



MTCC LATIN AMERICA
Maritime Technology Cooperation Centre



2ND NATIONAL WORKSHOP OF
THE GMN II PROJECT

Opportunities for Development, Innovation, and Transition Towards Maritime Decarbonization in Colombia

August 21 - 22, 2025

REPORT



MTCC LATIN AMERICA
Maritime Technology Cooperation Centre



Dirección General Marítima
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GMN | The Global
MTCC Network
A global network for energy-efficient shipping



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Second National Workshop in Colombia – Executive Summary

The Maritime Technology Cooperation Centre for Latin America (**MTCC-LA**), within the framework of the GMN Project (Global Maritime Technology Cooperation Centres Network), in its Phase II, an initiative implemented by the International Maritime Organization (**IMO**) and funded by the European Union (**EU**), and in collaboration with the General Maritime Directorate of Colombia (**DIMAR**), the Second National Workshop of the GMN II Project titled “Opportunities for Development, Innovation, and Transition towards Maritime Decarbonization in Colombia” was held at the Caribbean Oceanographic and Hydrographic Research Centre (CIOH) in the city of Cartagena de Indias, Colombia, on 21–22 August 2025.

The main objective of the workshop was to foster knowledge exchange, strengthen national cooperation, and promote the adoption of innovative and sustainable technologies to reduce greenhouse gas (GHG) emissions in Colombia maritime and port sectors, aligning local efforts with the IMO 2023 Strategy on the reduction of GHG emissions from international shipping.

Topics and Key Areas Addressed

- National maritime decarbonization strategies, challenges, and opportunities
- Technical measures for energy efficiency
- Sustainable alternative marine fuels
- Regional collaborative alliances in Latin America
- Technological solutions for maritime decarbonization
- The role of the banking sector in supporting maritime decarbonization
- Industry–academia–government cooperation
- Digitalization and emission monitoring tools
- Promoting gender equality in maritime energy efficiency initiatives

Main achievements of the Workshop

- ✓ **Inter-institutional cooperation:** **DIMAR** and the Shipyard of the Science and Technology Corporation for the Development of the Naval, Maritime and River Industry (**COTECMAR**), with the support of **MTCC-LA**, agreed to jointly develop a Maritime Decarbonization Roadmap for Colombia towards 2050.
- ✓ **Identification of challenges and solutions** for the adoption of decarbonization measures in the Colombian fleet and ports.
- ✓ **Preliminary design of pilot projects**, including a binational maritime corridor between Colombia and Panama.
- ✓ **Promotion of gender equality**, with strong female participation and a commitment to integrate the MAMLa Network and WISTA Colombia into future activities.
- ✓ **Engagement with financial institutions**, laying the groundwork for the development of bankable project proposals focused on energy efficiency.

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The workshop gathered over **64** in-person and virtual participants, including representatives from DIMAR, the Port Authority, the Ministry of Mines and Energy, the Ministry of Transport, the Ministry of Environment and Sustainable Development, Classification Societies, Universities, Maritime Academies, the Association of Shipping Companies and Agents, Ship Operators, Energy Providers, NGOs, Research Institutions, International Organizations, and other key stakeholders of the sector. **MTCC-LA** provided technical and organizational support for the planning and execution of the national workshop, with local coordination by DIMAR Colombia, in alignment with the objectives established under the **GMN II Project** framework.

1. Workshop Preparation and Coordination

The preparation of the Second National Workshop in Colombia was led by the MTCC LA, in coordination with **DIMAR**, the European Union through the **Global Gateway** Programme, and the International Maritime University of Panama (**UMIP**), in accordance with the guidelines of the Coordinating Unit of the **GMN Project Phase II**, implemented by the IMO. The actions included:

- Overall coordination of the event and compilation of speaker presentations.
- Preparation of graphic materials, press releases, and invitations.
- In-person and virtual logistical management: registration, technical support, and venue setup.
- Moderation of sessions and technical assistance to panelists.
- Drafting of this closing technical report.

1.1. Agenda of the II National Workshop

The Workshop agenda was structured by **MTCC-LA** and the IMO GMN Project Coordinating Unit to systematically address the technological, regulatory, and social challenges of maritime decarbonization in Colombia. Government, industry, finance, and academic experts were invited to discuss:

- Innovative energy efficiency technologies
- Policies and regulations for decarbonization
- Public-private partnerships and national cooperation
- Success stories and lessons learned
- Promoting gender equality
- Sustainable financing

To access the Workshop Agenda, click on the following link:

[Agenda 2nd National Workshop Colombia](#)

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2. Communication and Visibility Activities

The **MTCC-LA** designed and implemented the workshop's communication and visibility strategy:

- Design of promotional materials (posters, speaker biographies, videos).
- Dissemination of invitations and informational posts on LinkedIn, Facebook, and other platforms.
- Support from DIMAR focal points to ensure reach in government, academic, and industrial sectors.
- Preparation and distribution of a joint press release.

The **MTCC-LA** developed the registration system, managed communication with registrants, and coordinated the hybrid logistics through the MS Teams platform. The registration link was shared on social media and email invitations were sent to stakeholders and those interested in the national workshop.



Social Media Post 1



Social Media Post 2

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All workshop materials, including posters, promotional pieces, videos, and presentations, were produced by **MTCC-LA** and approved by the IMO's **GMN Phase II** Project Coordination Unit (PCU). **UMIP**, as the host institution for MTCC-LA, provided the necessary institutional and logistical support to ensure the success of the Second National Workshop of the GMN II Project in Colombia.



Figure 1 – Agenda Cover

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Figure 2 – Workshop Title



Figure 1 – Workshop Organizers

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2.1. Participation in the National Workshop

The workshop brought together 64 participants, including maritime authorities, representatives from the private sector, academia, and international organizations. The sectoral distribution was as follows:

Sector	Number of participants
Maritime administrations	14
Shipping and logistics industry	16
Ports and port authorities	10
Academia and research centers	10
Multilateral and financial organizations	6
Networks and NGOs (gender and sustainability)	8
Total	64

Participation was a total of **56% men and 44% women**, reaching the 1:1 target set in the 2025 Work Plan and the Gender Action Plan.

3. National Workshop Program

3.1. Inaugural speeches / Opening remarks

The day began with a brief protocol ceremony that framed the objectives of the Second National Workshop of the GMN II Project and positioned maritime decarbonization as a strategic priority for Colombia.

