



# FINAL CONFERENCE REPORT

## 2ND EU-CARIBBEAN GLOBAL GATEWAY CONFERENCE ON SARGASSUM

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*Turning the Tide: Sustainable Practices and Economic Opportunities for Sargassum in the Caribbean Basin*



**Final Conference Report**  
**Turning the Tide: Sustainable Practices and Economic Opportunities for**  
**Sargassum in the Caribbean Basin Conference**  
Radisson Grenada Beach Resort  
October 1 – 2, 2024

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## 1. Executive Summary

The 2<sup>nd</sup> EU-Caribbean Global Gateway Conference on Sargassum, organized by the EU, in collaboration with the OECS and the government of Grenada was a success, bringing together nearly 400 participants from across the Caribbean, Latin America and Europe, fostering a collaborative conversation on addressing the Sargassum issue. The conference which was themed ‘Turning the Tide: Sustainable Practices and Economic Opportunities for Sargassum in the Caribbean Basin,’ aimed to address the growing ecological, economic, and societal impacts of Sargassum blooms while exploring sustainable management and valorization strategies. This two-day event convened policymakers, financial experts, industry leaders, researchers, businesses, and other stakeholders to advance investment and foster partnerships that could drive innovative solutions and sustainable development in the region.

The primary objectives of the conference were to:

- Promote dialogue on the challenges and opportunities surrounding Sargassum in the Caribbean.
- Identify pathways for sustainable investment and economic valorization.
- Facilitate knowledge exchange and cooperation between public and private sectors.
- Strengthen regional governance structures to support Sargassum management.

Day 1 featured high-level discussions focusing on policy and strategic frameworks for effective Sargassum management. Key takeaways included:

- The critical need for cross-border cooperation to manage Sargassum influxes.
- Insights on the environmental and economic impacts of Sargassum, highlighting potential uses in industries such as biofuel production, construction, agriculture and biorefinery.
- The importance of aligning policy frameworks with local and regional needs for maximum efficacy.
- Emphasis on research-backed approaches for Sargassum valorization that balance ecological sustainability with economic gain.

Day 2 highlighted investment opportunities, financing mechanisms, and business townhalls:

- Presentations underscored various funding sources available for Sargassum-related projects, detailing the roles of public and private investors.
- Business townhalls demonstrated innovative commercial opportunities across sectors, including energy, agriculture, and biorefinery applications.
- Participants explored challenges in securing financing, regulatory barriers, and the need for coherent governance structures.
- Recommendations emphasized strengthening partnerships, enhancing access to capital, and developing supportive policy environments.

A ministerial forum was also held during Day 2, with the attendance of several high-level participants, where the Prime Minister of Grenada announced that Grenada would host a Sargassum Secretariat and Hub to share knowledge, and that forecasting capabilities for Sargassum would be a priority.

### Major Outcomes and Future Directions:

- A consensus emerged on prioritizing scalable, sustainable Sargassum solutions that benefit local communities and mitigate environmental impacts.
- The conference underscored the necessity for a robust regulatory framework that promotes innovation while ensuring environmental protection.
- Stronger collaboration between financial institutions, private enterprises, and governments was highlighted as crucial for scaling up investments.
- Moving forward, stakeholders were encouraged to maintain momentum by engaging in collaborative projects, sharing best practices, and advocating for research and development.

The conference concluded with actionable recommendations to enhance investment, bolster regional governance, and leverage technological advancements to turn Sargassum challenges into economic and environmental opportunities.

## 2. Introduction

The 2<sup>nd</sup> EU-Caribbean Global Gateway Conference on Sargassum, focused on the theme ‘Turning the tide: Sustainable practices and economic opportunities for Sargassum in the Caribbean basin’, served as a critical platform for advancing dialogue on harnessing economic and sustainable opportunities related to Sargassum management in the Caribbean region. This two-day event brought together a diverse array of participants, including policymakers, financial experts, industry leaders, researchers, businesses and other stakeholders with the shared objective of fostering investment and collaboration to address the multifaceted challenges posed by Sargassum blooms.

The continuous proliferation of Sargassum in the Caribbean has presented significant ecological, economic, and social challenges. While Sargassum poses threats to marine life, coastal ecosystems, and the livelihoods of coastal communities, it also offers untapped potential as a raw material for sustainable products. The conference aimed to bridge the gap between these challenges and opportunities by facilitating discussions and partnerships that focus on innovative strategies for the effective management, collection, and valorization of Sargassum. The forum highlighted practical solutions, investment avenues, and technological advancements that could transform this natural phenomenon into a resource contributing to regional growth and resilience.

The forum featured high-level contributions from key stakeholders across various sectors. Policymakers, such as H.E. Dr. Didacus Jules (OECS Director General), underscored the strategic imperatives for regional cooperation, while representatives from global financial institutions like the European Investment Bank (EIB) and the World Bank provided insights into available financial mechanisms. Industry experts, including business leaders from innovative startups and established companies, showcased practical applications and commercialization models for Sargassum. Researchers and environmental organizations added depth to the discussion by highlighting the latest scientific findings and the ecological implications of Sargassum blooms.

The Caribbean region, with its rich biodiversity and coastal economies, is at the forefront of Sargassum impact. Effective management and valorization are not only vital for mitigating the negative consequences on tourism, fisheries, and public health but also represent a unique opportunity to harness Sargassum for economic gain. By transforming this challenge into a source of biofuel, bioplastics, agricultural inputs, and other value-added products, Caribbean nations can build more sustainable economies and contribute to global environmental goals. The conference sought to advance a cohesive strategy that aligns public and private efforts to maximize the socio-economic and ecological benefits of Sargassum management.

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### 3. Day 1: Conference Proceedings

#### 3.1. Opening Ceremony and Welcome Remarks

The Opening Ceremony began with a prayer by Father Edward Mark and the national anthem by Sonika McKie, after which a series of cultural presentations, including spoken word artist Akino Romain, traditional dancing by Spices Dance Company and percussions performance by Kevin Bullen and Lion Pride Percussions. See below Photos 1-3 from the cultural presentations.

The Hon. Kerryne James, Minister for Climate Resilience, the Environment, and Renewable Energy of Grenada provided Welcome Remarks. Her address highlighted the urgency of the climate crisis and the pressing issue of Sargassum in the Caribbean, which has deeply impacted economies, ecosystems, and communities. Once beneficial in open ocean ecosystems, Sargassum now poses a significant threat as it overwhelms coral reefs, fishing areas, and beaches, directly affecting the tourism and fishing industries that sustain many Caribbean communities. Additionally, decaying Sargassum releases harmful gases, posing health risks for coastal residents.

The Minister emphasized that the crisis calls for swift action, urging stakeholders not to be paralyzed by the gravity of the situation but to transform this environmental hazard into a resource. Solutions could include repurposing Sargassum into biofuels, bioplastics, fertilizers, and even pharmaceuticals. The address acknowledged the invaluable role of global partnerships, such as those with the European Union and the OECS Commission, in pioneering these innovations.

Grenada has already made strides, stabilizing vulnerable coastlines and implementing climate-smart fishing practices while leveraging new technologies like drones for Sargassum monitoring. Yet, the Minister stressed that this is a collective challenge that requires global cooperation. The conference's theme, "Turning the Tide: Sustainable Practices and Economic Opportunities for Sargassum in the Caribbean Basin," underlines the goal of creating sustainable economies resilient to climate change. Linking this initiative to the Sustainable Development Goals (SDGs) – especially SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 17 (Partnerships) – the Minister calls on all participants to take bold and innovative actions.

In closing, the Minister expressed hope that this conference will be a turning point in the fight against Sargassum and the broader climate crisis, welcoming attendees on behalf of Grenada's Prime Minister for two days of transformative dialogue to shape the future of our blue planet. See below Photo 4 from Minister James' Welcome Remarks.



**Photos 1-4:** Cultural Presentations and Welcome Remarks during the Opening Ceremony

#### 3.2 Opening Remarks

Ambassador Malgorzata Wasilewska, Head of the European Union Delegation to Barbados, the Organization of the Eastern Caribbean (OECS) and CARICOM/CARIFORUM, expressed gratitude to Prime Minister Mitchell and the Government of Grenada for hosting the conference despite their ongoing recovery efforts from Hurricane Beryl, emphasizing the EU's commitment to supporting both immediate relief and sustainable reconstruction in the region. Addressing the

conference's broad scope, Ambassador Wasolewska underscored the need for actionable outcomes beyond mere discussion, with the visible enthusiasm among participants eager to collaborate. She highlighted the impacts of Sargassum on local tourism and communities, stressing the importance of protecting the region's beaches from overwhelming volumes of Sargassum. Ambassador Wasolewska acknowledged the wealth of existing research and ongoing innovations in Sargassum-related products, urging attendees to explore and amplify these initiatives. Notably, financial support from institutions like the European Investment Bank is available, but the challenge lies in creatively transforming Sargassum into a valuable economic resource that generates jobs, revitalizes tourism, and benefits local economies. The EU's strong presence is part of a broader commitment to collaboration with any partners willing to tackle this issue, with the Team Europe Global Gateway initiative aiming to turn insights into solutions that will protect livelihoods and ecosystems across the Caribbean Basin. The time for action, the Ambassador concluded, is now.

H.E. Dr. Didacus Jules, Director General of the OECS emphasized the urgency of action on Sargassum, opening with a call to move beyond endless conferences and discussions, uniting with shared challenge and opportunity. The crisis of Sargassum, which has severely impacted Caribbean coastal communities, public health, and government resources, is also an opportunity for economic and environmental transformation. Dr. Jules highlighted the need for a bold, three-pronged approach: increased investment in research to safely harness Sargassum's potential; a supportive policy environment to foster public-private partnerships and incentivize sustainable Sargassum-based industries; and enhanced regional cooperation, acknowledging the shared nature of this issue across the Caribbean. Stressing that "Sargassum knows no boundaries," the speaker urged for coordinated efforts on forecasting, collection, storage, and processing, underscoring fairness and collaboration. Dr. Jules highlighted the importance of the EU's Global Gateway initiative and encouraged private sector involvement, as local industries experiment with innovative Sargassum applications in fields like cosmetics, pharmaceuticals, energy, and agriculture. Addressing the vital role of local communities, especially those directly impacted, Dr. Jules called for solutions that promote inclusivity and resilience. Over the two-day conference, participants would examine diverse solutions, but the true measure of success would be in concrete actions and commitments. Dr. Jules closed by expressing deep gratitude to partners like the EU and the Government of Grenada, emphasizing that with collective action, the Caribbean can transform Sargassum from a crisis into a sustainable economic driver.

The Hon. Dickon Mitchell, Prime Minister of Grenada, expressed gratitude for the gathering of all stakeholders, recognizing the resilience demonstrated by Grenada in hosting the event despite the challenges posed by a recent severe drought and a Category 4 hurricane. Emphasizing Grenada's commitment to moving forward, the Prime Minister welcomed attendees to the "living lab" that is the Caribbean, highlighting how this region, especially in Grenada, serves as a frontline in addressing global climate challenges. The Caribbean, faced with escalating climate impacts, aims to contribute to global solutions rather than merely seeking aid. Grenada sees Sargassum influx not as a problem but as an opportunity to innovate, noting how Sargassum's unique properties might be valuable for uses such as construction and sea defenses. This perspective shift—viewing Sargassum as a resource rather than a burden—reflects the need for regional unity and creativity in response. This conference brings together diverse minds from over 30 countries, fostering a whole-of-society approach that includes scholars, practitioners, youth, and local communities. Prime Minister Mitchell called for disruptive, innovative ideas to address this issue sustainably and emphasized that strong partnerships, informed by science, will be essential. Encouraging collaboration without the limitations of traditional boundaries, he highlighted the need to overcome jurisdictional frictions in this regional approach. The speaker

closed by underscoring the importance of empowering affected communities and scaling up sustainable solutions to realize the full economic potential of the Caribbean's blue economy. Expressing optimism for the conference, Prime Minister Mitchell urged all participants to be ambassadors of progress beyond this gathering, turning discussions into actionable outcomes that would drive sustainable economic development for the Caribbean.



**Photos 5-7:** Opening Remarks by Ambassador Malgorzata Wasolewska, H.E. Dr. Didacus Jules and Hon. Prime Minister of Grenada Dickon Mitchell

### 3.3. Featured Address: Global Gateway Regional Response to Sargassum

Mr. Félix Fernández-Shaw, Director for Latin America, the Caribbean and Overseas Countries and Territories relations for the European Commission Directorate-General for International Partnerships (DG INTPA), gave the featured address, presenting on the Global Gateway Regional Response to Sargassum: Building Sustainable Sargassum Value Chain in the Caribbean. Mr. Fernández-Shaw emphasized the importance of collaborative action on Sargassum in the Caribbean, highlighting a pivotal moment when Prime Minister Gonzalez from Saint Vincent and the Grenadines called on the European Union for support. The speaker noted that, despite extensive conversations on the issue, progress had been slow due to fragmented efforts and the absence of a unified approach.

