ACROSS THE ATOLLS



Transitioning to Low Carbon Sea Transport in the Republic of the Marshall Islands

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MESSAGE BY HILTON KENDALL

Minister of Transport, Communications and Information Technology, Republic of the Marshall Islands



Iakwe.

In the Marshall Islands, the ocean is the road connecting our communities. Ships carry food, medicine, cargo, teachers, and families across hundreds of nautical miles. Reliable maritime transport is therefore not simply a matter of infrastructure or commerce. It is essential to our communities, our economy, our resilience and our way of life.

It was from this reality, and from our national climate ambition, that the Republic of the Marshall Islands (RMI) and Germany started the Low Carbon Sea Transport (LCST) Project in 2017. Together, we asked an important question: how can we make the transport system on which our country depends more sustainable, resilient and fit for the future?For almost a decade, that question led us to understand our transport system and our needs through research, data, and testing; to combine Marshallese maritime knowledge with new ideas and technologies; and ultimately to turn that knowledge into vessels, skills, maritime education, national planning, and international cooperation.

From the work of Waan Aelõñ in Majel, where traditional Marshallese boatbuilding and sailing knowledge helped shape new approaches, to lagoon transport, to Jela Meto and the development of our crews and students, and ultimately to the SV Juren Ae, this has always been about much more than one vessel. It has been about enhancing knowledge and capacity within the Marshall Islands: strengthening our maritime institutions, supporting our crews and boatbuilders, giving students practical experience, and connecting national experience with our international climate and maritime leadership.The Juren Ae embodies this approach. Its name comes from the traditional steering paddle of a Marshallese canoe, reflecting the idea that innovation should build upon, rather than replace, our maritime heritage. The Project has shown us that lasting maritime transformation brings technology, people, institutions and national ownership together.

New systems require skilled people, maintenance, capable institutions, and long-term commitment. Innovation also means learning from experience: understanding what works in our islands, what must be improved, and how the next generation of solutions can be made simpler, stronger, and more sustainable.
As this Project closes, its legacy now belongs to the Marshall Islands. With that legacy comes responsibility: to care for what has been built, to strengthen the skills and institutions needed to sustain it, and to carry forward what we have learned.

These lessons are now part of the experience that the Marshall Islands can share with its Pacific neighbours. On behalf of the Government and people of the RMI, I express our sincere appreciation to Germany and GIZ for this long-standing partnership. Germany has stood with us through an ambitious journey of experimentation, learning and achievement, and we value both the partnership and the trust that made this possible.

This is not only the story of a vessel or a Project. It is part of the Marshall Islands' continuing maritime journey: built on our heritage, driven by our climate ambition, and strengthened by partnership. What comes next is now our responsibility: to use this experience wisely, to improve upon it, and to help shape a more sustainable maritime future for our islands and our Pacific region.
Kommol tata.



MESSAGE BY IMMANUEL GEBHARDT

Country Director, GIZ Philippines and Pacific Island States



Iakwe.

For almost a decade, the Low Carbon Sea Transport Project has brought together the RMI and Germany around an ambitious idea: that the future of maritime transport in island countries can be more sustainable while remaining firmly grounded in local realities, knowledge, and needs.

For GIZ, it has been a privilege to implement this Project on behalf of the German Government through the International Climate Initiative (IKI), and to accompany our Marshallese partners on this journey.

The LCST Project did not begin with a predetermined technological solution. It began by listening, collecting evidence and understanding how maritime transport actually works across the Marshall Islands. From there, Marshallese institutions, communities, technical partners, and international experts explored what could work in this unique environment.

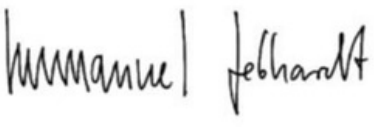
What followed was a remarkable process of experimentation and learning. Together with Waan Aelõñ in Majel, traditional Marshallese boatbuilding and sailing knowledge was connected with new materials, technologies and approaches to low-carbon lagoon transport. With the College of the Marshall Islands and Jela Meto, maritime education, and practical training were strengthened. With the Marshall Islands Shipping Corporation and many technical partners, new approaches to inter-atoll transport were tested and ultimately embodied in the SV Juren Ae. Alongside these practical investments, the Project supported national maritime planning, institutional coordination, and the Marshall Islands' wider engagement on maritime decarbonisation in the Pacific, and internationally.

These achievements also remind us that innovation is rarely a straight line. A first-of-its-kind project generates not only new technologies, but new knowledge. It shows what works, where assumptions need to be reconsidered, and how technology, operational capability, maintenance, institutions, and long-term ownership must develop together.

This is perhaps one of LCST's most valuable legacies. The vessels, infrastructure, and technologies are visible results, but equally important are the experience, relationships, and capabilities built over many years. They belong to the Marshall Islands and provide a foundation from which the next generation of maritime solutions can develop.

GIZ is grateful for the trust placed in us by the Government of the RMI and by the German Government. We particularly recognise the many Marshallese institutions, communities, seafarers, boatbuilders, and students who turned an ambitious concept into practical experience. As LCST comes to an end, Germany's cooperation with the Marshall Islands through this Project leaves behind more than individual assets. It leaves a body of knowledge and experience that can inform future maritime development in the Marshall Islands and contribute to the wider transition now taking shape across the Pacific.

On behalf of GIZ, I thank everyone who has contributed to this extraordinary journey and wish our Marshallese partners every success in carrying this legacy forward.