Víctor Luna Barahona – UMIP President

The official opening of the Second National Workshop of the GMN Project Phase II was marked by a formal ceremony attended by high-level institutional representatives, who delivered key messages regarding the international, national, and academic commitment to the decarbonization of maritime transport in Colombia. The welcoming remarks were given by Professor Víctor Luna Barahona, Rector of UMIP, the host institution of the MTCC-LA. In his address, Professor Luna reaffirmed UMIP's strong commitment to environmental sustainability and its dedication to continuing to promote the training of highly qualified professionals capable of leading technological transformation processes in the maritime sector. He emphasized the importance of forums such as this Workshop for enhancing knowledge transfer, the exchange of regional experiences, and the consolidation of strategic alliances focused on shared climate change mitigation goals.

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*Speaker 1*

Admiral John Fabio Giraldo Gallo, General Director of **DIMAR** (Colombian Maritime Authority), highlighted Colombia's strategic role in the transition to a more sustainable and climate-resilient maritime transport sector. He emphasized that, while the ratification process of Annex VI of the MARPOL Convention is underway in the Congress of the Republic, the country is already promoting concrete actions to reduce emissions from the maritime sector, in coordination with international organizations, the port industry, and academia.

Admiral Giraldo called for the identification of high-impact initiatives, such as the creation of green maritime corridors and the strengthening of sustainable port policies and incentives, reaffirming Colombia's commitment to global decarbonization goals and to responsible and innovative maritime management.

*Speaker 2*

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Alberto Menghini, Head of Cooperation for the **European Union in Colombia**, highlighted the country leadership in the sustainable maritime agenda and the commitment shown by the authorities to advance towards the ratification of Annex VI of the MARPOL Convention and the adoption of measures for the decarbonization of the sector. He emphasized that the European Union sees Colombia as a strategic partner for the development of green maritime corridors and the implementation of clean technologies in ports, including the electrification of port operations and the use of renewable energy.

Menghini reiterated the European Union's interest in supporting these efforts, fostering technical and financial cooperation for pilot projects that consolidate Colombia as a sustainable maritime and logistics hub in Latin America, and inviting public and private stakeholders to join in this green transformation.



Speaker 3

3.2. Presentation of the GMN Phase II Project and objectives of the National Workshop

Eng. Ervin Vargas Wilson – Director, MTCC-Latin America



Speaker 4

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Eng. Vargas began his presentation by highlighting that this second phase represents a strategic evolution from the previous stage, with a reinforced focus on regional cooperation, technological innovation, and alignment with the IMO's 2023 Strategy on reducing greenhouse gas (GHG) emissions. He explained that, under the new 2024–2027 framework, the MTCCs will act as technical bridges between maritime administrations, industry, and academia, promoting the replication of energy efficiency pilot projects and the adoption of alternative fuels.

He emphasized the program's four structural pillars:

- 1 Technological pilot projects, aimed at developing green maritime corridors between strategic ports with continuous monitoring of Carbon Intensity (CII).
- 2 Port electrification and progressive adoption of Onshore Power Supply (OPS) systems.
- 3 Development of a National Emissions Monitoring System, based on IMO-DCS standards and **MTCC-LA** digital tools.
- 4 Capacity building, public-private partnerships, and gender equality as cross-cutting themes of the project.

Finally, Mr. Vargas presented the objectives of the National Workshop, focused on:

- A. Identifying the technical, regulatory, and financial challenges of the Colombian context;
- B. Prioritizing technologies and mitigation measures adapted to the national reality.
- C. Laying the groundwork for a 2025–2050 Decarbonization Roadmap, consistent with Colombia's international commitments and the IMO's 2023 Strategy.

3.3. Session 1 – Overview of the Maritime and Port Sector in Colombia

The first technical session of **the 2nd National Workshop of the GMN II Project** focused on presenting the current progress of the Colombian maritime and port sector in addressing the challenge of decarbonization. Moderated by Eng. Ervin Vargas, the session brought together representatives from the state-owned port authority, the maritime administration, and the private logistics industry. The purpose was to strengthen the dialogue on public policies, share best practices, and outline the challenges that should be included in the future national decarbonization roadmap.

Speakers

REPORT

CN Alberto Luis Buelvas – General Maritime Directorate



Speaker 5

**Carlos José González España – Multimodal
Company**



Speaker 6

Magaly Aparicio – ARMCOL



Speaker 7

Natalia Gil Betancourt – Cartagena Port Group



Speaker 8

**Alexander Eslava – Port Expert,
National University**



Speaker 9

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Main topics addressed

• Current state of the maritime and port sector:

Colombia has 10 main port zones and more than 60 authorized terminals under the coordination of the General Maritime Directorate (DIMAR). In the Caribbean, Cartagena, Barranquilla, and Santa Marta stand out, while on the Pacific coast, Buenaventura handles more than 50% of the country's foreign trade.

The modernization of multipurpose terminals, the incorporation of electric cranes and hybrid equipment, as well as the advances in digitalization and environmental control led by the National Infrastructure Agency (ANI) and the Ministry of Transportation, were highlighted. Within the framework of the decarbonization strategy, port electrification and Onshore Power Supply (OPS) projects are being analyzed, along with energy efficiency policies in logistics operations.

• Regulatory framework and environmental monitoring system (MRV):

It was reported that Colombia is progressing in the ratification process of Annex VI of the MARPOL Convention, currently under review by the Congress of the Republic. In parallel, DIMAR is working on the design of a national Measurement, Reporting, and Verification (MRV) system for maritime sector emissions, which will be aligned with IMO-DCS standards and the climate objectives of the 2022–2026 National Development Plan and the National Climate Change Policy.

• **Challenges and opportunities in the face of climate change:** Among the main challenges highlighted were the average age of the national fleet (26 years), the high cost of technological modernization, and the need for green financing for national shipowners and coastal shipping operators.

Regarding opportunities, the country's potential for developing alternative fuels such as green hydrogen, ammonia, and marine biomethane was emphasized, leveraging the progress made by Ecopetrol and the Ministry of Mines and Energy in clean energy. The possibility of establishing green port tariffs and sustainable maritime corridors between Cartagena, Santa Marta, and Barranquilla was also discussed as starting points for a future regional green corridor.

