments of Fiji, Kiribati, the Republic of the Marshall Islands, Solomon Islands, Tonga, and Tuvalu have committed to reducing greenhouse gas (GHG) emissions in domestic shipping by 40 percent in 2030 and 100 percent in 2050, coupled with a large-scale transformation of their domestic maritime sectors in line with regional and international commitments concerning sustainable development.

Since [February 2022], representatives of the PBSP member countries have exchanged views on an ongoing basis regarding their common priorities and needs for accelerating sustainable development of a carbon-free maritime transport sector as a driver of broader social and economic development objectives. This Note summarizes common priorities and needs identified as of [July 2022] by PBSP member countries, for the purpose of informing and coordinating as appropriate national decision-making processes and discussions with international development partners.

Common strategic priorities and enabling actions for the Pacific Blue Shipping Partnership

PBSP member countries seek to achieve the following Common (Strategic) Priorities through their participation in the Partnership:

- Accelerate progress towards the country-driven zero-carbon transformation of their interdependent domestic maritime transport sectors (including all relevant supporting sectors and services), aligned with the 2050 Strategy for the Blue Pacific Continent and the 2030 Agenda for Sustainable Development.
- Reduce total GHG emissions attributable to their respective domestic maritime transport sectors by 40 percent by 2030.
- Decarbonize their respective domestic maritime transport sectors by 2050.

The Priorities listed above depend in practice on several key Enabling Actions, including:

- Nationally, and jointly between PBSP member countries for relevant topics of common concern, develop strategic, multi-sector and multi-stakeholder plans for sustainable development of the maritime transport sector as the primary practical framework for implementing the PBSP in accordance with country-driven priorities.
- Maintain coordinated participation of all relevant public and private sector development partners to mobilize and align finance and capacity development for the PBSP.

Common practical needs for Pacific Blue Shipping Partnership member countries

A large-scale zero-carbon transformation of Pacific Islands shipping—one that leaves no one behind—will depend on locally-driven but internationally connected technology development, entrepreneurship, and innovation across the public and private sectors. To avoid "carbon lock-in" and stranded asset risks, this transformation requires immediate action and cannot be delivered through a siloed approach—being inextricably connected with development of new energy supply chains, land-based service sectors, and the revitalization of institutions capitalizing on the rich maritime heritage of Pacific peoples. In this context common practical needs for PBSP member countries include:

- Financial and technical support for ongoing stakeholder dialogue and "innovation exchange" processes (national, multi-country, multi-sector, multi-institution) that bring together all relevant stakeholders into a common process that enables identification of practical actions aligned to the strategic objectives of the PBSP.
- Financial and technical support for compilation and sharing (on an open-licensed basis) of data and lessons learned relevant to the strategic objectives of the PBSP, including "challenge-driven" internationally connected research programs anchored by local experts and institutions.
- Active and adequately resourced participation of local experts and institutions in all relevant projects, programs and commissioned studies falling within the subject matter scope of the PBSP.

Realizing the ambitions of the PBSP will require significant "mission-oriented" public and private sector investment covering ships, ports and supporting services (e.g., maintenance and repair, renewable energy) at multiple levels of scale, including small local vessels. The scale of investment and degree of multi-institutional coordination required are far beyond the status quo for low-carbon shipping (or the maritime sector generally) across PICs but are commensurate with the level of investment into the renewable energy sector across the region. In this context common practical needs for PBSP member countries include:

- Accelerated upgrading of all infrastructure and supporting services relevant to the maritime transport sector, using the best available technologies underpinned by locally driven innovation and support for small and medium-sized enterprises (SMEs).
- Coordinated investment in accelerated testing and piloting of new approaches and technologies supporting sustainable low-carbon development of the maritime transport sector, including the development of local research and innovation networks, and strengthening of local institutions through supportive international partnerships aligned to country-driven priorities.