WHY THIS PROJECT? LCST VISION

Project Name	Low Carbon Sea Transport (LCST)
Project Region	Majuro, capital of the Republic of the Marshall Islands (RMI), Pacific Island region
Commissioned by	Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)
Implementing Partners	Ministry of Finance (RMI MOFAT, RMI MOTCIT & Marshall Islands Shipping Corporation as recipients), Hochschule Emden/Leer, Waan Aelõñ in Majel, Independent Diplomat, Climate Action Network Association, The Pacific Community
Duration	2017 - 2026

Objective

To reduce the carbon emissions and transition to energy efficient maritime transport in domestic sea transport in the Marshall Islands.





Project Rationale

The RMI relies on maritime transport for economic activity, connectivity, and resilience. Connectivity, especially for the remote islands and atolls, is vital for access to services and socioeconomic opportunities for citizens. Sea transport also ensures the delivery of education, health care, and environmental and economic development, and plays a role in responding to climate change impacts.

As RMI is almost entirely dependent on imported fossil fuel, the costs of such services are high and burdens national and household budgets.

The RMI fleet is nationally a significant emitter of carbon dioxide in the transport sector. The huge dimension of this country requires the provision of reliable and cost-efficient supplies throughout the sea-defined area. Shifting to renewable energy sources could help reduce this burden and would support more inclusive and sustainable economic growth for the country.

The RMI is a world leader in advocating for action on climate change and is the only country to explicitly include domestic sea transport in its Nationally Determined Contributions (NDCs). In December 2020, the country set the goal to reduce its greenhouse gas emissions from domestic shipping by 40% by 2030. Levels of comparison were those of 2010.
Full decarbonisation is to be achieved by 2050.

Development and trial of low-carbon propulsion technologies

Implementation of insights from trials and operationalizing a low-carbon vessel

Policy support to RMI Government (including in UNFCCC negotiations)

Enabling Pacific neighbours to procure a ship type with low-emission technologies

Ensuring long-term operation of the sailing ship SV Juren Ae

Project Partners:

University of Applied Sciences HOCHSCHULE EMDEN·LEER

REPUBLIC OF THE MARSHALL ISLANDS MINISTRY OF TRANSPORTATION, COMMUNICATIONS AND INFORMATION TECHNOLOGY

WAAN AELÕÑ IN MAJEL

Republic of the Marshall Islands MINISTRY OF FINANCE

CAN

I·D

Project Components








	2017-2024	2017-2024	2020-2024	2024-2026	2024-2026
Component	Inside Lagoon Transport	Inter Atoll Transport	High-Level Policy Support	Regional Upscaling	Ensuring Long-Term Operation & Capacity Building
Activities	Training and Prototyping in Traditional & Innovative Canoe Building	Approaches and Technologies for the Development of Low-carbon Maritime Transport	Strengthening RMI's Contribution on International Level (IMO & UNFCCC)	Enabling Pacific Neighbors to Procure a Ship Type similar to SV Juren Ae	Technically and Logistically Securing SV Juren Ae's Operation
Results	Increasing Economic Participation of Outer Islands	Increased Resilience of Local Outer Island Communities	Achieving RMI's National NDC Goals	RMI Regional Leader in Decarbonizing Shipping	International Policy Capacity Building

Approach

By making RMI's sea transport greener and raising energy efficiency, the Project is helping the country achieve its NDC. Ultimately, this will reduce transport costs and benefit public agencies, private companies, and the people of RMI.

The Project introduces a wide range of climate-friendly solutions, such as developing and pilot-testing low-carbon propulsion technologies in cooperation with partners.
Other steps are educating and training ship crews and researchers as well as using modern energy-efficient sailing technologies and renewable energy.

Results

Result area	Metric	Achieved	Target
Direct mitigation	GHG reduced, cumulative (t CO_2e)	**664.1**	663.1 (100%)
Indirect mitigation	GHG reduced, cumulative (t CO_2e)	**1,069.70**	950.4 (113%)
Capacity building	People trained / networked	384 (344 men, 40 women)	175 (219%)
Fleet	Low-carbon vessels delivered	2 (SV Kwai, 2021 · SV Juren Ae, 2024)	—
Maritime training	Jela Meto Training Center graduates	80 (2023–2025)	—
Intra-lagoon boats	Prototype low-emission craft built	**5**	—
Boatbuilders trained	Outer-island participants	22 (4 workshops)	—

Results reflect the latest formally reported project monitoring data available at the time of publication, covering the reporting period up to 31 December 2025. Final Project-closing results for 2026 were not yet available when this booklet went to print.

A PROJECT ACROSS 9 YEARS

BUILDING FROM MARSHALLESE KNOWLEDGE

Connecting local experience with new approaches to maritime transport

UNDERSTANDING THE TRANSPORT SYSTEM

Mapping the realities, challenges and opportunities of domestic sea transport

2017

2018

2019-2020

2021

THE OCEAN IS THE ROAD

Why maritime transport is at the heart of life in the Marshall Islands

CREATING A COMMON TABLE

Bringing different perspectives together to shape a shared vision

2022

INVESTING IN PEOPLE, NOT ONLY HARDWARE

Building the skills and institutions needed for lasting change

2023

FROM OPTIONS TO A NATIONAL DECISION

Turning technical possibilities into reality

A SHIP TAKES SHAPE IN SOUTH KOREA

From design and construction to a vessel made for the Pacific

2024-2025

OPERATING THE SV JUREN AE

From delivery to national service and learning along the way

2026

A PACIFIC PERSPECTIVE

What one vessel can teach us about scaling low-carbon sea transport in the Pacific

PROJECT COMPONENTS

01

INSIDE LAGOON TRANSPORT

The Inside Lagoon Component follows the same approach for small craft to be built in workshops on the Marshall Islands, rooted in the indigenous sailing canoe tradition. Two new designs, the Waan Aelõñ in Majel (WAM) Catamaran and the WAM Proa have been developed. Multiple vessels of each type were built since. They are used for emission-free transport and fishing in the lagoon and support the regular trips of the SV Juren Ae as feeder vessels.