Mr. Fernández-Shaw acknowledged the remarkable gathering of stakeholders in Grenada for this conference, who represent a diverse group with a common goal: to shift from seeing Sargassum as a threat to viewing it as an opportunity. The European Union proposes a focus on developing a Sargassum value chain in the Caribbean, aimed at creating local jobs, fostering technology transfers, promoting a circular economy, and supporting public policy goals.

The need to “sell Sargassum” was underscored, not in the sense of simply exporting it but by building a robust value chain in the region. Drawing a parallel with the rum industry, Mr. Fernández-Shaw emphasized the potential to establish a sustainable Sargassum-based economy, involving collection, storage, and transformation to benefit local communities.

Mr. Fernández-Shaw called for an end to redundant studies and instead encouraged all participants to take practical steps, each within their part of the value chain, to make the Sargassum economy a reality. The European Union, its member states, and financial institutions pledge their support to facilitate this vision, signaling readiness to provide funding, technical assistance, and partnerships. The address concluded with a challenge to attendees to propose

actionable ideas and contribute meaningfully toward a sustainable and impactful Sargassum value chain.



**Photos 8-9:** Featured Address by Mr. Félix Fernández-Shaw

### 3.4. Panel Discussions and Key Sessions

#### 3.4.1. Setting the Scene: Where Are We Now?

In this session moderated by the Masters of Ceremony Neila Ettiene, participants examined the current status and future directions of Sargassum valorization. The goal was to assess the state of research, the enabling environment, and value chain development. Drawing on insights from recent conferences in the Dominican Republic and Mexico, the discussion provided a comprehensive overview of progress in addressing Sargassum-related issues and identified the most promising opportunities. This session established a shared knowledge base to support informed dialogue among participants, addressing challenges and exploring innovative strategies for sustainable Sargassum management through valorization.

The four key experts who led the discussion of this session included:

- Dr. Dr. Brigitta van Tussenbroek, Senior Researcher, Universidad Nacional Autónoma de México (UNAM), Mexico
- Mr. Ignacio Muñoz, CEO, The Seas We Love, Mexico
- Dr. Pierre Failler, Professor of Economics, Centre for Blue Governance, University of Portsmouth, United Kingdom
- Dr. Ulises Jáuregui Haza, Coordinator of the Doctoral Program in Environmental Sciences, INTEC, Dominican Republic

The panel discussion offered a thorough analysis of Sargassum valorization, highlighting recent developments and challenges in managing Sargassum blooms in the Caribbean. Drawing from recent conferences in the Dominican Republic and Mexico, panelists emphasized transforming Sargassum from an environmental burden to an economic asset. Key advancements discussed included:

1. **Bio-stimulants:** The development of bio-stimulants derived from Sargassum was highlighted as a promising avenue for enhancing agricultural productivity. Bio-stimulants can act as plant supplements to improve crop yields and resilience. However, the panel noted that establishing a market for these products poses significant challenges, including regulatory hurdles and the need for demonstration of efficacy in various agricultural contexts.
2. **Barrier technology for shoreline protection:** The implementation of barriers to prevent Sargassum from reaching shorelines has seen significant advancements over the years, and are now more effective at intercepting Sargassum before it reaches shorelines, reducing the environmental damage and economical burden associated with shoreline accumulation. The panelists discussed successful case studies where barrier technology has been deployed effectively, showcasing its potential to minimize the negative impacts on coastal ecosystems.
3. **Predictive modeling:** Improved predictive modeling techniques were identified as essential for accurately forecasting Sargassum blooms. These models provide critical

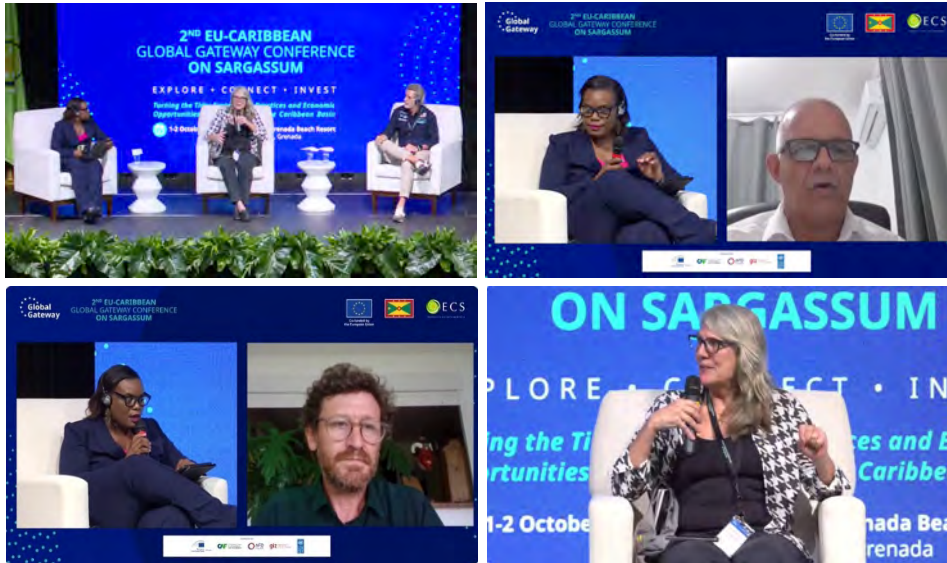
data on the probability of Sargassum reaching shorelines, enabling proactive management strategies, better preparedness and response. The panelists emphasized the need to integrate these models with collection and valorization strategies to optimize Sargassum management further.

4. **Public-private partnerships and policy development:** The panel highlighted the need for stronger collaboration between public and private sectors, advocating for policies to facilitate the growth of Sargassum-based industries. This includes governmental support for standardized collection processes and commercialization efforts to expand Sargassum's economic potential.
5. **International standards and regional collaboration:** Establishing coordinated standards and regular communication channels among Caribbean nations could help streamline Sargassum management across the wider Caribbean region. This approach would enable shared learning, prevent duplicative efforts, and foster a unified regional response.
6. **High-sea collection strategies:** Offshore collection of Sargassum before it reaches shorelines was identified as a key strategy. High-sea collection minimizes environmental and logistical challenges associated with shoreline accumulation, and predictive models can help determine which Sargassum patches should be collected.
7. **Involvement of local communities and education initiatives:** Small-scale community efforts, like composting and beach monitoring, as well as educational programs for youth, can increase public engagement and awareness. These initiatives help build local resilience and foster long-term stewardship of coastal ecosystems.

The panel also highlighted the health risks associated with decomposing Sargassum, which releases hydrogen sulfide gas. Efficient offshore collection methods, could mitigate these risks by intercepting Sargassum at sea. Public-private partnerships and government support were underscored as essential to scaling Sargassum industries, such as bio-gas, cosmetics, and fertilizers, while overcoming technological and regulatory hurdles.

Discussions addressed the importance of establishing international standards for Sargassum collection and valorization, proposing coordinated efforts to streamline regional innovations. Transport and storage challenges due to Sargassum's high water content were identified, with recommendations for efficient collection and innovative storage solutions. The panel advocated for involving local communities in small-scale Sargassum projects, enhancing public engagement and environmental stewardship.

Concluding, the panel underscored the need for adaptive governance, investment in research, and balanced strategies that align ecological benefits with economic opportunities. By fostering private sector engagement and leveraging regional collaboration, the Caribbean could transform the Sargassum influx into a sustainable economic opportunity.



**Photos 10-13:** Panel discussion: Setting the Scene: Where are we Now?

### 3.4.2. Unlocking the Potential: Overcoming Barriers in the Sargassum Value Chain

This panel, moderated by Professor Clive Landis, Pro Vice Chancellor and Principal, Cave Hill Campus, University of the West Indies, explored the challenges and potential of creating sustainable Sargassum value chains, aiming to turn this resource from an environmental issue into a valuable industry asset. Key barriers include Sargassum’s complex and variable chemical composition, heavy metal contamination (notably inorganic arsenic), environmental hazards from leachate and gas emissions, and the unpredictability of influxes along coastlines.

The five key experts who led the discussion of this session included:

- Dr. Pierre-Yves Pascal, Senior Lecturer, Université des Antilles, Guadeloupe, France
- Dr. Damien Devault, Senior Lecturer, University of Mayotte, Mayotte, France
- Dr. Maud Benoit, Services Manager and Partnership Developer, Algaia, France
- Dr. Kristie Alleyne, Consultant, Barbados
- Dr. Gael Many, GEO Blue Planet European Coordinator, Mercator Ocean International Blue Oceans, France

To address these barriers, experts highlighted advanced processing technologies—such as citric acid treatments and bio-refining—to reduce contaminants and create high-value products, though scalability remains a challenge. Additionally, containment technologies like floating barriers help mitigate coastal contamination risks, while advancing real-time monitoring and seasonal forecasting provide insight to better manage influxes. Emphasizing the need for increased R&D investment, the panel underscored that dedicated funding is crucial to developing scalable, cost-effective solutions and building robust industry applications. Ultimately, collaboration and innovation within the Sargassum sector could establish it as a sustainable resource for various industries, advancing environmental objectives while bolstering local economies.

Main challenges discussed by panelists:

1. **Arsenic contamination:** The bioaccumulation of arsenic in Sargassum due to its similarity to phosphate poses significant health risks, particularly the presence of inorganic arsenic, which is the more toxic form.
2. **Environmental impact:** Sargassum releases arsenic rapidly upon reaching coastal environments, leading to contamination risks that affect local ecosystems, public health, and tourism.

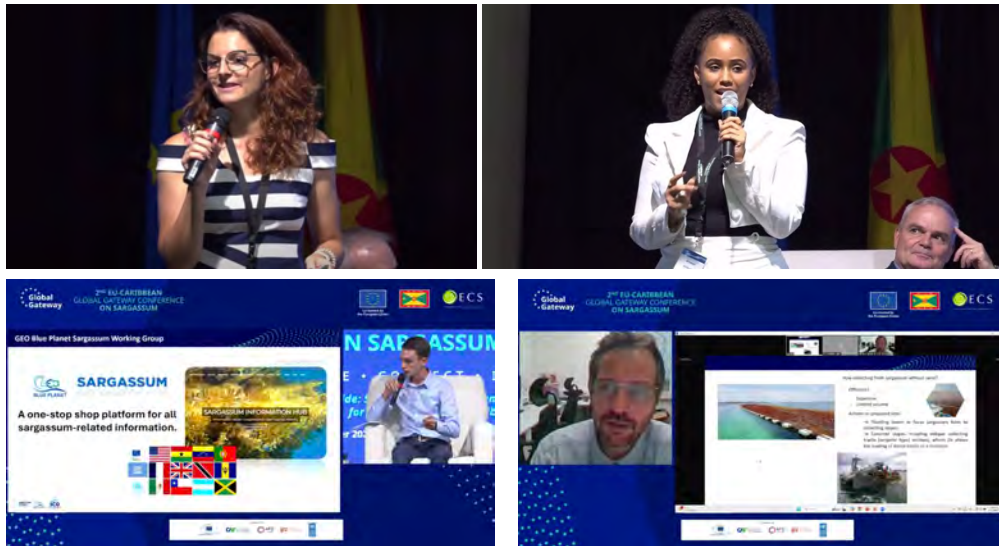
3. **Health risks for workers:** The handling of Sargassum, especially in coastal areas, presents health risks from toxic gases released when it decomposes, including hydrogen sulfide and ammonia, and other contaminants, necessitating better safety protocols.
4. **Scalability issues:** There is a critical need for sustainable processing methods capable of handling the fluctuating volumes of Sargassum, which can lead to stockpiling challenges.
5. **Research gaps:** There is a need for more collaboration and resources to bridge the gaps in venture capital and partnerships between the public and private sectors.

Opportunities discussed by panelists:

1. **Innovative processing techniques:** Methods such as dilution, rinsing, citric acid treatments, and fermentation show promise for reducing arsenic levels in Sargassum products.
2. **Collaborative initiatives:** Partnerships between wide range of organizations like Mercator Ocean International, Algaia, CarbonWave, The Seas We Love, etc. and various academic institutions are paving the way for better data sharing, forecasting, and research into sustainable Sargassum management and use.
3. **Market development:** The potential to transform Sargassum into valuable products (e.g., biostimulants, biomaterials, etc.) offers economic opportunities, especially if biomass supply can be aligned with market demand.
4. **Centralized data access:** Initiatives like the "one-stop shop" for Sargassum data can enhance accessibility for stakeholders and improve research coordination. Further support and enhancement of the Sargassum Information Hub is essential.
5. **Development finance interest:** Engagement from development finance institutions indicates a growing interest in funding scalable Sargassum initiatives that align with environmental and economic priorities.

The panelists stressed the importance of addressing heavy metal contamination, particularly arsenic, through rigorous management practices and innovative processing strategies to ensure safety for consumers and the environment. They highlighted the necessity of implementing containment strategies, such as offshore barriers, to mitigate the environmental impacts of Sargassum. Moreover, they underscored the need for scalable, cost-effective solutions to handle the variability in Sargassum influxes and for developing collaborative frameworks that engage all stakeholders—researchers, policymakers, and industry representatives—to tackle these challenges effectively. Enhanced safety protocols for workers handling Sargassum were also deemed critical in establishing a sustainable and responsible Sargassum industry.





