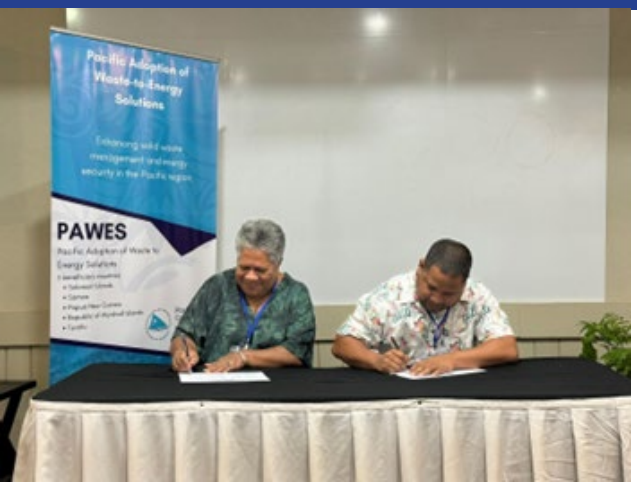
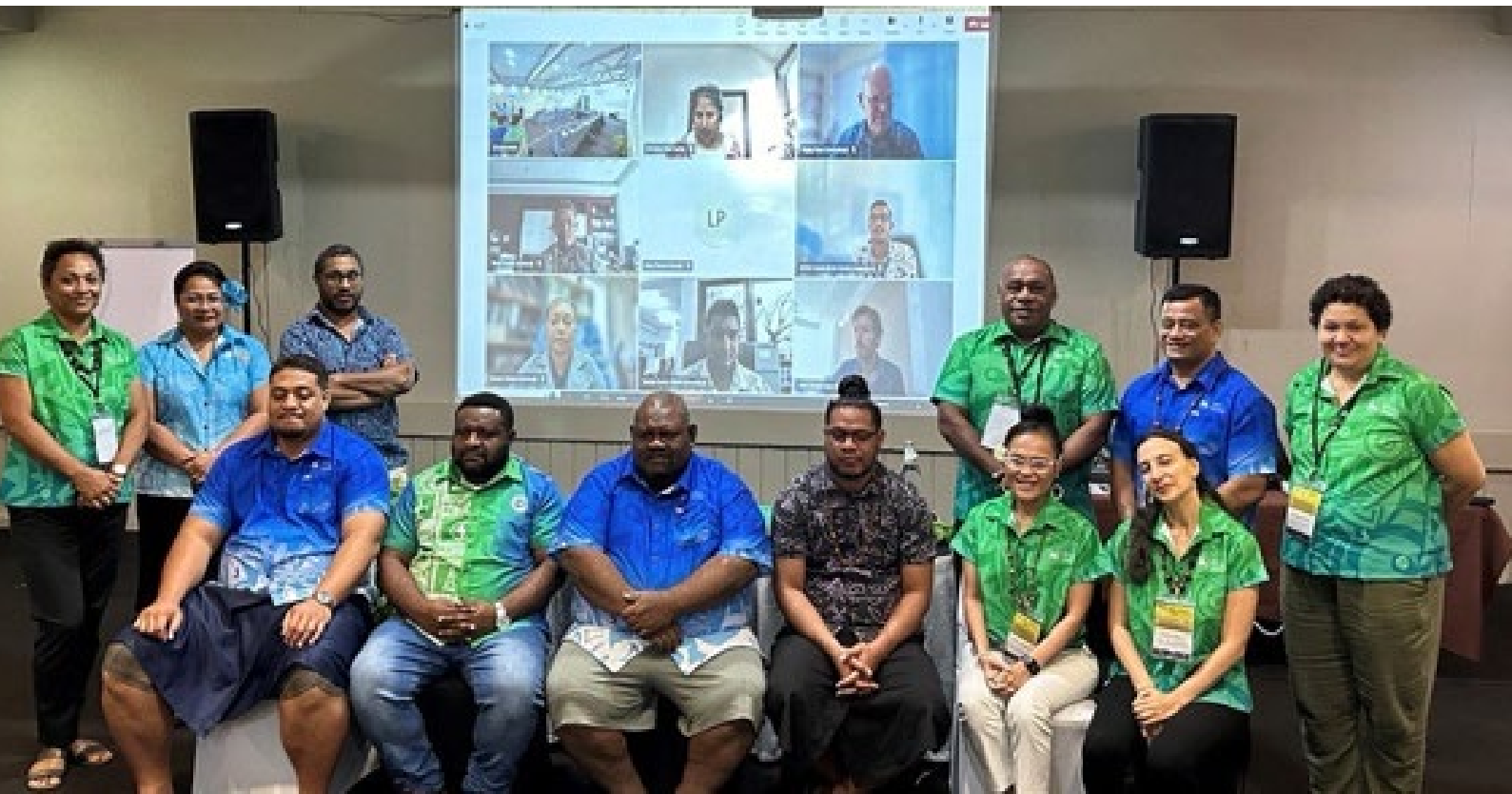
Pacific Adoption of Waste-to-Energy Solutions (PAWES) project

Year three annual report





Pacific Adoption of Waste-to-Energy Solutions (PAWES) project

Year three annual report

Suva, Fiji, 2025

Cover photos:

On top left: Sustainable Energy Qualification Document endorsement at Novotel Nadi, Fiji
Photo Credit: SPC Ms. Tokasa Tilatila
On top right: USP Scholarship Awardees Welcome Event at USP Laucala Campus, Fiji
Photo Credit: USP Ms. Anushka Maharaj
Bottom: Project Steering Committee (PSC) Meeting at Novotel Nadi, Suva
Photo Credit SPC Mr. Ray Campbell

Project title: Pacific Adoption of Waste-to-Energy Solutions (PAWES) project

Project duration: 4.5 years (54 months)

Reporting period: 13 December 2023–12 December 2024 (1 year)

Contribution Agreement No.: FED/2021/428-200

Lead implementing agency: Pacific Community (SPC)

Partner implementing agency: Secretariat of the Pacific Regional Environment Programme (SPREP)

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Table of Contents

Abbreviations

CPRT	Clean Pacific Roundtable
CMI	College of the Marshall Islands
DTC	Design Technology Centre
EQAP	Educational Quality and Assessment Programme
EU	European Union
FESRIP	Framework for Energy Security and Resilience in the Pacific
GEP	Geoscience and Energy Programme
IAC	Industry Advisory Committee
MEL	monitoring, evaluation and learning
MSW	municipal solid waste
MSc	Master of Science
NCE	no-cost extension
NUS	National University of Samoa
OACPS	Organisation of African, Caribbean and Pacific States
PAWES	Pacific Adoption of Waste-to-Energy Solutions
PQF	Pacific Qualifications Framework
PICs	Pacific Island countries
PICTs	Pacific Island countries and territories
PNG	Papua New Guinea
PRETMM	Pacific Regional Energy and Transport Ministers' Meeting
PSC	Project Steering Committee
RDF	refuse-derived fuel
RET	renewable energy technologies
RMI	Republic of the Marshall Islands
ROM	results-oriented monitoring
SWM	solid waste management
SEOM	Senior Energy Officials Meeting
SPC	Pacific Community
SPREP	the Secretariat of the Pacific Regional Environment Programme
SRP	supervised research project
UPNG	University of Papua New Guinea
USP	The University of the South Pacific
VSA	Volunteer Service Abroad
WtE	waste-to-energy
WP	work packages

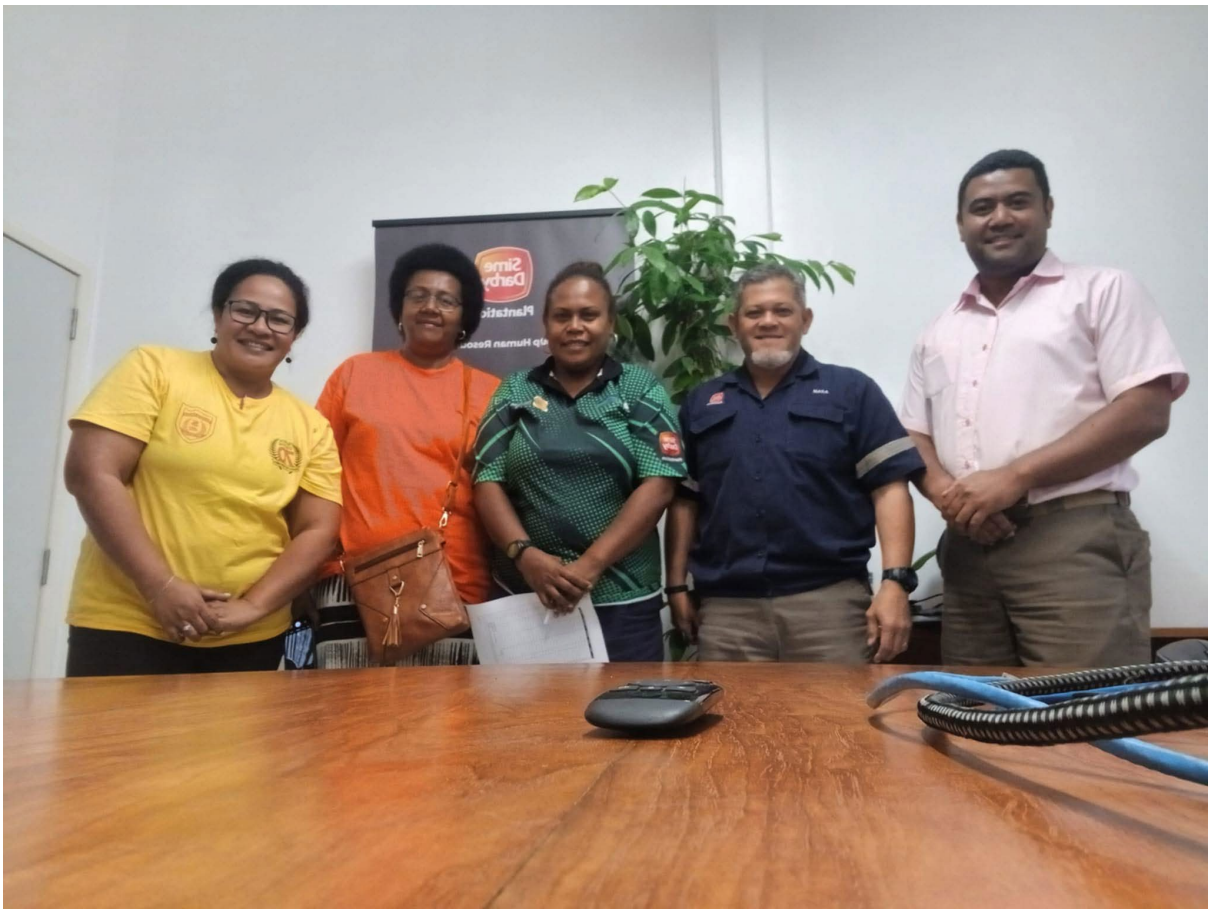
Abstract

The Pacific Adoption of Waste-to-Energy Solutions (PAWES) project, funded by the European Union through the Organisation of African, Caribbean and Pacific States (OACPS) Research and Innovation Programme, aims to enhance solid waste management (SWM) and energy security in the Pacific region, aligning with regional frameworks such as the Framework for Energy Security and Resilience in the Pacific (FESRIP) and the Efate Outcome Statement. This third interim report covers the period from 13 December 2023 to 12 December 2024, detailing progress, achievements and challenges encountered during the third year of the project.

Key achievements include the successful completion of baseline assessments and feasibility studies in five Pacific Island countries (PICs): Papua New Guinea (PNG), the Republic of the Marshall Islands (RMI), Samoa, the Solomon Islands and Tuvalu. These assessments have increased understanding of the importance of the waste-to-energy (WtE) nexus, strengthening government capacities for evidence-based decision-making in alignment with FESRIP's objectives to promote sustainable energy security. A major highlight of the project is the development of WtE qualifications, specifically Certificate IV and Diploma VI in Sustainable Energy, in collaboration with the Pacific Community's (SPC) Educational Quality and Assessment Programme (EQAP) to strengthen local capacity by equipping citizens with essential skills for the WtE sector. This initiative enhances workforce competency, creates employment pathways and aligns with national sustainability goals. By fostering local innovation and reducing reliance on external expertise, it ensures long-term sustainability and economic resilience in the Pacific's renewable energy transition. Another significant milestone is the awarding of five scholarships for Master of Science (MSc) by Research in WtE, in partnership with the University of the South Pacific (USP) and the University of Papua New Guinea (UPNG). The WtE Technology Symposium, together with regional presentations at events such as the 4th CPRT in Tuvalu, the Senior Energy Officials Meeting (SEOM) in Fiji and the Regional Workshop on a Circular Approach to Waste Management in Vanuatu, has underscored the shift away from viewing waste and energy as isolated sectors. Instead, an integrated approach is taking hold, one that treats WtE as a cohesive solution to complex environmental challenges. The need to socialise WtE policy for broader community engagement has become clear. This movement represents a pivotal realisation: it's no longer waste alone, no longer energy alone, but an interconnected path forward to sustainable, resilient and holistic WtE systems.

Challenges persist as the project undergoes implementation and to mitigate these, an 18-month no-cost extension (NCE) was requested and granted. The project remains highly relevant and continually responds to the waste management and energy needs of the Pacific region, directly supporting FESRIP's focus on resilience and sustainability. Efforts are ongoing to improve implementation efficiency and communication to achieve the planned outcomes. Additionally, the project aligns with the goals outlined in the Efate Outcome Statement, which emphasises accelerating decarbonisation and fostering a sustainable future for the Pacific region.