Current preliminary evidence suggests a positive return/risk profile for retrofit or replacement of a range of ship types (and supporting infrastructure) active in PBSP member countries.

Realizing returns on investment in a manner that maximizes broader Co-Benefits for social and economic development will require a coordinated approach to investment de-risking and planning through an iterative and phased approach. In this context common practical needs for PBSP member countries include:

- Alignment of all existing or planned capital investments in the maritime sector, and connected upstream sectors such as energy, with the Common Strategic Priorities of the PBSP (listed above). See below for principles for development partner engagement with the PBSP.
- Financial and technical support for iterative financial and investment planning, informed by the best available baseline evidence and anchored by local experts and institutions.
- Financial and technical support for co-development with local institutions of holistic and open-licensed baseline data and accounts for the maritime transport sector and associated topics, based on international standards.

The complexity and uncertainty associated with a low-carbon transformation of PIC maritime sectors should not be underestimated—the PBSP will need to be supported by a long-term, flexible, and iterative collective decision-making (i.e., governance) framework that link and coordinate the priorities of PBSP member countries with activities of the private sector, international development partners and a broad range of other stakeholders. In this context common practical needs for PBSP member countries include:

- Financial and capacity support for national, and joint between PBSP member countries for relevant topics of common concern, preparation of strategic, multi-sector, and multi-stakeholder plans for sustainable development of the maritime transport sector as the primary practical framework for implementing the PBSP in accordance with country-driven priorities.

Principles for development partner engagement with the Pacific Blue Shipping Partnership

The intended function of these principles is a reference point for decision-making by development partners, to ensure the broad alignment of their activities with the Common Strategic Priorities of the PBSP.

All international projects and programs relevant to the development of the maritime transport sector in PBSP member countries should:

- Utilize prior consultation with relevant member countries to ensure alignment of their scope and activities with national development priorities and the objectives of the PBSP.
- Undertake due diligence to minimize in-country duplication of resources and efforts across the activities of international projects and programs.
- Include direct and appropriately funded participation of local people and institutions from relevant member countries.
- Participate as appropriate in PBSP governance and consultation mechanisms to maintain close coordination with the Partnership and reduce capacity demands for in-country stakeholders.

Annex 2: Draft Founding Charter for the Pacific Blue Shipping Partnership

This annex provides a draft charter which is to serve as basis for discussion for the future governance framework of the Pacific Blue Shipping Partnership.

We, the authorized undersigned Ministers and government officials from {LIST THE COUNRIES} gathered at _____ conference held in _place___, ___country____, date 2023, to agree to create the Organization of the Pacific Blue Shipping Partnership aiming at providing the member of this.

Preamble

RECOGNISING the need for urgent action to combat climate change in accordance with the Paris Agreement and United Nations Framework Convention on Climate Change, including pursuing efforts to limit the average global temperature to 1.5 degrees Celsius above pre-industrial levels;

RECALLING the United Nations General Assembly resolution A/RES/76/300 recognizing the human right to a clean, healthy and sustainable environment;

AWARE also that population of the Pacific Island countries and territories are now at risk from an emerging range of new threats, including climate change, marine pollution, and fish stock depletion;

CONSCIOUS of the vulnerability of its communities, of the scarcity of resources and means to provide relief aid within Country or a system of islands affected by a disaster,

RECALLING that Pacific Islanders are the Custodians of the largest ocean, which unite them through deep knowledge and cultural values as well as a tradition of mutual support between their people and the willingness to facilitate of the delivery of Disaster Relief Aid.

DETERMINED to minimize the impacts of the COVID-19 pandemic and the dependence to fuels non-readily available in the pacific, which threaten to set back years of hard-won development gains, through strategic investment in new development opportunities;

MINDFUL of the traditional knowledge of indigenous Pacific habitants and their upper hand on the sea of islands and their resources for centuries.

