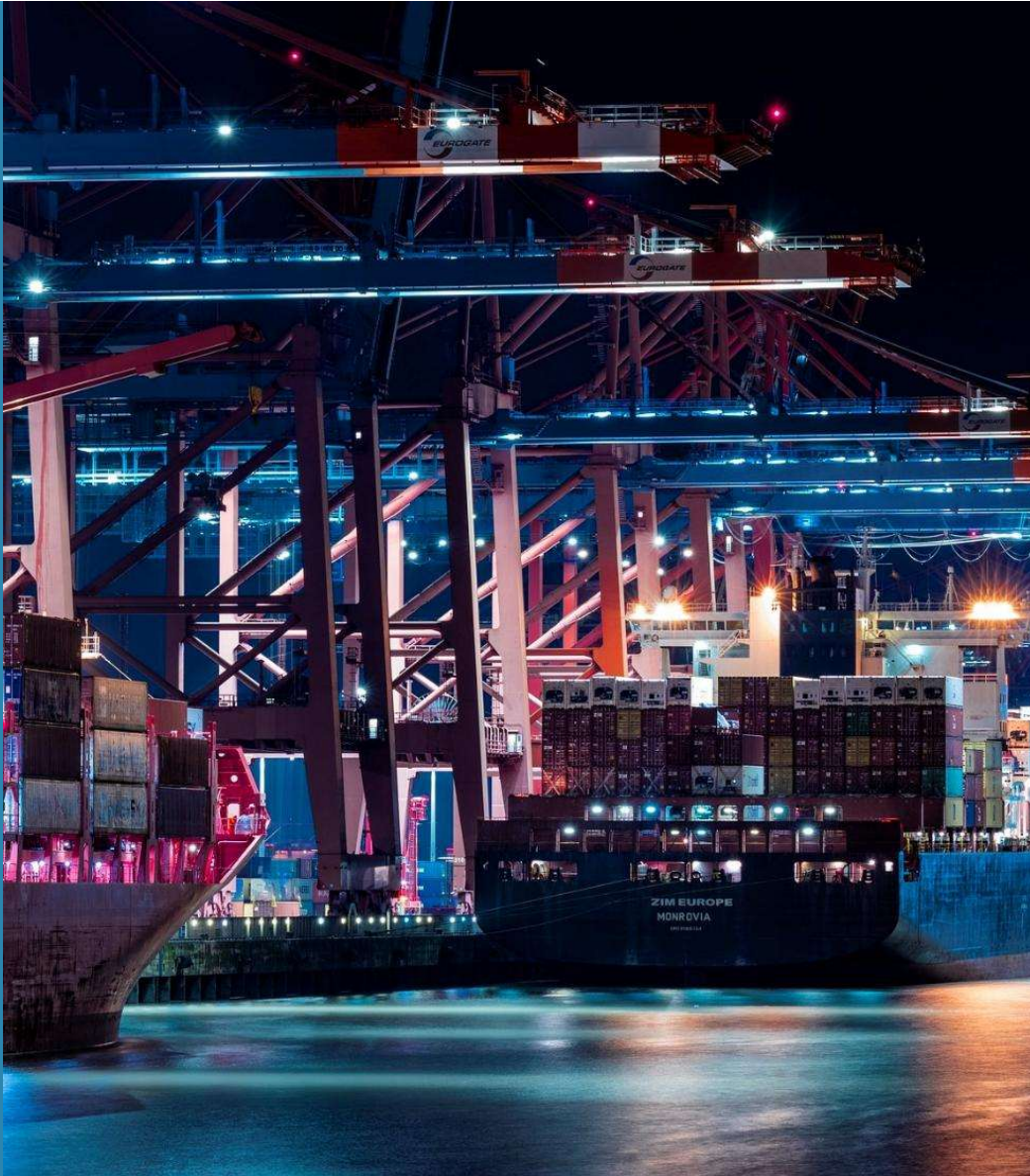




Advancing Decarbonization in Caribbean Shipping

Shore Power, Clean Fuels, and
Sustainable Port Operations

October 14 2025
CSA Conference





INTRODUCTION



3 Assumptions on What's Important for the CSA on Decarbonization

1. That Regulation may impose a New Fuel & Power Market:

- IMO policies may/will drive economic incentives for lower-carbon operations
- Demand emerging for low-carbon vessels & sustainable ports