**Photos 14-19:** Panel discussion: Unlocking the Potential: Overcoming Barriers in the Sargassum Value Chain

### 3.4.3. Policies, Strategies, and Action Plans at National and Local Levels

In this session, moderated by Mr. Edison Rijna, Cabinet Special Envoy for Bonaire, St Eustatius and Saba for EU, UN and Trade and Economic development in the LAC region, key policymakers from the Caribbean discussed national and local strategies for addressing the challenges posed by Sargassum influxes. Emphasis was placed on collaboration, community engagement, and transformative policies aimed at turning Sargassum from a burden into an asset.

The five key experts who led the discussion of this session included:

- Mr. Rodrigo Morales Castillo, representative for the Secretary of Environment and Natural Resources of Mexico
- Mrs. Stephanie Linton-Shields, Manager, Local Area Planning Branch, Spatial Planning Division, Jamaica National Environment and Planning Agency, Jamaica
- Ms. Judith Raming, Manager, Bonaire National Marine Park, STINAPA, Bonaire
- Dr Shelly-Ann Cox, Chief Fisheries Officer, Department of Fisheries, Barbados
- Hon. Jose Ramon Reyes, Vice Minister of marine resources, Ministry of Environment and Natural Resources, Dominican Republic

#### Key Country Approaches:

**Mexico:** Under a new environmentally focused agenda, Mexico is exploring Sargassum valorization through public-private partnerships, creating bio-based products, such as bioenergy, bioplastics, biofertilizers, and cosmetics, which could replace imported goods, and improving monitoring and collection. Mexico’s partnership with the EU, highlighted in a recent forum in Cancun, emphasized steps for creating best practices, improving monitoring, and refining collection techniques. The government is also focusing on regulatory frameworks to attract investment and support industry growth, involving development banks and private investors.

**Jamaica:** Faced with substantial impacts on coastal communities and economies, Jamaica engaged local communities, tourism organizations, NGOs, and government agencies to raise awareness and draft a national response strategy. Jamaica’s strategy includes shoreline cleanup, removal guidelines, community-led initiatives, and technology for Sargassum location alerts. Moving forward, a multi-agency task force will focus on engineering solutions, safe use of

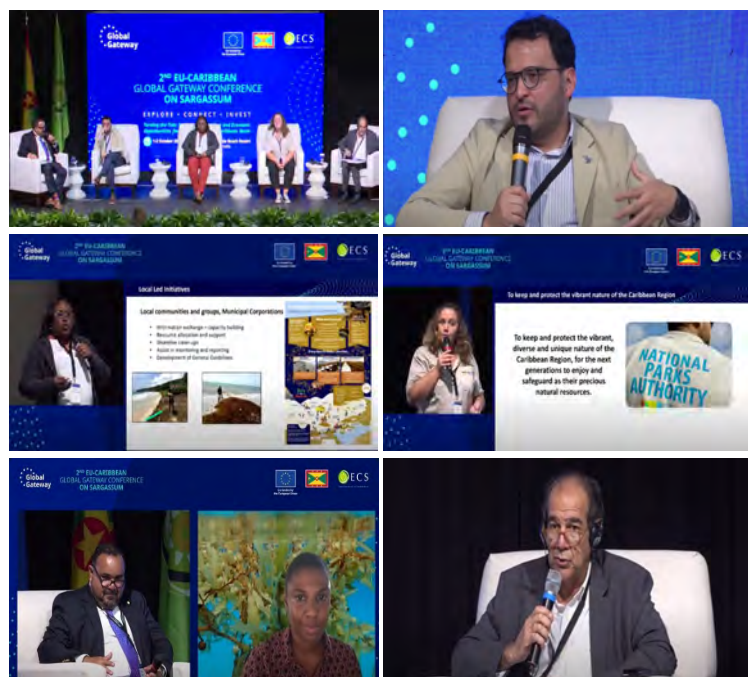
Sargassum in agriculture, continued public awareness, research into heavy metal contamination, and support for community-led Sargassum management and business development.

**Bonaire:** STINAPA, Bonaire’s conservation organization, leads Sargassum cleanup with a focus on environmental protection. With an increasing yearly influx, Bonaire has taken measures to enhance its Sargassum response. In 2021, STINAPA signed a Sargassum response plan, funded by Dutch and local governments, allowing them to improve clean-up operations by moving from manual to mechanized efforts. As a result, Sargassum removal efficiency rose from 5% in 2022 to 80% in 2024. Bonaire is also collaborating with Bahamian universities to explore potential uses for Sargassum waste, though island-based solutions may be limited. Looking forward, Bonaire aims to shift from reactive to preventive strategies, using monitoring tools to predict Sargassum arrival and developing frameworks for safe, timely harvesting and disposal methods.

**Dominican Republic:** With significant economic and environmental impacts from Sargassum and high cleanup costs, the Dominican Republic created an inter-institutional cabinet dedicated to manage Sargassum and allocated funds for research. Local communities and private companies have successfully reduced Sargassum impact through floating barriers and specialized cleaning teams, which also provide economic benefits. However, sustainable financing remains a challenge, as does minimizing environmental impacts from cleanup efforts. The Dominican Republic advocates for a circular economy approach, aiming to repurpose Sargassum into valuable resources. Further research, international partnerships, and a focus on sustainable practices are seen as essential for a resilient, long-term response.

**Barbados:** Barbados is developing a Sargassum Management Act, including valorization strategies. Barbados collaborates with local stakeholders and emphasizes economic benefits in line with blue economy principles. Hurricane Beryl severely damaged infrastructure, compounding challenges as Sargassum influxes coincided with ongoing cleanup. Barbados recently launched a vehicle powered by Sargassum-based compressed natural gas—a partnership between local rum distilleries and sustainable energy initiatives. Barbados is focused on long-term strategies, focused on adaptive management, disaster response, and strategic frameworks that involve private and governmental sectors.

This session underscored the importance of research-backed, community-driven strategies and regional partnerships to sustainably manage Sargassum influxes, balancing environmental and economic goals across the Caribbean.



**Photos 20-25:** Panel discussion: Policies, Strategies and Action Plans at National and Local Levels

#### 3.4.4. Policies, Strategies, and Action Plans at Regional Level

The panel discussion, moderated by Mr. Ignacio Ybanez, Special Envoy on Small Island Developing States from the European External Action Service, focused on regional actions to address the challenges posed by Sargassum influxes, highlighting the regulatory landscape and the need for cohesive policy frameworks. Experts and policymakers shared their experiences and insights into strategies that had been implemented or considered at a regional level. The emphasis was on legislative measures necessary to support investments and innovations in Sargassum management and value chain development. The discussion also explored the potential role of international agreements, such as the Cartagena Convention and other regional decisions, in enhancing coordination and improving management efforts for Sargassum in the Caribbean. The European Union's commitment to supporting Small Island Developing States (SIDS) in finding sustainable solutions was also noted.

The five key experts who led the discussion of this session included:

- Mr. Yoeri de Vries, Sr. Policy Officer, NL Ministry of Agriculture, Fisheries, Food Quality and Nature; Expert on Sargassum within the Cartagena Convention, The Netherlands
- Hon. Sylvie Gustave dit Duflo, Vice-President of the Departmental Council for Guadeloupe
- Mr. Milton Haughton, Executive Director, Caribbean Fisheries Mechanism Secretariat, Belize
- Mr. Oscar Quesada, Advisor of the Executive Directorate of the General Secretariat, SICA, El Salvador
- Dr Jaime Ortega, Copernicus LAC-Chile, Chile
- H.E. Francis Etienne, Ambassador of France to Saint Lucia

The Cartagena Convention, highlighted by Mr. de Vries, is a crucial UNEP regional framework aimed at protecting the marine environment in the Gulf of Mexico, the Caribbean Sea, and the northern Brazil shelf. It operates through three protocols: the Oil Spills Protocol, the Land-Based Sources of Pollution (LBS) Protocol, and the Specially Protected Areas and Wildlife (SPAW) Protocol. Notable milestones include the 2019 COP, which called for enhanced regional collaboration on Sargassum management. This resulted in initiatives like the International Sargassum Conference in Guadeloupe and the signing of the Caribbean Cooperation Programme (SargCoop). A working group involving all contracting parties was formed to assess regional needs, focusing on harmonized policies, improved monitoring, and public awareness. Collaboration with the Abidjan Convention facilitated joint Atlantic-wide webinars to elevate Sargassum management as a transcontinental issue.

Hon. Sylvie Gustave dit Duflo detailed Guadeloupe's approach to Sargassum, aligned with France's national management strategies. The first national plan (2018–2022) allocated €24 million, followed by a second plan (2022–2025) with €37 million for collection, processing, and valorization efforts. Guadeloupe's local strategy supports municipalities in Sargassum collection and aids affected economic sectors like tourism, fishing, and nautical activities. The region also initiated a public service program for Sargassum management and participated in the Interreg SARG'COOP program (2019–2024) to strengthen regional collaboration. This program included air quality monitoring, deploying sensors to measure hydrogen sulfide and ammonia, and hosting research calls and exhibitions to promote innovative technologies. Looking ahead, SARG'COOP 2 (2025) will expand these efforts, focusing on improved collection methods, recovery systems, and stronger partnerships.

Mr. Milton Houghton of CRFM underscored the transboundary nature of Sargassum blooms, which have surged since 2011 due to climate change and pollution, impacting marine ecosystems, fisheries, and tourism across the Caribbean. He emphasized CRFM's work within CARICOM to develop a regional management protocol, model legislation, and partnerships for

enhanced monitoring and policy development. Innovation, research, community engagement, and comprehensive policies integrating public health, equity, and sustainable Sargassum use were identified as key priorities.

Mr. Oscar Quesada elaborated on SICA's role in supporting its eight member states, including Belize and the Dominican Republic. Sargassum's impacts vary across these nations, but SICA fosters regional knowledge sharing through impact studies funded by the European Union, mapping best practices, and proposing a regional roadmap approved by heads of state. Intersectoral collaboration across SICA's ministerial councils in environment, tourism, fisheries, and agriculture aims to create a coordinated response to Sargassum challenges.

Dr. Jaime Ortega introduced the Copernicus satellite program, one of the world's largest Earth observation initiative. It provides free access to high-resolution multispectral and radar data for monitoring climate and ocean conditions. To enhance accessibility in Latin America, two regional centers in Panama and Chile facilitate faster data access and analysis. Copernicus tools like the Marine Service and Land Monitoring Service support environmental management, urban planning, and land use monitoring. Dr. Ortega highlighted advancements in using artificial intelligence (AI) for detecting and forecasting Sargassum blooms via satellite imagery. He stressed the importance of calibrating satellite data with on-the-ground measurements and fostering collaboration to refine these technologies. AI-powered tools are increasingly integrated into Copernicus systems, enabling more efficient workflows and improving forecasting accuracy. Dr. Jaime Ortega discussed how satellites like the Sentinel series and artificial intelligence (AI) are used to detect and forecast Sargassum blooms by identifying unique spectral signatures. He emphasized that advancing these technologies requires collaboration, community engagement, and data sharing to fully leverage tools like the Copernicus program for environmental monitoring.

Ambassador François Etienne highlighted the need for political commitment and international cooperation to address Sargassum challenges effectively. He stressed the importance of protecting offshore Sargassum as a vital marine habitat while focusing on managing its impacts when it washes ashore. Effective strategies require both physical management and policy frameworks within Exclusive Economic Zones (EEZs). Amb. Francois Etienne outlined France's six-phase strategy for Sargassum management:

1. First national plan (2018–2022): Focused on collection but faced challenges in storage and valorization.
2. SARG'COOP program (2019): Strengthened regional collaboration and improved satellite detection for forecasting.
3. Second national plan (2022–2025): €37 million allocated, including €6 million for research into Sargassum valorization.
4. Global initiative (2023): Launched at COP 28, uniting countries and organizations to combat Sargassum.
5. Regional cooperation (2024): New initiatives in Mexico and the Dominican Republic.
6. Future project (2025): €8 million investment by the French Development Agency to expand management efforts.

Amb. Etienne emphasized research on Sargassum valorization, including decontamination, pyrolysis for gas and fertilizer production, and energy generation. He advocated for creating a Caribbean panel, similar to the IPCC, to foster regional cooperation, data sharing, and coordinated strategies addressing the root causes of Sargassum blooms, such as climate change and eutrophication. Political will, international collaboration, and a legal framework (e.g., the Cartagena Convention) are essential to achieving sustainable solutions.