This report highlights the major activities, achievements and ongoing cross-sectoral collaborations, detailing data collection missions, the development of WtE qualifications and efforts to foster regional WtE capabilities. Additionally, findings from the European Commission's Results-Oriented Monitoring (ROM) mission emphasise the need for enhanced coordination, reporting and structural alignment to ensure project goals are met within the strategic priorities of the Pacific region.



Executive Summary

The Pacific Adoption of Waste-to-Energy Solutions (PAWES) project, funded by the European Union (EU) through the Organisation of African, Caribbean and Pacific States (OACPS) Research and Innovation Programme, addresses the pressing need for enhanced solid waste management (SWM) and energy security in the Pacific region. Aligned with the regional Framework for Energy Security and Resilience in the Pacific (FESRIP) and the Fifth Pacific Regional Energy and Transport Ministers Meeting (5th PRETMM), the Efate Outcome Statement and the outcome of the 2024 Senior Energy Official Meeting (SEOM), the project aims to provide sustainable waste-to-energy (WtE) solutions across five Pacific Island countries (PICs) – Papua New Guinea (PNG), Republic of the Marshall Islands (RMI), Samoa, Solomon Islands and Tuvalu. This third interim report covers the period from 13 December 2023 to 12 December 2024 and details key progress, challenges and outcomes as the project advances toward these goals.

The report outlines several achievements, including the completion of baseline assessments and feasibility studies that have built PICs government capacities for evidence-based decision-making in the WtE sector. The project has also made strides in developing WtE qualifications in collaboration with the Pacific Community's (SPC) Educational Quality and Assessment Programme (EQAP) and in awarding scholarships for Master of Science (MSc) by Research in WtE, contributing to the Efate Outcome Statement's focus on building sustainable capacity within the Pacific. These foundational steps lead the way for long-term sustainability and regional integration of WtE solutions in SWM and renewable energy planning.

The PAWES project continues to be highly relevant, demonstrating strong regional engagement and a growing demand for innovative WtE solutions that align with the FESRIP, Efate Outcome Statement, SEOM Outcome Document and the WtE Technology Symposium Report.

In addition to technical achievements, the report highlights significant activities, including data collection missions, cross-sectoral collaboration and the findings from the European Commission's Results-Oriented Monitoring (ROM) mission. The ROM review underscores opportunities to strengthen project coordination, reporting and organisational structure, thereby enhancing overall effectiveness and alignment with the strategic priorities of PICs.

Through a strategic focus on government capacity building, data enhancement, educational advancement and multi-sector engagement, the PAWES project is making a meaningful contribution to the Pacific's energy transition toward sustainable waste and energy management. This report not only reviews project performance but also provides a forward-looking strategy to ensure that WtE solutions are effectively integrated into the development priorities of PICs, furthering the goals of FESRIP, the Efate Outcome Statement, SEOM Outcome Document and other relevant regional frameworks.

Key Activities and Achievements

1. Baseline Assessments and Feasibility Studies:
    - Completed baseline assessments in PNG, RMI, Samoa, Solomon Islands and Tuvalu.
    - Conducted cost-benefit analyses for WtE options in Samoa, including gasification of refuse-derived fuel (RDF) and incineration of municipal solid waste (MSW).

2. Data Collection and Consolidation:
    - Partnered with the Secretariat of the Pacific Regional Environment Programme (SPREP) to enhance data availability and accessibility on SWM and renewable energy technologies (RET).
    - Data collection missions conducted in Papua New Guinea, Solomon Islands and Republic of the Marshall Islands, focused on gathering data on key waste streams with high calorific values.
3. Cross-Sectoral Collaboration:
    - Organised WtE sessions at regional conferences and workshops, including the 4th Clean Pacific Roundtable (CPRT), Senior Energy Officials Meeting (SEOM) and the Regional Workshop on a Circular Approach to Waste Management in the Pacific.
    - Promoted collaboration between government entities, academic institutions and the private sector through the WtE Technology Symposium.
4. Development of WtE Qualifications:
    - Collaborated with SPC's EQAP to develop and endorse WtE qualifications.
    - Formed an Industry Advisory Committee (IAC) to guide the development of these qualifications.
5. Scholarship Program:
    - Awarded scholarships to students from the University of the South Pacific (USP) and the University of Papua New Guinea (UPNG) for research in WtE.
    - Supported students in identifying research topics and conducting supervised research projects.
    - Engaged in discussions with the College of the Marshall Islands (CMI) and the National University of Samoa (NUS) to explore opportunities for launching WtE undergraduate and internship programs.
6. Project Management and Monitoring:
    - Held annual Project Steering Committee (PSC) and quarterly multipliers meetings to review progress and address challenges.
    - Implemented recommendations from the European Commission's results-oriented monitoring (ROM) mission to improve project efficiency and effectiveness.

Project Intervention Logic

The PAWES project is funded by the ACP Innovation Fund, OACPS Research and Innovation Programme. A programme implemented by the Organisation of African, Caribbean and Pacific States, with the financial contribution of the European Union. The project is led by the Pacific Community (SPC) in partnership with the Secretariat of the Pacific Regional Environmental Programme (SPREP). It aims to enhance SWM and energy security in the Pacific region by enabling national and subnational governments to make informed decisions on developing a sustainable WtE sector and supporting tertiary education providers in offering updated training and conducting research on SWM, RET and WtE. With a budget of €1,762,774, the 54-month project is being implemented in PNG, RMI, Samoa, the Solomon Islands and Tuvalu.

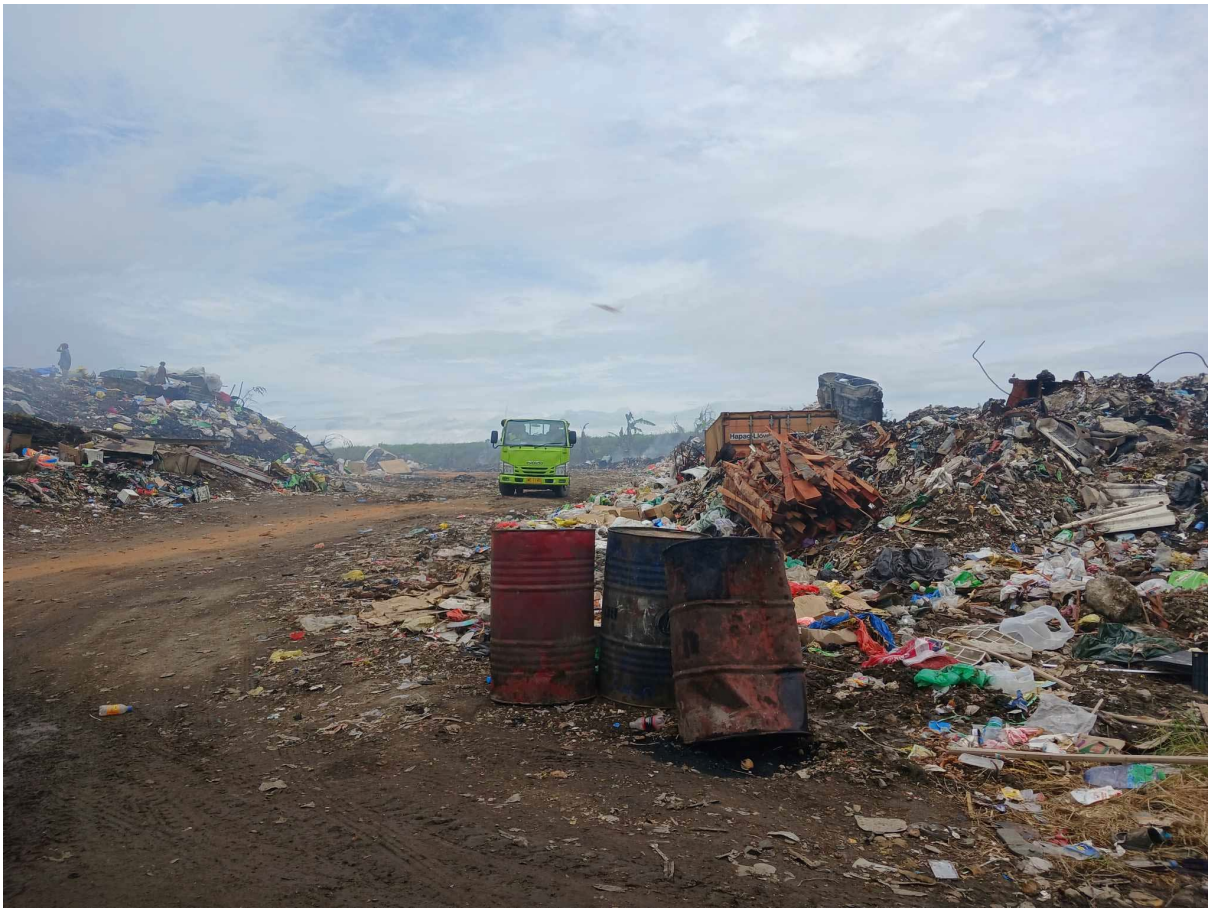
Table 1: Summary of Intervention Logic

<table>
<tr><td colspan="5">Overall Objective or Impact</td></tr>
<tr><td colspan="5">Enhanced SWM and energy security in the Pacific region</td></tr>
<tr><td colspan="5">Specific Objectives or Outcomes</td></tr>
<tr><td colspan="3">Specific Objective 1:
National and subnational government entities able to make informed decision on developing a sustainable WtE sector.</td><td colspan="2">Specific Objective 2:
Tertiary education providers providing updated training and performing state-of-the-art research on SWM, RET and WtE.</td></tr>
<tr><td colspan="5">Expected Outputs</td></tr>
<tr><td>Output 1.1</td><td>Output 1.2</td><td>Output 1.3</td><td>Output 2.1</td><td>Output 2.2</td></tr>
<tr><td>Enhanced capacity of government entities in the application of support for evidence-based decision-making in WtE</td><td>Increased access to data on SWM and RET</td><td>Enhanced cross-sectoral collaboration among government entities and the educational, research and private sector on WtE</td><td>Tertiary education providers adapting and developing WtE training courses for preparing students for jobs that match existing and future market demands</td><td>Tertiary education providers adapting and developing innovative WtE solutions.</td></tr>
<tr><td colspan="5">Main activities. These are expressed as work packages (WP)</td></tr>
<tr><td colspan="5">WP1 – Capacity strengthening of government entities in the application of support tools for evidence-based decision-making in WtE.
Deliverables:
• Baseline assessment report on government decision-making in RET and SWM. (A1.1.1–A1.1.7)
• Feasibility assessment report for WtE in the Pacific, including community consultation reports and economic cost–benefit analysis. (A1.2.1–A1.2.4)
• Training materials for WtE policy-making in the Pacific. (A1.3.1 and A1.3.2)
• WtE policy-making workshop reports. (A1.3.3–A1.3.5)</td></tr>
<tr><td colspan="5">WP2 – Collection and consolidation of data on SWM and RET in the Pacific region.

Deliverables:
• Report on SWM and RET data that is currently available and accessible. (A2.1.1)
• Report on unreported and undiscoverable data, with recommendations on how the data can be made accessible. (A2.1.2 and A2.1.3)
• New or modified RET and SWM databases. (A2.2.1 and A2.2.2)
• Data collection protocols where necessary. (A2.2.3)
• Data access and usage workshop reports. (A2.3.2)
• Data usage analytics. (A2.3.3)</td></tr>
<tr><td colspan="5">WP3 – Promotion of cross-sectoral collaboration among government entities and the educational, research and private sector.

Deliverables:
• Presentations on WtE in the Pacific, including past experiences, ongoing needs and potential solutions. (A3.2.3)
• Meeting reports detailing the outcomes of WtE sessions at international/regional conferences. (A3.1.1–A3.1.4 and A3.3.1–A3.3.3)
• Pacific WtE website. (A2.3.1 and A3.2.1, A3.2.3)
• Website usage analytics. (A3.2.4)
• Trip reports from trade missions outside the region. (A3.4.1–A3.4.3)</td></tr>
</table>

WP4 – Adapting and developing WtE training courses for tertiary education providers. *Deliverables:* • Accredited RET qualifications including educational WtE material. (*A4.1.1–A4.1.3*) • Report on Pacific SWM and RET skills gap. (*A4.2.1*) • Short courses on WtE in the Pacific. (*A4.2.2–A4.2.5*) • Honours and master's thesis on WtE research projects in the Pacific. (*A4.3.1–A4.3.5*)
WP5 – Developing WtE solutions through tertiary education providers. *Deliverables:* • Pilot project design reports. (*A5.1.1 and A5.1.2*) • Pilot installations. (*A5.1.3 and A5.1.4*) • Pilot project results reports. (*A5.1.5*)
WP6 – Project Management (*A6.1–A6.7*)



Year 3 Progress Updates

WP1 – Capacity of government entities in the application of support tools for evidence-based decision-making in WtE

A1.1 – Baseline assessment on decision-making processes at governmental level on the waste and renewable energy sectors

1.1.1 Design of the baseline assessment methodology
Status: Completed in Year 1

1.1.2 Set-up of an operational IT system
Status: Completed in Year 1

1.1.3 Set-up of the baseline assessment team
Status: Completed in Year 1

1.1.4 Execution of the baseline assessment
Status: Completed in Year 3

The first drafts of the Baseline Assessment Reports for all five beneficiary countries (PNG, RMI, Samoa, Tuvalu and Solomon Islands) were shared with relevant government stakeholders and the SPC Publishing team, receiving initial feedback. Based on recommendations from the SPC Publishing Team, an external peer review was conducted to edit the final five reports. After the peer review, the revised drafts were shared with government stakeholders for a final round of feedback. Subsequently, the final five reports were further edited by the SPC Publishing team before being published on the SPC PAWES Webpage.