2. Increased Fuel Supply Autonomy & Electricity Assurance:

- Reliable locally generated fuel & power sources

3. Improved Fuel Availability and Reduced Shore Power Cost

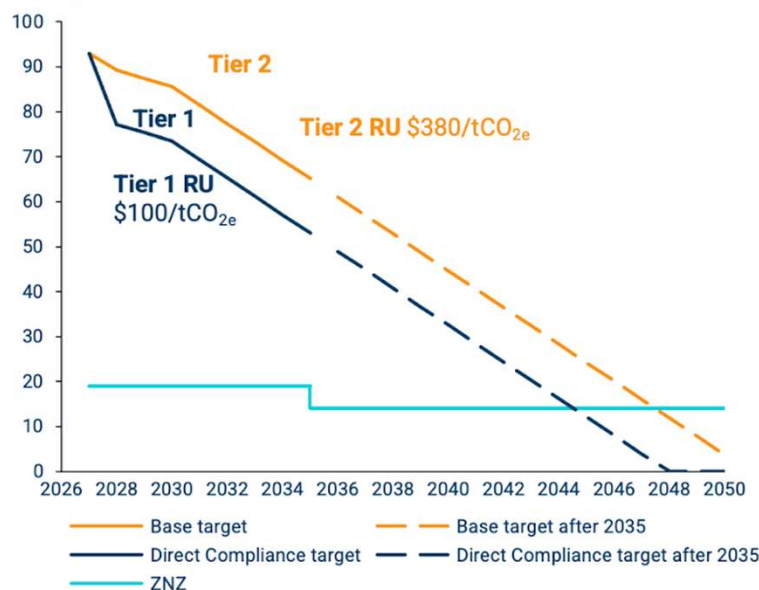
- Increased availability of guaranteed source of fuel from ports
- Lower energy costs during docking

2 Proposed Solutions to address the 3 Assumptions at Conclusion

As We Speak...

The outcome of the MEPC 83 is the single most influential regulation that bridges the cost gap between fossil fuels and ZNZ fuels

Two GFI's tiers agreed at MEPC 83– Illustrative Example, gCO₂e/MJ



- Z-factors are established through 2035, with the Committee tasked to define Z-factors for the 2036–2040 period by January 1, 2032.
- The **Base Target** establishes a base for maximum allowable GHG intensity for fuels used onboard with a **large penalty for non-compliance**.
- The **Direct Compliance Target** establishes a secondary threshold for achieving compliance which has a **smaller penalty for non-compliance**.
- Ships operating **below direct compliance** level can generate credits called **Surplus Units (SUs)**.
- The **ZNZ line** establishes a threshold for fuels that are aligned with the IMO's longer term objectives and sets a minimum **eligibility for additional reward** to encourage the uptake of these fuels in the short-term.

Note: The Z-factor for the Base Target in 2040 has already been set at 65%. The two-tier trajectories from 2025 to 2050 are based on a linear path. GFI based on a Well-to-Wake basis.



KEY IMO GHG TARGETS

- CO2 emission reduction per transport across international shipping: 40% by 2030
- GHG Emissions reduction by:
 - 20% by 2030
 - 70% by 2040
 - Net zero by 2050
- Uptake of ZNZ GHG emission technologies, fuels &/or energy sources for energy used by international shipping:
- Minimum 5%, striving for 10% by 2030

A deeper IMO dive via Caribbean Shipping Lanes (CSL) Study:

- Examined the technical elements of the IMO negotiations
- Reviewed current status of Caribbean countries on high level re: access, availability, cost, & environmental impacts of alternative fuels & associated infrastructure
- Shared Insights into opportunities for the Caribbean across the maritime value chain
- Provided strategic recommendations for Caribbean negotiators to strengthen their participation in IMO negotiations and assess the future impact of decarbonization measures



Key Findings from CSL Study:



Caribbean has potential to achieve alignment with IMO's GHG Strategy



Realizing this opportunity requires a coordinated effort



Significant investments in infrastructure and financial support from international agencies will be required



Provisions for “just transition” should be leveraged extensively to **secure** concessions/funding/support for Infrastructure and R&D incentives and Capacity Building

Key Finding - Regional Readiness Example: Fuel Storage Hubs in the Caribbean

Infrastructure exists with potential to repurpose for accommodating low-carbon fuel bunkering in the Caribbean.