**Photos 26-33:** Panel discussion: Policies, Strategies and Action Plans at

### 3.4.5. Unlocking Sargassum’s Potential: Forecasting, Collection, and Storage

This panel, moderated by Dr. Stephen Nimrod, Assistant Professor of Marine Biology/Ecology at Sr. George’s University, convenes industry experts and environmental scientists to delve into the essential processes that underpin the Sargassum value chain. Forecasting, collection, and storage are key to transforming Sargassum from an environmental challenge into a sustainable resource. Panelists shared insights into cutting-edge forecasting tools that enable timely and accurate predictions, innovative collection techniques that balance efficiency with environmental impact, and effective storage solutions that maintain the quality and usability of harvested seaweed. Additionally, the discussion addressed regulatory and policy considerations critical to implementing these solutions at both national and regional levels. Through this collaborative dialogue, the panel aimed to foster partnerships among businesses, governments, and research institutions to drive user-centric and sustainable approaches to Sargassum utilization.

The five key experts who led the discussion of this session included:

- Dr. Marc Lucas, Project Manager, CLS, France
- Dr. Karl Payne, CERMES, University of the West Indies, Barbados
- Mr. Andrés Bisonó, CEO, SOS Carbon/ SOS Biotech, Dominican Republic
- Mr. Serafí Mercadé, Managing Director, Beach Trotters, Spain
- Ms. Sadie-Ann Sisnett, Programme Specialist, UNDP, Barbados

Dr. Marc Lucas from Collecte, Localisation, Satellites (CLS) outlined the organization's efforts in Sargassum monitoring and forecasting through satellite technology. CLS developed SAMTool, a satellite tracking and short-term forecasting tool for Sargassum, which became operational for six users in 2020-2021 and expanded to 20 users by 2022-2024. Additional value-added services, including CMEMS Evolution SODA and seasonal forecasting tools, were developed during this time. Supported by organizations like CNES, ESA, METEO France, and the EU's Horizon 2020 program, CLS provides daily Sargassum detection, drift forecasts, early warnings, and user-friendly web platforms using eight satellite sensors with forecasts ranging from five days to five months. For 2024-2025, CLS is focusing on advanced satellite detection products and real-time detection/forecasting capabilities. Dr. Lucas emphasized the importance of integrating AI-assisted forecasting with community involvement through mobile apps for localized reporting and better management of Sargassum influxes. He highlighted that determining the volume of Sargassum to be harvested is crucial for building a successful value chain. SAMTool plays a central role in enabling effective Sargassum management across the Caribbean.

Dr. Karl Payne, from CERMES-UWI, presented on the evolution of forecasting products to predict Sargassum blooms, models for growth and mortality, and innovative solutions like AI-guided harvesting. Growth and mortality models are crucial for understanding the life cycle of Sargassum and managing its effects and innovative solutions, such as AI-guided harvesting, may offer practical approaches to mitigate the challenges posed by Sargassum. Dr. Payne emphasized that collaboration among researchers and stakeholders is essential to effectively address the Sargassum challenge.

Mr. Andrés Bisonó from SOS Carbon highlighted collaborative efforts to manage Sargassum effectively, focusing on mitigating its environmental and economic impacts through efficient supply chain management and the creation of formal jobs. SOS Carbon operates a continuous collection program that maximizes efficiency by involving fishermen and community members in year-round activities, ensuring job stability beyond the Sargassum season. Their Littoral Collection Module (LCM) can collect up to 10 tons of fresh seaweed per hour per boat, equating to 150,000 pounds per workday per LCM. This system is designed to be low-capital, high-capacity, cost-effective, and environmentally friendly, with sand-free collection and minimal visual pollution. SOS Carbon's primary objective is to transform and valorize Sargassum into sustainable products using blue biotechnology, promoting both environmental and economic sustainability. The organization has implemented its systems across the Dominican Republic, Mexico, Puerto Rico, and Antigua and Barbuda. Additionally, SOS Carbon collaborates with partners like Origin by Ocean to explore innovative uses for Sargassum and has begun exporting full containers of the collected seaweed to Finland for bioprocessing. Their efforts showcase a scalable and sustainable approach to addressing the challenges posed by Sargassum blooms.

Mr. Serafí Mercadé from Beach Trotters showcased practical solutions for Sargassum collection, containment, and forecasting. Their innovations include:

- Scarbat: A highly efficient beach raker that collects Sargassum without disturbing sand.
- Mursargaz: A durable and efficient barrier designed to stop and divert Sargassum, featuring a 40cm freeboard and reinforced material.
- Captor and Syrennis: Advanced harvesting boats designed to work with contention barriers, preventing Sargassum from spreading. These boats use tow vessels to transport Sargassum bags to unloading points, ensuring uninterrupted harvesting.
- Algatros: A large cargo vessel equipped with extendable arms that funnel Sargassum and debris into collection ramps, allowing for large-scale collection at sea.

Beach Trotters also developed the M5D Airfox Drone, a solar-powered drone with 10-hour autonomy and an 18-nautical-mile range. It provides Sargassum drift detection and forecasting, offering a practical and accessible solution for hotels and public sector organizations to

anticipate Sargassum influxes without relying on satellite data. This system will soon be launched as part of an integrated solution with their harvesting equipment.

Ms. Sadie-Ann Sisnett discussed a UNDP-led initiative to strengthen Sargassum management in five Caribbean nations—Barbados, St. Kitts and Nevis, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago. Funded by the Government of Japan with a USD 12.3 million budget, the project provides specialized equipment, including conveyor harvesters, ATVs with storage carts, tractors with grapple attachments, mechanical beach rakes, conveyors, personal protective equipment, and dump trucks. The initiative also involves establishing site-specific management plans, promoting sustainable storage solutions, and improving infrastructure for collected Sargassum. It aims to enhance marine conservation, support integrated coastal management, and reduce adverse impacts on key sectors like fisheries and tourism. The project incorporates lessons from successful practices in Mexico to guide its implementation.



**Photos 34-39:** Panel discussion: Unlocking Sargassum’s Potential: Forecasting, Collection, and Storage

### 3.4.6. Economic Impact and Business Models for Sargassum Valorization

Moderated by Dr. Stacy Richards-Kennedy from the Development Bank of Latin America and the Caribbean (CAF), this panel explored the economics and business models surrounding the utilization of Sargassum. The session focused on successful case studies and emerging opportunities in the sector, emphasizing how various enterprises have effectively leveraged Sargassum as a resource. The panel also outlined the financial and economic benefits these ventures have brought to the industry. By analyzing these business models, the discussion aimed to uncover common challenges and cross-cutting issues that could influence the successful valorization of Sargassum.

The four key experts who led the discussion of this session included:

- Mr. Jake Kheel, Vice President, Fundación Grupo Punta Cana, Dominican Republic
- Dr. Angus Friday, Director, SarGas, Grenada

- Dr. Mari Granström, CEO, Origin by Ocean, Finland
- Prof. Walter Stinner, German Biomass Research Center – DBFZ, Germany

Mr. Jake Kheel from Fundación Grupo Punta Cana highlighted initiatives to address the Sargassum crisis in the Caribbean, particularly the Punta Cana Sargassum Solutions Accelerator (PASS), which focuses on scalable solutions to protect tourism-dependent economies. Grupo Punta Cana's strategy includes:

- Offshore interception using floating barriers, with over a decade of testing different models.
- At-sea collection through barges and specialized vessels.
- Onshore collection using equipment and trained operators to minimize sand erosion.
- Sargassum repurposing into products like fertilizers, compost, biogas, biomaterials, and cosmetics, reducing landfill use.

The PASS initiative is being formalized and plans to invite promising innovators—companies, entrepreneurs, and academics—to test and develop solutions in Punta Cana. Collaboration across the hotel industry and Caribbean stakeholders is emphasized to create replicable, region-wide approaches. Grupo Punta Cana is also establishing a Sargassum Solutions Fund to finance innovations, support supply chains, and accelerate the implementation of transformative solutions. The initiative aims to protect ecosystems, communities, and economies, underscoring the urgency of immediate action.

Dr. Angus Friday from SarGas outlined the potential for sustainable practices that can contribute to economic growth while addressing environmental challenges. Sargas Ltd is a European-Caribbean collaborative company, composed of five members. The company is actively seeking strategic and investment partnerships to advance processing initiatives, such as biofuel production, fertilizers, bioplastics, nutraceuticals and pharmaceuticals and carbon sequestration. To facilitate these efforts, the company is leveraging crowdfunding platforms like [Azuros.ai](https://www.azuros.ai) to attract equity investment. By doing so, it aims to expand its reach and enhance the sustainable transformation of Sargassum into high-value biomaterials, contributing to climate change mitigation and environmental protection. Dr. Friday delved into further details about their biofuel production project, where SarGas is seeking IPP status. The discussions emphasized collaboration among European and Caribbean stakeholders to create a robust blue/green economy.

Dr. Mari Granström from Origin by Ocean began her presentation by mentioning the historical significance of oil discovery since 800 BC, which still drives our entire economy. What is not usually mentioned is that seaweed was also discovered at the same time around 800 BC. Today, we are faced with the issue of excessive oil-based products, such as plastics, and seaweed in oceans. What solutions can we focus on? The company Origin by Ocean aims to leverage this situation by transforming the surplus of seaweed into valuable alternatives for oil-based products. The initiative focuses on creating a wide range of compounds, such as emulsifiers, thickeners, and anti-aging agents, pigments, etc. that are typically derived from oil, thereby presenting a sustainable opportunity to reduce dependency on oil through innovative seaweed-based solutions. An audience member raised concerns about the presence of heavy metals in products such as cosmetics or pharmaceuticals. Dr. Granström responded by explaining that while this could be an issue for certain extracts, Origin by Ocean specifically works with molecules that do not contain heavy metals.

Professor Walter Stinner from the German Biomass Research Center (DBFZ) discussed sustainable practices and economic opportunities for Sargassum, focusing on bioeconomic applications such as biodegradable plastics, fertilizers, biogas, and cosmetics. He highlighted the challenges of underdeveloped supply chains, limited resources, high harvesting costs, and concerns over heavy metal contamination. He emphasized the need for collaboration and the establishment of viable value chains to harness Sargassum's potential. Prof. Stinner advocated

integrating Sargassum with organic waste management systems, particularly for biogas and biofertilizer production, as a mature and practical solution. He proposed combining Sargassum with other organic residues to address energy security challenges on islands and efficiently manage large volumes of material through anaerobic digestion.

During the Q&A session, Dr. Yessica Castro suggested using byproducts from high-value Sargassum products for electricity generation via anaerobic digestion. Dr. Granström from Origin by Ocean offered waste samples for further analysis, supporting collaborative efforts to optimize Sargassum use. Prof. Stinner emphasized that focusing solely on high-value products is insufficient and stressed the importance of scalable, high-volume transformation methods for Sargassum management.



**Photos 40-44:** Panel discussion: Economic impact and business models for Sargassum valorization

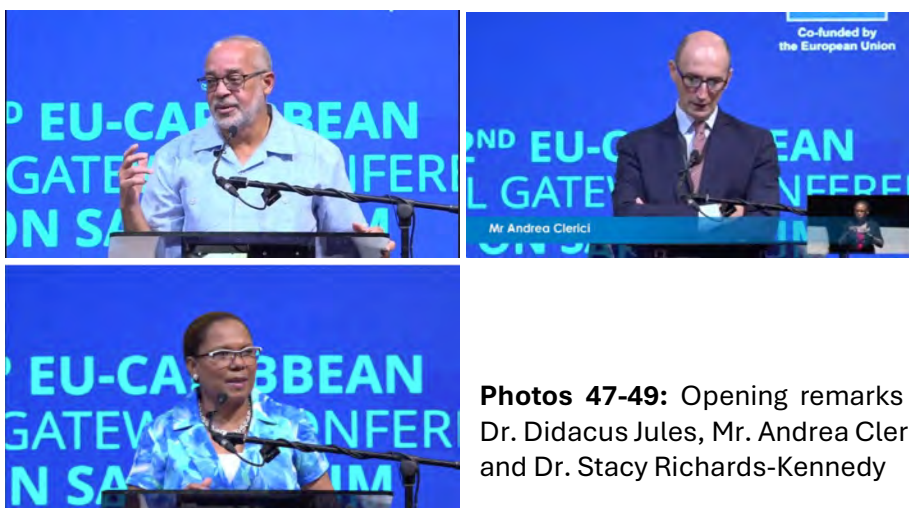
## 4. Day 2: Investment Forum

### 4.1. Opening of the Investment Forum

Day 2 of the Sargassum Conference began with opening remarks by H.E. Dr. Didacus Jules, Director General of the OECS, who emphasized the need for collaborative action to tackle the Sargassum issue, highlighting that governments cannot address it alone. The private sector's involvement is crucial, but solutions must be economically viable for businesses. Dr. Jules urged stakeholders to view Sargassum not just as an environmental challenge but as an economic opportunity with applications in biofuels, agriculture, pharmaceuticals, bioplastics, and construction. He called for public-private partnerships, supported by government incentives like tax breaks and infrastructure investment, to foster innovation. He stressed the importance of research and development, involving universities to bridge the gap between ideas and practical solutions. Financing opportunities, such as those from CAF Bank, were noted, with a call for governments to establish favorable policy conditions to attract investment. Dr. Jules reaffirmed the OECS governments' commitment to enabling investment and supporting Sargassum solutions.