02

INTER ATOLL TRANSPORT

Within the Inter-Atoll Component, sea transport between the islands was analyzed to develop and build a new ship type based on low-carbon technology. A detailed shipping study and an options catalogue for decision-makers were developed. These efforts culminated in the construction and commissioning of the SV Juren Ae.

03

HIGH-LEVEL POLICY SUPPORT

The Policy Component aims to support ambitious maritime policy of the RMI government on an international stage. Measured by landmass or population, the Marshall Islands might be a small player but its strategic location and strong stance regarding climate justice issues have placed it on the map. Its large shipping registry makes the country an important member of the International Maritime Organization (IMO). In recent years the RMI has played an important role in developing international law frameworks regarding climate change, human rights and maritime regulation.

04

REGIONAL UPSCALING

Building on the experience generated through LCST and SV Juren Ae, the Project increasingly supports the regional scaling of low-carbon maritime transport solutions. This includes sharing vessel designs, construction and operational experience, monitoring approaches, policy lessons and training models, while adapting solutions to national circumstances. This experience also contributes to the emerging Pacific Blue Shipping Partnership (PBSP) as a Pacific-led platform for regional cooperation and scaling.

05

ENSURING LONG-TERM OPERATION

The final component focuses on establishing the conditions for sustainable operation and continued learning from SV Juren Ae. This includes strengthening the College of the Marshall Islands (CMI) – Marshall Islands Shipping Corporation (MISC) partnership, supporting the Jela Meto Training Center for future seafarers, and using operational and vessel-performance data to strengthen practical knowledge on energy-efficient vessel operation.

WORDS FROM OUR PARTNERS

DR PETER NUTTALL, TECHNICAL EXPERT, MICRONESIAN CENTER FOR SUSTAINABLE TRANSPORT (MCST)

“ One of the greatest honours and challenges of my career was receiving a formal letter from Foreign Minister Tony deBrum in 2014, asking Alison Newell and me to come to the Marshall Islands and help establish a Centre of Excellence to drive a country-owned agenda for transport decarbonisation. He was asking for nothing less than a paradigm shift: solutions commensurate with the 1.5-degree agenda. That was the ambition from which the Micronesian Center for Sustainable Transport was established in Majuro. There was no blueprint. For shipping, we saw two complementary objectives: to use the Marshall Islands’ position as a major ship registry to advocate for ambitious international action at the IMO, and to demonstrate at home that low-carbon shipping could work at island scale. We began developing concepts and funding proposals, while Minister deBrum and Ambassador Ishoda engaged their international counterparts, including in Germany. The strength of Marshallese and Pacific climate leadership, combined with the technical and academic partners who came alongside us, gave us the confidence to try something that had not been done before. ”

CHRISTINA SHYNE, SAILING TRAINING EXPERT

“ Seeing Juren Ae develop from a vessel under construction in Korea into a sailing ship crossing the Pacific to her new home in the Marshall Islands was a very special experience. Working on the rig and then sailing the vessel ourselves showed that bringing an innovative sailing cargo ship to life requires much more than design and construction – it requires practical seamanship, training and people who understand how all the systems work together at sea. For me, bringing Juren Ae home was also about passing that practical knowledge on to the Marshallese seafarers who will carry her forward. ”

DR STEFAN RINDFLEISCH, EHLERMANN RINDFLEISCH GADOW (ERG) PARTNER

“ The development of Juren Ae demonstrated that maritime innovation is not only an engineering challenge. Bringing a new vessel concept from design to construction and operation requires technical ambition to be matched by clear contractual structures, regulatory requirements and a sound understanding of maritime law. For ERG, it was a privilege to accompany this pioneering project and contribute to turning an ambitious concept into a vessel built for the realities of the Pacific. ”

KLAUS KÜPER, HEAD OF DEPARTMENT BRIESE SCHIFFAHRTS GMBH

“ Innovative vessels such as Juren Ae require more than new technologies – what ultimately matters is that all systems work together safely, reliably and efficiently under real operating conditions. Briese Research contributed practical ship-management experience and technical expertise to define operational requirements, identify technical weaknesses and areas requiring further attention, and prepare the vessel for reliable and sustainable operation. The Project also demonstrates the importance of involving experienced operators and maritime practitioners at an early stage when new technologies are developed and introduced into commercial shipping. ”

THE OCEAN IS THE ROAD

For the RMI, the ocean is not a barrier but the country's highway.

Communities, goods, health services and education **all depend on reliable maritime transport** linking remote atolls across one of the world's largest ocean territories.

Recognising both this dependence and the growing urgency of climate action, Germany and the Republic of the Marshall Islands launched the LCST Project in 2017.

The vision was ambitious: to demonstrate that domestic shipping could become **cleaner**, **more efficient** and **more resilient**, while strengthening **local capacity** and contributing to the country's **international leadership** on maritime decarbonisation.