Identified challenges

- Lack of unified data on energy consumption and emissions from smaller vessels, tugboats, and coastal shipping.
- Limited access to climate finance for small and medium-sized shipping companies.
- Shortage of technical personnel specializing in energy efficiency, OPS operation, and alternative fuel management.
- Need to strengthen inter-institutional coordination among port, environmental, and academic entities.

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Results and agreements

✓ **National Maritime Emissions Inventory:**

DIMAR, with technical support from **MTCC-LA** and the Ministry of Environment and Sustainable Development, will consolidate fuel consumption and emissions data as the basis for the national monitoring and reporting system.

✓ **Creation of the National Technical Working Group for Maritime Decarbonization:**

It was agreed to establish an inter-institutional group to align pilot projects, facilitate the management of international financing, and promote cooperation with the IMO's Marine and Coastal Management (MMC) Programme.

✓ **Training and Technology Transfer:**

MTCC-LA will develop technical training programs on EEXI/CII calculations, energy efficiency management, and decarbonization technologies, aimed at technical personnel from ports, shipping companies, and authorities.

The session demonstrated a strong, multi-sectoral institutional commitment to advance towards low-carbon maritime transport, positioning Colombia as a key player in the regional green corridors between Latin America and Europe.

It was emphasized that the future ratification of MARPOL Annex VI, sustainable port modernization, and access to green financing are the essential pillars for consolidating the country's maritime energy transition.

3.4. Session 2 – Use of Sustainable Alternative Marine Fuels: Experiences and Lessons Learned

The second technical session of the workshop addressed one of the pillars of the maritime energy transition: the adoption of low- and zero-carbon fuels. This session provided an opportunity to put into perspective tangible technological advances, structural barriers, and sustainability criteria that determine the viability of these solutions in the Colombian context.

Moderator:

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Martín Rousseaux – General Manager, Rousseaux



Speaker 10

Speakers

Edilberto Peralta – Lloyd's Register



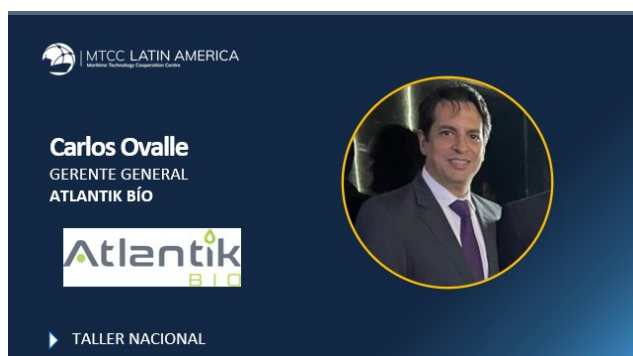
Speaker 11

José Alberto Rosas – ABL Group



Speaker 12

Carlos Ovalle – Romil de Colombia Zona Franca SAS



Speaker 13

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Highlighted technical contents

Topic	Summary of the intervention
Global trends and ammonia	Peralta presented the progress of the “Fuel for Thought – Ammonia Report,” highlighting the potential of ammonia as a zero-carbon fuel in maritime transport. He noted the technical challenges associated with its toxicity, cryogenic storage, and certification under the IGF Code, and emphasized the need to initiate pilot projects on dual-fuel coastal vessels and establish a national maritime ammonia safety training program, in cooperation with DIMAR and maritime universities.
Methanol: commercial experience	Carlos Ovalle Romil, representatives of Colombia Zona Franca S.A.S. – Atlantik Bío, shared experiences of conversions on cargo ships in Europe and Asia, highlighting that the CAPEX for green methanol is 20% lower than for LNG, with rapid scalability to e-methanol. He proposed Cartagena and Barranquilla as pilot ports for the supply of gray/green methanol, through fixed-price supply contracts and partnerships with local producers of bio-methanol derived from agricultural waste.
LNG as a bridge fuel	Rosas presented the progress made in the development of liquefied natural gas (LNG) and biogas infrastructure for maritime and port applications. They explained that LNG remains a key transition fuel in the decarbonization of Colombian maritime transport, highlighting its 20–25% reductions in CO ₂ and near-zero emissions of SO _x and particulate matter. They emphasized the ongoing projects to install satellite LNG plants and biodigesters in the Caribbean region, with the aim of supplying hybrid LNG-biomethane fuels to coastal and river vessels.

Main findings

- There is no single path to maritime decarbonization. The process in Colombia will require multiple technological routes, adapted to the national port, river, and economic realities, considering the conditions of Caribbean and Pacific ports.
- Comparative viability of fuels:
 - ✓ Methanol: is emerging as the most commercially feasible option between 2026 and 2030, due to its compatibility with existing engines and lower CAPEX compared to LNG.

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- ✓ LNG: remains the most viable bridging fuel in the short term, leveraging the existing infrastructure at SPEC (Cartagena) and its potential integration with biomethane.
 - ✓ Ammonia: could be adopted in the medium term (2030–2040), contingent on progress in safety standards, availability, and production costs at the regional level.
- Critical challenges identified:
- ✓ Lack of supply infrastructure for alternative fuels.
 - ✓ High conversion costs (CAPEX) and limited access to green financing.
 - ✓ Shortage of personnel specialized in the safe operation of alternative fuels, risk management, and maintenance of dual-fuel systems.

Debate and agreements

During the Q&A session, participants raised concerns about the certification of new technologies, regulatory flexibility for the use of alternative fuels, and eco-financing mechanisms, including green and blue bonds for sustainable maritime projects.

Following the exchange of experiences, the following agreements were reached:

- ✚ Develop a feasibility study to implement a fuel supply and export system from Colombian ports, in coordination with key stakeholders.
- ✚ Design a National Training Program in Maritime Decarbonization, led by DIMAR, **MTCC-LA**, and academia, focused on the technical training of operators, inspectors, and crew members.
- ✚ Incorporate a technology prioritization matrix (LNG → Methanol → Ammonia) into the National Maritime Decarbonization Roadmap 2025–2050, as a strategic tool for planning and accessing climate funds.

The panelists agreed that Colombia is strategically positioned to lead the maritime energy transition in the region, provided it consolidates its own technical, regulatory, and financial capabilities. It was emphasized that the country must move toward a just, inclusive, and technologically viable transition, based on cooperation among government, industry, academia, and multilateral organizations.