Mr. Andrea Clerici, Director of Corporate Finance at the European Investment Bank (EIB), highlighted the importance of addressing the Sargassum challenge in the Caribbean. The EIB, committed to climate and environmental sustainability, has allocated around 60% of its global financing to this sector and has invested over €2 billion in the Caribbean since 1978, supporting public and private projects with grants and technical assistance. The bank is exploring opportunities in the seaweed industry, informed by a study from the Global Seaweed Coalition, and sees potential for Sargassum commercialization in sectors like bioplastics, biofuels, and construction materials. Mr. Clerici stressed the importance of collaboration between governments, development banks, private sectors, research institutions, and local communities to create a Sargassum value chain that can mitigate environmental impacts, drive economic diversification, create sustainable jobs, and support climate mitigation. He cited EIB's support for innovative companies, which transform Sargassum into valuable materials, emphasizing that partnerships are crucial for developing sustainable solutions.

Dr. Stacy Richards-Kennedy, Regional Manager for the Caribbean at CAF, emphasized the need for collaborative action among governments, industries, financial institutions, and academia to address the socio-economic and environmental challenges posed by Sargassum in the Caribbean. The influx of Sargassum impacts tourism, fisheries, and public health, making it imperative to transition from discussions to tangible, funded actions that convert this crisis into sustainable growth opportunities. CAF is establishing an \$11 million regional governance framework for the integrated management of Sargassum to reduce its effects on marine ecosystems, tourism, and fisheries. Committed to supporting the blue economy and preserving marine ecosystems, CAF aligns its operations with the Paris Agreement and has pledged significant funding for regional initiatives. Dr. Richards-Kennedy called for regional collaboration to create stable Sargassum supply chains, develop high-value products, and implement sustainable solutions. She urged stakeholders to act immediately, highlighting CAF's role in providing innovative financing and partnerships to support Caribbean nations in addressing Sargassum-related challenges.



**Photos 47-49:** Opening remarks by Dr. Didacus Jules, Mr. Andrea Clerici, and Dr. Stacy Richards-Kennedy

#### 4.2. Financing Investment Perspective

Moderated by Mr. Andrea Clerici, this panel explored the the tools available for financing Sargassum initiatives and businesses, with representatives from both public and private financing institutions providing insights. The objective was to highlight the opportunities and challenges associated with funding Sargassum projects, focusing on both mitigation activities and the valorization of Sargassum. The session detailed current funding sources and discussed potential strategies to enhance public and private investment in Sargassum initiatives.

The five key experts who led the discussion of this session included:

- Mr. Alberto Romay, Principal Executive, Venture Capital and Impact Investing Division, CAF
- Mr. Dale Galvin, Managing Director, Global Fund for Coral Reefs
- Ms. Kristina Eisele, Representative for the Southern and Eastern Caribbean, EIB
- Mr. Benoît Bosquet, Director for Sustainable Development for the Latin America and Caribbean Region, World Bank
- Mr. Rodrigo Navas, Director IDB Invest, Manufacturing

Mr. Alberto Romay outlined CAF's role in promoting private sector development by offering financial products like corporate loans, guarantees, equity investments, and advisory services. He identified key challenges in financing Sargassum initiatives, including risk aversion, competing government budgets, the need for advanced technology, and high transactional costs. Mr. Romay emphasized that solid business plans and financial projections are essential for managing risks, and projects must align with government regulations and budgets that may prioritize sectors like healthcare and education. CAF supports financing through corporate loans, co-financing with local financial institutions, private equity funds, and technical assistance. The bank collaborates with regional partners, such as the CARICOM Development Bank, and highlighted the potential of venture capital for innovative Sargassum projects. Financial advice is targeted mainly at larger firms, while technical assistance helps smaller businesses improve governance and research capabilities.

Mr. Dale Galvin from Pegasus Capital Advisors and the Global Fund for Coral Reefs (GFCR) discussed the impact of Sargassum in the context of ocean conservation and the blue economy. He highlighted that Sargassum threatens coral recovery, exacerbating challenges like coral bleaching, rising ocean temperatures, and acidification. He emphasized the growing need for climate finance, particularly for adaptation efforts, which are underfunded compared to mitigation projects, even though adaptation is crucial for livelihoods, food security, and ecosystem health. The GFCR employs a blended finance approach, combining grant funding with private investments, crucial for reducing risk in emerging markets like Sargassum management. The fund focuses on sustainable ocean production, including fisheries, aquaculture, and circular economy solutions. Sargassum presents a unique investment opportunity due to its low collection cost compared to farmed seaweed, and growing markets in biostimulants, nutraceuticals, biofuels, and bioplastics. Mr. Galvin stressed the importance of collaboration among governments, NGOs, and private investors to address the Sargassum challenge. He emphasized the need for research, waste management, and converting Sargassum into marketable products while achieving triple bottom line results—environmental, social, and financial.

Ms. Kristina Eisele from the European Investment Bank (EIB) highlighted the bank's extensive global investment history, with over €1.5 trillion invested in 160+ countries since 1958, including more than €2 billion in over 200 projects in the Caribbean since 1978. The EIB has applied its expertise, particularly from the European seaweed industry, to explore Sargassum management opportunities in the Caribbean, collaborating with the Global Seaweed Coalition and supporting innovation through loans, equity, and advisory services. The EIB's focus on Sargassum includes supporting both public and private sectors along the Sargassum value chain. Key initiatives include:

1. Public Sector Support: Through the Caribbean Sustainable Water Management and Clean Oceans Program, the EIB offers loans and grants to tackle waste and wastewater management, incorporating Sargassum pilot projects.
2. Private Sector Support: The EIB emphasizes regulatory certainty and political commitment for market development, using flexible financial instruments and concessional funding.

3. Equity Investments: The bank invests in blue and circular economy projects, including Sargassum initiatives.
4. Microfinance and Financial Intermediaries: The EIB plans to support microfinance institutions in the Dominican Republic and create the Caribbean Green and Inclusive Facility to provide affordable lending and advisory services to MSMEs for green investments, including Sargassum-related projects.

Ms. Eisele concluded by stressing that the EIB aims to promote sustainable Sargassum management in the Caribbean through tailored support for public programs, private investments, and microfinancing, enhancing both economic and environmental resilience in the region.

Mr. Benoît Bosquet from the World Bank Group outlined the financial instruments and initiatives that could support addressing the challenges and opportunities of Sargassum. While blue carbon finance was noted as a potential opportunity, he pointed out that the World Bank currently lacks a dedicated instrument for it. The World Bank primarily offers loans and equity stakes, along with managing trust funds from donors, such as the Pro Blue multi-donor trust fund, which has invested around \$130 million globally to support the blue economy. Key initiatives highlighted include:

1. Pro Blue Fund: Invested in projects like mapping ocean wealth with the OECS and potential integration of Sargassum's economic value.
2. Blended Finance: Examples include Belize's 'Blue Cities and Beyond' initiative and the 'Unleashing the Blue Economy in the Caribbean' program, which combines World Bank loans, Pro Blue, and GEF grants.
3. Private Sector Involvement: The IFC helped secure the first-ever blue loan to Indorama Ventures for recycling PET bottles.
4. Insurance Models: The Caribbean Catastrophe Risk Insurance Facility (CCRIF) has a Coast Fisheries Insurance Model, which could be expanded to cover Sargassum-related disasters.
5. Blue Bonds: The successful issuance of the Seychelles Blue Bond, raising \$15 million, with World Bank guarantees and GEF concessional financing, to support community and research projects.

Mr. Bosquet emphasized the World Bank Group's tools in supporting the blue economy and suggested that there are potential opportunities to include Sargassum within these frameworks for future initiatives.

Mr. Rodrigo Navas from IDB Invest highlighted the urgent need to address climate change as a generational challenge, with Sargassum and related issues being a direct consequence. He discussed the IDB Group's efforts to support development in its 26 member countries, many of which are heavily impacted by Sargassum. The IDB Group, consisting of the public arm (IDB), IDB Lab (focused on innovation), and IDB Invest (private sector arm), provides a range of financial solutions, technical assistance, and advisory services to support governments in implementing innovative projects. The IDB Group finances feasibility studies and supports initiatives that convert Sargassum into products such as building materials and fertilizers, which align with sectors like energy, agribusiness, and tourism. Their work is aligned with the UN SDGs, focusing on productivity, regional value chains, gender equality, climate action, and social inclusion. Key offerings include loans, guarantees, equity, blue and green loans, and technical cooperation. Mr. Navas emphasized the importance of collaboration to address the Sargassum crisis and foster regional development, with the goal of reporting significant environmental impact through coordinated efforts.



**Photos 50-55:** Panel discussion: Financing Investment Perspective

Although not part of this panel, Dr. Angus Friday gave a brief demonstration of the Azuros platform, a crowdfunding platform focused on supporting the blue and green economy in small island developing states (SIDS). Azuros connects innovators and investors, offering funding opportunities for smaller projects before scaling to larger investments. The platform is an EU-Caribbean collaboration, co-founded by individuals from Grenada, Jamaica, and the UK. Crowdfunding has grown significantly, with platforms like Kickstarter and Kiva raising over \$1 billion annually. Azuros allows investors to track returns via personalized dashboards and discover matched projects, while innovators manage their campaigns with the assurance of pre-vetted investors. Azuros focuses on SIDS and taps into the \$3 trillion ocean economy, with islands controlling over 30% of global exclusive economic zones. The platform is collaborating with Sargas, a company converting Sargassum into biogas and fertilizer, to enhance its impact. Azuros invites partnerships to advance sustainable projects in island economies.



**Photo 56:** Dr. Angus Friday gives a demonstration of Azuros platform

### 4.3. Business Townhalls

#### 4.3.1. Collection and Storage

Moderated by Mr. Alvaro Pereira and Martha Prada from CAF, this Townhall session delved into the topic of Sargassum collection and storage, discussing logistics, technologies, and main challenges and opportunities in Sargassum collection and storage. Efficient collection systems are essential for unlocking the full potential of Sargassum. Equally important is proper storage, which ensures the biomass retains its quality for transformation into valuable products. This requires not only advanced technology and equipment but also a focus on environmental sustainability, cost-effectiveness, and scalability. Innovations are needed to enable swift action when blooms arise, while also allowing us to store large quantities of sargassum in a way that keeps it viable for future processing. While the collection and storage sectors are often seen as basic operational functions, they are, in fact, critical bottlenecks. Effective solutions in these

areas have a direct impact on the efficiency of the entire value chain. The more effectively we collect and store sargassum, the more cost-efficient and environmentally responsible we can be in converting it into energy, fertilizers, and other high-value products. This business townhall was attended by 44 participants.

The six key experts who led the discussion of this session included:

- Mr. Ignacio Muñoz, TSWL - MORENOT
- Mr. Daveian Morrison, Awganics
- Mr. Rolando Chavez Peñaherrera, DESMI Sea Turtle Sargazo Project
- Ms. Shawn Carter, UNDP Barbados
- Mr. Marc Lucas, CLS
- Mr. Randall Purcell, Seafield Solutions

Ignacio Muñoz, representing The Seas We Love (TSWL), outlined a collaborative project with the Mexican federal government, including Pablo Arenas and IMIPAS, to regulate Sargassum collection in the Exclusive Economic Zones (EEZs) of Caribbean countries. The project aims to scale offshore Sargassum collection for industrial use across various sectors, leveraging Mexico's specialized vessel for research and addressing knowledge gaps about the species. The regional initiative, involving all 34 EEZs, includes a 270-day data-gathering cruise, with results shared via a geoportal. Emphasizing marine biodiversity protection, the project employs advanced technologies such as acoustic systems, artificial intelligence for spatial monitoring, and bio-surveillance. Deloitte's feasibility study revealed that offshore Sargassum collection is five times more productive and cost-effective than beach collection, reducing environmental impact and costs. Key elements include compliance with Mexican government guidelines, the potential regulation of Sargassum as a fishery resource to attract investor confidence, and the creation of SARGATEC, a platform to establish a value market for Sargassum. This initiative promotes a circular economy model, supporting sustainable industry growth and scalable services for diverse applications.

Mr. Daveian Morrison of Awganic Inputs discussed the company's efforts to utilize Sargassum as a resource, transitioning from animal feed applications—limited by heavy metal concerns like arsenic—to biomass production, where these issues are mitigated by heat processes during oxidation and vaporization. Awganic focuses on creating economic opportunities through public-private collaboration. In 2016, consultations revealed that removing Sargassum from beaches harmed ecosystems, affecting turtle habitats and causing sand erosion. This led Awganic to preemptively collect Sargassum offshore, starting in Old Harbour Bay in 2019, using a low-cost seawall barrier made of tires and galvanized metal. For storage, they addressed challenges like fungal growth by maintaining moisture content below 20% and ensuring proper ventilation. Their initial storage solution—an 18-foot tall structure—was later upgraded to a secure, weatherproof stainless steel container. Currently, Awganic produces Sargassum-based charcoal, which burns longer and has a higher calorific value than traditional briquettes. However, timely collection is critical, as Sargassum deteriorates quickly once removed from water. Morrison expressed interest in partnering with the GraceKennedy Foundation, leveraging its Kingston Harbour infrastructure for Sargassum collection.