- **Annex 01** Tuvalu Baseline Assessment Report
- **Annex 02** RMI Baseline Assessment Report
- **Annex 03** PNG Baseline Assessment Report
- **Annex 04** Samoa Baseline Assessment Report
- **Annex 05** Solomon Islands Baseline Assessment Report.

1.1.5 Analysis of the assessment data of the sample sites
Status: Completed in Year 2

1.1.6 Dissemination of assessment results
Status: In progress

Refer to "1.1.4 Execution of the baseline assessment"
The report will be published on SPC PAWES webpage

1.1.7 Extraction of relevant data for other work package activities
Status: Completed in Year 2

A1.2 – Feasibility assessment of WtE for the Pacific

1.2.1 Review potential working WtE options for the Pacific

Status: Completed in Year 2

1.2.2 Select options that provide technical and environmental merit and public adoption

Status: Completed in Year 2

1.2.3 Cost/benefit analysis of selected options

Status: Completed in Year 3

The WtE baseline assessments of waste availability and composition in PNG, RMI, Samoa, Solomon Islands and Tuvalu have now been completed. The next phase involved providing guidance on appropriate technologies for WtE projects in each country. This requires a detailed economic analysis of various options for each country.

Economic Analysis of WtE Schemes in Samoa

Date: 13 to 20 July 2024

Participants: Christopher Williamson, Bioenergy Advisor; Inia Saula, Energy Officer

Location: Samoa

Samoa was selected as the first country for this phase, due in large part to its prior experience with the Afolau gasifier, offering valuable "lessons learned" on the implementation of gasification technology. A capacity-building exercise was conducted to lead and execute the evaluation. Dr Williamson, a volunteer from Volunteer Service Abroad (VSA) New Zealand, has been serving as a bioenergy advisor to the SPC from March to August 2024, working closely with SPC Energy Officer Mr Saula.

The existing Feasibility Assessment Report for Samoa is updated to include a new section, Section 6: Economic Analysis of WtE Schemes in Samoa, which evaluates three potential WtE schemes on Upolu Island.

I. **Gasification of refuse-derived fuel (RDF)**
   This option involves separating organic material and recyclables from the waste stream and gasifying the remaining RDF. It is expected to generate approximately 2343 MWh annually. However, the exact capital and operating costs of the plant are unknown. For reference, a similar project (the Afolau plant) had a capital cost of approximately USD 2.7 million.
II. **Repurposing the Afolau Gasifier**
   Instead of constructing a new facility, this option proposes converting the existing gasifier at Afolau to handle RDF. This approach could lower capital costs but may increase operational expenses due to the need to transport RDF from Apia.
III. **Incineration of municipal solid waste (MSW)**
   This option focuses on recycling glass and metals, while the organic fraction would be incinerated to produce steam for electricity generation. The estimated capital expenditure for such a plant is USD 12.5 million, making it the least economically feasible of the three options.

Each of these schemes requires further analysis, particularly in terms of operating expenses, tariff rates and capital costs before a final feasibility assessment can be made.

For more details, refer to the following annexes:

- **Annex 06** Samoa Feasibility Assessment Report
- **Annex 07** Bioenergy in Samoa Report
- **Annex 08** Data Scientists Trip Report for Samoa.

1.2.4 Assess feasibility of potential WtE options and scaling up at national and regional level

Status: In progress

Refer to "1.2.3 Cost–benefit analysis of selected options"

The existing draft Feasibility Assessment Reports for all five beneficiary countries will be shared with the respective national stakeholders for their review and feedback. Upon consolidation of the feedback, the final versions of the reports will be refined and edited by the SPC Publications Team before being published on the SPC PAWES Project Webpage.

A1.3 – Training on WtE policy-making adapted to the Pacific

1.3.1 Design training course and training methodology

Status: Completed in Year 2

1.3.2 Develop training materials on WtE sector

Status: Completed in Year 2

1.3.3 Set up a team of trainers

Status: Completed in Year 1

1.3.4 Develop a training calendar in consultation with government entities

Status: Completed in Year 1

1.3.5 Deliver workshops to national and subnational governments

Status: Completed in Year 2

1.3.6 Set up a mentoring programme and provide mentoring to national government representatives to support the updating and development of plans and roadmaps

Status: Cancelled as per Addendum 1

WtE policy and roadmaps

A Terms of Reference was drafted to invite proposals from individuals, companies or consortia interested in developing WtE policies and roadmaps for five selected countries. The document was prepared in close collaboration with government representatives from each country to ensure the specific needs and priorities of each nation were reflected. Each government appointed a focal point to lead the coordination of their respective WtE policy and roadmap development. Given the limited in-house technical capacity within many government departments, it was decided that external technical assistance would be contracted to support the delivery of this initiative. This approach ensures that the policies and roadmaps will be developed with the necessary expertise and aligned with regional and international best practices while also catering to each country's unique context and objectives.

However, since this activity is no longer part of the no cost extension (NCE) requested and granted, a concept note has been developed to mobilise alternative resources outside the scope of the PAWES Project for the execution of this initiative. The concept note outlines

potential funding avenues, strategic partnerships and collaborative frameworks to support the development and implementation of WtE policies and roadmaps for the five initial target countries: PNG, RMI, Samoa, Solomon Islands and Tuvalu. This initiative aligns with the FESRIP and the Efate Outcome Statement, emphasising the need for integrated approaches to energy security and climate resilience. Additionally, in response to requests from other member countries of SPC, the additional resources will be mobilised to propose the inclusion of additional member countries in the WtE initiative. This expanded scope demonstrates the growing regional interest in WtE solutions and highlights the need for comprehensive, scalable policy frameworks that cater to the specific energy and waste management challenges faced by each country. Through these concept notes, efforts will be made to identify new donors, private sector investors and technical partners capable of providing the financial and expert resources necessary to achieve these objectives.

For more details, refer to the following annexes:

- **Annex 09** ToR for WtE Policy and Roadmaps
- **Annex 10** Concept Note for WtE Policy and Roadmaps

WP2 – Collection and consolidation of data on SWM and RET in the Pacific region

A2.1 – Updating of existing data/databases

2.1.1 Desktop review of available national and regional datasets

Status: Completed in Year 2

2.1.2 National consultations to determine unreported or undiscoverable data

Status: In progress

WtE Data Collection Mission

A Collection Mission Advisory Letter and a Data Collection Mission Statement were shared for the WtE Data Collection Mission across three PAWES Project beneficiary countries: PNG, RMI and Solomon Islands, prior to the visit. This initiative, led by SPREP, involves addressing data deficiencies in waste management and exploring WtE solutions. The mission was led by the SPREP Waste Expert and the SPC Data Scientist in November and December 2024, with approximately five days allocated per country.

Summary:

This initiative aimed to equip recipient countries with essential insights into their waste management issues and explore innovative energy recovery techniques. The mission focused on gathering data on key waste streams with high calorific values, such as waste tyres, waste oil and organic waste. The data collection exercise was crucial for identifying waste types that could be transformed into energy and addressing the lack of information on tyre and waste oil recycling.

Goals and objectives:

- To evaluate the amount of WtE information in country.
- To update the current WtE database or create a new one.
- To assess the potential for future WtE projects within the nation.

Scope of work:

The initiative involved collaboration with national Waste and Energy Offices, with support from

personnel from the relevant stakeholders and a PAWES Scholarship recipient from the UPNG. The mission included data gathering, interviews, questionnaires and observations at various locations over a week.

Target locations:

The data collection covered twenty households, five hotels, five restaurants, five workshops, five retail/wholesale stores and a landfill in each country. Locations were selected from both urban and rural areas.

Methodology

The data collection for the WtE initiative utilised a multi-faceted approach to ensure comprehensive and reliable insights.

- **Interviews:** These were conducted with household owners to understand waste management practices, energy needs and perceptions of WtE technologies.
- **Household site visits:** Observations were carried out in various areas of Honiara to assess current waste management practices, infrastructure and potential WtE sites.
- **Commercial sector assessments:** Data was gathered from vehicle repair workshops, garages and restaurants in several districts and industrial areas to analyse waste generation and management practices.
- **Landfill analysis:** Existing government reports, environmental impact assessments and academic studies were reviewed to understand historical waste management trends and policy frameworks.

By integrating qualitative and quantitative methods, this approach provided a holistic understanding of the WtE landscape, ensuring that proposed strategies are practical, culturally relevant and tailored to the local context.

Expected outcomes:

- Comprehensive Waste Characterisation Report detailing types and quantities of waste.
- Identification of energy recovery potential from diverse waste streams.
- Updated baseline data to support decision-making in waste management and energy production.
- Stakeholder engagement and awareness through training sessions and community workshops.
- Recommendations for appropriate WtE technologies and feasibility studies for pilot projects.
- Contribution to policy frameworks integrating WtE solutions.
- Capacity building through training on data collection, waste analysis and energy conversion technologies.
- Establishment of a long-term monitoring framework for waste generation and energy recovery rates.

(A) Solomon Islands Data Collection Mission

Date: 10–17 November 2024

Participants: 6 total, including 2 females and 4 males

Summary:

During the mission to the Solomon Islands, previously unreported data identified during the baseline assessment visit was gathered. The focus was on households and commercial entities such as restaurants, hotels, garages and workshops. The unreported data includes organic kitchen wastes, used lubricants, used cooking oil, cans, cartons, paper/cardboard, bottles, tyres and filters.

Reflective observations:

Households, hotels, restaurants and workshops/garages are generally aware of waste management practices. Most of these wastes are separated for landfill and recycling purposes. However, issues remain with the timely disposal, collection and handling of wastes.

Key lesson learned:

There is a lack of communication between the Department of Agriculture and the Department of Energy and Waste Management Office.

Recommendation:

For consistent waste data collection, it is crucial for the Waste Management Division to take a leading role in compiling waste data with high energy values.

Annexes:

- **Annex 11** Solomon Islands Data Collection Mission Advisory Letter
- **Annex 12** Solomon Islands Data Collection Mission Statement
- **Annex 13** Data Scientists Trip Report for Solomon Islands
- **Annex 14** Data Collection Mission Report for Solomon Islands

(B) PNG Data Collection Mission
Date: 17–24 November 2024

Participants: 5 total, including 2 females and 3 males.

Summary:

During the mission to Papua New Guinea, previously unreported data identified during the baseline assessment visit was gathered. The focus was on households and commercial entities such as restaurants, hotels, garages and workshops. The unreported data includes organic kitchen wastes, used lubricants, used cooking oil, cans, cartons, paper/cardboard, plastics, bottles, tyres and filters.

Reflective observations:

Households, hotels, restaurants and workshops/garages are generally aware of waste management practices. Most of these wastes are separated for landfill and recycling purposes. However, in PNG, many garages/workshops store their own used lubricants, highlighting the need to compile data on those with high energy values.

Key lesson learned:

There is a lack of communication between the Livestock Development Corporation, the National Energy Authority and the Waste Management Office in sharing information.

Recommendation:

For consistent waste data collection, it is crucial for the Waste Management Division in PNG to take a leading role in this exercise.

Annexes:

- **Annex 15** PNG Data Collection Mission Advisory Letter
- **Annex 16** PNG Data Collection Mission Statement
- **Annex 17** Data Scientist's Trip Report for PNG.

(C) RMI Data Collection Mission
Date: 28 November–07 December 2024

Participants: 5 total, males only.
Summary:

During the mission to RMI, previously unreported data identified during the baseline assessment visit was gathered. The focus was on households and commercial entities such as restaurants, hotels, garages and workshops. The unreported data includes organic kitchen waste, used lubricants, used cooking oil, cans, cartons, paper/cardboard, plastics, bottles, tyres and filters.

Reflective observations:

Households, hotels, restaurants and workshops/garages are generally aware of waste management practices. Most of these wastes are separated for landfill and recycling purposes. However, in RMI, there are delays in the collection of rubbish.

Key lesson learned:

There is a lack of communication between the National Energy Office, the Department of Agriculture and the Waste Management Office in sharing information (e.g. biogas systems, organic wastes).

Recommendation:

For consistent waste data collection, it is crucial for the Waste Management Division in RMI to take a leading role in compiling data on waste with high energy values.

- **Annex 18** RMI Data Collection Mission Advisory Letter
- **Annex 19** RMI Data Collection Mission Statement
- **Annex 20** Data Scientists Trip Report for RMI

These missions significantly improved the availability and accessibility of data related to SWM and RET in the Pacific, with a particular emphasis on WtE applications. This was achieved through comprehensive data collection and consolidation. Additionally, the mission established efficient mechanisms for data utilisation and dissemination, thereby supporting evidence-based decision-making in WtE initiatives. These efforts are expected to enhance the capacity for sustainable waste management and energy recovery in the region, fostering a cleaner and more resilient future.

2.1.3 Enter un-reported or un-discovered data into existing national and regional datasets where necessary

Status: Completed in Year 3

Refer to "2.1.2 National consultations to determine unreported or undiscoverable data"

Data collected during the missions will be systematically integrated into existing national and regional datasets to strengthen and expand the data repositories of all five PAWES Project beneficiary countries. This will ensure more comprehensive and up-to-date information for informed decision-making and policy development.