CONSCIOUS of the necessity to decarbonize its domestic and regional transport fleet, to adopt the higher standards of sustainability, to look for more efficient and cost-effective ways to link their economies, to develop their maritime transport expertise and capacity to facilitate the delivery of disaster relief aid to affected areas or populations during a ‘non-conflict related disaster’.

REITERATING the commitments undertaken by the international community in the Millennium Declaration of 2000 to intensify cooperation to reduce the number and effects of natural and man-made disasters,

REAFFIRMING the Pacific Sustainable Development Roadmap, and country-driven development strategies, as the plan for implementing the 17 Goals and 169 Targets documented in the 2030 Agenda for Sustainable Development.

Decide:

Content

Article 1: General provisions

1. The Parties to this agreement shall seek, without any derogation of the respective sovereignty and jurisdiction, to coordinate action to accelerate the development of a sustainable, resilient and 100 percent carbon-free maritime transport sector for Pacific Countries Parties to this Agreement by 2050, including a 40 percent reduction of greenhouse gas emissions from domestic shipping by 2030, through a country-driven Pacific Blue Shipping Partnership.
2. The Organization of the Pacific Blue Shipping Partnership is composed of the following bodies:
    a. The Office of Knowledge, composed of the Scientific and the Economic & Planning Committee as detailed in article 4.
    b. The Board, composed of representatives of the parties and observers as detailed in article 5.
    c. The Secretariat, as detailed in article 6.
    d. The Audit Committee as detailed in article 7.
    e. The Council of the Sages as detailed in article 8.
3. The Organization of the Pacific Blue Shipping Partnership and all its bodies, dependencies, committees, and sub-committees shall have such legal personality and capacity as may be necessary to perform their functions including to contract, to sue, to incorporate legal entities, and to acquire and dispose of movable and immovable property. The parties to this agreement will grant privileges and immunities to the Organization and its officers.
4. Public documents must be easily accessible. The work of the Organization must take place in complete transparency. Interested individuals may request access to other information and data which the Pacific Blue Shipping Partnership will need to respond to and disclose the requested information and data, as long as it does not contain sensitive information.
5. Members, staff, and contractors must provide a declaration of conflict of interest upon being contracted by the Organization and should renew such a declaration on a yearly basis.

Article 2: Interpretation of this agreement

1. In case of difficulties in the operation of the Organization and in relation to the interpretation of this agreement, reference should be made to the three pillars on which this agreement is based on:
    - The Organization of the Pacific Blue Shipping Partnership is country owned. The work of the Organization must be country-driven. This means that the solutions developed and advocated for by the Office must be in line with the needs and requests of the

member countries as developed in their national energy and transport action plans and that the Countries Parties to this Agreement must coordinate their actions at the Board.

- The work of the Organization must be Science Based in that the decisions adopted by the Board must be based on the best knowledge and analysis provided by the Office and its sub-committees in their publicly accessible reports. The Board is nevertheless free not to follow the report submitted by the Office provided that it justifies its position transparently.
- The Office is delivering the service of providing knowledge to the countries party to this Agreement in the most complete autonomy and independence from the Board.

2. The work of the Organization will also be guided by the following objectives:
    - Adhere to the principles of the blue economy in terms of regeneration, renewability, sustainability, ecosystem consideration, symbiosis, abundance, and autonomy.
    - Foster the development of a sustainable domestic and regional transport capacity to:
        - Operate safely and in a manner that supports national priorities and community needs.
        - Respond to food security issues and other emergency issues.
        - Provide disaster relief fleet capable of being deployed in the parties to this agreement areas affected by natural disasters by waiving cabotage restrictions for these vessels.
    - Develop capacity in the Pacific for and enhance knowledge on:
        - the blue economy in general and sustainable maritime transport in particular;
        - sustainable shipbuilding and maintenance shipyards;
        - the crewing and management of sustainable vessels
    - Design antifragile systems, that is systems that are not only robust and resilient to natural, economic, or political shocks, but that benefit from shocks.