- St. Croix, Ocean Point Terminal– 32 Million bbls Capacity
- St. Eustatius, GTI Terminal – 14 million bbls capacity
- St. Lucia, Buckeye Terminal – 10 million bbls capacity
- Trinidad, Paria – 2 million bbls capacity



An aerial shot of the refinery on St. Croix's south shore. Photo credit Ernice Gilbert, V.I. Consortium.
<https://viconsortium.com/vi-environment/virgin-islands-epa-plan-could-ease-restart-path-for-st-croix-refinery-by-lifting-upgrade-rules>

IDB COMMISSIONED STUDY- A“ONE CARIBBEAN” READINESS ASSESSMENT RE: SHORE POWER & GREEN FUEL BUNKERING

To support their promotion of the energy transition in shipping and port services, the Inter-American Development Bank (IDB) has commissioned KGL's assessment of one (1) port in each of the seven ONE Caribbean countries:

Bahamas, Barbados, Belize, Guyana, Jamaica, Suriname, & Trinidad and Tobago



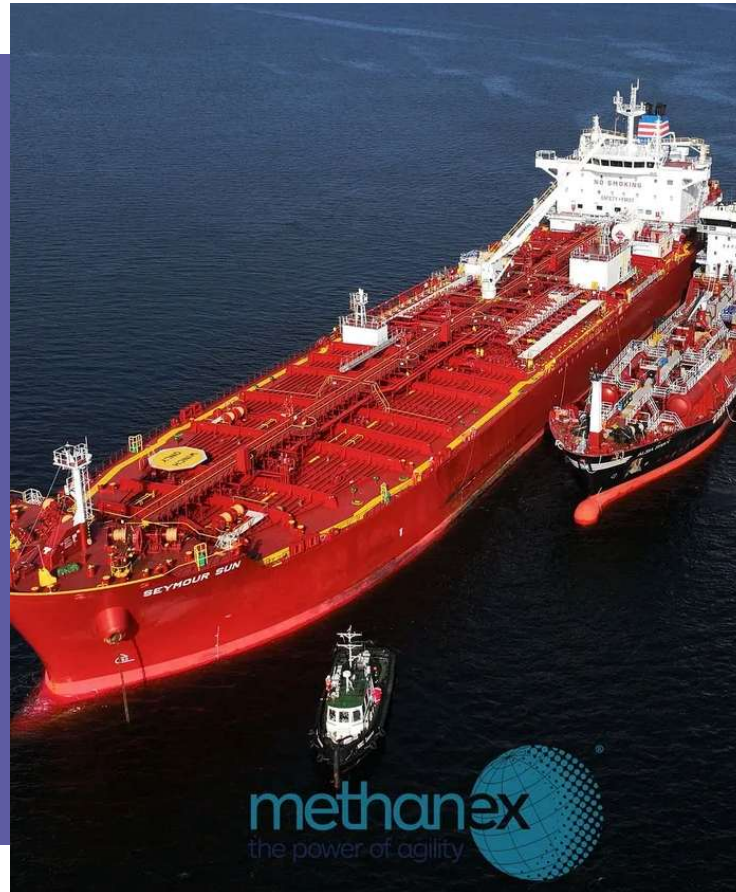
READINESS ASSESSMENT SCOPE INCLUDES:

Shore Power Feasibility :

Evaluating the technical and operational readiness for implementing shore power solutions

Green Fuel Bunkering Readiness:

Evaluating infrastructure for production, storage, and distribution of alternative fuels such as green hydrogen/methanol/ammonia, biofuels



- *Related Milestone Event (image):*
In August 2024, the the first ship-to-ship methanol bunkering demonstration in the Caribbean was conducted at the Port of Point Lisas.