Mr. Rolando Chavez Peñaherrera of DESMI detailed the company's extensive experience in liquid and solid transport, including Sargassum management since 2015. He highlighted the misconception that Sargassum removal is cost-free, noting significant expenses. Initial attempts with oil booms proved ineffective, leading to the development of specialized mechanical floating units, such as the SEA TURTLE, TRI-TURTLE, and WHALE SHARK, designed to collect sand-free, live Sargassum before it reaches the beach. These systems, with 30 km already deployed, aim to protect beaches and supply fresh Sargassum for industrial use. The units use conveyor belt systems to transport Sargassum 250 meters offshore, maintaining freshness. Current models

have a five-year lifespan, with future versions incorporating stainless steel and more durable designs. DESMI's technology costs about \$3 per cubic meter for Sargassum removal—significantly lower than typical methods. A new model, *e-total*, is under development, aiming to reduce energy consumption to 0.4 kWh per cubic meter, potentially lowering costs to \$2 per cubic meter, further enhancing its appeal for industrial applications.

Ms. Shawn Carter, UNDP Project Manager for the “Improving Sargassum Management Capacities in the Caribbean” project, outlined the initiative funded by the Government of Japan to enhance Sargassum management in five Caribbean countries: Barbados, St. Kitts, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. The project focuses on two key areas:

1. **Provision of Equipment:** Approximately 80% of the \$12 million budget is allocated to equipment for Sargassum collection and removal, such as booms, barriers, drifts, trolleys, and handheld tools, while addressing safety concerns.
2. **Scientific Monitoring:** Efforts include assessing Sargassum influx volumes and creating specific collection and management plans.

Initial research involved market analysis and site visits to 32 locations across nine islands to identify priority areas, emphasizing labor-intensive beach removal for ecosystems like turtle nesting habitats. Lessons were drawn from successful methods in Mexico and beneficiary countries. A key challenge is ensuring equipment maintenance post-project, requiring coordination across government sectors. The project prioritizes cost-effective, temporary collection solutions and addresses storage needs for commercial use, despite budget limitations.

Mr. Marc Lucas from CLS, a company partly owned by the French Space Agency, presented work related to Sargassum detection via satellite over the last decade. CLS provides daily maps and operational services through a web-based GIS system called SAMTOOL, using data from eight satellites with varying resolutions. Their system operates 24/7, offering real-time detection and seasonal forecasts for up to five months. He emphasized the importance of accurate detection for building business models around Sargassum, as understanding its availability and movement is crucial for planning effective solutions. He also highlighted the ability to analyze environmental conditions, such as winds, currents, and sea surface temperatures, to better predict Sargassum behavior. CLS collaborates with various partners and offers free access to some of their data through the Copernicus Marine Service, funded by the French state. They encourage others to explore their data and are available to assist with analysis or file handling.

Mr. Randall Purcell, co-founder of *Seafields*, a UK startup, shared the company’s mission to build billion-dollar industries tackling global crises. Drawing on his 25 years at the World Bank, he emphasized the need for sustainable alternatives to plastics and oil-based fertilizers, aligning with the IPCC's goal to remove 5–10 gigatons of carbon annually by 2050. *Seafields* views Sargassum as a profitable and scalable solution for carbon removal. Operating in Antigua, Barbados, and St. Vincent & the Grenadines, the company plans to produce bioplastics, biofuels, and biostimulants from Sargassum. Partnering with Carbon Wave, *Seafields* is tapping into the billion-dollar biostimulant market, with Heineken testing these products in Brazil to reduce synthetic fertilizer use in soybean farming. Their innovative system, launching in 6–7 months, features 5,000 m<sup>2</sup> hexagonal water structures for preserving and cultivating Sargassum, including in international waters. *Seafields* has secured a logistics partnership with a major shipping company and attracted investment from a top oil company to scale operations. Their model includes licensing opportunities for local Caribbean actors, enabling regional companies to address environmental challenges while participating in this transformative solution.

Following the experts’ presentations, a Q&A session took place, where some key points were mentioned:

1. **Future Improvements in Monitoring:** The launch of NASA's PACE satellite with hyperspectral sensors will enhance data collection. Combining satellite data with in-situ data and local collaboration (e.g., using drones and involving fishers) will improve understanding of sargassum dynamics.
2. **Avoiding Beach Conflicts:** To prevent conflicts between tourism and Sargassum management, strategies should focus on planning seasonal actions and defining designated zones for beach use.
3. **Private Sector Engagement:** To involve the local private sector, governments and communities must work together to generate interest and provide training. Sargassum processing can be highly profitable, with significant potential for biostimulants and other products.
4. **Storage Challenges:** Limited space for Sargassum storage on Caribbean beaches is a concern. Solutions like drying Sargassum on ships or establishing industrial parks for pre-processing could help. Additionally, Sargassum must be carefully handled to avoid sand contamination.
5. **Operational and Maintenance Plans:** Equipment, training, and long-term maintenance plans are essential for successful operations. Involving local governments in budgeting for labor and maintenance will help ensure sustainability after the project ends.
6. **Early Warning Systems:** Regional cooperation can make satellite data more accessible to individual countries. Although satellite data can be costly, it is more efficient than in-situ data collection, especially with pooling resources for shared use.
7. **Environmental Impact on Marine Life:** When collecting Sargassum, it's important to avoid harming marine life, such as turtles and fish, that rely on the mats for shelter. Barriers and deflection strategies need to be carefully designed to minimize risks.
8. **Investment Priorities:** The focus should be on protecting beaches through deflection systems and developing storage and waste management solutions. Sustainable beach management, forecasting, and collecting systems should be prioritized, with governments playing a role in creating policies and enabling environments. Sustainable funding mechanisms and disaster-resilient funds should also be explored for long-term management of Sargassum and other environmental crises.



**Photos 57-63:** Townhall 1: Collection and Storage

#### 4.3.2. Energy Solutions

Moderated by Veronica Navas from IFC and Etienne Raffi Kechichian from The World Bank, this session focused on energy solutions. Energy production from Sargassum is a promising area of the Sargassum value chain, with its rich organic composition offering potential for biofuels, biogas, and waste-to-energy technologies. By transforming Sargassum into renewable energy, it can contribute to the clean energy transition and help mitigate the environmental issues caused by large blooms. This approach offers economic opportunities while addressing the invasive nature of Sargassum, contributing to energy security and sustainability. A total of 44 people attended the business townhall discussing these opportunities.

The four key experts who led the discussion of this session included:

- Dr. Legena Henry, Rum & Sargassum Inc
- Mr. Benjamin Nestorovic, Sargas Ltd
- Mr. Jake Kheel, Fundación Grupo Punta Cana
- Mr. Rolf Krüger, Variodin

Dr. Legena Henry presented on generating renewable fuel by co-digesting Sargassum seaweed with other local waste streams, such as rum distillery wastewater and black belly sheep manure. This project, developed by researchers at the University of the West Indies, Cave Hill campus, addresses the monumental challenge of over 800 dump trucks of Sargassum arriving daily on Barbados' beaches. The company aims to sell biogas at 50% of fossil fuel costs, backed by over 400,000 data points. Having raised nearly USD 600K, Rum and Sargassum Inc. successfully launched an electric car powered by Sargassum biogas, tested in Barbados in September 2024. The test drive showcased renewable natural gas (RNG) generation and demonstrated its application in transportation. Dr. Henry outlined the company's multi-year plan, which requires a three-year capital expenditure phase and achieves net profitability by the fourth year. With a projected USD 26 million investment, the company envisions powering Barbados' entire transport sector using Sargassum biogas. The presentation concluded with an introduction to a team of experts from prestigious institutions such as MIT, Harvard, and Yale, underscoring their technical and academic strength.

Mr. Benjamin Nestorovic highlighted SarGas Ltd.'s public-private partnership approach to utilizing Sargassum as a resource for biofertilizer and biogas. The company focuses on alleviating Grenada's dependence on imported fossil fuels for electricity and fertilizers. SarGas plans to establish a 150 kW biogas facility on Grenada's east coast, aiming to generate over 1 GWh of electricity annually. With projected yearly revenues of \$560,000 and a payback period of five years, the company seeks to raise \$2 million to launch the project and collaborate with local authorities for biomass supply and scalability. SarGas aims to provide local, sustainable energy solutions while addressing environmental and agricultural challenges..

Mr. Jake Kheel discussed strategies implemented by Fundación Punta Cana to address the impacts of Sargassum on the tourism sector in the Dominican Republic. Through innovation and partnerships, the organization has developed the Puntacana Sargassum Solutions Accelerator (PASS) to support entrepreneurs and test new technologies on-site. Over the years, Grupo Punta Cana has researched and developed methods to intercept Sargassum before it reaches the shore, testing various floating barriers, collection vessels, and cleanup equipment. The organization's vision includes fostering scalable, cost-effective solutions to the Sargassum crisis, with secured funding for ongoing research and development. PASS aims to create a collaborative environment where innovative solutions can be piloted and scaled, benefiting the region's tourism

Mr. Rolf Krüger presented Variodin's approach to renewable energy generation through the sustainable processing of waste and alternative fuels. The company's proprietary technology transforms municipal, agricultural, and industrial waste into green hydrogen, synthetic fuels, and

raw materials while minimizing CO2 emissions. Their modular system adapts to regional energy needs, promoting energy independence, economic stability, and job creation. Variodin is actively researching the use of Sargassum as part of its biomass mixes in collaboration with universities in Germany and Scandinavia. However, limited Sargassum availability (7–8 months per year) poses challenges, necessitating robust storage and processing infrastructure. Variodin's modular approach provides a competitive alternative to traditional energy production methods, aligning with environmental sustainability goals.

Mr. Miguel Montesino discussed AENOR's initiatives in certifying carbon credits and developing sustainable Sargassum utilization projects. Their plans include constructing six biodigester plants, ten jet barges, and six spider barges, with a total cost of USD 300 million. The project boasts a proven internal rate of return (IRR) of 18% and an estimated annual demand of USD 275 million over 10 years. Initial funding includes 20% equity, and discussions with investors such as Sumitomo and Hyundai are underway. AENOR has presented a valuation study and a draft Project Design Document (PDD) to the Governor of Quintana Roo for carbon credit certification under Gold Standard. The initiative aims to create 800 direct and 9,000 indirect jobs, supporting beach Sargassum collection and advancing Sustainable Development Goals (SDGs).

Mr. Alfredo Molina, a Deloitte partner, detailed the feasibility study conducted in collaboration with The Seas We Love to explore Sargassum-based energy production. The study focuses on three business cases: offshore collection using proven technology, production of biomethane, biofertilizer, and calcium carbonate, and production of sustainable aviation fuel. Preliminary studies show positive outcomes, aligning with Corsia sustainability requirements for commercial viability. Deloitte is progressing toward engineering studies for machinery development, aiming to transition from feasibility studies to actionable projects. Collaborations with organizations like Ocean Cleanup enhance the initiative's technical foundation. The project is poised for implementation, with promising results indicating significant potential for Sargassum as a sustainable resource for energy production.

Key points coming out of the Q&A session and discussion included:

1. **Challenges for replicating the model in small islands like Grenada:** The aim is to create a replicable model. Combining Sargassum with other materials is possible, but regulatory gaps can complicate certification. Biogas production and Gas Liquid Processing are feasible and promising in the Caribbean, but regulations must be developed.
2. **Major hurdles, risks and concerns:** A key challenge is the disparity between small pilot projects (\$10K-\$600K) and large-scale investments (\$100M+). Overcoming logistical and regulatory hurdles is essential for scalability. Securing funds and grants for startups in small islands like Barbados and the OECS is difficult due to funders' focus on scalability.
3. **Addressing heavy metals contamination:** Concentrations of heavy metals like arsenic are generally low but vary, requiring continuous testing. Lack of laboratory facilities that are equipped to test for chemical composition, including arsenic speciation. The presence of arsenic is not unique to Sargassum; it's found in other produce as well.
4. **Value chain integration and coupling energy production with other processes:** Sargassum should be considered a high-quality raw material, harvested and processed quickly. Infrastructure, funding, and legislative frameworks need to be prioritized. Coupling energy production with other value-added processes (e.g., bioplastics, carbon credits) is beneficial.
5. **Government role and effective models:** Government support varies by island. Examples include Barbados, where government support has enabled policy discussions and funding. Monopolies in energy production can be barriers; independent power producers need government support. Success requires governments to facilitate regulations, permits, and partnerships among stakeholders. In Mexico, a structured

governance program supports initiatives like TSWL to manage Sargassum effectively, contrasting with the Dominican Republic, where regulatory obstacles have hindered progress.

In conclusion, this townhall session discussed the fact that Government roles vary depending on the stage of the value chain and public policies and investment thresholds need adaptation for biogas to be successful. Tourism and hotel sectors often avoid coordination without enabling policies, despite the high costs they incur in managing Sargassum as waste.