> ***When I first came to the Marshall Islands in 2017, I was measuring fuel, travelling on domestic vessels, and trying to understand maritime transport across the atolls. None of us knew where the journey would lead. What followed was a process of collecting evidence, comparing options, testing solutions, learning and adapting. What began as a technical question became a broader effort to combine Marshallese knowledge, engineering, institutional capacity and international cooperation for more sustainable maritime transport. Looking back, the key lesson is that innovation is not about getting everything right the first time, but about building the knowledge, relationships, and confidence to make the next generation better.***

- RAFFAEL HELD, GIZ PROJECT DIRECTOR, LOW CARBON SEA TRANSPORT





AN IDEA TAKES SHAPE ▶

▶ **2015 - COP21, Paris:** The late Tony deBrum and then German Federal Environment Minister Dr Barbara Hendricks discuss the potential for cooperation on low-carbon maritime transport, helping bring greater attention to the issue.

▶ **2017 - The LCST Project begins:** *The political ambition becomes a practical development project.*

What would it take for a small island state to decarbonise the ships it depends on?




UNDERSTAND: Baseline studies, maritime data, emissions and transport needs




EXPERIMENT: Prototypes, technology assessments, boatbuilding and operational testing




BUILD: Local skills, institutions and eventually a new generation of vessels

> ***Back then, we asked: why not bring together the challenge of connecting remote islands with the opportunity to reduce the Pacific's dependence on fossil fuels? We put our heads together – Albon Ishoda, Peter Nuttall, Michael Vahs and myself – and developed the idea of using modern sailing technology as a practical solution for the Marshall Islands. It took persistence to convince others that the idea was worth pursuing, but we hoped the Marshall Islands could become a pilot and that, if successful, the experience could inspire wider change across the Pacific. Looking back almost ten years later, it is remarkable to see what grew from those early conversations.***
>
> **- DR WULF KILLMAN, GIZ CCCPIR PROGRAM DIRECTOR**

THE ANSWER WOULD NOT COME FROM ONE TECHNOLOGY.

It would emerge gradually: through **research**, **experimentation**, **local knowledge**, **training**, **international cooperation** and a willingness to **test what had not been tested before**.



UNDERSTANDING THE TRANSPORT SYSTEM

Before designing a new vessel or selecting a technology, LCST first set out to understand **how maritime transport actually worked** in the Marshall Islands.

For a country spread across 29 atolls and more than 1,000 islands, shipping is not simply one sector of the economy. It is what connects communities to food, fuel, health services, education, infrastructure and one another. Yet the realities of transport between islands are shaped by long distances, dispersed populations, limited infrastructure, imported fuel and very different operating conditions. From 2017 on, the project therefore invested in building an **evidence base**.

Baseline studies examined **vessel performance, fuel consumption, emissions, routes, cargo and passenger movements, logistics and operational practices**.

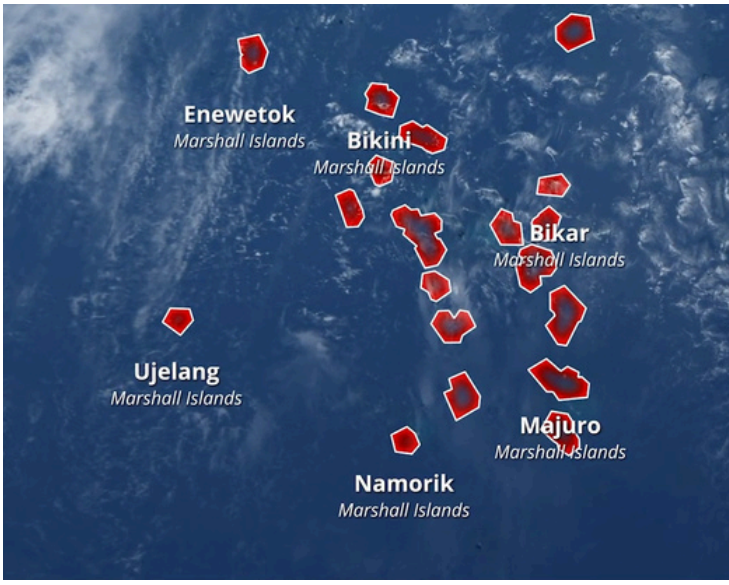
> ***Our early research laid the foundation for the major decisions that followed. By analysing transport demand, fleet operations, infrastructure limitations, weather patterns and energy consumption in the Marshall Islands, we moved from assumptions to evidence. The baseline study revealed both the challenge and the opportunity: a transport system heavily dependent on imported fuel, yet operating in one of the world's most favourable environments for wind-assisted shipping.***
>
> ***The subsequent technical options assessment systematically compared retrofit and newbuild solutions, identifying technologies capable of reducing emissions while maintaining the reliability and affordability island communities depend upon. This evidence-based process shaped the LCST solution portfolio and contributed to the development of SV JUREN AE, demonstrating how low-carbon shipping can meet the specific needs of island nations while offering lessons for sustainable maritime transport far beyond the Marshall Islands.***

- PROF. CAPT. MICHAEL VAHS (EMDEN/LEER UNIVERSITY OF APPLIED SCIENCES)
HEAD OF RESEARCH & DEVELOPMENT, LCST

FIRST STEP: BASELINE STUDIES

Researchers from the University of Applied Sciences Emden/Leer (HEL) worked alongside local partners to understand both inter-atoll shipping and transport within lagoons. This work was important precisely because there was **no single technological answer** waiting to be selected. **Different options had to be assessed** against the realities of the Marshall Islands: the distances vessels travel, the cargo they carry, the available infrastructure, local wind conditions, costs and the ability to operate and maintain new technologies locally.