Article 3: Definitions

1. In this agreement, “Organization” means the Organization of the Pacific Blue Shipping Partnership.
2. In this agreement, “Office” means the Office of Knowledge of the Pacific Blue Shipping Partnership.
3. In this agreement, “Secretariat” means the Secretariat of the Blue Shipping Partnership
4. In this agreement, “Board” means the Board of the Pacific Blue Shipping Partnership.
5. In this Agreement, “Council” means the Council of the Sages responsible to resolve disputes between parties to this agreement, bodies of this Organization, or staff of this Organization.
6. In this agreement, “Conflict of Interest” refers to a situation where an individual or the entity for which they work, whether a government, business, media outlet or civil society organization, is confronted with choosing between the duties and demands of their position and their own private interests.
7. In this agreement, “Vessel” means: any type of craft operating in connection with or depending on the water to operate.

8. In this Agreement, “Disaster” means a serious disruption of the functioning of society, which poses a significant, widespread threat to human life, health, property, or the environment, whether arising from accident, nature, or human activity, whether developing suddenly or as the result of long-term processes but excluding armed conflict.
9. In this Agreement, “staff” means: all the people employed by the Organization.
10. In this Agreement, “Knowledge” means: Any form of knowing including but not limited to Technical, scientific, Economic, and most particularly Traditional Knowledge.
11. In this Agreement, “Blue Economy” means: an economy based on regeneration of ecosystems in a logic of abundance and autonomy. Drawing inspiration from nature to take what is necessary and to function in symbiosis with it.
12. In this Agreement, “Antifragile System” means: a system that gains from stressors, shocks, volatility, noise, disorder, mistakes, faults, attacks, or failures.
13. In this agreement, “Delegate” means: a representative of a country party to this Agreement officially appointed by that country.
14. In this agreement, “Observer Status” means: an individual from an accredited funding partner and/or shareholder who is allowed to sit in regular meetings of the Board. Observers can make interventions during regular meetings of the Board and submit documents, reports and proposals that will be considered by the Board.
15. In this agreement, “Sage” means: an individual officially appointed to the Council based on their demonstrated community leadership for justice and equity. Each party to this Agreement appoints one Sage at the Council.

Article 4: The Office of Knowledge of the Pacific Blue Shipping Partnership

1. The Office is composed of the Scientific Committee and of the Economic & Planning Committee under the direction of the Head of the Office.
2. The Head of the Office is elected by the Committees
3. Members of the Scientific Committee and Economic & Planning Committee are appointed or contracted based on their proven technical knowledge and its relevance for the pacific following a competitive selection process by independent recruitment agencies with a good understanding of the Pacific.
4. The Office is responsible for providing the best science and information available on relevant domains of shipping decarbonization in the Pacific in the domains of the two Committees without limitation of topics. The Office and its Committees operate autonomously and independently from the rest of the Organization and is free to allocate its resources and structure its work according to its research agenda.
5. The Office with its Scientific and Economic & Planning Committees is responsible, inter alia, for: designing Partnership programs; undertaking environmental impact assessments or regulatory impact assessments; undertaking economic analysis and viability plans as well as market studies; undertaking policy analysis; identifying data needs and gaps and collating relevant data. To undertake this work, it should consider National Action Plans (NAPs) and any other information that it deems relevant.
6. The research agenda is decided by the Head of the Office at the demand of the Board or at its own discretion.

7. Reports produced by the Office and its Committees should contain recommendations, be transparent and publicly accessible.
8. The Office is at the disposal of the Board to present and justify its work and reports upon request by the Board or the Secretariat.