#### 4.3.3. Agricultural and Construction Solutions

Moderated by Rodrigo Navas and Camila Rodriguez



**Photos 64-69: Townhall 2: Energy**

Taylor from IDB Invest, this session focused on use of Sargassum in the agriculture and construction sectors, focusing on new innovations and technologies. Sargassum can be transformed into a wide range of products for the agriculture sector, including fertilizers, bio-stimulants, compost, animal feed supplements, etc., enhancing soil and animal health and crop productivity. In construction, Sargassum can be processed into sustainable building materials like blocks, panels, and insulation, offering an eco-friendly alternative to traditional materials and contributing to reduced carbon emissions in the industry. Utilizing Sargassum in these sectors supports a circular economy model, transforming waste into valuable resources and addressing environmental challenges. This townhall event highlighted how Sargassum-based innovations can be scaled to meet growing demand and align with sustainability objectives. A total of 33 participants attended this business townhall, where speakers shared their strategies for leveraging Sargassum in agriculture and construction.

The five key experts who led the discussion of this session included:

- Ms. Carol Lue, AgriShare/CaribShare Biogas
- Ms. Alena Kharissova, Thrasos 3D
- Ms. Sophie Jones-Williams, Plant and Food Research Institute
- Mr. Andrés Bisonó, CEO, SOS Carbon / SOS Biotech
- Mr. Joshua Forte, Red Diamond Compost

Ms. Carol Lue of Agrishare/CaribShare is a pioneer in recycling technology and has led the Jamaican hotel sector's recycling initiatives since 2016. Her company collects and recycles food waste from hotels, transforming up to 20 tons daily into bio-reactive organic fertilizer and biogas using a large-scale digestive system. The biogas powers cold storage units for small farmers,

reducing costs and promoting regenerative agriculture. With a UNEP 2024 Ocean Innovation Challenge grant, Agrishare/CaribShare plans to scale up with a \$300,000 budget, aiming for a national policy and decentralized storage network to support small farmers.

Ms. Alena Kharissova from Thrasos 3D presented their innovative approach to repurposing Sargassum into ceramic 3D-printed structures for disaster reconstruction and artificial coral reefs. Coral reefs, which cover only 0.2% of the ocean floor, are vital ecosystems supporting 25% of marine species and generating \$2.7 trillion annually for 200 million people through tourism and coastal protection. However, 80% of Caribbean reefs have died, leading to severe coastal impacts such as beach erosion. For instance, beaches in the Mexican Caribbean have experienced 50% erosion following coral reef loss. Thrasos 3D's Domosfera is a modular, biomimetic structure made of 70% Sargassum, designed to mitigate beach erosion and support new reef ecosystems. These eco-friendly structures, which can dissipate 97% of wave energy, transform seaweed waste into valuable ecological assets. Four Domosferas, creating 10 m<sup>2</sup> of reef habitat, can be produced from 300 kg of Sargassum. With 200,000 tons of Sargassum reaching the Caribbean annually, this solution offers significant potential for environmental and coastal restoration. The company projects that by 2026, they will cover 10,550 m<sup>2</sup> of reef, removing approximately 700 tons of CO<sub>2</sub> and reducing carbon emissions by 23%. To achieve these goals, Thrasos 3D is seeking \$500,000 to \$1.5 million in funding for field trials, patenting, and pilot projects. They also aim to update reef-building standards, streamline permitting processes, and raise public awareness about the importance of coral reef restoration and coastal protection.

Ms. Sophie Jones-Williams from New Zealand's Plant and Food Research Institute oversees projects validating Sargassum uses for bio-cellulose and bio-fertilizers in the Caribbean, focusing on environmental and economic benefits. Partnering with local and international organizations such as CRFM, key project principles included full utilization of resources, minimizing harm, and ensuring sustainability and effectiveness. Initial trials in Barbados show a 50% higher efficacy than commercial fertilizers. The next steps include scaling up production, revenue analysis, and collaborating with farmers to expand organic product use.

Emerging from SOS Carbon, Mr. Andrés Bisonó explained that SOS Biotech leverages blue tech and biotechnology in the Caribbean, focusing on sustainable seaweed harvesting and transformation into biological products. Operations span the Dominican Republic, Mexico, Antigua, Barbuda, and Puerto Rico, with plans to scale the supply chain for consistent raw material availability. They have introduced two main agricultural products: *Marine Symbiotic*, which boosts yields across crops (e.g., 43% increase in tomato yields) and reduces dependency on synthetic fertilizers, and *Marine Blossom*, extending the life of fresh flowers in the floral industry. Both products have proven beneficial and received organic certification. SOS Biotech is also expanding into cosmetics and animal supplements, conducting trials in the U.S. and Colombia.

Mr. Joshua Forte presented the biotech social enterprise Red Diamond Compost, which converts organic waste, including Sargassum seaweed, into sustainable agricultural inputs. Their flagship product, *Supreme Sea*, developed over a decade ago, has been validated in trials across the UK, Spain, and Italy, earning Red Diamond Compost national recognition in Barbados. The company tailors products based on local agricultural needs and utilizes active compounds extracted from Sargassum to create concentrated liquid fertilizers. Research revealed benefits such as improved soil health, pathogen resistance, enhanced nutrient utilization, and stress resistance in plants. The product facilitates the release of inorganic nitrogen, improves soil carbon, and supports enzyme production, contributing to plant growth and resilience with trace minerals that aid nutrient uptake and development.

General questions and comments discussed during this Townhall are summarized below into four key points:

1. **Arsenic and soil contamination:** Concerns were raised about testing for arsenic and potential soil contamination. It is essential to demystify the threats posed by Sargassum and establish regulations to ensure product safety.
2. **Technical and non-technical challenges:** The primary technical challenge is economic viability; smaller projects may yield lower short-term profits but support continuous improvement. Non-technical challenges, such as implementation difficulties, require increased resources, resilience and collaboration. Transport is a significant challenge due to Sargassum's corrosive effects on machinery and containers, making storage costly. A centralized approach could help streamline operations.
3. **Stable supply and regulations:** Ensuring stable harvesting and production, alongside implementing key agricultural regulations, remains a complex challenge. Supply risks persist, and funding typically requires international cooperation. Regulatory frameworks, including organic waste recycling laws, are necessary for companies to operate and maximize value in the Caribbean and Europe.

4. **Local laboratory capacity:** The Caribbean faces a shortage of local lab testing facilities, though capacity is growing, especially for consumer and cosmetic products. A cohesive regional strategy is crucial for the success of these initiatives.



**Photos 70-75:** Townhall 3: Agricultural and Construction Solutions

#### 4.3.4. Biorefinery

Moderated by Ms. Kristina Eisele from EIB and Mr. Nicoles Kersting from COWI, this business townhall focused on exploring the commercial potential of Sargassum into biorefinery products, such as cosmetics, pharmaceuticals and bioplastics. Biorefinery is one of the most valuable segments in the Sargassum value chain, using advanced extraction technologies to produce compounds for global industries. Creating economic opportunities that extend beyond local markets, Sargassum-derived bioactive ingredients can be used in cosmetics for anti-aging and skincare, and in pharmaceuticals for potential health benefits. Additionally, Sargassum-based bioplastics provide a sustainable alternative to traditional plastics, addressing environmental concerns of the plastics crisis. The biorefinery sector is essential for maximizing both economic and environmental value, fostering new industries, reducing reliance on non-

renewable resources, and promoting a circular economy. This townhall event was attended by 21 participants.

The five key experts who led the discussion of this session included:

- Ms. Paulina Zanela, Thalasso Ocean
- Mr. Geoff Chapin, Carbonwave, Puerto Rico
- Ms. Gennike Mayers, Geli Pedi Ltd
- Ms. Sarah Hosking, Unilever
- Dr. Mari Granström, Origin by Ocean

Mr. Geoff Chapin from Carbon Wave focuses on large-scale Sargassum collection and processing in Mexico and Puerto Rico, collecting 30,000 tons annually in Quintana Roo. Partnering with local hotels, the company installs barriers for sustainable beach cleaning and produces bio-stimulants and emulsifiers. Their bio-stimulant, which constitutes 65% of processed Sargassum, has demonstrated a 12.5% increase in crop yields, with successful tests like a Heineken barley crop trial delivering a 10x return for farmers. Distributed across the US, Mexico, and Europe, Carbon Wave also produces Sargassum-based pulp for emulsifiers branded as Sea Balance, used in cosmetics and distributed to 41 countries. The company plans to double production from its \$2 million Puerto Rico plant while developing Sargassum-based leather and 3D-molded hospitality products. Carbon Wave has also created a globally recognized carbon credit methodology to mitigate methane emissions from decomposing Sargassum. With \$12 million in secured funding, they seek \$2–3 million more to scale operations.

Ms. Paulina Zanela introduced Thalasso Ocean, a Mexican-Norwegian venture leveraging Norway's marine technology expertise to transform Sargassum into high-value products. Their container-based micro-refinery model allows decentralized processing near collection sites, cutting transportation costs tied to Sargassum's 90% water content. These refineries are adaptable for other materials, built in 3–4 months, and cost-efficient. Thalasso Ocean focuses on producing fucoidan for medical applications, alginates for bioplastics, and bio-stimulants for agriculture. Partnerships with textile brands enable the remaining biomass to be used in sustainable paper and textiles. Having raised most of their \$1 million development target, the company plans to expand beyond Mexico and Puerto Rico.

Dr. Mari Granström presented on Origin by Ocean, a Finnish company using invasive seaweed species like Sargassum for sustainable chemical production. Their zero-waste process extracts five functional ingredients for industries like textiles, cosmetics, and detergents, reducing reliance on oil-based ingredients and methane emissions. Their first pilot in Finland has been completed, with commercial production expected by 2027 and plans to expand into the Caribbean. By 2034, the company aims for a €1.5 billion turnover, with environmental goals including the removal of 3,000 tons of nitrogen from oceans and significant carbon reductions.

Ms. Gennike Mayers presented on her Tobago-based startups, Geli Pedi Ltd and Spargassum, which produce spa and personal care products infused with Sargassum extracts. With USD 10k in seed capital, the co-founders created moisturizing oils and soaps, partnering with universities for R&D and testing for heavy metals to ensure safety. Operating without full-time staff, they distribute products through spas, hotels, and gift shops, leveraging collaborations to scale operations. Their strategy emphasizes building the full value chain from Sargassum collection to product distribution, highlighting the role of partnerships in supporting small businesses.

Key questions and comments discussed during this Townhall include the following:

1. **Products meeting health standards:** Important to test end products to ensure they meet health standards, particularly for products that enter the food chain or are in direct contact with the body. Companies follow protocols typically accessible online. Need to ensure testing capabilities in the Caribbean region.

2. **Disposal of heavy metals:** Disposal methods include concentrating and precipitating arsenic for solid waste disposal by specialized companies. Each country follows its own disposal regulations.

3. **Microfinancing for small businesses:** Microfinancing in the Caribbean may include technical support, though grant funding is needed for growth.

4. **Government policy and engagement:** Policy change in emerging sectors requires persistence, expertise, and sometimes lobbying. Experience in Europe shows it can take years and necessitates active participation from small companies to influence legislative shifts.



Photos 76-81: Townhall 4: Biorefinery

#### 4.4. Ministerial Forum

On the afternoon of October 2<sup>nd</sup>, 2024, a high-level Ministerial Forum on Sargassum was organized, with the objective to agree on the actions, investments and political support need for a Global Gateway Regional Response to Sargassum. With attendance from over 30 countries and representatives from the EU (INTPA, EEAS) and international financing institutions (EIB, IDB, CAF, WB, CDB, CDF, GCF), key points included:

- Support for the SargCoop 2 programme and concerns about public health risks from heavy metals and arsenic in Sargassum.
- Focus on scaling industrial development and the importance of environmental priorities.
- Recognition of research gaps, with interest in biofuels and biostimulants as solutions.
- Emphasis on minimal Sargassum beaching, research opportunities, and the need for a strategic approach to industrialization.
- The importance of addressing the root causes of Sargassum blooms to find long-term solutions for affected livelihoods.
- Support for shared insights and recognition of collective responsibility.
- Reaffirmed commitment to proactive efforts, with a focus on collaboration despite not being directly affected.
- Acknowledgment of challenges with investment returns and the need for capacity-building.
- Highlighting the need for early warning systems, technology transfer, and integration of sustainable practices.
- Presentation of a 6-point plan focusing on turning Sargassum into a commodity and attracting public-private partnerships.

- Recognition of the financial strain caused by Sargassum influxes and the need for decisive action and collaboration.

During the Ministerial Forum, Hon. Dickon Mitchell, Prime Minister of Grenada, announced that Grenada would host a Sargassum Secretariat and Hub to share knowledge, and that forecasting capabilities for Sargassum would be a priority.