The session concluded with a commitment to strengthen public-private dialogue and promote pilot projects that demonstrate the technical and economic feasibility of sustainable alternative marine fuels in the Colombian context.

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3.5. Session 3 – Decarbonization in Action: Regional Initiatives and Lessons Learned

The third session of the workshop showcased practical examples of decarbonization already underway in Latin America and other comparable regions, with the aim of extracting useful lessons for Colombia. The session was moderated by Captain Marco Antonio Olier, who guided the discussion toward the transferability of best practices and the creation of national pilot projects.

Moderator and Panelists

- **Capt. Marco Antonio Olier Mendoza - DIMAR**



Speaker 14

- **Javier Díaz – Project Manager – MTCC-Latin America**



Speaker 8

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- **Gabriel Fuentes - NHH**



Speaker 9

- **Rafael Orjuela – PGCC LTDA**



Expositor 17

Content developed

1. **Training for maritime decarbonization** – Engineer Javier Díaz presented the Maritime Decarbonization Education and Training Initiatives (MDETI), a curriculum transformation initiative focused on the competencies required for the decarbonization of the maritime and port sector. This initiative combines modules on energy efficiency, simulators, the use of alternative fuels, and practical experience in port terminals. He suggested replicating the program, emphasizing that "without trained personnel, there is no possible transition."
2. **Green shipping corridors** – Gabriel Fuentes showed preliminary results for a potential green shipping-corridor route between Puerto Cortés (Honduras) and Colón (Panama). I have proposed a joint pre-feasibility study by the ENP, the Honduran DGMM and the Panama Canal Authority.
3. **Pre-project “Green Port Colombia”** – Rafael Orjuela closed the panel by outlining a project that combines equipment electrification, an OPS system, *Eco-Port* certification, and an educational module that involves green financing through different actors.

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Key findings

- ✚ Decarbonizing maritime transport in Colombia requires a combined strategy that integrates specialized training, operational data management, and demonstrative pilot projects in the country's main ports.
- ✚ The lack of reliable metrics on energy consumption and emissions from the domestic fleet, especially in coastal and river navigation, is one of the main technical challenges for implementing evidence-based measures.

Session agreements

- ✚ National Maritime Decarbonization Training Program: DIMAR, MTCC-LA and maritime universities, will promote the adaptation of the MDETI curriculum to the Colombian context, with an emphasis on energy efficiency and alternative fuels.
- ✚ It was agreed to initiate, together with the Ministry of Transport, the Cartagena Regional Port Authority, and the **MTCC-LA**, a pre-feasibility study to evaluate the technical and environmental viability of a green maritime corridor in the Caribbean region.

Expected results

- ✚ Understanding decarbonization methodologies applicable to Colombia.
 - ✓ Result achieved: Two priority areas were established: technical training and green maritime corridors. The “Green Port Colombia” initiative, aimed at strengthening port sustainability, was proposed as a flagship project.
- ✚ Identifying replicable initiatives in Latin America.
 - ✓ Result achieved: Ongoing technical cooperation was agreed upon between DIMAR, MTCC-LA, UMIP, other maritime universities, and key stakeholders to transfer best practices and digital tools for measuring and reporting GHG emissions.

Session closing

The moderator concluded that a pilot project supported by reliable data and local talent is the most effective mechanism for demonstrating tangible benefits and attracting international climate finance.

The audience highlighted the relevance and applicability of the content, reaffirming their commitment to making the “Green Port Colombia” initiative a flagship national project that will drive green investment, technological innovation, and technical training over the next three years.

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3.6. Session 4 – Regional Industry Alliance in Latin America (RIALA)

The fourth session of the workshop focused on the foundations for establishing the Regional Industry Alliance in Latin America (RIALA), conceived as a collaborative mechanism that will allow shipping companies, ports, agents, and academia to coordinate decarbonization projects and access green financing. The discussion was led by Javier Díaz, Project Manager of **MTCC-LA**.

Panelists

Alexis Xavier Rodríguez – A. P. Møller-Maersk



Speaker 18

Capt. David Fuentes – COTECMAR



Speaker 19

Profesor Víctor Luna Barahona Rector, UMIP



Speaker 20

Jaime Sánchez (ARMCOL)



Speaker 21

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Session development

1. Foundations of the Alliance:

Engineer Javier Díaz explained that RIALA seeks to connect the Latin American maritime ecosystem under a governance framework: a technical secretariat of the MTCC-LA thematic working groups, and a seed fund for pilot projects. He emphasized that this alliance coordinates supra-regional efforts and facilitates access to climate finance.

2. Global Industry Perspective:

Alexis Rodriguez outlined Maersk's strategy to achieve net-zero emissions by 2050 and suggested that RIALA could be a very good initiative involving industry to promote new technologies and alternative fuels through aggregated purchases and regional supply contracts.

3. Colombian National Perspective:

Captain David Fuentes of COTECMAR stressed the importance of joining the alliance, stipulating that it must include tangible benefits: technical training, access to green credit lines, and an operational data exchange platform that reduces bureaucratic burdens and enables the adoption of new technologies applied to maritime transport.

4. Role of Academia:

Víctor Luna proposed that UMIP and related centers serve as a technical observatory for RIALA, generating performance metrics and professional competency certifications in alternative fuels, with regional recognition.

5. Representation of the Shipowners Sector:

Jaime Sánchez, representative of the Colombian Shipowners Association (ARMCOL) and collaborator with Astivik Shipyard, emphasized the need for the national shipbuilding industry to actively participate in the decarbonization transition. He stressed that Colombian shipowners face high technological conversion costs and limited access to green financing and therefore urged RIALA to promote regional mechanisms for financial and technical support for fleet modernization.

Key findings

- There is consensus that public-private collaboration is essential to mobilize investment in maritime and port infrastructure.
- Academia positions itself as guarantor of technical capacity and knowledge transfer.

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Agreements and next steps

1. A draft term of reference will be drawn up to formally launch RIALA by **MTCC-LA** in the coming months.
2. The creation of a financial vehicle, funded by voluntary contributions from founding partners and counterpart funding, will be explored, aimed at pre-feasibility studies of green corridors and OPS systems in Colombian ports.