A2.2 – Development of new data/databases

2.2.1 Gap analysis for national/regional data and databases
Status: Cancelled as per Addendum 1

2.2.2 Develop new or adapt existing databases where necessary
Status: Cancelled as per Addendum 1

2.2.3 Develop new data collection protocols where necessary
Status: Cancelled as per Addendum 1

2.2.4 Data collection and insertion in databases
Status: Cancelled as per Addendum 1

A2.3 – Analysis of use of data

2.3.1 Promotion and advocacy of new or updated databases
Status: Cancelled as per Addendum 1

2.3.2 Training or workshops on how to access and use the data
Status: Cancelled as per Addendum 1

2.3.3 Analysis of data usage
Status: Cancelled as per Addendum 1

WP3 – Promotion of cross-sectoral collaboration among government entities and the educational, research and private sector

A3.1 – Deliver Pacific WtE presentations at international/regional conferences

3.1.1 Review past and ongoing RET and SWM conferences/meetings/workshops
Status: In progress

The PAWES PMU conducts a review of past and ongoing RET and SWM conferences, meetings and workshops. This assessment aims to identify the most relevant platforms that would be suitable for integrating a dedicated session or a series of presentations on WtE. The review focuses on evaluating the scope, objectives and audience of these events to ensure alignment with WtE priorities, fostering knowledge-sharing, collaboration and strategic engagement with key stakeholders in the sector.

3.1.2 Plan and arrange dedicated WtE sessions in planned conferences
Status: In progress

Regional WtE Technology Symposium
Theme: *"Pioneering Waste-to-Energy Solutions"*
Date and Time: 25 September 2024, 3:00 p.m.–5:00 p.m.
Location: Novotel Hotel, Nadi, Fiji
Participants: 59 total, including 19 females and 40 males

The WtE Technology Symposium successfully brought together stakeholders from academia, government and the private sector to discuss innovative solutions for waste management and energy generation. The event was held under the theme *"Pioneering Waste-to-Energy Solutions"*, reflecting the region's commitment to advancing sustainable practices through cutting-edge technologies. This theme aligns closely with the FESRIP, which emphasises the

need for innovative technologies to accelerate decarbonisation and strengthen energy resilience across the Pacific Islands.

I. Global and regional overview

The symposium opened with an overview of the global and regional waste and energy landscape. This session sparked critical discussions on barriers and opportunities for WtE initiatives within local communities. Attendees explored successful global and regional case studies, learning from existing WtE programs to better adapt these solutions to Pacific contexts.

II. Academia perspectives

The symposium's first session provided a collaborative platform for academic representatives from SPC's EQAP, USP and UPNG to discuss the role of research and educational institutions in advancing WtE solutions in the Pacific. Conducted in a talanoa discussion format, this session allowed participants to delve into the unique challenges and potential strategies for integrating WtE technologies within local contexts. Through open dialogue, academia emphasised the importance of localised research, interdisciplinary partnerships and capacity building in fostering sustainable energy innovations. This academic perspective is crucial to the broader FESRIP vision, which prioritises innovative approaches for decarbonisation and resilience building across the region.

III. Regulatory landscape

The next session delved into the regulatory frameworks surrounding WtE, featuring contributions from PNG, Samoa and RMI. Panellists examined the challenges related to energy policies, emphasising the importance of collaboration between energy and environmental departments. The discussions highlighted the urgent need for adaptable and flexible regulatory structures, especially those that support emerging technologies. This ties directly into FESRIP's goals of fostering energy policies that promote sustainable practices and accommodate evolving WtE solutions.

IV. Private sector perspectives

A key feature of the symposium was the involvement of the private sector. Representatives from organisations such as Design and Technology Centre (DTC), BioEnergy Insight and Tropik Wood shared insights into emerging WtE technologies. Their presentations emphasised the importance of aligning private sector innovation with public sector regulatory frameworks, offering a roadmap for integrating cutting-edge solutions into existing systems. These efforts directly support FESRIP's push for greater private sector engagement to drive the development of WtE technologies in the Pacific.

V. Engaging display booths

Throughout the event, display booths from Eco Grow, BioEnergy Insight and Tropik Wood provided participants with hands-on demonstrations of biodigester technologies and other waste management solutions. These booths fostered valuable networking opportunities and showcased the latest innovations in WtE technology. This interactive component reinforced the symposium's collaborative spirit, essential for successfully deploying WtE initiatives across the region.

The symposium concluded by reaffirming the need for continued donor support to achieve WtE goals, echoing FESRIP's focus on financing and resource mobilisation. As the Pacific continues to explore WtE as a viable solution for both waste management and energy generation, events such as this symposium play a critical role in promoting sustainable development and resilience across the region.

Further details can be found in the following annexes. Please note that the WtE Technology Symposium Report is still in draft form:

- **Annex 21** WtE Technology Symposium Agenda
- **Annex 22** WtE Technology Symposium Report.

3.1.3 Facilitate WtE sessions

Status: In progress

The PAWES Team leveraged from the following meetings to integrate WtE sessions and presentations:

A) The "Waste Management Technologies Dialogue" during the 4th CPRT

Theme: *"Transforming Waste into Worth: A Revolutionary Approach to Sustainable Development."*

Date: 06 August 2024

Location: Rt Hon. Dr Sir Tomasi Puapua Convention Centre, Funafuti, Tuvalu

Participants: 184 total, including 91 females and 93 males

The event brought together a diverse group of experts, stakeholders and the regional waste management community to share ideas and explore innovative technologies and strategies for converting waste into valuable resources.

Key highlights:

I. **Focus on innovation and sustainability:** The dialogue centred on advancing the idea that waste can be transformed into an asset rather than a burden. It showcased cutting-edge technologies, sustainable business models and practices that aim to reduce waste generation while creating economic value. A strong emphasis was placed on inspiring eco-friendly behaviour and promoting a culture of sustainability.

II. **Global waste challenge:** As the global waste management industry is projected to reach USD 1.5 trillion by 2025, traditional methods of waste management are no longer sufficient to handle the environmental, social and economic impacts of waste. The session addressed the urgent need for innovative solutions and discussed technologies capable of transforming waste into valuable commodities, thus contributing to a circular economy.

III. **Collaborative discussions and case studies:** The event was structured into two key sessions:

   Session 1: Waste reduction and minimisation strategies, where speakers presented innovations aligned with the Pacific's development strategies and case studies from small island developing states, showcasing successful pathways towards a circular economy.

   Session 2: Emerging technologies and innovation, featuring demonstrations of WtE technologies such as biogas, pyrolysis and trash booms. These technologies were highlighted as critical tools for reducing waste, generating energy and fostering sustainable development.

IV. **Stakeholder engagement and knowledge sharing:** The dialogue encouraged collaboration between technology experts, policymakers, entrepreneurs and the academic community. Interactive question and answer sessions allowed participants to engage in discussions about the presented technologies and how they could be implemented to achieve more sustainable waste management practices across the Pacific region.

The event concluded with discussions aimed at fostering innovation, driving policy changes and promoting WtE solutions in the Pacific region, ultimately contributing to both environmental sustainability and economic growth.

For more details, refer to the following annexes:

- **Annex 23** Agenda for Waste Management Technologies Dialogue
- **Annex 24** Agenda for the 4th CPRT
- **Annex 25** 4th CPRT Outcome document
- **Annex 26** Project Manager's Trip Report
- **Annex 27** 4th CPRT Report.

B). "Senior Energy Officials Meeting (SEOM)" during Pacific Regional Energy Meeting Series
Theme: *"Just, Inclusive and Equitable Energy Transition"*
Date: 23-25 September 2024
Location: Novotel Hotel, Nadi, Fiji
Participants: 77 total, including 27 females, 49 males and 1 no preference.

Over the five-day event, SPC facilitated policy dialogues that encouraged active engagement between government and private sector representatives, particularly around WtE projects. These discussions are aligned with the region's broader energy security goals, embodied in frameworks like the FESRIP.

A major highlight of the meeting was the review and discussion of the 5th Pacific Regional Energy and Transport Ministers' Meeting (PRETMM) Outcome, the Efate Statement. This outcome document, reflecting the collective vision of Pacific Island nations, underscores the region's commitment to accelerating energy transition efforts, particularly in renewable energy and sustainable waste management. The Efate Statement aligns closely with FESRIP and reinforces the need for regional cooperation in tackling pressing energy challenges, including WtE solutions.

Throughout the SEOM, participants explored the implementation plans of FESRIP, with a specific focus on integrating WtE projects into national and regional strategies. Day 3 featured the " Waste-to-Energy Technology Symposium". This dialogue highlighted the active role of both public and private sectors in driving forward WtE projects, as well as passive support through policy frameworks. The resulting outcome document from these discussions will serve as a strategic guide for future energy planning across the Pacific.

By the end of the week, SEOM concluded with a finalised outcome document, incorporating key insights from the Efate Statement and providing a roadmap for enhanced energy security, WtE integration and sustainable development in the Pacific region.

Further details can be found in the following annexes:

- **Annex 28** FESRIP 2021 to 2030 Volume 1 The Framework
- **Annex 29** 5th PRETMM Efate Outcome Statement
- **Annex 30** SEOM Outcome Document

For additional resources, please refer to the SEOM meeting website: Pacific Regional Energy Meetings Series 2024 | SPC Geoscience, Energy and Maritime Division
You can also view the SEOM Media Release here: Pacific Senior Officials convene to tackle energy challenges and shape sustainable future | The Pacific Community

C) Regional workshop on a circular approach to waste management in the Pacific.
Theme: *"Creating Resources from Waste and Pollution"*
Date: 30 September – 04 October 2024
Location: Iririki Island Resort, Port Vila, Vanuatu

Participants: 64 total, including 23 females and 41 males.

Over the five-day workshop, organised by SPREP and supported by multiple international programs such as Sustainable Waste Actions in the Pacific, Pacific-EU Waste Management Programme (PacWastePlus) and Japan Promotion of Regional Initiative on Solid Waste Management Phase III, participants explored innovative ways to incorporate circular economy principles into Pacific Island waste management systems. The circular economy model, which emphasises reducing waste through recycling, reuse and extending the lifecycle of products, was examined in contrast to the traditional linear production model.

The workshop featured seven sessions, each focusing on different aspects of circular waste management. Discussions highlighted how Pacific Island countries and territories can implement sustainable policies, such as bans on low-quality imports, and local composting programs, while creating economic opportunities in the region.

A significant moment of the event was the Waste-to-Energy session on Day 2, where presentations and site visits provided participants with valuable insights into cutting-edge waste management solutions, including pyrolysis technology and community-based WtE pilot projects. Participants visited the Bouffa landfill, where they examined waste handling processes and saw first-hand how waste separation and biomethane production can support both energy generation and waste reduction. These site visits offered practical examples of turning waste into renewable energy, revealing the potential for biomethane to be generated from organic waste at a community scale. The follow-up presentations further detailed pyrolysis technology, which converts various types of waste into fuel through high-temperature processes, as well as small-scale pilot projects such as those in the Solomon Islands that use localised, adaptable models for rural and remote areas. Together, these initiatives reflect the Pacific region's proactive approach to transforming waste into a valuable resource, advancing energy resilience, sustainability and economic opportunities.

Participants also reviewed regional disaster waste management strategies and sustainable financing models for waste management, with practical activities encouraging collaboration and the development of local solutions.

By the end of the workshop, an outcome document was produced, outlining strategic recommendations for integrating circular economy approaches into national waste management frameworks and enhancing regional cooperation.

This meeting showcased the Pacific region's growing momentum toward a sustainable, circular approach to waste management, with participants leaving with actionable strategies and reinforced networks to drive future projects.

Further details can be found in the following annexes:

- **Annex 31** Concept Note for Regional Workshop on a Circular Approach to Waste Management
- **Annex 32** Report for Regional Workshop on a Circular Approach to Waste Management
- **Annex 33** Data Scientist's Trip Report for Vanuatu

3.1.4 Disseminate meeting outcomes

Status: In progress

The outcomes of the meetings are effectively shared with beneficiary countries through key PAWES Project communication platforms. These include the annual PSC Meeting and the quarterly Multipliers Meeting, ensuring that stakeholders remain informed and engaged in the

project's progress and developments.

A3.2 – Build Pacific WtE website

3.2.1 Develop a dedicated Pacific WtE dashboard on the existing Pacific Data Hub and/or Pacific Reginal Data Repository

Status: Cancelled as per Addendum 1

3.2.2 Develop automated and flexible features

Status: Cancelled as per Addendum 1

3.2.3 Promotion and advocacy of the new website

Status: Cancelled as per Addendum 1

3.2.4 Track the use of the data and dashboard content through a dashboard analytics page

Status: Cancelled as per Addendum 1

A3.3 – Strengthening existing private sector–government partnership initiatives

3.3.1 Enhance collaboration between relevant regional (e.g. The Sustainable Energy Industry Association of the Pacific Islands) and national agencies

Status: Cancelled as per Addendum 1

3.3.2 Enhance collaboration between national and private energy and waste agencies (e.g. national energy and waste associations)

Status: Cancelled as per Addendum 1

3.3.3 Stimulate private sector engagement in WtE

Status: In progress

Refer to "3.1.2 Plan and arrange dedicated WtE sessions in planned conferences"

The Regional WtE Technology Symposium actively fostered private sector engagement by providing a platform for industry leaders to showcase emerging WtE technologies and explore collaboration opportunities. Companies such as DTC, BioEnergy Insight and Tropik Wood shared insights on aligning private sector innovation with public sector regulatory frameworks, emphasising the need for integrated approaches to scale up WtE solutions. Additionally, engaging display booths offered hands-on demonstrations of biodigester technologies and waste management innovations, encouraging partnerships and investment in the sector. These efforts align with FESRIP's objective of enhancing private sector participation to drive technological advancements and accelerate the adoption of sustainable WtE initiatives in the Pacific.