#### 4.5. Governance Session: Understanding Governance Complexities

Moderated by Mr. Alvaro Pereira and Martha Prada from CAF, this session underscored the importance of a reliable regulatory framework in order to build a sustainable Sargassum industry in the Caribbean, which must balance resource management, technological innovation, and stakeholder collaboration. Clear policies for interagency coordination, ecosystem-based management, and regional cooperation are of key importance. Promoting sustainable harvesting technologies, incentivizing value-added uses like bioplastics, and engaging local communities are also critical. Additionally, fostering public-private partnerships and supporting capacity-building initiatives are essential to ensure that Sargassum's economic potential is realized while protecting marine ecosystems. Effective monitoring and adaptive management are crucial to keep pace with evolving environmental and industry dynamics.

The six key experts who led the discussion of this session included:

- Ms. Susana Perera Valderrama, UNEP/SPAW
- Mr. Pablo Arenas, Instituto Mexicano de Investigación en Pesca y Acuicultura Sustentable (IMIPAS), Mexico
- Dr. Legena Henry, Rum & Sargassum Inc, Barbados
- Dr. Walter Stinner, DBFZ German Biomass Research Center gGmbH, Germany
- Mr. Enrique Pugibet, Medio Ambiente y Recursos Naturales (MARENA), Dominican Republic
- Ms. Mathilde Richelet, Agence Française de Développement (AFD), France

Ms. Susana Perera Valderrama presented UNEP/SPAW's transboundary strategies for enhancing coordination on sustainable Sargassum technological solutions. Sargassum inundations in the Caribbean impact fisheries, tourism, health, and biodiversity, with national and regional initiatives often operating in isolation. She emphasized the need for a unified regulatory framework, leveraging the Cartagena Convention to promote regional cooperation. Proposed actions include strengthening the Sargassum working group, creating standardized management protocols, and harmonizing policies across countries. A coordinated action plan and funding strategy are critical for addressing the crisis with support from all contracting parties.

Mr. Pablo Arenas from IMIPAS discussed converting Sargassum into a sustainable fishery resource, emphasizing governance challenges for managing it at sea. He highlighted the lack of coherent regulations on harvesting, transport, and industrial transformation and called for a shift toward marine harvesting rules. Research is needed to determine sustainable harvesting methods, ownership rights, and environmental impacts. Drawing from Mexico's kelp harvesting regulations, he outlined plans for regional research campaigns to study Sargassum's ecosystem and potential industrial applications, advocating for scientific cooperation across the Caribbean.

Dr. Legena Henry of Rum & Sargassum Inc., a Barbados-based biofuel startup, discussed transforming Sargassum into biofuel using distillery wastewater, manure, and seaweed. Founded in 2021, the company has raised USD 600k for equipment, research, and talent development. Dr. Henry stressed the need for policies to support innovation and bridge the gap between academic research and commercialization. She called for regional initiatives similar to Horizon Europe and SBIR to foster collaboration among academia, startups, and governments, enabling sustainable harvesting and technological innovation in Sargassum management.

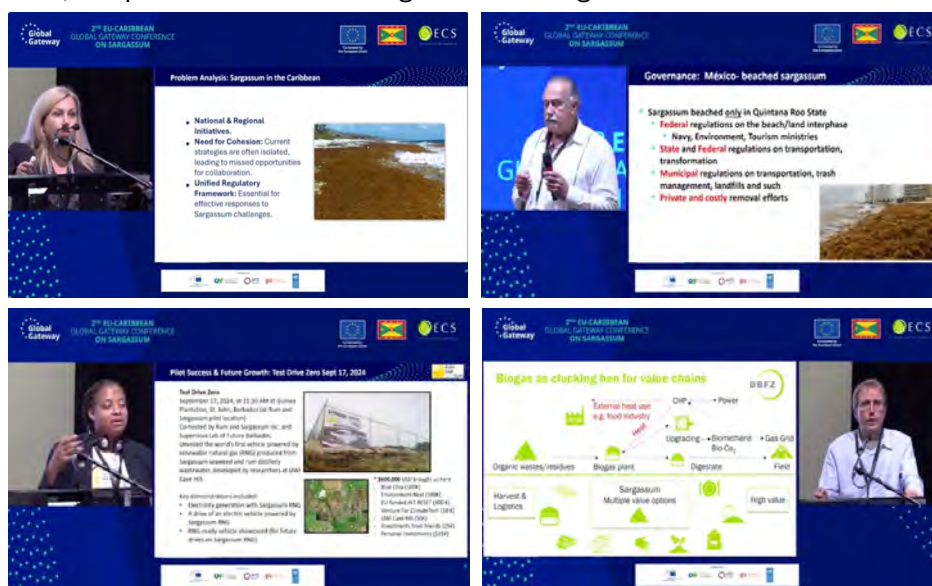
Dr. Walter Stinner from DBFZ highlighted biogas as a scalable, proven technology for Sargassum utilization, especially given high Caribbean energy costs. He emphasized integrating biogas with other organic wastes to address logistical challenges and seasonal variability. Regulatory frameworks are needed for marine ecology, storage, and product quality standards, including fertilizers. He also advocated for energy laws and pricing systems to incentivize biogas integration with renewable energy. Coordinated governance and regulations are crucial to achieving ecological and economic goals in Sargassum-based solutions.

Mr. Enrique Pugibet from MARENA highlighted the need for stronger governance and shared responsibilities to address Sargassum challenges in the Dominican Republic. Key issues include the absence of a specific regulatory framework, weak interinstitutional coordination, and budgetary constraints. To tackle these, the country has established a Multisectoral Table for Sargassum Management and a Cabinet for the Fight Against Sargassum. Efforts focus on enhancing regulations, engaging local communities, fostering international collaboration, and investing in research and technology. Strategies include developing predictive models, sustainable treatment methods, and value chains for Sargassum-derived products. Mr. Pugibet emphasized the potential for Sargassum to drive regional cooperation, innovation, and sustainability, while stressing the urgency of immediate action for long-term solutions.

Ms. Mathilde Richelet from AFD outlined the agency’s regional approach to addressing Sargassum influxes through a project based on a comprehensive needs assessment. The challenges identified were categorized as structural, organizational, and technical. The project focuses on three key areas:

1. Regional Coordination: Enhancing existing platforms and working groups, expanding them to include more Caribbean states, and fostering knowledge exchange and best practices.
2. Support for Caribbean States: Creating Sargassum management roadmaps, strengthening the chain from detection to valorization, and encouraging public-private partnerships.
3. Scientific Cooperation: Collaborating with research institutions to establish an expertise committee that evaluates current knowledge, identifies gaps, and connects research with policymaking.

Ms. Richelet emphasized the importance of flexibility due to the unpredictable nature of Sargassum influxes and stressed the need for building strong partnerships at regional and national levels. The project is set to launch in 2025, aiming to promote collaboration and develop sustainable, adaptive solutions for Sargassum management.





Photos 82-89: Governance Session

## 5. Conference Outcomes and Recommendations

The 2<sup>nd</sup> EU-Caribbean Global Gateway Conference on Sargassum held in Grenada on October 1–2, 2024, aimed to develop sustainable value chains for Sargassum. The conference was organized by the European Union (EU) in partnership with the Organisation of Eastern Caribbean States (OECS) and the Government of Grenada. The conference's theme was "*Turning the Tide: Sustainable Practices and Economic Opportunities for Sargassum in the Caribbean Basin*". Main outcomes from each session of the conference include:

**Setting the scene: Current status and future directions** - The conference began with a comprehensive assessment of the current state of Sargassum valorisation, drawing on insights from recent discussions in the Dominican Republic and Mexico. This overview underscored the importance of advancing research, fostering a supportive policy environment, and enhancing the development of sustainable value chains.

**Research and development: Unlocking the potential and overcoming barriers** - Challenges such as the chemical variability of Sargassum, contamination issues, and unpredictability of influxes were highlighted. Experts shared innovative technologies and emphasized the need for more investment to fully tap into Sargassum's potential for industries like biofuels, bioplastics, biofertilizers and others.

**National and local policies, strategies and action plans** - Policymakers from various countries shared their current approaches to managing Sargassum influxes. Collaborative, community-focused strategies and the importance of policy coherence were emphasized for effective management and action.

**Regional policies, strategies and action plans** - Discussions on regional frameworks showcased the necessity for joint efforts to support Sargassum management. The potential of agreements like the Cartagena Convention was explored to promote cooperative policies.

**Critical steps: Forecasting, collection and storage** - Experts detailed best practices and technological advancements in predicting and managing Sargassum collection and storage. The panel underscored the importance of regulatory support to facilitate these processes.

**Economic impact and business models** - Case studies demonstrated successful business applications of Sargassum, including the creation of bio-based products. Barriers such as market entry challenges and investment gaps were discussed, with a call for supportive business ecosystems.

**Financing investment perspective** - Comprehensive insights were provided into available financial tools and strategies to support Sargassum-related projects. The discussions emphasized both public and private sector roles in funding. Limited access to flexible financing, the need for tailored investment frameworks, and regulatory uncertainties were some of the challenges identified. Enhanced cooperation among multilateral banks, venture capital funding focusing on impact investing, and targeted funding streams for both mitigation and value-added uses of Sargassum were some of the highlighted solutions.

**Business Townhalls** - Showcased successful business models and innovations in Sargassum management, energy production, agricultural solutions, and biorefinery. Sessions also identified potential partnerships for public-private initiatives aimed at scaling up collection, processing, and commercialization, through enhanced collaboration and coordination.

- **Collection and Storage:** The need for efficient logistics and partnerships to manage Sargassum influx.
- **Energy Solutions:** Advancements in converting sargassum to biofuels and biogas.
- **Agriculture and Construction:** Promising developments in eco-friendly fertilizers and building materials.
- **Biorefinery:** High-value products like bioplastics and extracts were emphasized as growth sectors.

**Governance Session** - Addressed regulatory challenges and the need for clear governance structures to manage Sargassum sustainably. Recommendations highlighted the need to develop region-specific regulatory frameworks that facilitate cross-border collaboration and create inclusive policies involving stakeholders from local communities, environmental bodies, and private investors. Finally, this was highlighted as critical to implement transboundary strategies to standardize best practices across Caribbean nations.

**Key Recommendations:**

- **Accelerate Implementation:** Shift from dialogue to action with a cohesive, regionally coordinated approach. Advocate for consistent regulations that encourage innovation while protecting marine ecosystems.
- **Attract Investments:** Leverage public-private partnerships to secure funding for scalable, sustainable projects. Through enhanced public-private partnerships, promote collaborative investment models to mitigate the risks and optimize the profitability of sargassum projects. Develop dedicated financial mechanisms that support startups and established companies working on Sargassum solutions.
- **Sustain Collaboration:** Maintain and strengthen cross-sector partnerships to foster continuous innovation and resilience. Strengthen collaborations in R&D for scalable, cost-effective technologies for harvesting, processing, and product development. Ensure that local communities are included in decision-making processes to drive equitable economic benefits and sustainable practices.

## 6. Conclusion and Next Steps

The conclusion of the second EU-Caribbean Global Gateway Conference on Sargassum highlighted both the severity of the crisis and the significant opportunities for sustainable development within the Caribbean. Final closing remarks from Mr. Félix Fernández-Shaw, where he expressed gratitude for the successful two-day conference and acknowledged the contributions of various stakeholders, including Minister James, Prime Minister Mitchell, and

their teams, as well as his own team. He highlighted the conference's main goal of bringing people together to build value chains for managing Sargassum. He emphasized the need to structure the conversation and align efforts, particularly around the collection, storage, and processing of Sargassum to develop the value chain. He encouraged continued collaboration and suggested that the upcoming work will focus on testing systems and implementing solutions, drawing on existing experiences.

Hon. Kerryne James also provided final remarks, she highlighted the importance of the 2-day conference, which fostered valuable exchanges among Caribbean nations, Central American partners, and international stakeholders, all committed to transforming the Sargassum challenge into a catalyst for resilience and growth. Key outcomes included the endorsement of a regional Sargassum Secretariat, to be hosted in Grenada, which will harmonize efforts, support policy development, and coordinate research. Additionally, the creation of a Sargassum information hub was agreed upon to centralize data, innovations, and best practices. Research and innovation were central to the discussions, with institutions like the University of the West Indies exploring Sargassum's potential for biofuels. The importance of regional and international partnerships was emphasized, with initiatives from Guadeloupe, Dominican Republic and Mexico contributing valuable practices. Strong policy frameworks and accessible financing mechanisms were recognized as essential for supporting Sargassum valorization projects. The conference concluded with a call to turn dialogue into action, focusing on three critical pillars:

- 1. Accelerating implementation**
- 2. Attracting investments**
- 3. Sustaining collaboration**

The commitment to collective action was reinforced, with a vision of transforming the Sargassum crisis into a story of hope, resilience, and sustainable progress for the Caribbean. The conference concluded with a call for tangible action and sustained cooperation to turn the Sargassum challenge into an opportunity for sustainable development. This commitment, underpinned by shared knowledge and regional unity, can drive transformative progress across the Caribbean Basin. Gratitude was expressed to all partners, contributors, and participants, urging continued cooperation and decisive action moving forward.



**Photos 90-91:** Closing Remarks