ASEAN Port and Logistics 2025

Re-shaping the Transportation and logistic sector in creating a path to global economic recovery

PELINDO

- ASEAN Ports and Logistic 2025 Exhibition Conference
- 1st July to 3rd July 2025 at JW Marriot Hotel Jakarta, Indonesia
- Hosted by PELINDO and supported by the Chartered Institute of Logistic and Transport Indonesia(CILT-ID)
- Presenter: Capt. Zakhir Khan from Bintulu Port Authority, Malaysia
- ‘THEME: INTERGRATING A SUSTAINABLE STRATEGIC FRAMEWORK IN OPTIMISING PORT MANAGEMENT SYSTEMs FOR IMPROVED TERMINAL EFFICIENCIES

Leveraging Greenhouse Gas Inventory Management Systems to Drive Sustainable Port Operations and Enhance Terminal Productivity

Introduction

- The maritime and port industry faces mounting pressure to decarbonize
- Sustainability is now a core driver of operational strategy
- GHG Inventory Systems can align environmental and productivity goals

BINTULU PORT AUTHORITY

BINTULU SMART DIGITAL GREEN PORT

How Was it Started?

- Bintulu Port is the largest single point LNG export terminal in the world and also serves as import export gateway for Sarawak and the Brunei – Indonesia – Malaysia – Philippines East ASEAN Region Growth Area.

- Inspired to be the first carbon neutral port in the region, Bintulu Port has started the initiative with the development of Smart Digital Green Port Blueprint encompass of United Nations Sustainability Development Goals' targets and indicators; environment, economic and social pillars; and smart ports' indicators, action plan, performance measurement procedures and reporting system.

- Bintulu Port is set to be a Smart Digital Green port within time span from 2019 to 2030 with the implementation of programs and projects as concluded by all stakeholders in a comprehensive and structured blueprint with aim to achieve the following mission;
  - Full-fledged green port status by year 2025 (revised after Covid)
  - Full-fledged Smart Digital Port status by year 2030, and
  - Certified Carbon Neutral port by year 2030

BINTULU PORT AUTHORITY

BINTULU SMART DIGITAL GREEN PORT – OUR JOURNEY

SUSTAINABILITY INITIATIVES BY PORT AUTHORITY

- Smart Digital Green Port (SDGP) Blueprint development
- SDGP Management Training
- SDGP MRV Training
- SDG Scoring Training
- SDGP Action Plan Workshop
- ESG Awareness Training
- 2023 Bintulu Port Air Emission Inventory Report
- Green Management System software development
- Air Quality Sensors Installation
- Air Emissions Reduction Strategy document