The studies also broadened the understanding of what maritime decarbonisation would require.



Reducing emissions could not depend on replacing one vessel with another. Inside-lagoon vessels, routing, operational efficiency, infrastructure, fleet renewal, regulation, financing and training were all part of the picture.

The evidence collected during these early years became the foundation for the Project's later work: from the development of **low-carbon vessel** concepts to the **Maritime Transport Roadmap** and, ultimately, the decision to build **SV Juren Ae**.









> ***When we started the baseline work in 2017, there was very little evidence showing where emissions from domestic maritime transport actually came from. One of the most important findings was that small outboard-powered craft contributed almost as much as commercial shipping, which fundamentally broadened our understanding of the challenge and later shaped the Maritime Transport Roadmap: real decarbonisation in the Marshall Islands requires transforming the whole transport system - vessels, lagoon transport, routes, infrastructure and operations - while maintaining reliable connections for island communities.***
>
> **- MARK OXLEY, CONSULTANT (PACIFIC MARINE MANAGEMENT)**

CREATING A COMMON TABLE

Understanding the problem was only the beginning. The next challenge was to create a space where the **different people involved in maritime transport** could work towards solutions **together**.

Maritime decarbonisation touches many areas at once: **government policy, shipping operations, engineering, traditional knowledge, research, financing and community needs**.

No single institution could address all of these dimensions alone.

Following an early restructuring of the Project, the **Management and Technical Advisory Committee (MTAC)** was established to **bring these perspectives together**.

Government ministries, shipping operators, technical experts, research institutions, regional organisations and development partners could meet around the same table, **exchange information and jointly consider the direction of the project.**

> ***The MTAC created a common table for decisions that no single institution could make alone. That coordination helped turn a complex technical and policy challenge into a nationally owned process.***
>
> **- ALSON KELEN, DIRECTOR OF WAAN AELÕÑ IN MAJEL (WAM), CANOES OF THE MARSHALL ISLANDS**





THE MTAC: CONVERGING MANY PATHS AROUND ONE TABLE

The value of the MTAC was therefore not simply organisational. It created a mechanism for **turning a complex, multidisciplinary challenge into a nationally owned process**.

Through meetings, technical discussions and planning workshops, partners could **compare different perspectives**, challenge assumptions and connect technical work with national priorities. It also provided continuity as the project moved from research towards practical implementation.

This **collaborative approach** became one of the defining characteristics of LCST. The Project was not simply bringing a technology to the Marshall Islands. It was creating the **conditions for Marshallese institutions and partners** to **collectively** determine what a low-carbon maritime **transition** should look like.

The common table established in 2019 would prove increasingly important as the Project moved from identifying options to making decisions about technology, policy, training and investment.



BUILDING FROM MARSHALLESE KNOWLEDGE

As the Project moved from understanding the transport system towards developing solutions, one principle became increasingly important: innovation did not have to start from scratch.

The Marshall Islands possesses **generations of knowledge** about sailing, boatbuilding, navigation and the ocean. **Traditional canoes** were designed around the **conditions of the Pacific** long before modern engineering existed. Their shapes, sails, outriggers and construction techniques reflected **detailed knowledge** of wind, waves, currents and the **practical realities of travelling between islands.**

LCST increasingly explored how this **knowledge** could **contribute to contemporary low-carbon sea transport.**

A central partner in this process was **Waan Aelõñ in Majel – Canoes of the Marshall Islands (WAM)**. Rather than treating traditional knowledge as something belonging only to the past, **the Project worked with local expertise** to explore how **traditional principles** could be **combined with modern engineering** and new propulsion technologies.

> ***Developing the inside-lagoon craft demonstrated that international collaboration only works as genuine, same-level cooperation, where Western engineering and traditional knowledge carry equal weight rather than one side simply advising the other. Developing appropriate technology in this way takes sustained capacity-building: training local builders and sailors, repeatedly testing and improving the design in real conditions, and staying engaged long enough for the knowledge and trust to take root beyond any single prototype or person.***



- HENRIK RICHTER-ALTEN (UNIVERSITY OF EMDEN/LEER, WAM ADVISOR)

FROM TRADITIONAL KNOWLEDGE TO MODERN ADAPTATION

This approach became particularly visible through the development and testing of **Inside-Lagoon Transport prototypes.** Boatbuilding methods introduced through project training were combined with traditional canoe-building approaches, while different designs explored the potential of sailing and electric propulsion.

The process was deliberately practical and iterative: **design, build, test, learn and improve.**

Additional **WAM catamarans** and traditional outrigger canoes were constructed in 2021, with **vessels** tested not only in Majuro but **also on outer atolls including Likiep and Aur.** This allowed the Project to **learn** from actual use and **from the communities** who would ultimately depend on these vessels.

The experience demonstrated something fundamental: **Marshallese maritime knowledge** was the resource **from which innovation could grow.**



Years later, the **same principle would be visible in SV Juren Ae.**

The vessel would be a modern cargo ship, but its underlying logic: **using the wind** to move people and goods across the Pacific, was deeply familiar.





> *"LCST showed that Marshallese knowledge is not something belonging only to the past – it can help shape the future. By combining traditional sailing and boatbuilding with modern design and electric propulsion, we developed solutions rooted in our own islands."*
>
> **- ALSON KELEN, DIRECTOR OF WAAN AELÕÑ IN MAJEL (WAM), CANOES OF THE MARSHALL ISLANDS**

FROM OPTIONS TO A NATIONAL DECISION



By the beginning of the 2020s, the Project had accumulated something more valuable than a single technological solution: **evidence**, **experience,** and a clearer **vision for the future of maritime transport** in the Marshall Islands.