Article 5: The Board of the Pacific Blue Shipping Partnership

1. The Board is composed of delegates representing each party to this agreement for a term of five years. Each party nominate one delegate to the Board. Accredited partners or shareholders can appoint observers to the Board.
2. The full Board with observers meets at regular intervals depending on the needs, but at least every six months.
3. The Board composed exclusively of delegates can meet in closed sessions when required.
4. The delegates elect a Chair for a period of two years. The Chair can be re-elected once. The Chair is responsible for obtaining a consensus in the decision made by the Board.
5. The Board is responsible for adopting the strategy and for making executive decisions.
6. The Board decisions are consensual, and all delegates must be heard.
7. In case of indisposition of a delegate for less than six months, the country they represent can temporarily ask another delegate of the Board to represent them too. A country whose delegate has been absent for more than six months must appoint a new delegate. The absence of appointment of a new delegate shall have no impact on the decisions of the Board.
8. The Board must release regular statements and accounts of their decisions.
9. The Board bears responsibility for the policies and projects it adopts for the Organization.

Article 6: The Secretariat of the Pacific Blue Shipping Partnership

1. The Secretariat provides support to the Board in its decision-making process.
2. Subject to the direction and approval of the Board, the functions of the Secretariat shall be to support the Parties to, inter alia:
    - organizing, facilitating, and hosting Board meetings;
    - providing a focal point for communications with Pacific Blue Shipping Partnership member countries and observer organizations;
    - managing the Pacific Blue Shipping Partnership's finances and distributing budgets to the different Pacific Blue Shipping Partnership bodies according to a specified distribution key/formula;
    - identifying, developing and coordinating Pacific Blue Shipping Partnership activities, projects and programs and supporting management thereof, including applying for project funding (if necessary) and facilitating and processing calls for proposals of potential projects;
    - coordinating implementation of the provisions within the Agreement, including underlying Pacific Blue Shipping Partnership governance framework and other relevant agreements concerning the Pacific Blue Shipping Partnership member countries;
    - maintaining a register of Pacific Blue Shipping Partnership projects and activities;

- compiling reports on the implementation of Board decisions and distributing it to the Board ahead of their meetings;
- compiling reports on the progress of developing and implementing NAPs, based on information provided by Pacific Blue Shipping Partnership member countries, and distributing it to the Board ahead of their meetings;
- organizing and facilitating data sharing between Pacific Blue Shipping Partnership countries;
- running and maintaining a Pacific Blue Shipping Partnership website and publishing relevant information, research findings and Board statements and decisions on it;
- organizing public information events;
- coordinating responses to freedom of information requests; and
- providing other secretarial functions as decided by the Board.

3. The Secretariat must report on the implementation of the Board decisions and distribute the report four weeks before the Board meets.
4. The Secretariat will be led by a Director who will be selected by the Office.

Article 7: The Audit Committee

1. The Audit Committee is a non-permanent body in charge of controlling the transparency and accountability of all the bodies of the Organization. The Audit Committee has two branches, the Financial Branch, and the Governance Branch.
2. The Financial Audit Committee Branch
3. Provides an annual financial report on all bodies of the Organization drafted by external and independent auditor approved by the Board.
4. The report will detail the account keeping, financial records, payments, asset keeping and liabilities of all bodies of the Organization.
5. The Governance Audit Committee Branch
6. Every two years provides a governance report on all bodies of the Organization drafted by three external and independent auditors.
7. The Governance Audit Report will endeavour to surface pertinent governance issues, including non-financial benefits, both internally and externally on the way this Organization interact with other organizations.

Article 8: Dispute resolution - The Council of Sages

1. The Council of sages is a non-permanent body of the Organization, called to resolve any persistent difficulty both internal to the Organization but also externally in the relationship this Organization has with others.
2. Each party to this Agreement appoints one Sage at the Council based on their demonstrated community leadership for justice and equity.
3. The Head of the Office, any member of the Board, and the Director of the Secretariat can refer a difficulty to the Council by simple request.

4. If employees have concerns about misconduct and either cannot report these to their superiors or the latter have failed to effectively act on their concerns, employees may also report to the Council.
5. The Council must meet and decide on any issue within four months.
6. The Council will resolve the issues presented to the Sages by consensus based on what is just and equitable, considering the objective of the Blue Economy and the interest of the community of the Pacific as a whole.
7. The expenses of the Council of the Sages are supported by the Board.