Session closing

The moderator concluded that creating RIALA offers a concrete avenue for collaborative action, combining the industry's innovation capacity, the regulatory legitimacy of administration and the knowledge of academia. The audience endorsed the initiative and will await the draft terms of reference to align commitments from the various key actors in Colombia's maritime industry.

3.7. Session 5 – Practical Workshop: Decarbonization Technological Solutions – Group Presentations

The final technical activity of the day took participants from theory to practice. Through a guided exercise, attendees applied calculation and visualization tools to design proposals for technological solutions aimed at reducing emissions from Colombian vessels and terminals.

Moderator

Yully Tatiana Palacio – DIMAR



Speaker 22

Presenters:

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Ing. Martín Rousseaux - Rousseaux



Expositor 23

Ing. Ervin Vargas Wilson – MTCC-LA



Expositor 24

Workshop development

1. Methodology and Tools.

Four (4) mixed groups worked with a Life Cycle Assessment template for fuels and a digital dashboard, comparing a coastal vessel in three scenarios (base diesel, diesel + EEXI measures, conversion to methanol).

2. Interactive Demonstration.

Rousseaux guided the participants in using speed, fuel, and power data to calculate the Carbon Intensity Index (CII).

3. Real-Time Visualization.

Vargas explained to the working groups the return on investment analysis of operational and technical measures such as slow steaming, shaft generators, and switching to alternative fuels.

4. Presentation of Results.

During the session, each group presented their project proposal in four (4) slides (objective, technology, cost, CO₂ reduction, timeline).

Key findings

- Up-to-date data is essential to justify projects to financial entities.
- Combining technical and operational measures offers a considerable CO₂ reduction.
- Local ports and shipping lines need continuous training in Life-Cycle Assessment (LCA) of fuels and CII to formulate “effective” proposals

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Agreements reached

- 1. Multisectoral and Interdisciplinary Technical Working Group:** To advance effective measures applied to the Colombian context for the decarbonization of maritime transport.
- 2. LCA-CII Course:** Technical training sessions will be held, and work will begin on developing a technical course open to the industry in Colombia.

Closing

The moderators stressed that simple, visual tools turn climate goals into projects with clear numbers. The activity received a 95 % rating for practical usefulness, and participants requested that this type of training be repeated.

3.8. Session 6 – Field Visit to COTECMAR

Objective

Verify the energy efficiency initiatives being implemented at COTECMAR and identify new opportunities for the decarbonization roadmap.

Highlights

- Technical tour of the shipyard facilities in Mamonal, including the naval repair workshops, small vessel design workshops, and the areas of innovation in hybrid propulsion and energy efficiency.
- Institutional presentation by COTECMAR, highlighting its research areas in clean energy, new materials, and modernization of the national fleet.
- Technical exchange between COTECMAR, DIMAR, **MTCC-LA**, and participants on the integration of low-carbon technologies and opportunities for international cooperation.

Key findings

- COTECMAR possesses advanced technological and naval engineering capabilities that can become a cornerstone for the energy transition of the Colombian maritime sector.
- The shipyard has experience in applied innovation projects, such as the design of vessels with improved hydrodynamic efficiency and auxiliary electrical systems, which contribute to emissions reduction.

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- High potential was identified for the development of hybrid and electric propulsion pilot projects, as well as for technology transfer and specialized training in conjunction with the **MTCC-LA**.

Next steps agreed

- Develop a memorandum of understanding (MoU) between COTECMAR, UMIP, and MTCC-LA to promote pilot projects for energy efficiency and alternative fuels.
- Incorporate COTECMAR as a key technical partner in the implementation of the region's Decarbonization Roadmap, making it a strategic partner of RIALA.

3.9. Session 7 – Interactive Workshop: Way Forward to Develop a National Decarbonization Strategy

In this session, participants worked on a SWOT matrix specifically designed for the Colombian maritime and port context. The exercise, led by Ervin Vargas, Javier Diaz, and Martín Rousseaux, aimed to identify the strategic elements that underpin the development of a Maritime Decarbonization Roadmap for Colombia 2025-2050.

Sectors analyzed and discussion guides

- Group 1 – Maritime transport (cabotage, fishing, tourism)**
 - **Strengths:** fleet capabilities, operational experience, existing routes.
 - **Weaknesses:** technical limitations, regulatory gaps, lack of training.
 - **Opportunities:** available technologies or financing; regional alliances.
 - **Threats:** transition costs, international competition, regulatory risks.
- Group 2 – Ports and green logistics**
 - **Strengths:** existing sustainable infrastructure and practices; advanced ports.
 - **Weaknesses:** urgency for modernization, insufficient logistical preparedness.
 - **Opportunities:** new technologies, inter-terminal cooperation.
 - **Threats:** energy demand, resistance to change, impact on competitiveness.
- Group 3 – Regulation, education and financing**
 - **Strengths:** current legal frameworks.
 - **Weaknesses:** regulatory voids, shortage of qualified staff and resources.
 - **Opportunities:** regulatory improvement, updated curricula, international support.
 - **Threats:** difficulty aligning sectors, obstacles to green financing.

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Main conclusions of the groups

- The Colombian maritime sector demonstrates a strong commitment to energy transition but requires greater investment in sustainable port infrastructure and accessible green financing mechanisms.
- The lack of consolidated data on fuel consumption and activity of the national fleet remains the main technical barrier to progress in emissions measurement and verification.
- Regional cooperation, for example, with Panama and other Caribbean countries, as well as the creation of tax incentives, are key tools to accelerate the adoption and production of alternative fuels and clean technologies.

Each group formulated three (3) priority proposals for the future National Maritime Decarbonization Strategy. The most voted proposals were:

1. Complete the national fleet inventory and establish an open data system for emissions (short term).
2. Develop port electrification pilot projects in strategic terminals such as Cartagena, Santa Marta, and Buenaventura (medium term).

Evaluation and next steps

The moderators consolidated the contributions from each group and submitted them to DIMAR as input for the development of Colombia's Maritime Decarbonization Roadmap. The session achieved a 95% satisfaction rate, highlighting its practical and collaborative approach, which allowed for the proposal of concrete actions for authorities, industry, and ports in the short and medium term.

3.10. Session 8 – Panel discussion: the role of financial institutions and the banking sector in supporting maritime decarbonization projects

This session addressed how to mobilize monetary capital for decarbonization initiatives in Colombia. It brought together specialists in climate finance and development banking, who offered perspectives on instruments, requirements, and lessons learned.