The country increasingly began **translating this experience into national climate and maritime policy.**

A major milestone came in **December 2020**, when the Marshall Islands revised its **Nationally Determined Contribution** under the Paris Agreement and became the first country to explicitly include **domestic maritime transport emissions** within its commitments.

The revised targets aimed for a **40% reduction** in CO_2 emissions from domestic shipping **by 2030** compared with 2010 levels, with a transition towards **zero emissions by 2050**.

This connected the practical work taking place in the Marshall Islands with the country's **international climate leadership.**

> ***LCST has shown what can be achieved through years of close cooperation between the Ministry of Transportation, GIZ and our many national and international partners. By working together consistently, we were able to move from ideas and policy discussions to concrete results - including the national maritime transport roadmap, the SV Juren Ae, Jela Meto, and renewed investment in traditional canoe building and sailing - and it is now important that we sustain these achievements and continue the work.***
>
> **- PHIL PHILIPPO, SECRETARY MOTCIT, REPUBLIC OF THE MARSHALL ISLANDS**



At the same time, the Marshall Islands continued advocating for ambitious action on international shipping through the **International Maritime Organization** and United Nations Framework Convention on Climate Change (**UNFCCC)** processes.

At the international level, RMI continued to advocate for **stronger action to reduce greenhouse-gas emissions from international shipping.**

But international ambition needed to be matched by action at home.

The **Maritime Transport Roadmap**, developed with the **Ministry of Transport,** translated the country's targets into a practical pathway.

It identified measures related to **fleet transformation, capacity development and sustainable financing**, helping move low-carbon maritime transport from an individual project towards a **longer-term national strategy.**



WHAT KIND OF MARITIME TRANSPORT SYSTEM DO WE WANT TO BUILD?

> ***LCST helped us connect the Marshall Islands' ambitious position on decarbonising international shipping at the UN, with the practical realities of those implementing the transition at home. Bringing island-led experiences and solutions to the global stage, helped maximise the impact we could have at home and globally.***
>
> **- TONY RIPLEY, CLIMATE ADVISOR, INDEPENDENT DIPLOMAT**

The answer involved technology, **policy, institutions, finance, skills, and national ownership**.

For a country often described primarily through its vulnerability to climate change, this represented another important shift: **the Marshall Islands was not waiting for the transition to happen elsewhere.** It was helping to define and **demonstrate** what that transition could look like.

INVESTING IN PEOPLE, NOT ONLY HARDWARE

A new vessel can demonstrate what is technically possible. But a vessel alone cannot **transform the maritime sector**.

Someone has to **operate** it, **maintain** it, **repair** it, **navigate** it, **manage** its systems and eventually **improve** the technology.

As LCST moved towards implementation, **investing in people** therefore became as important as investment in hardware.

The Project supported the development of permanent **maritime training capacity** in the Marshall Islands, including the establishment of the **Jela Meto Training Center in Majuro**. Developed in cooperation with the **Marshall Islands Shipping Corporation** and the **College of the Marshall Islands**, the Centre created a foundation for integrating **sustainable maritime technologies into national maritime education**.

The name itself reflects the connection between ***knowledge*** and the ***ocean***: **Jela Meto** combines the idea of knowing with ***meto***, the ocean.

> ***LCST has been a catalyst for shifting attention towards sustainable sea transport, bringing together two areas that are critical for the Marshall Islands: energy and the sea that connects our islands and our people. It has also reminded us as Marshallese of something we have always known: that we can combine our traditional knowledge of harnessing the wind with modern technologies, such as solar, to reduce our dependence on imported fossil fuels.***
>
> **-ANGELINE HEINE-REIMERS – DIRECTOR, NATIONAL ENERGY OFFICE (NEO)**



THE JELA METO TRAINING CENTER

The training approach deliberately **connects traditional and modern knowledge.** Students can begin with **traditional navigation and seafaring**, learning about stars, the sun, currents and the ocean, before progressing towards **modern navigation systems,** charts, instruments and satellite technologies.

Young people can begin with the canoe, progress to technical maritime training and eventually **gain practical experience aboard vessels** such as SV Juren Ae.

The Project also opened new opportunities for **women** in maritime careers. Lina Harry, one of the first young women introduced to the programme, went on to graduate, complete sea time aboard SV Juren Ae and gain practical experience in steering and navigation. Her journey illustrates the **wider purpose of investing in local capacity**: the transition towards sustainable shipping should **create opportunities for a new generation of Marshallese professionals.**

The legacy of the Project cannot be measured only in vessels built or tonnes of emissions reduced.





It can also be **measured in people who now possess knowledge** that did not previously exist within the national system, and who can **pass that knowledge on.**

The ocean is fundamental to life in the Marshall Islands. As proud navigators and resilient people, we recognize the vital importance of integrating traditional knowledge and skills with modern maritime education and innovative technologies. A critical piece for me is prioritizing our students and placing them at the forefront of all ideas and initiatives. These efforts must work in tandem as a way forward in navigating and overcoming vulnerable circumstances our islands and people face today. Our CMI Maritime students engaging in the Low Carbon vessel "Juren Ae" is a great example of this.

- MEITAKA KENDALL-LEKKA, PRESIDENT OF THE COLLEGE OF THE MARSHALL ISLANDS (CMI).