A3.4 – Undertake WtE trade missions

3.4.1 Review international WtE meetings
Status: Cancelled as per Addendum 1

3.4.2 Presentation in selected international WtE meetings
Status: Cancelled as per Addendum 1

3.4.3 Initiate potential collaborations
Status: Cancelled as per Addendum 1

WP4 – Adapting and developing WtE training courses for tertiary education providers

A4.1 – Adaption of RET qualifications

4.1.1 Review and revise existing RET qualifications at the regional level
Status: Completed in Year 3

Refer to "4.1.2 Develop WtE input for the qualifications"

The project has worked closely with the SPC's EQAP to develop, endorse and accredit two WtE qualifications, Certificate IV and Diploma VI in Sustainable Energy. This process has been guided by an IAC composed of experts in SWM, RET, WtE; educational institutions; and private sector representatives from five beneficiary countries. The IAC's role has been to integrate WtE components into existing RET qualifications. Operating under ToR, the IAC has ensured that the revised qualifications will be accredited on the Pacific Qualifications Framework (PQF) and adapted to meet national or local needs.

4.1.2 Develop WtE input for the qualifications
Status: Completed in Year 3

Four IAC meetings were held, with two in 2023 and two in 2024. The details of the 3rd and 4th meetings are outlined below:

(a) 3rd Industry Advisory Committee (IAC) Meeting
Date: 20–23 February 2024
Location: Novotel Hotel, Nadi, Fiji
Participants: 12 total, including 5 females and 7 males

Summary:

The objective of this meeting was to review and finalise the drafts of the WtE qualifications, integrating WtE components into the broader Sustainable Energy curriculum for tertiary education. Participants represented academia, private industry and local government. The committee, in collaboration with SPC's EQAP, produced a draft framework for both Certificate- and Diploma-level qualifications. These qualifications, aligned with the PQF, are key to building regional capacity in WtE technologies and supporting sustainable energy solutions.

Further details can be found in the following annexes:

- **Annex 34** 3rd IAC Meeting Report
- **Annex 35** 3rd IAC Meeting Agenda

(b) 4th Industry Advisory Committee (IAC) Meeting
Date: 21–24 May 2024
Location: Nalagi Hotel, Nadi, Fiji
Participants: 12 total, including 5 females and 7 males
Summary:

This meeting focused on finalising the regional Certificate IV and Diploma VI qualifications in Sustainable Energy, which include WtE components. These qualifications, aligned with the PQF, address the growing need for skilled professionals in renewable energy and WtE sectors, supporting sustainable energy solutions across the Pacific Islands and contributing to efforts to combat climate change.

Further details can be found in the following annexes:

- **Annex 36** 4th IAC Meeting Report
- **Annex 37** 4th IAC Meeting Agenda.

(c) Stakeholder Endorsement Meeting on WtE Qualifications
Date: 2–6 September 2024
Location: Novotel Hotel, Nadi, Fiji
Participants: 22 total, including 5 females and 17 males
Summary:

This meeting successfully endorsed the regional Certificate IV and Diploma VI in Sustainable Energy, developed through collaboration with SPC, SPREP and key industry stakeholders. These qualifications, aligned with the PQF and national regulatory standards, meet the growing demand for skilled professionals in renewable energy, energy efficiency and waste management, with WtE components integrated into the curriculum. The PAWES project is contributing to a workforce ready to address the Pacific's energy and sustainability challenges.

Further details can be found in the following annexes:

- **Annex 38** Endorsement Meeting Report
- **Annex 39** Endorsement Meeting Agenda

4.1.3 Facilitate accreditation of the qualifications

Status: In progress

Refer to "4.1.2 Develop WtE input for the qualifications"

The final step is securing accreditation under the PQF. The project team will submit the accreditation application, aiming for approval by June 2025. These qualifications are regionally owned, allowing training providers to deliver them without purchasing from any entity. A quality assurance process will be established to ensure only approved providers can deliver the qualifications.

Further details can be found in the following annexes:

- **Annex 40** Unit Standard Level 4
- **Annex 41** Unit Standard Level 6
- **Annex 42** Qualification Document Level 4
- **Annex 43** Qualification Document Level 6

4.1.4 Assist relevant national education agencies to adapt the regional qualifications to local context

Status: Cancelled as per Addendum 1

A4.2 – Co-development of short courses on WtE with tertiary education providers

4.2.1 Skills gap analysis:

Status: Cancelled as per Addendum 1

4.2.2 Review existing international WtE short courses

Status: Cancelled as per Addendum 1

4.2.3 Adapt existing WtE short courses to the Pacific context

Status: Cancelled as per Addendum 1

4.2.4 Develop new Pacific WtE short courses at national and/or regional level

Status: Cancelled as per Addendum 1

Since this activity, Pacific WtE Short Courses are no longer part of the NCE requested and granted; a concept note has been developed to mobilise alternative resources outside the scope of the PAWES Project for the execution of this initiative. The concept note outlines potential funding avenues, partnerships and collaborative frameworks that would support the development and implementation of Sustainable Energy Qualifications and Short Courses for the five initial countries. Additionally, in response to requests from other member countries of the SPC, the concept note proposes the inclusion of these additional Pacific Island countries and territories in the WtE initiative. This expanded scope demonstrates the growing regional interest in WtE solutions and highlights the need for comprehensive, tailored strategies that cater to the specific energy and waste management challenges faced by each country. Through the concept note, efforts will be made to identify new donors, private sector investors and technical partners capable of providing the financial and expert resources necessary to achieve these objectives.

For more details, refer to the following annexes:

- **Annex 44** Concept Note for Sustainable Energy Qualifications and Short Courses
- **Annex 45** ToR for Sustainable Energy Qualifications and Short Courses.

4.2.5 Mentor, monitor and evaluate the delivery of WtE short courses

Status: Cancelled as per Addendum 1

A4.3 – Co-development and facilitation of research demonstration projects with tertiary education providers

4.3.1 Develop and implement research demonstration projects on WtE for Master's students

Status: In progress

A) University of the South Pacific (USP):

Group overview:

The cohort consists of four students who began full-time studies in February 2024:

- Melas Christian Nos (Male)
- Natalie Kausimae (Female)
- Miriam Taukiei (Female)
- Nikita Shriwastow (Female)

Currently, these students are completing preparatory postgraduate courses in anticipation of their independent, yet supervised, research projects (SRP) scheduled for 2025. Each scholar is enrolled in two courses per semester. By the end of 2024, they will have completed a total of four courses, earning a postgraduate diploma. The goal is for the scholars to achieve high marks, facilitating their transition into a hybrid master's program in the following year, which includes six postgraduate courses and the SRP, along with additional courses related to their chosen research specialisations.

Research topics: Each student has identified a specific research focus and has submitted their SRP Proposal in October as listed below:

- **Nikita Shriwastow:** Converting waste cooking oil into biodiesel in Fiji using the first-generation biodiesel generator.
- **Natalie Kausimae:** Transforming organic waste into cooking gas in the Solomon Islands through anaerobic digestion.
- **Melas Christian Nos:** Producing biogas from kava waste incorporated with cow dung using anaerobic digestion.
- **Miriam Taukiei:** Using pyrolysis to convert plastic waste into fuel or gas in Tuvalu.

Academic progress:

The students performed exceptionally well in their first-semester courses and are now completing their second-semester studies, which are scheduled to conclude at the end of November 2024. USP is also exploring the possibility of offering summer courses tailored to this cohort, pending confirmation.

Program completion:

By the end of 2025, it is expected that all four students will have completed their programs and will be equipped with industry-ready qualifications.

For more details, refer to the following annexes:

- **Annex 46** Melas Christian Nos – Supervised Research Project Proposal
- **Annex 47** Natalie Kausimae – Supervised Research Project Proposal
- **Annex 48** Miriama Taukiei – Supervised Research Project Proposal
- **Annex 49** Nikita Shriwastow – Supervised Research Project Proposal

B) University of Papua New Guinea (UPNG):

- **Selected candidate:** Freddy Amos Lakera (Male).

After an initial pool of 150 applicants, Freddy Amos Lakera was selected due to his engineering background and experience in agricultural biogas systems. His research aims to explore scalable WtE opportunities in PNG, focusing on the technological, environmental and policy dimensions necessary for successful implementation.

Research objectives:

The student has submitted the Research Project Literature Review which encompasses the items below:

- A quantitative assessment of WtE opportunities in PNG.
- The identification of suitable WtE technologies for PNG.
- An analysis of the enabling environment required, including capacity, infrastructure, policies and regulations for effective project deployment.

The project includes the development of a prototype and is conducted in collaboration with PNG's National Energy Authority, where Lakera's findings are expected to support data-driven policy decisions.

Project timeline:

The student has submitted his research proposal and budget, which are currently under review. To accommodate PNG's lengthy procurement process, preparations are under way to begin purchasing materials before December 2024. The project timeline anticipates a thesis submission by February 2026, with a planned graduation in April 2026. The work plan and research questions will remain dynamic and may be refined as the project evolves.

Technological evaluation:

The student has assessed various WtE technologies for PNG, considering economic viability, scalability and potential to address SWM challenges:

- **Anaerobic digestion:** Found to be somewhat suitable, particularly for organic waste.
- **Pyrolysis, gasification and incineration:** Currently deemed economically unfeasible.
- **Waste oil recovery and palm oil waste incineration:** Viable, though they do not address MSW.

The student is currently evaluating a hybrid system that combines anaerobic digestion with gasification or pyrolysis to convert SW into biomethane gas and syngas to produce heat and electricity in PNG.

For more details, refer to the following annex:

- **Annex 50** Freddy Amos Lakera – Research Project Literature Review.

C) College of Marshall Islands (CMI) and National University of Samoa (NUS)

In response to the requests from the governments of Samoa and RMI, the PAWES project team engaged in discussions with the CMI and NUS to explore options for introducing undergraduate and internship programs that ensure broader access and support for local students in WtE education.

- In RMI, the program will focus on the enrolment in a 1-year Associate of Arts degree in Liberal Arts, with an emphasis on Environmental and Marine Science and WtE research. Since CMI does not currently offer a specific WtE certificate program, this option will address the immediate needs.
- In Samoa, the initiative will support enrolment at NUS in a MSc degree, incorporating a WtE research component. This will build on the work of an ongoing scholar, with the program needing to be completed by the end of 2025. Typically, the MSc is a 2-year programme: students complete a Postgraduate Diploma in the first year, followed by the MSc degree in the second year, similar to the structure at the USP.

For more details, refer to the following annexes:

- **Annex 51** CMI Letter of Agreement
- **Annex 52** Letter of Concern from RMI
- **Annex 53** NUS Letter of Agreement
- **Annex 54** Letter of Concern from Samoa

4.3.2 Select master's students for participation in the research demonstration projects

Status: In progress

Master's students from the USP and the UPNG were selected last year. However, in response to the requests from the governments of Samoa and RMI, the PAWES project team is actively working to identify and recruit additional qualified students for participation in the research demonstration projects in Samoa and RMI. This expanded selection process aims to ensure broad regional representation and foster inclusive academic engagement. Student selection and onboarding activities are scheduled for early next year, providing sufficient lead time for integration into the demonstration projects. This initiative is designed to strengthen local capacity in WtE education, applied research and technical implementation, thereby contributing to long-term sustainability and national ownership of WtE solutions across the Pacific region.

4.3.3 Mentor master's students

Status: In progress

(a) Supporting USP scholars

(i) USP scholars welcome event

The SPC PAWES Project, in collaboration with the USP, awarded four Master's scholarships to students from Vanuatu, Fiji, the Solomon Islands and Tuvalu. These scholars are undertaking research on sustainable waste management solutions, significantly contributing to the region's environmental well-being.

To formally introduce and support these scholars, a USP Scholars Welcome Event was held on 7 March 2024. The event served as a vital platform for academia, industry stakeholders and community members to network, exchange ideas and learn about the PAWES Project's objectives. A key focus was on the role of WtE technologies in advancing sustainable development across the Pacific.

Further details can be found in the following annex:

- **Annex 55** Opening Remarks by SPC for the USP Event.

(ii) Briefing for USP Students

On 26 April 2024, a dedicated briefing session was held for USP students involved in the WtE research initiative. Attended by the project manager, technical experts and students, this session provided a comprehensive overview of WtE research in the Pacific, emphasising critical aspects such as:

- key research areas: biogas, biomass and pyrolysis;
- methodologies: data collection, feasibility assessments and site selection;
- policy integration: aligning research with national sustainability policies; and
- research challenges: addressing concerns on data accessibility and supervisor engagement.

The session reinforced SPC and SPREP's commitment to fostering research innovation and equipping students with the necessary resources and mentorship to overcome research obstacles.

Further details can be found in the following annexes:

- **Annex 56** Briefing for USP Students Meeting Agenda
- **Annex 57** Briefing for USP Students Meeting Presentation by Energy Expert
- **Annex 58** Briefing for USP Students Meeting Presentation by Waste Expert
- **Annex 59** Briefing for USP Students Meeting Presentation by DTC
- **Annex 60** Briefing for USP Students Meeting Presentation by SPREP
- **Annex 61** Briefing for USP Students Meeting Recording Part 1
- **Annex 62** Briefing for USP Students Meeting Recording Part 2

(iii) Meeting with USP staff and students

On 3 October 2024, SPC convened a key meeting with USP staff and students to review research progress and supervisory arrangements under the PAWES Project. Discussions focused on:

- submission timelines for research proposals;
- supervisory allocations and support structures;
- progress updates from USP students, alongside insights from research at regional institutions such as the UPNG;
- budget allocations for research demonstrations and pilot projects, with a projected completion deadline of 31 December 2025; and
- a potential no-cost extension to accommodate student graduations and financial reporting requirements.

To enhance collaboration, USP committed to participating in PAWES monthly meetings, further strengthening research partnerships in WtE advancements for the Pacific.