Moderator

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Carolina Herrera – ANDI



Speaker 25

Speakers

Agustina Calatayud - BID



Speaker 26

Javier Franco – Universidad Externado de Colombia



Speaker 27

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Dialogue content

1. Overview of Green Finance in Colombia

It was explained that Colombia has a Sustainable Bond Framework and climate facilities from the IDB and the Green Climate Fund for the development of decarbonization projects.

2. Requirements for Eligible Projects

The criteria for ports and fleets were listed:

- GHG inventory,
- Cost-benefit analysis,
- Clear governance and local co-financing. It was also noted that “proposals fail when they lack verified operational data and impact metrics.”

3. Questions and debate

The audience inquired about sovereign guarantees, exchange rates, and the possibility of issuing a Colombian blue bond. The panelists agreed that a small pilot project on this topic could “open the door” to the sustainable finance market.

Session closing

The panel made it clear that attracting investment requires climate policies and sound business models. The moderator urged participants to present at least two bankable projects that would position Colombia as one of the leading producers and exporters of alternative fuels in Latin America. The session was rated 94% as useful for understanding how to transform ideas into bankable proposals.

3.11. Session 9 – Round table: Promoting gender equality for maritime decarbonization in Honduras

The final session of the workshop brought together representatives from women's professional networks to discuss how gender equality can accelerate the climate transition and contribute to SDG 5. The conversation was guided by **Aricel Araújo**, administrative coordinator of **MTCC-LA**.

Guest Panel – Moderator – Aricel Araújo



Speaker 28

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Cristina Cantillo - DIMAR



Speaker 29

Liliana Centanaro Acuña – WISTA Colombia



Speaker 30

Elvia Bustavino Presidenta WISTA Panamá



Speaker 31

Key topics

- ✚ **Current Gaps:** Low participation of women in technical and operational port positions persists, with their presence concentrated in administrative areas.
- ✚ **Examples of Leadership:** In Cartagena, female engineers and naval officers actively participate in shipyard innovation and modernization projects led by COTECMAR. DIMAR has also promoted the incorporation of women into its workforce.
- ✚ **Training and Visibility:** The creation of a national maritime-port gender census was proposed, with the support of DIMAR and the MTCC-LA, to measure annual progress and promote equity policies in industry.
 - **Gender-Responsive Financing:** It was highlighted that green funds and ESG credit lines available in Colombia can reduce financing rates if projects include verifiable parity and inclusion goals. The development of an “Inclusive and Sustainable Port” seal, combining carbon and workplace equity metrics, was proposed.

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Agreed proposals

- Incorporate indicators of female participation, the gender pay gap, and representation in management positions into the Maritime Decarbonization Roadmap 2025–2050 (led by DIMAR, with support from **MTCC-LA** and port stakeholders).
- Develop the first maritime-port gender census in Colombia and set a goal of achieving 40–60% parity in technical and leadership positions by 2030.

Closing

The panelists agreed that the inclusion of women in the maritime and port supply chain strengthens innovation, sustainability, and the adoption of new technologies toward a low-carbon transition. The audience rated the session as 96% useful and proposed organizing a specialized workshop on green finance with a gender focus in 2026, in coordination with financial institutions and multilateral organizations.

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4. Summary of results and actions of the National Workshop – GMN Project II (Colombia)

Session Title	Results / Conclusions	Next Steps	Responsible(s) and Support	Timeline
1. Overview of the maritime and port sector in Colombia	Emissions and capacities baseline.	Conduct the MRV-CO ₂ inventory.	DIMAR	Q1 – Q3 2026
	Identification of challenges and opportunities (data, OPS, retrofits).	Establish the National Technical Decarbonization Group.	IMO and MTCC-LA as Technical Support	
2. Use of Alternative Marine Fuels	Feasibility matrix (methanol > LNG > ammonia).	Study of Colombia's potential as a producing country	DIMAR – Shipping companies	Q1 – Q4 2026
	Barriers: infrastructure and CAPEX.	Design of tax incentives for conversion to dual-fuel vehicles.	IMO and MTCC-LA as Technical Support	
3. Decarbonization in action – initiatives and lessons	MEDTI Model for Colombia	Action plan for MEDTI Curriculum	DIMAR – ECOPETROL	Q1 – Q3 2026
	Preliminary Project “Green Port Colombia”	Pre-feasibility study for the production and export of alternative marine fuels	MTCC-LA as Technical Support	
4. Regional Industry Alliance (RIALA)	Consensus to formalize the alliance.	Present the ToR for its governance.	MTCC-LA	Q3 2026
	Identification of stakeholders		IMO - Support for collaborative governance	
5. Practical workshop – technological solutions	Two ship case studies on retrofits and methanol as fuel, analyzed in the workshop.	Development of Fuel Life Cycle (LCA) Course and Carbon Intensity Indicator (CII) for inspectors.	MTCC-LA – Review of content aligned with regulations	Q2 – Q3 2026
	Life Cycle Analysis (LCA) of fuels and Digital Dashboard of the Carbon Intensity Indicator (CII).		IMO – Technical Support	
6. Field visit to COTECMAR	Verification of applied technologies on shipyard.	Establishing Strategic Alliances.	DIMAR – COTECMAR – MTCC-LA	Q1 – Q4 2026
	Energy Efficiency Measures in the Design and Construction of Vessels	Preparing a technical proposal for joint project development.		

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Session Title	Results / Conclusions	Next Steps	Responsible(s) and Support	Timeline
7. Interactive workshop – SWOT strategy	SWOT matrix presented and agreed by participants.	Results of the SWOT analysis	DIMAR – COTECMAR	Q2 2025 – Permanent
		Quarterly meetings of the Technical Group.	MTCC-LA as Technical Support	
8. Climate Finance Panel	Presentation of proposals based on bankable criteria.	Financial structuring guide.	Sector of Finance of Colombia	Q3 2025 – Q3 2026
	Opportunity for blue and green bonds.			
9. Gender equality and energy transition Round Table	Gaps: need to increase the representation and participation of women in leadership roles in the maritime and port sectors.	Include gender indicators in all GMN Phase II Project activities	MTCC-LA	Q3 2025 – Q3 2026
		Publish port gender census.	IMO – Support of the Women in Maritime program	
			Red MAMLa – WISTA – DIMAR	
Feedback Session	Overall positive assessment (95%) of the workshop's content and dynamics.	Integrate feedback to optimize the structure and topics for the next edition.	MTCC-LA	Q1 2026
	Recommendations to extend the duration of the panels and to deepen practical applications.	Evaluate inclusion of additional open-question blocks and advanced practical exercises. Recommendations to extend panel durations and deepen practical applications.		