IDB Readiness Study Participant: PLIPDECO, Point Lisas (Trinidad)

PLIPDECO is the owner and landlord of the **870 hectare** Point Lisas Industrial Estate, located on the west coast of central Trinidad

Estate houses approximately **88 tenants**

- methanol, ammonia and urea plants
- two steel plants
- a power plant
- smaller light manufacturing and service companies

Berths

- Six (6) commercial

Cargo Types

- Dry and Liquid Bulks
- Containers
- General Cargo
- Break Bulk

Power Requirements

- IMO estimates that the average power requirement container vessel requires 550kW while alongside discharging cargo, and that a 40,000 metric tons DWT tanker requires 600 kW while discharging
- PLIPDECO can accommodate 3 container vessels and 5 tankers/ bulk carriers at any one time on the Estate.
- **This would require 5 MW for Shore Power** (maximum scenario if all vessels are discharging)

PLIPEDCO GREEN FUEL BUNKERING OPPORTUNITIES

PLIPEDCO does not currently deliver bunker fuels. However there are assets in its vicinity which provide the following asset repurposing opportunities:

Opportunity 1:

Two (2) bunker tanks (RTW deliveries alongside berths)

- Heavy Fuel Oil (HFO) – 20,000 barrels
- Marine Diesel Oil (MDO) – 10,000 barrels
- **Opportunity exists to convert one or both tanks to GFB**

Opportunity 2:

- A second facility imports fuels for the island
- It has two (2) time chartered bunker tankers in operation along coast and does some offshore bunkering
- **Opportunities exists to deliver GF bunkers at the Pt Lisas anchorage**

PLIPDECO SHORE POWER SUPPLY STATUS

All electrical power to the port is off the Trinidad & Tobago Electricity Commission (T&TEC) Grid

Currently has no infrastructure that allows for shore side electrical connections to ships alongside

However there is a 12kV substation in the immediate vicinity of the berths, which currently provides electrical power to two (2) fully electric gantry cranes at Berth #5



SOLUTION #1: LARGE SCALE RENEWABLE ENERGY **CONVERSION** IN THE CARIBBEAN FOR REGIONAL CREATION OF CLEAN MARINE FUELS

“RE For Fuels”:

Renewable electricity can be used to electrolyse water, producing green hydrogen and oxygen. Hydrogen is then used to make green ammonia & green methanol, leading candidates for low-carbon marine fuel

Point Lisas: Top Five Global Exporter of Methanol and Ammonia

Spare capacity in existing infrastructure to generate green ammonia, methanol once RE is supplied