Further details can be found in the following annexes:

- **Annex 63** Meeting with USP Outcome Document

(b) Monthly check-in calls for scholarship awardees

To ensure ongoing support, monthly check-in calls have been established between the Scholarship Awardees and the PAWES Team, scheduled for the first Monday of each month (with flexibility based on scholars' availability). These check-ins aim to:

- provide a platform for scholars to discuss progress, challenges and research milestones;
- offer mentorship, technical guidance and academic feedback; and
- facilitate knowledge-sharing and problem-solving among scholars and advisors.

By fostering an open and supportive communication environment, these check-ins help strengthen students' research capabilities and professional development.

Further details can be found in the following annexes:

- **Annex 64** Meeting Agenda
- **Annex 65** Meeting Transcript 02 July 2024
- **Annex 66** Meeting Minutes 30 August 2024
- **Annex 67** Meeting Minutes 07 October 2024
- **Annex 68** Meeting Minutes 04 November 2024
- **Annex 69** Meeting Minutes 02 December 2024

4.3.4 Analyse the research projects to determine the applicability for incorporation into future iterations of the feasibility studies

Status: In progress

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students".

The analysis of research projects aims to assess its relevance for future feasibility studies in WtE initiatives. Currently, multiple research demonstration projects are being implemented by USP and the UPNG. At USP, four master's students are conducting supervised research projects exploring various WtE technologies, such as anaerobic digestion for biogas production, pyrolysis for plastic-to-fuel conversion and biodiesel generation from waste cooking oil. These projects, scheduled for completion by 2025, will generate valuable insights into the technical feasibility and practical applications of WtE solutions in Pacific Island contexts. Similarly, at UPNG, the research focuses on scalable WtE technologies for PNG, evaluating hybrid WtE systems combining anaerobic digestion with gasification or pyrolysis to optimise waste management and energy generation. Furthermore, the PAWES project team is expanding WtE education through undergraduate and internship programs at CMI and NUS, addressing capacity-building needs in RMI and Samoa. The findings from these diverse research initiatives will contribute critical data and practical models to inform future feasibility studies, ensuring that WtE projects are tailored to regional waste streams, resource availability and infrastructure capabilities.

4.3.5 Disseminate the results of the research projects through the WtE website developed in A3.2

Status: Planned for Year 4

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

The results and key insights from the co-designed WtE research demonstration projects, developed in collaboration with tertiary education providers, will be disseminated through the SPC PAWES Project webpage. This dissemination aims to enhance knowledge sharing by ensuring that research findings and project outcomes are widely accessible to stakeholders across the Pacific. By showcasing innovative WtE solutions tailored to the region's unique context, the platform will promote best practices and foster cross-sector collaboration. Additionally, the SPC PAWES Project webpage will serve as a centralised hub for policymakers, researchers, industry experts and community members, facilitating interactive engagement and supporting the adoption of sustainable WtE solutions. Through this initiative, SPC will encourage meaningful dialogue and partnerships that contribute to long-term, sustainable energy strategies in Pacific communities.

WP5 – Developing WtE solutions through tertiary education providers

A5.1 – Co-design and development of pilot projects with tertiary education providers

5.1.1 Select feasible WtE options for the Pacific: Select the most appropriate option(s) from the feasibility assessment in A1.2 for piloting

Status: In progress

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

Based on ongoing research initiatives at USP and UPNG, several WtE technologies have been identified as potentially feasible for the Pacific region. Research at USP, conducted by master's students, is exploring anaerobic digestion for biogas production, pyrolysis for plastic-to-fuel conversion and biodiesel generation from waste cooking oil, all of which are suited to Pacific waste streams and resource availability. Similarly, UPNG's research focuses on scalable hybrid WtE systems that integrate anaerobic digestion with gasification or pyrolysis to enhance waste management and energy generation. These studies, set for completion by 2025, will provide critical technical and practical insights to inform the selection of the most viable WtE options for piloting. Additionally, capacity-building efforts through this initiative will ensure that local expertise supports the implementation of selected technologies. By leveraging these research findings, the most appropriate WtE solutions can be identified and piloted, considering regional infrastructure capabilities and sustainability needs.

5.1.2 Design pilot WtE projects

Status: Planned for Year 4

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

The research demonstration projects focusing on WtE will be delivered in 2025 through the NCE period. Each student will initially work on these projects in the laboratory, where they will develop and refine their methodologies and approaches. Following this phase, the scholars will pilot their respective projects in their selected countries, implementing their research findings in real-world settings.

5.1.3 Execute pilot WtE projects and develop pilot solutions

Status: Planned for Year 4

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

This hands-on experience will enable the students to test their innovative solutions, assess their feasibility and gather valuable data. By engaging in both laboratory and fieldwork, they will gain practical insights and enhance their understanding of the challenges and opportunities associated with WtE initiatives in their regions. These initiatives not only aim to advance their academic and professional development but also contribute to sustainable practices in waste management and energy production within their communities.

5.1.4 Analyse the pilot projects and solutions

Status: Planned for Year 4

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

The analysis of pilot projects and solutions will be guided by ongoing research at USP and UPNG, which explore various WtE technologies suited to the Pacific region. At USP, research on anaerobic digestion, pyrolysis and biodiesel production will provide key insights into the efficiency, scalability and sustainability of these solutions in Pacific Island contexts. Similarly, UPNG's focus on hybrid WtE systems, integrating anaerobic digestion with gasification or pyrolysis, will offer valuable data on optimising waste management and energy generation. Assessment of the pilot projects will be based on their technical feasibility, environmental impact, economic viability and alignment with local waste streams and resource availability. Additionally, this will contribute by evaluating the effectiveness of WtE education and capacity-

building programs in supporting long-term project sustainability. The findings from these pilot projects will be critical in refining WtE implementation strategies, ensuring they are tailored to regional needs and can be scaled effectively across the Pacific.

5.1.5 Disseminate the results of the pilot projects through the Pacific WtE website developed in A3.2

Status: Planned for Year 4

Refer to "4.3.1 Develop and implement research demonstration projects on WtE for Master's students"

The results and key insights from the co-designed WtE pilot projects, developed in collaboration with tertiary education providers, will be disseminated through the SPC PAWES Project webpage. This dissemination is intended to enhance knowledge sharing by making research findings and project outcomes widely accessible, promote best practices by showcasing innovative WtE solutions tailored to the Pacific context and facilitate stakeholder engagement by providing an interactive platform for policymakers, researchers, industry experts and community members. To ensure maximum reach and impact, the findings will also be featured on the SPC PAWES Project webpage, serving as a centralised hub for information exchange and collaboration on WtE initiatives across the Pacific region. This platform will foster meaningful dialogue, encourage cross-sector partnerships and support the adoption of sustainable WtE solutions that align with the unique needs of Pacific communities.

WP6 – Project management (A6.1–A6.7)

6.1 Setting up the project management structure

Status: In progress

Project Team

The following are the positions included in the project management structure and the status of recruitment.

1. Project Manager

The Project Manager (PM) resigned October 2023. During the recruitment process for a new PM, the Technical Waste Officer, Lilian Penaia (SPREP), acted as the Project Manager with oversight from Florence Ventura, Acting Deputy Director Geoscience and Energy Programme (GEP) and the Principal Adviser EU PMU. The PM position was advertised in November 2023 and interviews were held in December 2023. Christine Deo-Reddy commenced work as the new PM in February 2024.

2. Technical Waste Officer

Lilian Penaia is a current SPREP staff member based in Samoa, serving as the Technical Waste Officer. She reports directly to the PM and to the SPREP Solid Waste Management Adviser, Susana Telakau. This position is one of only two full-time roles within the PAWES project, and thus she dedicates 100% of her time to this project.

3. Economist

The Economist position at SPC remained vacant, and thus part of this work was delivered through a consultant, Dwain Qalovaki operating as Dau Pacific Pte Ltd.

4. Data Scientist/Energy Officer

Inia Saula continued in the position of Energy Officer in the GEM team, with 40% of his time

dedicated to the project as the Data Scientist.

5. Trainer

Due to her extensive commitment to Pacific Adaptation to Climate Change and Resilience, Ms Melinda Mathers could not dedicate time to the trainer role. Consequently, the SPC EQAP programme was approached to partner with the PAWES project and deliver on WP 4.1. Thus, the Team Leader Qualifications, Rajendra Prasad, and the Professional Officer Qualification Development, Apenisa Tamani, oversee the development of WtE qualifications for WP 4.1 from SPC's EQAP Office.

6. Finance Officer

Emma Mani is a current SPC staff member serving as a Project Accountant for the GEM division, dedicating 25% of her time to this project.

7. SPC Finance and Administration Assistant

The PAWES Project was unable to recruit a new Finance and Administration Assistant due to the one-year contract duration. As a result, a Finance and Administration Assistant from SPC's core operations was temporarily assigned to support the project.

8. Communications Officer

Communications support for this initiative is provided by the GEM Division's communications team, with 20% of a full-time officer's time allocated to the project. Initially, this role was fulfilled by Communications Officer Talei Tora; however, her contract ended in May 2024. As a result, temporary communications support was sourced from SPC's core operations.

9. EU Project Management Unit

The EU PMU's Principal Adviser, Claire Thoms, and the EU Finance and Business Adviser, Patricia Clare, provide continuous oversight, support, advice and capacity building to the project team. Consequently, 5% of their time is charged to the project budget.

10. Team Leader Energy Security – GEM Division

Florence Ventura served as the Team Leader for Energy Security within the GEM Division, to whom the Project Manager reported. Her position was a core SPC role and wasn't funded by the project. Additionally, she served as Acting Deputy Director for GEM from mid-2023 until March 2024; however, she concluded her tenure with SPC in September 2024.

11. GEP Deputy Director – GEM Division

Ngedikes Olai Uludong joined SPC as the GEP Deputy Director in March 2024. She is the new direct line manager for the Project Manager. Her position is a core SPC role and is not funded by the project.

12. Planning, Monitoring, Evaluation and Learning Team – GEM Division

Varanisese Tawake serves as the Team Leader for Planning, Monitoring, Evaluation and Learning (PMEL) within the GEM Division. She was supported by Jerry Oikwao, the PMEL Adviser, until his departure in mid-2024. Together, they provided oversight, support and capacity building to the project team in implementing PMEL activities. These positions are core SPC roles and are not funded by the project.

6.2 Project meetings

Status: In progress

Annual Project Steering Committee (PSC) Meeting

- **Date and Time:** 27 September 2024
- **Location:** Hybrid Meeting – Novotel Nadi
- **Time:** 8:30 AM–10:30 AM FJT

The 3rd PSC Meeting brought together a diverse group of stakeholders from across the Pacific, including government representatives from PNG, Samoa, Tuvalu and Solomon Islands, as well as consortium partners SPC and SPREP, along with the donor partner – the EU delegation in Fiji. Academic institutions such as the USP, the UPNG, NUS and the CMI were also present, along with industry stakeholders, including the Sustainable Energy Industry Association of the Pacific Islands. This continuous collaboration among government, academic and private sector partners is crucial in assessing project progress and shaping future steps for WtE solutions in the region.

Key achievements were highlighted, particularly in capacity-building efforts for WtE policy development. Significant progress was reported on WP1, which included the finalisation of baseline assessments and feasibility studies across five PICs: PNG, RMI, Samoa, Tuvalu and the Solomon Islands. This work has strengthened government capacity for evidence-based decision-making in the WtE sector. WP2 focused on the consolidation of SWM and RET data, which will be instrumental for future planning and project execution.

The meeting also addressed progress in WP3, which promotes cross-sectoral collaboration between government agencies, academic institutions and private sector stakeholders. Highlights included successful WtE missions and workshops that encouraged knowledge sharing and practical solutions for WtE projects across the region. Academic partnerships were strengthened with universities such as the USP, UPNG, CMI and NUS, facilitating the provision of scholarships and the development of new sustainable energy qualifications.

The scholarship program, a key component of the PAWES project, saw notable progress, with students at USP and UPNG advancing their research projects. These efforts align with the project's broader goal of building regional expertise in WtE technologies.

WP5 provided updates on pilot research and demonstration projects that are being developed in collaboration with institutions like USP, UPNG, CMI and NUS. These projects aim to demonstrate the practical applications and scalability of WtE solutions in the Pacific region. The meeting also discussed challenges such as delays caused by the COVID-19 pandemic, which led to the request for a NCE to extend the project timeline to June 2026. This extension ensures that critical activities, including the scholarship programs and pilot projects, are completed successfully.

During the meeting, the PSC endorsed a revised ToR, which incorporated updates related to the NCE timeline and inclusion of new partners such as CMI and NUS. The revised ToR also clarified roles such as the Data Analyst position to better reflect responsibilities in managing waste and energy data.

In terms of next steps, the meeting outlined a detailed work plan for the NCE period, with a focus on finalising research demonstration projects, completing the development of sustainable energy qualifications and continuing to support the scholarship program. A clear budget for the NCE period was presented, ensuring that financial resources are appropriately allocated to achieve the project's objectives. The PSC also finalised key action points, including the

circulation of Samoa's updated feasibility report.

The meeting concluded with a commitment to maintaining strong collaboration among stakeholders to ensure the successful implementation of WtE solutions in the Pacific. The next PSC meeting is tentatively scheduled for June 2025 in Samoa, with ongoing quarterly updates through the Multipliers Meetings to monitor progress.

Further details can be found in the following annexes:

- **Annex 70** 3rd PSC Meeting Minute
- **Annex 71** 3rd PSC Meeting Agenda
- **Annex 72** 3rd PSC Meeting PPT

6.3 Support to local multipliers

Status: In progress

Quarterly Multipliers Meeting

Support for all multipliers has advanced during the third year. The Quarterly Multipliers Meetings serve as a vital platform for updating stakeholders and partners on project progress while addressing emerging challenges and opportunities. The goal is to ensure that all participants are well informed and prepared to make sound decisions moving forward.