A SHIP TAKES SHAPE IN SOUTH KOREA

After years of research, consultation, testing and planning, the **LCST vision finally began to take physical shape.**

In **2023**, construction of **SV Juren Ae** was underway in South Korea, transforming years of analysis and engineering into a **full-scale vessel** designed specifically for low-carbon domestic maritime transport in the Pacific.

The vessel was the result of an **international chain of cooperation**.

> ***From the first conceptual sketch of Juren Ae aboard a Marshallese supply ship to scientific research, detailed planning, construction and commissioning, the project showed that climate-friendly commercial shipping can become a reality even in a remote island nation like the Marshall Islands. Above all, it demonstrated that bold ideas are worth pursuing when enough people share a common vision and have the persistence to turn it into reality.***
>
> **- SIEGFRIED WAGNER, NAVAL ARCHITECT**

Research and **technical expertise** from **Germany**, **local knowledge and transport needs** identified in the **Marshall Islands**, and ship-design and **construction expertise from South Korea** came together to develop a pilot sailing cargo vessel designed for Pacific conditions.

The **design** process had begun years earlier. Between **2017 and 2020**, a tender design was developed with the **University of Applied Sciences Emden/Leer** and **SDC Ship & Design Consult GmbH in Hamburg.**



SV JUREN AE: A PILOT SAILING CARGO VESSEL

Following an international procurement process, **KOSTEC**, based in Busan, South Korea, was selected to develop the workshop and detailed design. Construction of SV Juren Ae subsequently took place at **Asia Shipbuilding in Geoje.**

The ship was not conceived as a conventional cargo vessel with renewable technology simply added afterwards. Its **design** was **shaped** by the actual **conditions** in which it would operate: the **routes, cargo requirements, geography and wind conditions** of the Marshall Islands.

The construction represented more than an engineering milestone. It was the point at which **research became hardware.**

The keel was laid in **May 2023** and the vessel was launched in **November**. Throughout the process, attention was given not only to the vessel's **innovative propulsion and efficient design**, but also to **safety, reliability, internationally recognised standards** and the ability to learn from future operation.



SV Juren Ae was conceived as a **demonstrator and learning platform** as much as a ship. Its systems would allow **operational information** to be collected, creating **practical knowledge for future low-carbon vessels**.

At the same time, preparations continued in the Marshall Islands to ensure that the **country** would be **ready to receive and operate the vessel.**

Technology was crossing an ocean, along with the knowledge.

> ***Drawing on my experience as an outside consultant with direct experience in the Pacific inter-island trade, I believe the Project successfully highlighted the possibility, practicality, and united effort required to make regional shipping more sustainable, safe, and reliable.***
>
> **- EVYATAR BEN RESHEPH, MISC TECHNICAL CONSULTANT**



OPERATING THE SV JUREN AE

The launch of SV Juren Ae was the beginning of the Project's most important test:

Could a vessel designed as a low-carbon model actually become part of everyday maritime life in the Marshall Islands?

With its arrival and handover, the SV Juren Ae moved **from the shipyard into the waters for which it had been designed**.

The Project entered a new phase: **operation, learning and adaptation.**

For the **Marshall Islands Shipping Corporation**, this meant gaining practical experience with a **different model of shipping**. **Wind** could once again become an **active source of propulsion,** while modern systems and engineering supported the vessel's operation.

Captain Teitera Turei and other Marshallese maritime professionals became part of this **learning process**, experiencing first-hand how **sailing technology** could function within **contemporary domestic shipping.**

> ***Operating SV Juren Ae has shown us that wind can again become a practical part of Marshall Islands shipping. It is different from operating a conventional vessel and requires new skills, but that experience is exactly what prepares us for the future.***
>
> **- CAPTAIN TEITERA TUREI (MISC), MASTER MARINER**



During its voyages to outer islands, the SV Juren Ae transported **essential goods** and supplies while carrying cargo back to Majuro, including **copra**, **fish,** and locally produced goods. Its arrival could become a community event in itself: people gathering along the lagoon, welcoming the vessel and bringing local food and products to be transported between islands.

These voyages highlighted why **maritime decarbonisation matters beyond emissions figures**. In a country where communities are separated by vast distances of ocean, **shipping is a lifeline.**

The question is not simply how to reduce the carbon footprint of a ship, but how to **maintain and improve the connections** on which island communities depend.

Operating the SV Juren Ae also generated something that cannot be obtained in a design office: **experience**.

The vessel provided an opportunity to learn about **performance, maintenance, safety, fuel use, sailing operations** and the **practical requirements** of low-carbon shipping in Marshall Islands conditions.







> ***LCST gave MISC the opportunity to move from conventional shipping towards testing what low-carbon operations actually mean in Marshall Islands conditions. We now understand much more clearly what works, what needs improvement and what the next generation of vessels must deliver.***
>
> **- DANNY WASE – GENERAL MANAGER, MARSHALL ISLANDS SHIPPING CORPORATION (MISC)**

This experience can inform future vessel designs and fleet renewal. The SV Juren Ae became a powerful symbol of the country's climate leadership.

The Marshall Islands had long advocated for ambitious action in international climate and maritime negotiations. Now it could point to a vessel operating in its own waters and say: this is what implementation looks like.

The transition from project demonstration to national service therefore marked one of the most important achievements of LCST.

The Project had not simply produced a ship. It had created the conditions for the ship to be used, studied, and learned from within the national maritime system.