Targeting EcoPorts Certified Green Port

ECOPORTS

2018

2020

Covid-19 Period

2022

2025

2030
Aligning with IMO reducing at least 40% GHG Emissions compared to 2008 levels

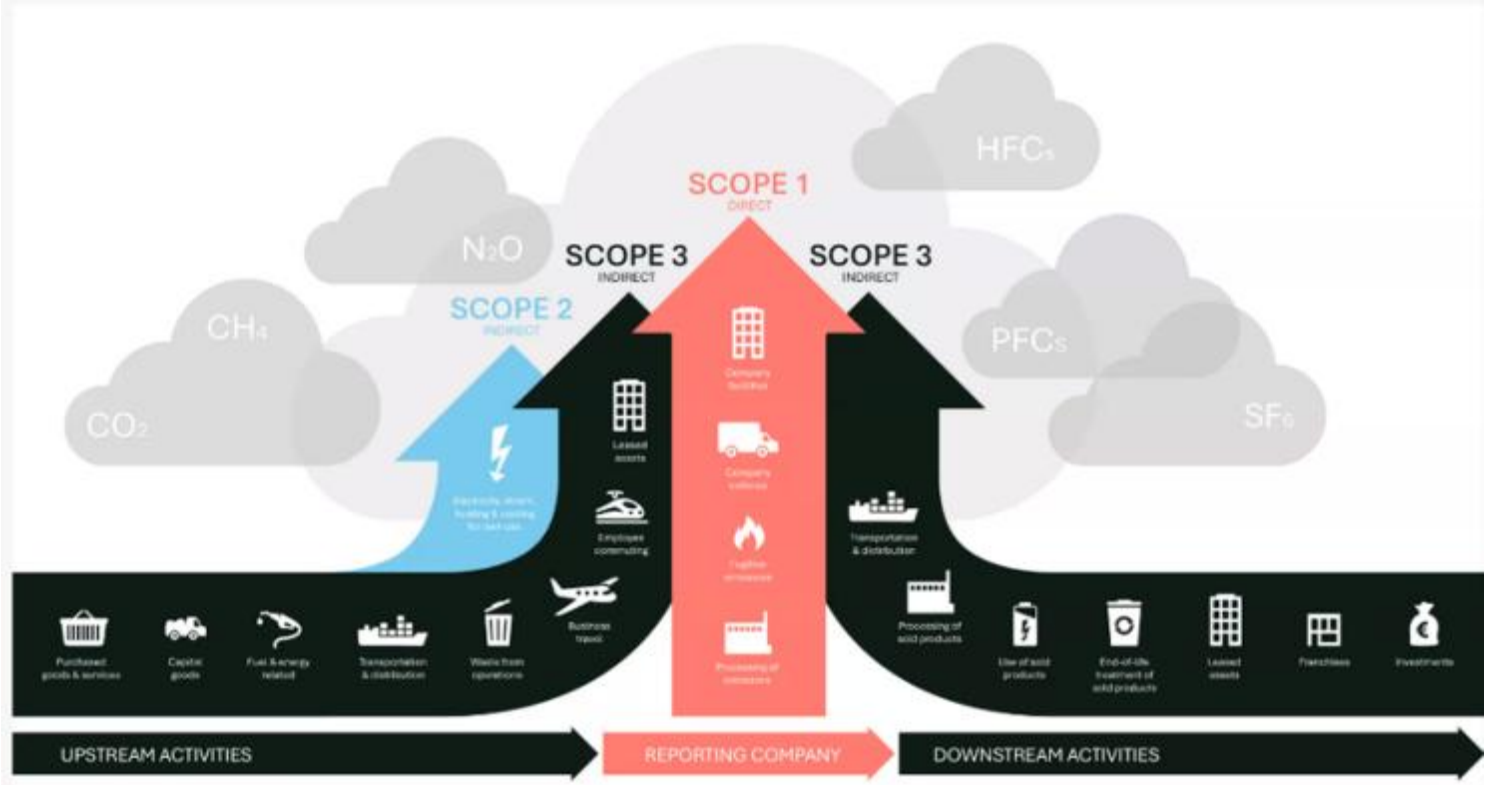
2050
Aligning with IMO Net-Zero GHG Emissions