The PAWES multipliers, comprising representatives from PNG, Solomon Islands, Samoa, Tuvalu and RMI, along with members from the USP, UPNG, SPC and SPREP, actively engaged in these meetings.

In 2024, four multipliers' meetings were conducted in a hybrid format:

1. **1st Multipliers Meeting**: 18 April 2024
2. **2nd Multipliers Meeting**: 22August 2024
3. **3rd Multipliers Meeting**: 8 November 2024
4. **4th Multipliers Meeting**: 12December 2024

For more details, refer to the following annexes:

- **Annex 73** 2024 1st Multipliers Meeting Recording
- **Annex 74** 2024 1st Multipliers Meeting Agenda
- **Annex 75** 2024 1st Multipliers Meeting PPT
- **Annex 76** 2024 2nd Multipliers Meeting Recording
- **Annex 77** 2024 2nd Multipliers Meeting Agenda
- **Annex 78** 2024 2nd Multipliers Meeting PPT
- **Annex 79** 2024 3rd Multipliers Meeting Minutes
- **Annex 80** 2024 3rd Multipliers Meeting Agenda
- **Annex 81** 2024 3rd Multipliers Meeting PPT
- **Annex 82** 2024 4th Multipliers Meeting Minutes
- **Annex 83** 2024 4th Multipliers Meeting Agenda
- **Annex 84** 2024 4th Multipliers Meeting PPT

6.4 Financial management

Status: In progress

The financial report is attached as Annex 85, as required by the Contribution Agreement, covering the period from 13 December 2023 to 12 December 2024. The financial summary is self-explanatory; however, key points are summarised as follows:

Year 3 Delivery rate

- Total project budget allocation for Year 3: EUR 1,129,595
- Total expenditure with commitments by 12 December 2024: EUR 829,153
- Remaining balance of funds received as of 12 December 2024: EUR (42,600)
- Percentage of total expenditure including commitments over funds received: 147%

Human resources

- Total budget for human resources in Year 3: EUR 513,841
- Expenditure and commitments in Year 3: EUR 265,297
- Delivery rate: 52%

Travel

- Expenditure, including commitments: EUR 14,358
- Year 3 budget: EUR 43,500
- Expenditure and commitments as a percentage of budget: 33%

Equipment and supplies

- Expenditure, including commitments: EUR 232
- Year 3 budget: EUR 2,800
- Expenditure and commitments as a percentage of budget: 8%

Local Office

- Local office budget line total: EUR 19,955
- Consumables expenses: EUR (2,474)
- Information and communications technology full cost recovery: EUR 5,071
- Total local office expenditure: EUR 2,597
- Expenditure rate against Year 3 budget: 13%.

Other Costs and Services

- Budget lines include Publications, Studies/Research, Expenditure Verification/Audit, Financial Services, Cost of Conferences/Seminars and Visibility Actions.
- Budget line total: EUR 50,600
- Total expenses and commitments: EUR 104,865
- Delivery rate for this budget line in Year 3: 207%

Others/Multipliers

- Budget for Multipliers (including USP and UPNG): EUR 425,000
- Total expenses with commitments for USP: EUR 411,652
- Delivery rate for this budget line in Year 3: 97%.

Additionally, Annex 86 includes the KPMG external expenditure verification audit, as per the Contribution Agreement and budget line 5.3.

6.5 Monitoring, evaluation and learning (MEL)

Status: In progress

ROM review mission recommendations

The ROM review mission, conducted through virtual interviews from 26 February to 8 March 2024, outlined several key recommendations for the implementing partners:

1. Finalising agreements with alternative-to-government and alternative-to-private-sector multipliers.
2. Streamlining the reporting chain and enhancing the quality of progress reports.
3. Establishing a simpler, more effective and agile organisational structure and decision-making mechanism for the Intervention, while improving monitoring.
4. Reviewing the Intervention workplan and budget with consideration for a NCE.
5. Enhancing coordination with complementary interventions.
6. Developing a sustainability strategy and exit plan.
7. Implementing strategies to ensure that Intervention benefits reach all beneficiary groups.

In line with the ROM recommendations, discussions have been held regarding an 18-month NCE to accommodate delays in onboarding all scholarship students. These students commenced a 2-year scholarship research program during the first semester of 2024. A comprehensive workplan has been developed to address all recommendations from the ROM review mission. This workplan was shared at the Multipliers and the PSC Meetings.

For more details, refer to the following annex:

- **Annex 87** ROM Review Mission Report

A6.6 Communication strategy

Status: In progress

Updates on the PAWES Project are regularly published on SPC's PAWES Project webpage as activities progress.

(a) SPC's PAWES Project Webpage

For the latest project developments, visit:

Pacific Adoption of Waste-to-Energy Solutions | SPC Geoscience, Energy and Maritime Division

Analytics: Total visits to the Project Page amounted to 1,795.

(b) Recent Blog Articles on the PAWES Project Webpage

Explore key milestones and insights through the following articles:

1.Waste-to-energy master's scholarship recipients to research sustainable waste management solutions for the Pacific | SPC Geoscience, Energy and Maritime Division = 92 visits

2. Empowering the Pacific: capacity-building workshop boosts waste-to-energy solutions in Papua New Guinea | SPC Geoscience, Energy and Maritime Division = 11 visits

3. Ensuring excellence: quality assurance and periodic review in regional waste-to-energy qualifications | SPC Geoscience, Energy and Maritime Division = 11 visits

4. Countries to ramp up Waste to Energy projects to tackle growing waste issues and energy security | SPC Geoscience, Energy and Maritime Division = 17 visits

5. Milestone achievement in sustainable energy solutions through Regional Qualifications | SPC Geoscience, Energy and Maritime Division = 32 visits

Analytics: Blog stories were accessed a total of 163 times.

(c) Visibility and branding

All content adheres to agreed branding guidelines, ensuring prominent and consistent representation of SPC, OACPS and EU identities across digital and print media.

(d) Categories of publication

The project has developed and disseminated a range of publication types tailored to engage and inform diverse stakeholder groups. These publications are listed below.

- **Technical reports:** This category comprises both the WtE Baseline Assessment Reports and the WtE Feasibility Assessment Reports for all five PAWES Project beneficiary PICs. The Baseline Assessment Reports have undergone rigorous peer review to ensure technical soundness and credibility. In parallel, stakeholder feedback on the Feasibility Assessment Reports is currently being consolidated to guide final revisions. Once finalised, all technical reports will be made publicly accessible through the SPC PAWES webpage and shared directly with national counterparts to support evidence-based policy-making and strategic planning.

  Additionally, annual progress reports will be uploaded to the webpage following formal clearance by the SPC Publications Team.
- **Event reports:** These reports, such as the WtE Technology Symposium Report, include detailed summaries and analyses of key outcomes and recommendations from regional workshops, events and meetings. The reports serve to document progress, lessons learned and follow-up actions.
- **Promotional materials:** Visibility products such as event banners and posters are designed and disseminated to enhance awareness and engagement at public and stakeholder events.
- **Media blogs:** Short, accessible blog posts are published through the SPC PAWES Project webpage and shared across social media platforms. The aim of these updates is to keep the public, partners and donors informed about project milestones and developments.
- **Accredited training publications:** The Unit Standards and Qualification Documents for the regional Certificate IV and Diploma VI in Sustainable Energy are currently undergoing formal accreditation. Once approved, these documents will be edited, formatted and published on the SPC PAWES webpage, providing a key resource for capacity building in the energy sector.

(e) Communication channels

The PAWES Project uses a blend of traditional and digital channels to reach diverse audiences:

- **Email distribution lists**: Updates are shared with national focal points, donor partners and regional stakeholders.
- **Events and conferences**: Presentations and display booths are critical for direct engagement and dissemination during CPRT, SEOM and other regional platforms.
- **Multimedia tools**: PowerPoint presentations and infographics are utilised during meetings and stakeholder engagement to make technical content more accessible.
- **Social media**: Posts on SPC's Facebook, LinkedIn and X platforms help amplify reach, especially for announcements such as scholarship awards, symposium events or the release of new qualifications.
- **Website**: This is the central repository for downloadable publications, event summaries and educational resources.

(f) Audience reactions and feedback mechanisms

The communication efforts have been met with growing interest and engagement, especially in the following areas:

- **Government stakeholders**: Feedback during PSC and multipliers meetings indicates appreciation for the clarity and usability of the baseline and feasibility reports.
- **Academic institutions**: Universities expressed strong interest in the WtE qualifications and research collaborations, as seen in endorsement meetings and discussions with EQAP.
- **Private sector**: Following the WtE Technology Symposium, several private firms expressed willingness to collaborate on pilot projects.

A6.7 Reporting

Status: In progress

This interim report is part of the reporting process as per the Contribution Agreement.

Logical Framework Progress Report against Indicators and Targets

Table 2 provides the progress update for the logical framework (logframe) at the end of year 3.

Table 2: Logframe

	Results chain	Indicator	Baseline value (reference year)	Target value (reference year)	Year 1 Updates	Year 2 Updates	Current value (reference year)	Comments
Impact (overall)	**Enhanced solid waste management and energy security in the Pacific region**	1. Completion of a comprehensive stocktaking report on waste and energy policies and regulations in the five beneficiary countries	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	Baseline Assessment Reports
		2. Number of multi-stakeholders meetings held with representatives from academia, industry and government in the five beneficiary countries	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	WtE Mission Reports
Outcome (s) (Specific objective(s))	SO1 National and subnational government entities able to make informed decisions on developing a sustainable waste-to-energy (WtE) sector	1.1 Completion of assessments of the strategies and roadmaps promoting the waste-to-energy (WtE) sector in each beneficiary country.	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	Baseline Assessment Reports
		1.2 Increase in the number of WtE Feasibility Studies conducted	0 (2022)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	Feasibility Assessment Reports
		1.3 Completion of Baseline Assessment Reports on waste generation and energy potential	0 (2022)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	Baseline Assessment Reports
	SO2 Tertiary education	2.1 Number of WtE courses successfully integrated into existing curricula by tertiary education	0 (2021)	2 (2026)	0 (2022)	0 (2023)	0 (2024)	

	Results chain	Indicator	Baseline value (reference year)	Target value (reference year)	Year 1 Updates	Year 2 Updates	Current value (reference year)	Comments
	providers providing updated training and performing state-of-the-art research on solid waste management (SWM), renewable energy technologies (RET) and WtE	providers						
		2.2 Number of students successfully completing integrated WtE courses within existing curricula	0 (2021)	2 (2026)	0 (2022)	0 (2023)	0 (2024)	
		2.3 Number of new RET qualifications at tertiary education providers accredited by the EQAP Board (by country, stage of accreditation)	0 (2021)	2 (2025)	0 (2022)	0 (2023)	0 (2024)	
		2.4 Number of WtE research projects set up by tertiary education providers (by country)	0 (2021)	5 (2025)	0 (2022)	0 (2023)	0 (2024)	
		2.5 Number of innovative WtE solutions identified by tertiary education providers (e.g. existing ones piloted or adapted to the local context, new ones created) (by country)	0 (2021)	5 (2025)	0 (2022)	0 (2023)	0 (2024)	
		2.6 Number of innovative WtE solutions adopted by users (by country)	0 (2021)	5 (2025)	0 (2022)	0 (2023)	0 (2024)	
	O1.1 Enhanced capacity of government entities in the application of support tools for evidence-	1.1.1 Number of training events organised (by country, subject)	0 (2021)	12 (2024)	2 (2022)	8 (2023)	4 (2024)	-Waste Management Technologies Dialogue -Senior Energy Officials Meeting (SEOM) -Regional Workshop on a Circular Approach to Waste Management in the Pacific. -Regional WtE Technology Symposium
		1.1.2 Number of government entities trained on WtE (by country)	0 (2021)	4 per country	12 (2022)	51 (2023)	51 (2024)	-Waste Management Technologies Dialogue (16 government entities)

	Results chain	Indicator	Baseline value (reference year)	Target value (reference year)	Year 1 Updates	Year 2 Updates	Current value (reference year)	Comments
	based decision-making in WtE			(2024)				-Senior Energy Officials Meeting (12 government entities) -Regional Workshop on a Circular Approach to Waste Management in the Pacific (11 government entities) -Regional WtE Technology Symposium (12 government entities)
		1.1.3 Number of staff from government entities trained on WtE (by country, sex, age, cadre)	0 (2021)	12 per country (2024)	30 (2022)	145 (2023)	125 (2024)	-Waste Management Technologies Dialogue (72 government staff) -Senior Energy Officials Meeting (15 government staff) -Regional Workshop on a Circular Approach to Waste Management in the Pacific (22 government staff) -Regional WtE Technology Symposium 16 government staff
		1.1.4 Number of staff from government entities mentored in applying support tools in WtE decision-making (by country, sex, age, cadre)	0 (2021)	3 per country (2024)	0 (2022)	0 (2023)	8 (2024)	Economic Analysis of Options for Samoa
	O1.2 Increased access to data on SWM and RET	1.2.1 Completion of Waste Generation and Characterisation Studies in Targeted Countries	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	Baseline Assessment Reports Data Collection Mission Report
		1.2.2 Number of existing/new datasets on SWM and RET made available at regional level (by state: new/existing, type)	0 (2021)	1 (2024)	0 (2022)	0 (2023)	1 (2024)	SPREP Data Repository
	O1.3 Enhanced cross-	1.3.1 Number of annual consultation events organised for co-developing initiatives for the WtE	0 (2021)	1 per country per year, 1	1 (2022)	2 (2023)	3 (2024)	-3rd Industry Advisory Committee (IAC) Meeting -4th Industry Advisory Committee