PHOTO BY RICHARD RAMIREZ

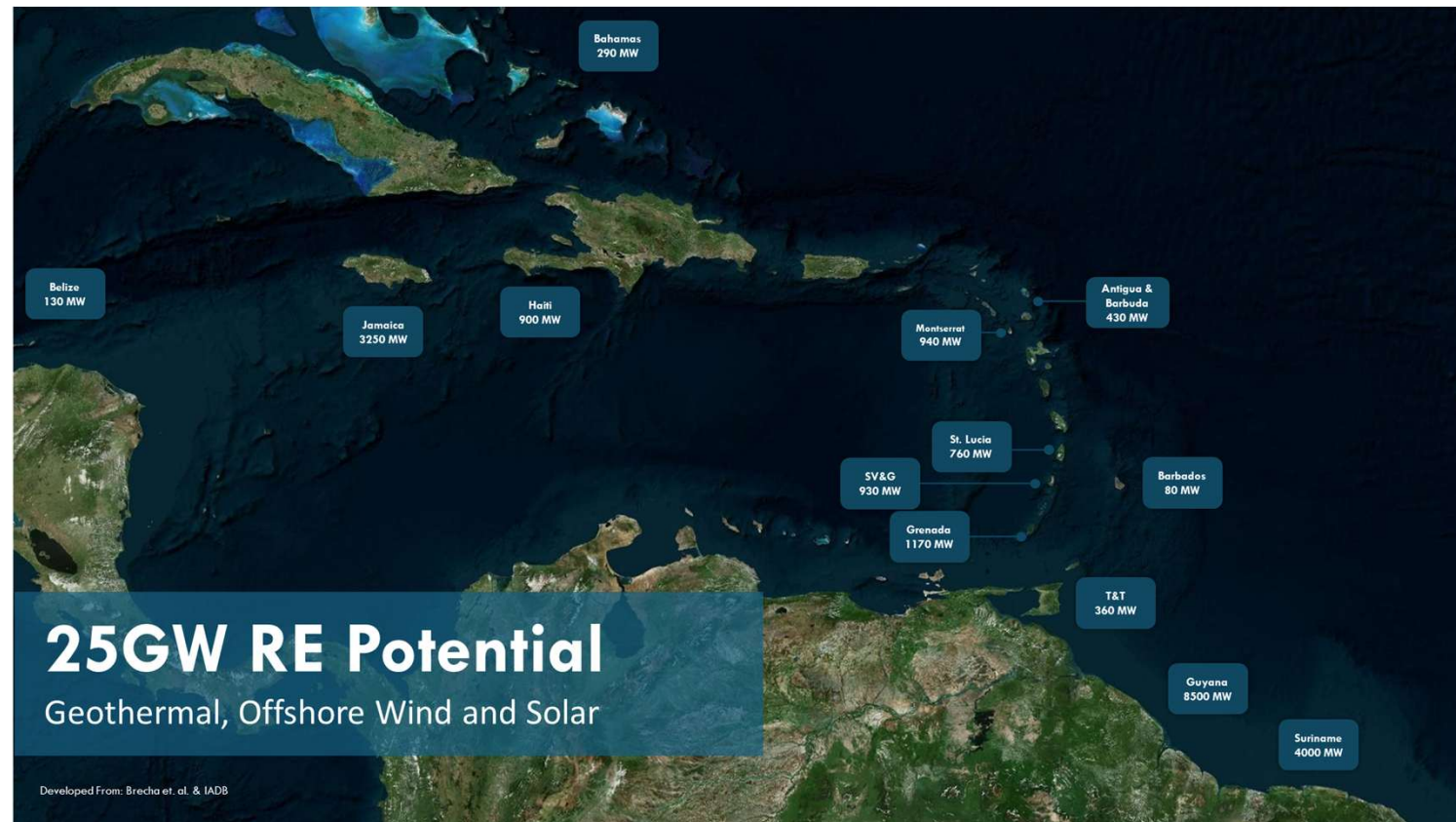
SOLUTION #2: LARGE SCALE RENEWABLE ENERGY GENERATION IN THE CARIBBEAN FOR REGIONAL CREATION OF CLEAN MARINE FUELS AND SHORE POWER

“RE For Shore Power”