Article 9: Undertakings of the Parties to this Agreement

1. The countries parties to this Agreement undertake to waive Cabotage Rules requirement for any vessel supported by the Pacific Blue Shipping Partnership.
2. The countries parties to this Agreement must appoint a delegate representing them to the Board.
3. The countries parties to this Agreement must share its data with the Office for its research. Countries data will nevertheless remain the ownership of the countries that have shared it and will not appear in the Office reports if required by those countries.
4. The Countries parties to this Agreement undertake to fund their delegates to attend the Board meetings.

Article 10: Entry into force of the Agreement

1. This Agreement shall be open for signature by the States named in the preamble hereto and shall be subject to ratification.
2. This Agreement shall enter into force thirty days following receipt by the depositary of the fifth instrument of ratification. Thereafter it shall enter into force for any signing or acceding State thirty days after receipt by the depositary of an instrument or ratification or accession.
3. This Agreement shall be deposited with the Government of the Republic of the Marshall Islands / Fiji which shall be responsible for its registration with the United Nations.
4. Following entry into force, this Agreement shall be open for accession by other States with the concurrence of the Parties to this Agreement.
5. Reservations to this Agreement shall not be permitted.

Article 11: Revision and amendment of this Agreement

1. At the request of not less than one third of the Contracting States to this Agreement, the depositary shall convene a conference of the Contracting States for revising or amending it.
2. The Parties shall conclude arrangements where necessary to facilitate the implementation of the terms and to attain the objectives of this Agreement. The Parties concluding such arrangements shall lodge copies with the depositary of this Agreement.
3. Any instrument of ratification, acceptance, approval, or accession deposited after the entry into force of an amendment to this Convention is deemed to apply to the Convention as amended.

Article 12: Denunciation of this Agreement

1. This Agreement is a binding international agreement concluded among States and is governed by international law.
2. Any Party may withdraw from this Agreement by giving written notice to the depositary. Withdrawal shall take effect one year after receipt of such notice.
3. Any amendments to this Agreement proposed by a Party shall only be adopted by unanimous decisions of the Parties.

IN WITNESS WHEREOF the undersigned, duly authorized by their respective Governments, have signed the Agreement.

DONE at [City, Country], this […] day of […], […], in a single original

IN WITNESS WHEREOF the undersigned plenipotentiaries, being duly authorized by their respective Governments, have signed this Convention.

The Declaration will remain open for signature until DATE–Conference

Annex 3: Joint supplement to Nationally Determined Contributions under the Paris Agreement

This annex provides draft multi-country Nationally Determined Contributions (NDC) under the Paris Agreement which are to serve as a basis for discussion to Pacific Blue Shipping Partnership (PBSP) member countries interested in enhancing their current single-country NDCs with regard to maritime transport through a joint regional approach.

The Governments of [Fiji, Kiribati, the Republic of the Marshall Islands, Solomon Islands, Tonga, and Tuvalu] are committed to the full, effective, and transparent implementation of the Paris Agreement in accordance with its provisions and the relevant Decisions of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).

The above-mentioned Governments, representing the PBSP member countries, hereby communicate the following updates to the Executive Secretary of the UNFCCC pursuant to Article 4 of the Paris Agreement, without prejudice to their respective NDCs communicated individually.

The commitments referred to herein represent voluntary cooperation concerning the design and implementation of NDCs to allow for higher ambition in mitigation and adaptation actions and to promote sustainable development and environmental integrity, recalling Goal 17 of the 2030 Agenda for Sustainable Development and Article 6(1) Paris Agreement.

Coordinated contributions to the zero-carbon transformation of the maritime sector in Pacific Island Countries

The maritime transport sector is a foundation of social and economic connectivity between Pacific peoples, and an enabler of progress toward economic resilience and sustainable development in Pacific countries.