	Results chain	Indicator	Baseline value (reference year)	Target value (reference year)	Year 1 Updates	Year 2 Updates	Current value (reference year)	Comments
	sectoral collaboration among government entities and the educational, research and private sector on WtE	sector with stakeholders from the educational, research and public and private sector (by country, region)		regional per year (2024)				(IAC) Meeting -Stakeholder Endorsement Meeting on WtE Qualifications
		1.3.2 Number of stakeholders and people participating in the consultation events (by country, type of stakeholders, sex, age)	0 (2021)	At least 100 participants per country by 2024 (2024)	38 (2022)	178 (2023)	16 (2024)	PNG – 5 stakeholders and people RMI - 5 stakeholders and people Solomon Is. - 6 stakeholders and people
		1.3.3 Number of new multi-sector and multi-stakeholder platforms established and existing ones strengthened (by country/sub-region, type)	1 (2021)	At least one per country by 2024 and one regional (2024)	0 (2022)	3 (2023)	0 (2024)	
	O2.1 Tertiary education providers adapting and developing WtE training courses on preparing students for jobs matching existing and future market demands	2.1.1 Number of existing qualifications on SWM and RET adapted to WtE (by country/ region, type of provider)	0 (2021)	2 (2024)	0 (2022)	0 (2023)	2 (2024)	Certificate IV and Diploma VI in Sustainable Energy
		2.1.2 Number of WtE courses designed and incorporated into existing curricula by tertiary education providers	0 (2021)	2 (2025)	0 (2022)	0 (2023)	0 (2024)	
		2.1.3 Number of WtE courses piloted within existing curricula by tertiary education providers	0 (2021)	2 (2025)	0 (2022)	0 (2023)	0 (2024)	
		2.1.4 Number of students enrolled in the WtE pilot courses (by type of provider, sex, age)	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	USP - 4 students UPNG – 1 student
		2.1.5 Number of WtE research demonstration projects executed (by type, country, type of provider)	0 (2021)	5 (2024)	0 (2022)	0 (2023)	5 (2024)	USP - 4 projects UPNG – 1 project

	Results chain	Indicator	Baseline value (reference year)	Target value (reference year)	Year 1 Updates	Year 2 Updates	Current value (reference year)	Comments
	O2.2 Tertiary education providers adapting and developing innovative WtE solutions	2.2.1 Number of tertiary education providers supported in the adaptation and development of innovative WtE solutions (by country)	0 (2021)	4 (2024)	0 (2022)	0 (2023)	5 (2024)	5 countries
		2.2.2 Number of innovative WtE solutions piloted/created/adapted to the local context (by country)	0 (2021)	2 (2024)	0 (2022)	0 (2023)	5 (2024)	5 countries

Year 3 Challenges and Mitigation Measures

Table 3 provides an updated overview of challenges and mitigation strategies at the end of Year 3.

Table 3: Risk Mitigation Measures

Challenges	Mitigation Measures
1. COVID-19–related delays in project execution	
The COVID-19 pandemic significantly delayed the PAWES project due to recruitment challenges and travel restrictions within the Pacific region. This led to a slow start, delaying the recruitment of a Project Manager and essential baseline assessments. Travel was restricted in several PICs throughout 2022 and into 2023, affecting project timelines and reducing access to beneficiary countries.	*Request for no-cost extension (NCE):* To compensate for the delayed start, an 18-month extension has been requested, extending the project to 13 June 2026. This would allow for the completion of critical components such as the Scholarship and Research Demonstration Pilot Project. *Project team resilience:* Despite the delays, the project team has restructured the work plan to focus on priority deliverables within the new timeline.
2. Delays in awarding master's scholarships	
Awarding scholarships to master's students faced significant delays, as the initial selection process in early 2023 needed to be restarted to ensure transparency. Consequently, scholarships that were intended to start in 2023 were delayed and recipients only commenced their studies in February 2024.	*Restarted transparent selection process:* The scholarship selection was restarted and successfully concluded by early 2024, ensuring that the scholarships are awarded in an equitable and transparent manner. *Extended project timeline to support recipients:* The NCE allows scholarship recipients to complete their two-year program within the revised project timeline, thereby safeguarding the project's educational objectives.
3. Financial constraints for SPC's co-financing obligation	
SPC currently lacks the funding to meet its co-financing obligation of €471,342.00, or 16.42% of the total project budget, which could hinder the full execution of the project's scope.	*Focused extension scope:* Instead of extending the full project, SPC has focused on the most impactful components, scholarships and demonstration pilot projects, to maximise project outcomes within budget constraints. *Revised budget and work plan:* The project budget has been revised to ensure that available funds are allocated strategically, allowing SPC to fulfil its co-financing requirements while remaining within the revised financial scope.
4. Additional tertiary multipliers	
Addressing country-specific WtE needs has required reallocating funds from the original budget set aside for USP to support new	*Reallocation of funds to new partnerships:* To sustain momentum in WtE initiatives, funds have been redirected to CMI, NUS and UPNG, ensuring continuity in scholarship and research efforts

partnerships with regional institutions. This reallocation introduces new budget lines to provide targeted support for: the UPNG, focusing on the needs of PNG, the NUS, aligned with Samoa's specific priorities, and the CMI, meeting the goals of the RMI. While this approach enhances local impact, it presents the challenge of managing multiple budget allocations to ensure each region's specific needs are met within the project's framework.	across the region. *Increased number of tertiary multipliers:* Expanding the network of tertiary multipliers broadens the project's impact, increasing research and educational support to further sustainable WtE solutions across the Pacific region, while keeping the project aligned with its primary objectives.
5. Limited funding and budget constraints	
Although increasing the number of tertiary multipliers enhances project impact, limited budget resources make it challenging to expand support effectively. The project budget must accommodate the needs of multiple institutions while staying within allocated financial limits.	*Flexible allocation of grants:* By keeping grant values for UPNG, CMI and NUS below EUR 100,000, SPC maintains a flexible budget that aligns with the realistic financial needs of each institution. This approach ensures resources are distributed efficiently, allowing support for multiple tertiary multipliers without exceeding budget limits. *Strategic Partnerships:* SPC has prioritised partnerships with institutions that offer programs aligned with national capacity-building goals, maximising the impact of funds within these constraints.

Conclusion and Way Forward:

The PAWES Project has made significant strides in enhancing SWM and energy security in the Pacific region, despite facing challenges due to the COVID-19 pandemic and staffing limitations. Over the past year, the project has fostered capacity building within five PICs – PNG, RMI, Samoa, Solomon Islands and Tuvalu – through baseline assessments, feasibility studies and development of WtE qualifications. These accomplishments provide a solid foundation for informed decision-making and cross-sectoral collaboration, essential to the successful integration of WtE solutions.

Collaboration with the SPC's EQAP has been crucial in establishing academic qualifications, contributing to a skilled workforce needed for WtE implementation. Cross-sectoral workshops have further strengthened regional WtE knowledge and resources, supporting future policy and project development.

Moving forward, the PAWES Project acknowledges the absence of a cohesive, regional WtE policy for the Pacific. Addressing this gap, the project will develop a WtE Policy Concept Note to lay the groundwork for comprehensive policy integration within existing frameworks, ensuring that WtE initiatives are woven into national development plans for the first time. This step is vital to advancing sustainable energy and waste management across the Pacific.

The 18-month NCE extends the project's duration until mid-June 2026, enabling completion of key deliverables such as the WtE Scholarship and Research Demonstration / Pilot Project, thereby fulfilling contractual obligations with the USP and UPNG. Additionally, in response to requests from the governments of Samoa and the RMI, the PAWES project team is exploring collaborations with CMI and NUS to establish undergraduate and internship programs. This approach emphasises the importance of capacity building at all levels to reduce dependency on external consultants and foster a resilient local workforce.

While current EU funding supports only five countries and the NCE highlights specific work packages, growing interest from stakeholders presents an opportunity to secure additional financing. Positioned as anchor funding, this EU support is expected to enhance the NCE's potential to attract further investments in the future.

An integrated approach to WtE aligns with key regional frameworks such as FESRIP, the 5th PRETMM's Efate Outcome Statement and SPREP's Pacific Regional Waste and Pollution Management Strategy. Partnerships across government, academia and private sectors will be instrumental in enhancing human resource capacity through scholarships and targeted programs, with an emphasis on supporting emerging technologies such as pyrolysis, which has gained traction in recent discussions.

As the PAWES Project progresses, sustained regional cooperation, collaboration and resource mobilisation will be essential to meet both current and future environmental and energy needs. Through its WtE initiatives, the project is well positioned to contribute to long-term resilience and sustainability for the PICs, ensuring a cleaner and more sustainable future.

Annexes

Annex 01	Tuvalu Baseline Assessment Report
Annex 02	RMI Baseline Assessment Report
Annex 03	PNG Baseline Assessment Report
Annex 04	Samoa Baseline Assessment Report
Annex 05	Solomon Islands Baseline Assessment Report
Annex 06	Samoa Feasibility Assessment Report
Annex 07	Bioenergy in Samoa Report
Annex 08	Data Scientists Trip Report for Samoa
Annex 09	ToR for WtE Policy and Roadmaps
Annex 10	Concept Note for WtE Policy and Roadmaps
Annex 11	Solomon Islands Data Collection Mission Advisory Letter
Annex 12	Solomon Islands Data Collection Mission Statement
Annex 13	Data Scientists Trip Report for Solomon Islands
Annex 14	Data Collection Mission Report for Solomon Islands
Annex 15	PNG Data Collection Mission Advisory Letter
Annex 16	PNG Data Collection Mission Statement
Annex 17	Data Scientist's Trip Report for PNG
Annex 18	RMI Data Collection Mission Advisory Letter
Annex 19	RMI Data Collection Mission Statement
Annex 20	Data Scientists Trip Report for RMI
Annex 21	WtE Technology Symposium Agenda
Annex 22	WtE Technology Symposium Report
Annex 23	Agenda for Waste Management Technologies Dialogue
Annex 24	Agenda for the 4th CPRT
Annex 25	4th CPRT Outcome Document
Annex 26	Project Manager’s Trip Report
Annex 27	4th CPRT Report
Annex 28	FESRIP 2021 to 2030 Volume 1 The Framework
Annex 29	5th PRETMM Efate Outcome Statement
Annex 30	SEOM Outcome Document
Annex 31	Concept Note for Regional Workshop on a Circular Approach to Waste Management
Annex 32	Report for Regional Workshop on a Circular Approach to Waste Management
Annex 33	Data Scientist's Trip Report for Vanuatu
Annex 34	3rd IAC Meeting Report
Annex 35	3rd IAC Meeting Agenda
Annex 36	4th IAC Meeting Report
Annex 37	4th IAC Meeting Agenda
Annex 38	Endorsement Meeting Report
Annex 39	Endorsement Meeting Agenda
Annex 40	Unit Standard Level 4
Annex 41	Unit Standard Level 6
Annex 42	Qualification Document Level 4
Annex 43	Qualification Document Level 6
Annex 44	Concept Note for Sustainable Energy Qualifications and Short Courses

Annex 45	ToR for Sustainable Energy Qualifications and Short Courses
Annex 46	Melas Christian Nos - Supervised Research Project Proposal
Annex 47	Natalie Kausimae - Supervised Research Project Proposal
Annex 48	Miriama Taukiei - Supervised Research Project Proposal
Annex 49	Nikita Shriwastow - Supervised Research Project
Annex 50	Freddy Amos Lakera - Research Project Literature Review
Annex 51	CMI Letter of Agreement
Annex 52	Letter of Concern from RMI
Annex 53	NUS Letter of Agreement
Annex 54	Letter of Concern from Samoa
Annex 55	Opening Remarks by SPC for the USP Event
Annex 56	Briefing for USP Students Meeting Agenda
Annex 57	Briefing for USP Students Meeting Presentation by Energy Expert
Annex 58	Briefing for USP Students Meeting Presentation by Waste Expert
Annex 59	Briefing for USP Students Meeting Presentation by DTC
Annex 60	Briefing for USP Students Meeting Presentation by SPREP
Annex 61	Briefing for USP Students Meeting Recording Part 1
Annex 62	Briefing for USP Students Meeting Recording Part 2
Annex 63	Meeting with USP Outcome Document
Annex 64	Meeting Agenda
Annex 65	Meeting Transcript 02 July 2024
Annex 66	Meeting Minutes 30 August 2024
Annex 67	Meeting Minutes 07 October 2024
Annex 68	Meeting Minutes 04 November 2024
Annex 69	Meeting Minutes 02 December 2024
Annex 70	3rd PSC Meeting Minute
Annex 71	3rd PSC Meeting Agenda
Annex 72	3rd PSC Meeting PPT
Annex 73	2024 1st Multipliers Meeting Recording
Annex 74	2024 1st Multipliers Meeting Agenda
Annex 75	2024 1st Multipliers Meeting PPT
Annex 76	2024 2nd Multipliers Meeting Recording
Annex 77	2024 2nd Multipliers Meeting Agenda
Annex 78	2024 2nd Multipliers Meeting PPT
Annex 79	2024 3rd Multipliers Meeting Minutes
Annex 80	2024 3rd Multipliers Meeting Agenda
Annex 81	2024 3rd Multipliers Meeting PPT
Annex 82	2024 4th Multipliers Meeting Minutes
Annex 83	2024 4th Multipliers Meeting Agenda
Annex 84	2024 4th Multipliers Meeting PPT
Annex 85	Financial Report
Annex 86	KPMG Audited Report
Annex 87	ROM Review Mission Report