A PACIFIC PERSPECTIVE

In 2026, the story of LCST had grown **beyond the boundaries of one project, one vessel and even one country.**

The experience accumulated over almost a decade had created **something that could be shared:** practical knowledge about how a small island state can begin **transforming maritime transport** in conditions where shipping is essential, fossil fuels are imported and climate impacts are already being felt.

The SV Juren Ae became a **visible model** for this approach.

The vessel showed that **wind propulsion and modern engineering** could be combined in a contemporary cargo vessel **designed around Pacific realities**.

It also demonstrated that **traditional knowledge** does not need to disappear in the transition to new technologies.

The **same wind** that carried Marshallese ancestors across the Pacific can once again contribute to moving people and goods today.

But perhaps the most important lesson was broader:

> ***The SV Juren Ae was never only about building one ship. It was about turning an ambitious idea into experience – learning what is possible, what it takes to operate new technology in Pacific conditions, and how we can do even better next time. That knowledge now belongs to the Marshall Islands and can help shape the next generation of low-carbon shipping across the Pacific.***
>
> **- RAFFAEL HELD, GIZ PROJECT DIRECTOR, LOW CARBON SEA TRANSPORT**



MARITIME DECARBONISATION IS NOT ONLY ABOUT TECHNOLOGY

It requires local ownership, evidence, policy, training, finance, institutions and partnerships.

This is particularly relevant for Pacific island states, where **many communities face similar challenges**: dispersed populations, long maritime distances, high dependence on imported fuel and limited resources for replacing conventional fleets.

The next step is therefore not simply to replicate the SV Juren Ae exactly. It is to **replicate the process of learning and cooperation** that made SV Juren Ae possible.





> ***The Marshall Islands now brings practical experience to the international debate, not only ambition. LCST has helped demonstrate and test solutions at home that can inform a much larger Pacific transition.***
>
> **- H.E. ALBON ISHODA, PRESIDENTIAL SPECIAL ENVOY FOR MARITIME DECARBONISATION & CLIMATE DIPLOMACY**

Regional discussions have already begun exploring how experience from the Marshall Islands can **support wider Pacific cooperation**, including through the **Pacific Blue Shipping Partnership (PBSP).**

The possibility of vessel trials, knowledge sharing, joint procurement and future regional fleets opens a pathway towards a maritime transition shaped by Pacific countries themselves.

The ambition is to create **vessels** that **serve people** while **reflecting Pacific values and realities.**



This also changes the position of the Marshall Islands in the global climate conversation. For years, the country has used its voice internationally to **demand stronger action on climate change and shipping emissions**. Through LCST, that advocacy is increasingly backed by **practical experience.** The RMI can now contribute to what the world needs to do, and **what it has learned from trying to do it.**

And that may be the most lasting legacy of LCST.

LOOKING AHEAD

THE JOURNEY CONTINUES

LCST began with a shared ambition: to demonstrate that **maritime transport** in the Marshall Islands could become **cleaner, more resilient and less dependent on fossil fuels** while remaining **rooted** in the **knowledge and realities of the islands.**

Almost a decade later, the **Project leaves behind more than a vessel.** It leaves **knowledge, trained people, institutions, partnerships** and **practical experience** that can continue to **shape the future of maritime transport** in the Marshall Islands and **across the Pacific**.

The journey that began with an idea **now continues in the hands of those who will operate, improve, and carry these solutions forward.**

GIZ LCST TEAM

THROUGH THE YEARS

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A SHARED JOURNEY

This story was made possible by many hands, many ideas, and many people who believed that change was possible.

The journey towards low-carbon sea transport in the Marshall Islands spans many years, institutions, partners and individuals across the Marshall Islands and beyond. It is a story of people who envisioned a different way of moving across the ocean, those who turned ideas into action, those who supported the journey along the way, and those who continue to carry it forward.

We would like to express our deepest gratitude to **everyone** who contributed to this journey, through their knowledge, commitment, time, leadership, friendship, and belief in the vision.

We gratefully acknowledge the many people and institutions who contributed to the development, implementation, and continuation of this work.

IN MEMORY

OF THOSE WHO HELPED SHAPE THE VISION

Some of the people who helped shape this journey are no longer with us. Their ideas, commitment, and belief in the potential of low-carbon sea transport remain part of the story we tell today. We remember with gratitude and respect:

Hon. Tony deBrum, former Foreign Minister of the RMI and a leading voice for climate action and sustainable development. He was instrumental in initiating the transition towards low-carbon sea transport in the Marshall Islands, helping to lay the foundation for the cooperation that would become the LCST project. His vision connected the need to reduce emissions with the practical realities of life in an island nation, where reliable and sustainable maritime transport is essential to communities across the country.

Carsten Träger, whose engagement on behalf of the German government and Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN) contributed to the dialogue between Germany and the Marshall Islands on decarbonising maritime transport and sustaining this cooperation beyond individual projects and funding cycles.

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Cartheny Laukon, former Deputy General Manager of the Marshall Islands Shipping Corporation (MISC), who was an important point of contact between MISC and the LCST project.

Dr. Irene Taafaki, former leader of the College of the Marshall Islands (CMI), whose commitment helped carry the project forward and whose support was particularly important to its focus on capacity building and investing in people.

Their vision, expertise, and commitment continue to be part of the foundation on which the work ahead is built.

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TO THE LCST PROJECT

The following list recognises many of the individuals and institutions who contributed to LCST over the years. It is not intended as an exhaustive record of everyone who supported the Project.

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