Recognizing their common but differentiated responsibilities and respective capabilities to combat climate change and the adverse effects thereof, PBSP member countries will:

- Accelerate progress towards the country-driven zero-carbon transformation of their interdependent domestic maritime transport sectors, aligned with the 2050 Strategy for the Blue Pacific Continent and the 2030 Agenda for Sustainable Development.
- Reduce total greenhouse gas (GHG) emissions attributable to their respective domestic maritime transport sectors by 40 percent by 2030.
- Decarbonize their respective domestic maritime transport sectors by 2050.
- Nationally, and jointly between PBSP member countries for relevant topics of common concern, develop strategic, multi-sector, and multi-stakeholder plans for sustainable development of the maritime transport sector as the primary practical framework for

implementation of the above-mentioned commitments in accordance with country-driven priorities.
– Maintain coordinated engagement with relevant public and private sector partners, including formal communication of priorities and needs common to PBSP member countries, to mobilize finance and capacity development for the above-mentioned commitments from a wide variety of sources, instruments and channels, recalling Articles 9–12 of the Paris Agreement and the agreed responsibilities of developed countries.
– Publish transparent accounts of progress towards the above-mentioned commitments, based on international statistical standards and requirements agreed upon by relevant CMA/COP decisions.

Illustrative technical measures

Without prejudice to the general Coordinated Contributions described above, the following technical measures will be considered as potential practical means to achieve, in accordance with the national or collective priorities and plans of PBSP member countries, the zero-carbon transformation of the maritime sector in Pacific Island Countries.

The listed measures are not intended to be considered in isolation from other sectoral or multi-sector development priorities, recognizing the importance of integrated and coherent planning to combat climate change and achieve sustainable development in accordance with the national and collective priorities of PBSP member countries.

Ongoing/instant measures

– Demand-supply management, data systems, and supporting infrastructure: achieving emissions reductions through optimized routing, vessel specialization, passenger/cargo separation as appropriate, improved information systems, and related measures.
– Improved vessel maintenance programs: achieving emissions reductions through increased efficiencies concerning technological performance and utilization.
– Retrofit of wind-assisted ship propulsion systems, supplemented by installation on new-build vessels: achieving emissions reductions through reduced fuel consumption.
– Optimization of engines to suit typical operating conditions (engine derating): achieving emissions reductions through reduced fuel consumption.
– Retrofit existing vessels with propulsion-improving devices: achieving emissions reductions through reduced fuel consumption.
– Broad-based capacity development relevant to all ongoing, short-term, and long-term technical measures.

Short-term measures (focused on achieving 40 percent emissions reductions by 2030)

– Fuel replacement using blended biofuels, including the development of supporting infrastructure.
– Switching of motors from two-stroke to four-stroke engines, including the development of supporting infrastructure: achieving emissions reductions through reduced fuel consumption.
– Local research and piloting concerning long-term measures (see below).

Long-term measures (focused on achieving zero emissions by 2050)

- Multi-scale vessel electrification including development of supporting infrastructure: achieving zero-carbon maritime transportation.
- Fuel replacement using e-Fuels (liquid hydrogen, ammonia, methanol) produced using renewable energy and unblended biofuel.

Subject to revision based on additional data or methodological improvements, Fiji, Kiribati, the Republic of the Marshall Islands, Tonga, Tuvalu, and Solomon Islands report the following domestic baseline data relevant to the Coordinated Contributions described above:

TABLE 3: BASELINE OF CO_2 EMISSIONS FOR 2019

Country	Total estimated vessels (including small outboards)	Total estimated carbon dioxide (CO_2) emissions (in tons)
Fiji	5,377	315,903
Kiribati	1,952	33,487
Republic of the Marshall Islands	469	8,794
Solomon Islands	3,369	202,969
Tonga	604	8,488
Tuvalu	437	10,853

Source: High-Level Baseline Assessment report