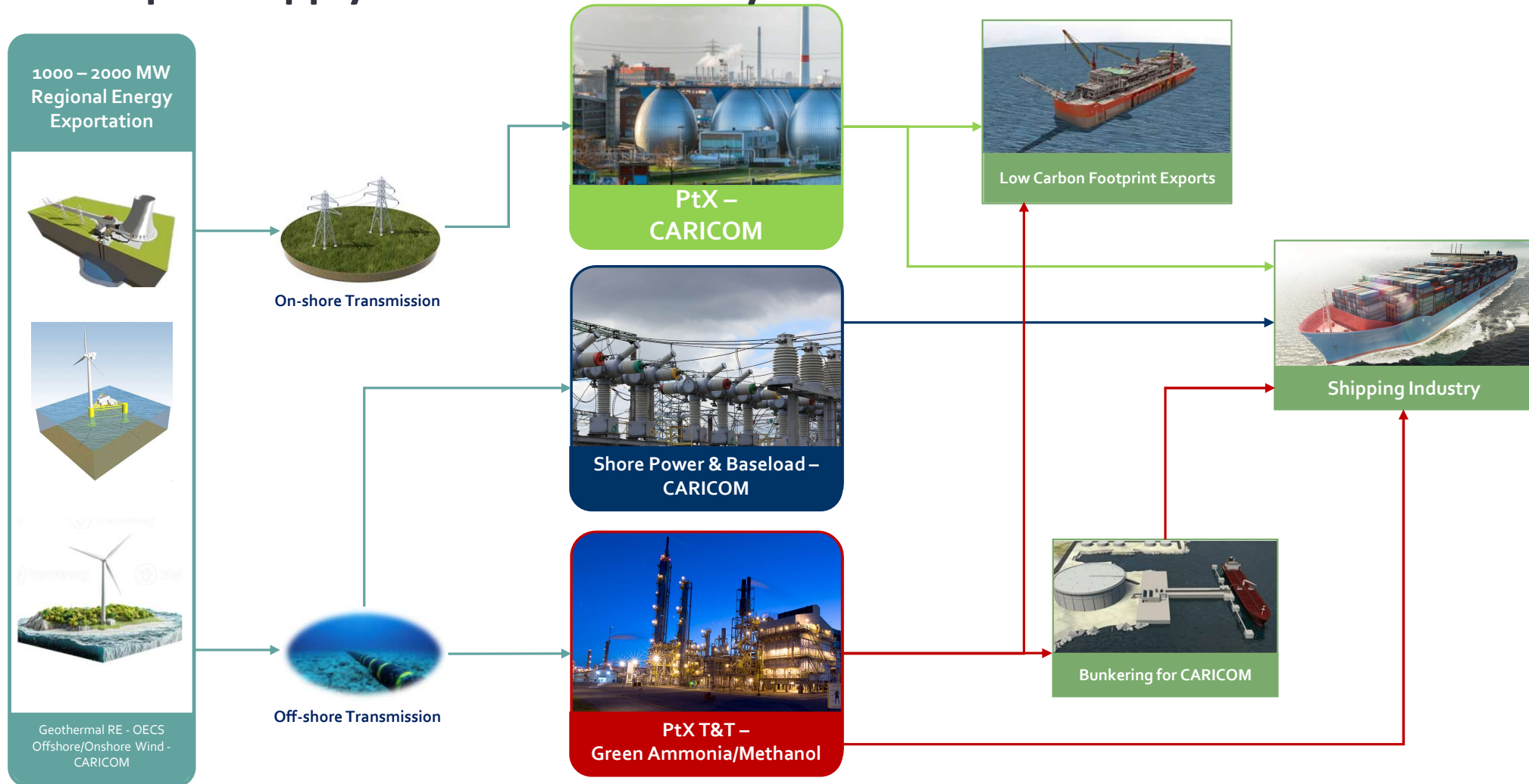
Locally generated, low-carbon electricity can supply ships at berth, replacing diesel/fuel oil power.

The Caribbean has an estimated 25GW of RE generation potential, that has not been harnessed due to limited off-take/market demand.

The Port and Shipping Industries can materially and positively impact that previous constraint, by creating a Demand that unlocks the Supply



RE Surplus Supply + Maritime Industry Demand = New Business Case



Moving to Action: Letter of Intent signed b/w Kenesjay Green Limited & the Antigua & Barbuda Port Authority (ABPA)



The redeveloped Deepwater Harbour Port Facility in St John's, Antigua and Barbuda.

<https://www.plenglish.com/news/2022/12/13/antigua-and-barbudas-port-eastern-caribbean-transshipment-hub/>

Strategic Partnership

- The LOI establishes a **public-private framework** to connect the maritime industry's demand for **low-carbon fuels** with **renewable energy** development in the Caribbean.
- Reinforcing both organisations' commitment to sustainable economic growth and energy transition leadership within the region

Regional Demonstration Model

- Intended to **establish a replicable commercial framework** showing how **clean fuels** and **renewable electricity** can power port operations and shipping routes
- Supports the region's broader ambition to become a low-carbon maritime corridor connecting island economies.

Supply & Demand Synergies

- **Builds on ABPA's partnership with the Veer Group**, preparing the port to support zero-emission container ships.
- *Explores opportunities to **connect geothermal-rich islands such as St. Kitts & Nevis** with **demand hubs like Antigua & Barbuda***

Intended Outcomes

- Accelerated progress toward energy security, GHG reduction, and economic diversification.
- Strengthens positioning of the Caribbean as a credible player in Zero/Near-zero fuel supply chain



In Closing...

Thank You

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