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5. Participant Feedback

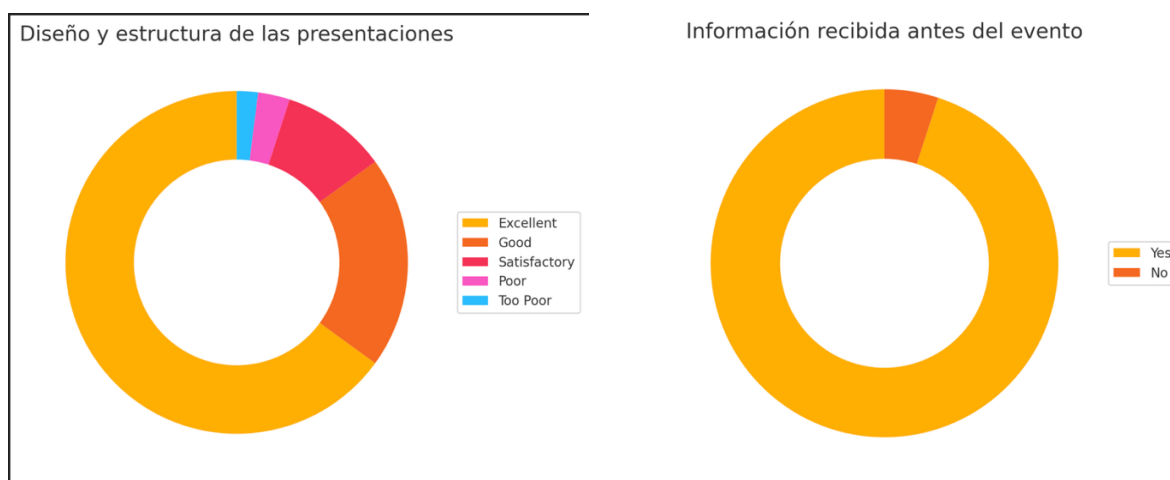
5.1. Summary of the National Workshop

The **Second National Workshop of the GMN Project Phase II** was a milestone in capacity building and sectoral coordination for decarbonizing maritime transport in Colombia. Over two days, technical sessions, panels, a practical workshop, a field visit, and a gender equality roundtable were held, allowing for a comprehensive approach to the energy transition.

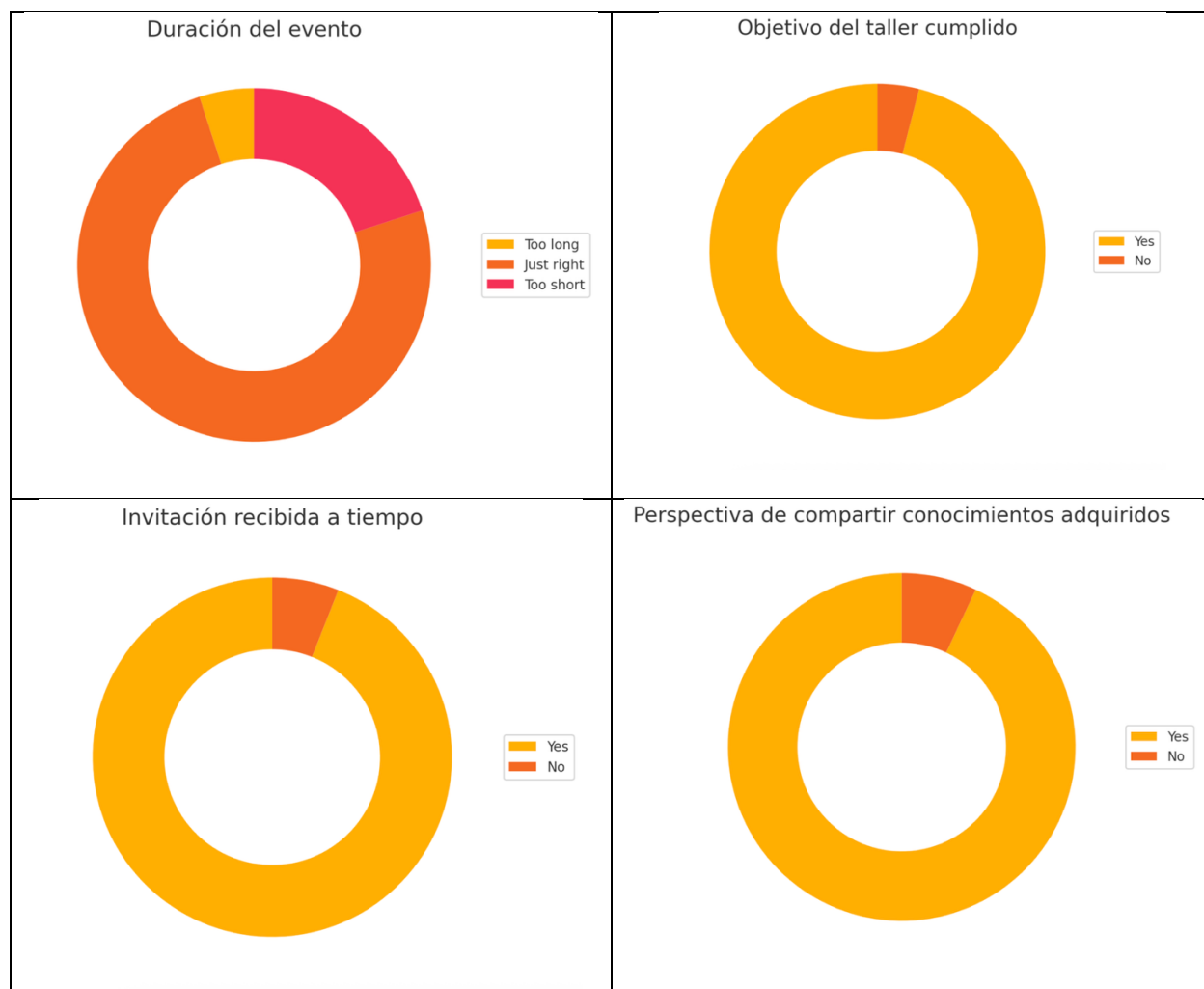
Key Workshop Achievements

- Presentation of concrete experiences from maritime administrations in energy efficiency and emissions reduction.
- Exchange of lessons learned on alternative fuels with internationally renowned classification societies.
- Demonstration of project tools and models in the "Decarbonization in Action" session, fostering applied learning.
- Collective reflection on gender equality as a structural component of energy transition.
- Strategic debate on climate finance and the role of the banking sector.
- Promotion of the creation of the Regional Industry Alliance in Latin America (RIALA) for regional technical cooperation.

In addition, a satisfaction survey was conducted, the results of which are shown below.



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Interpretation of the results

- 95% rated the workshop as Very Useful or Useful, confirming the relevance of the content.
- 96% received logistical information well in advance, and 96% stated that the objectives were met.
- 95% considered the agenda length adequate, although they requested more time for open questions and advanced simulations.
- 94% stated that they would share what they learned with their organization, which amplifies the workshop's impact.

In the closing session, the **MTCC-LA** thanked all the delegations for their participation, reaffirmed its role as the Regional Center for Maritime Technological Cooperation, and presented the lines of work that will be promoted in Phase II of the GMN, in accordance with national priorities and the IMO mandate. The collective commitment achieved lays the foundation for continued collaboration toward a cleaner, more efficient, and more resilient Colombian maritime sector.

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6. Challenges

During the preparation and execution of the Second National Workshop of the GMN Project Phase II, several challenges were identified that offer valuable lessons for organizing future national and regional events. These include:

- Multisectoral coordination prior to the event: Although broad representation of key maritime stakeholders was achieved, the need to strengthen early coordination and dissemination mechanisms among DIMAR (the Colombian Maritime Authority), shipping companies, academia, and financial institutions is recognized.
- Heterogeneity of participants' technical level: National differences in technology adoption and institutional capacities revealed knowledge gaps regarding decarbonization, reinforcing the importance of continuing to promote differentiated and specialized training.
- Logistics and coordination of simultaneous sessions: The hybrid (in-person-virtual) format required additional logistical and technical efforts to ensure a smooth and high-quality experience for both local and international attendees.
- Time management in panel discussions: In some sessions, the high level of interaction reduced the time available for questions and answers; it is suggested that the structure of thematic blocks be readjusted or the duration extended in future editions.
- Cross-cutting integration of key approaches: While topics such as gender equality and technological innovation were addressed in specific blocks, there is an opportunity to mainstream these themes across all presentations and discussions.

These challenges did not hinder the success of the event; on the contrary, they reflect the complexity and richness of a high-level gathering. Addressing them proactively will strengthen the organizational capacity of the **MTCC-LA** and its partners, reinforcing their leadership in promoting spaces for reflection and action toward a just energy transition in the maritime sector in Colombia.

7. Next Steps

This Second National Workshop of the GMN Project Phase II has established a clear and agreed-upon roadmap for advancing the decarbonization of the maritime sector in Colombia and for serving as a guide for the region. Among the agreed-upon lines of action are:

- ✓ Strengthening the technical capacity of DIMAR and key stakeholders.
- ✓ Development of high-impact national pilot projects.
- ✓ Formalization of and participation in the Regional Industry Alliance (RIALA).
- ✓ Creation of a national open data system on emissions and efficiency.
- ✓ Mainstreaming gender equality (WISTA, Red MAMLa).
- ✓ Mobilizing climate finance.

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Key Performance Indicators (KPIs) for the 2025 work plan

Description	agreed KPI	KPI achieved (2025)
Preparation for the 1st National Workshop (call for applications and logistics)	≥ 50 participants – Male: Female ratio ≥ 1:1	64 participants – 44% female attendance
Holding the 2nd National In-Person Workshop	2nd National In-Person Workshop organized	2nd National In-Person Workshop held
Delivery of the national workshop report	1 Report submitted to the IMO	1 Report submitted to the IMO
Integration of women in the 2nd National Workshop	1 session on female integration – 40% female participation in the national workshop	One women's integration session was held, with 44% female attendance.
Dissemination to stakeholders for the preparation of a roadmap for the establishment of RIALA	≥ 2 participating shipping companies	2 participating shipping companies interested in joining RIALA

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8. Annexes

8.1. National Workshop Presentations

To access the Workshop Presentations, click on the following link:

[Click here to view the presentations](#)

8.2. Event Photos



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[Click here to access photos and videos of the event](#)

8.3 Flyer of the Second National Workshop in Colombia

[Click here to access the Flyer](#)

8.4 Agenda of the Second National Workshop in Colombia

[Click here to access the Agenda](#)

8.5 Video Summary of the Second National Workshop in Colombia

[Click here to access the Video Summary](#)

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Acknowledgements

The successful completion of the Second National Workshop of the GMN Project Phase II in Colombia was made possible by the commitment and collaboration of numerous stakeholders who contributed their experience, time, and effort to achieve the proposed objectives. We express our sincere gratitude to:

- The General Maritime Directorate (DIMAR), for its institutional leadership and strategic vision in driving the transition to a more sustainable and resilient Colombian maritime sector.
- The Science and Technology Corporation for the Development of the Naval, Maritime, and River Industry (COTECMAR), for its technical support and for opening its facilities for the field visit, showcasing the country's progress in innovation and energy efficiency.
- The speakers, panelists, and moderators, for sharing their knowledge, experiences, and perspectives, which enriched each workshop session.
- National and international institutions, including representatives from the public, private, academic, and financial sectors, whose contributions strengthened the technical dialogue and consensus-building for a national decarbonization roadmap.
- To the IMO's GMN Phase II Project Coordination Unit, for their ongoing technical and logistical support that made this event in Colombia possible.
- To the **MTCC-LA** team and UMIP, for their guidance, planning, and operational support at every stage of the event.
- To all participants, whose active participation, contributions, and commitment demonstrated Colombia's interest in consolidating a greener, more efficient, and inclusive maritime transport sector.

This national workshop not only served as a platform for sharing best practices and decarbonization solutions for the Colombian maritime sector, but also strengthened a community committed to innovation, climate action, and sustainability.

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