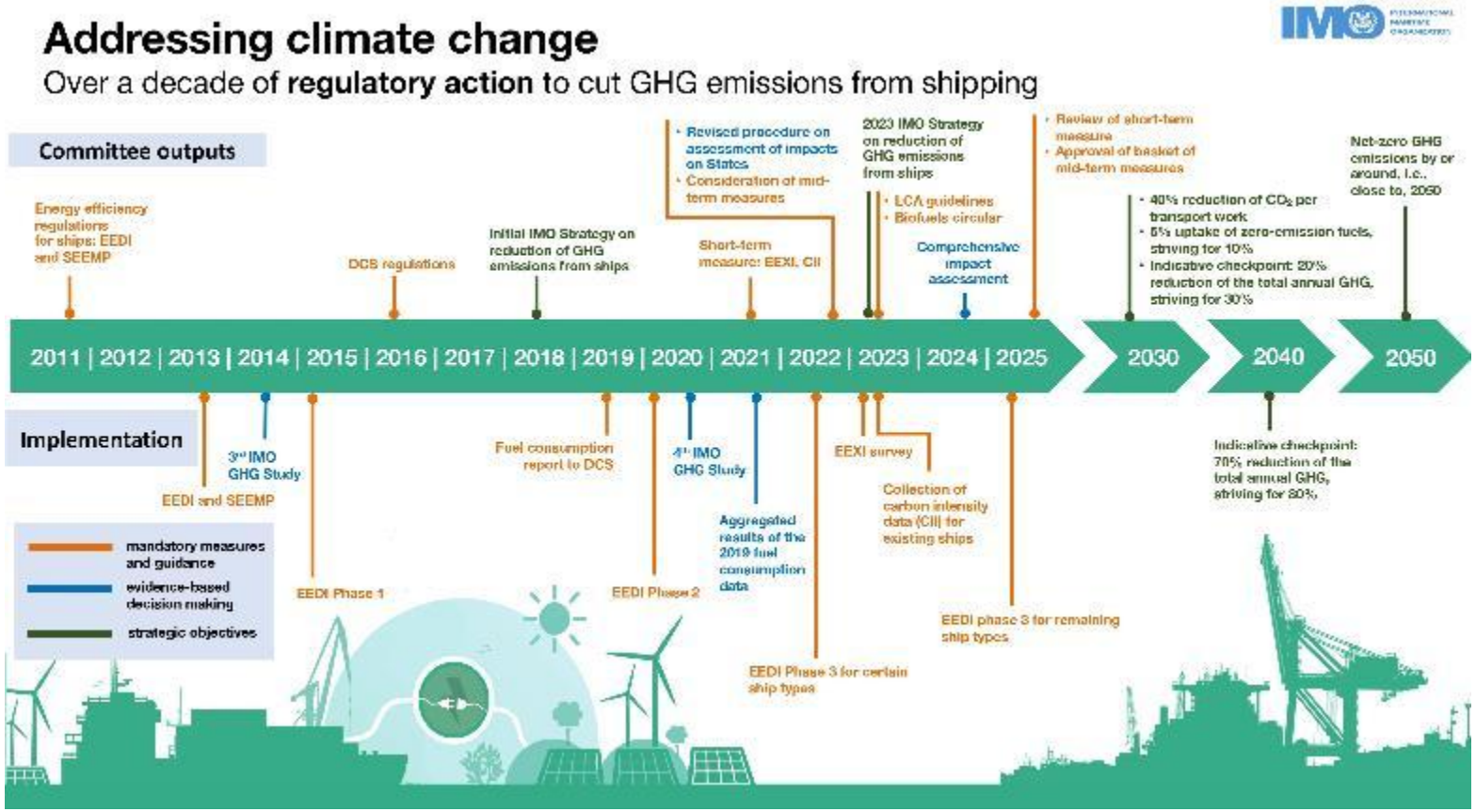
SUSTAINABILITY INITIATIVES BY PORT OPERATOR

- 5G Network
- Beam E-Scooters
- E-buggies
- Unmanned Nested Security Drone
- Electric Vehicles
- Face Recognition Technology
- Roof Top Solar Panels
- Smart Environmental Monitoring System
- Smart Barrier Gate
- Digital Speed Limit
- Electronic Tally System
- Hybrid RTG
- Hybrid rail-mounted gantry (RMG) cranes
- Hybrid ship-to-shore (STS) cranes.
- EV Charging Infrastructure
- Electric Towing Terminal Tractors
- Electric Reach Stackers
- Green Pallets
- New Port Operating System (POS)
- Supply Base Operations System
- Smart CCTV system

What is a GHG Inventory Management System?

- A structured approach to measure, record, and report GHG emissions
- **Covers Scope 1** (direct),
- **Scope 2** (indirect from energy),
- **Scope 3** (supply chain, vessel emissions, etc.)
- Enables data-driven sustainability strategies
- Intensity – for comparison



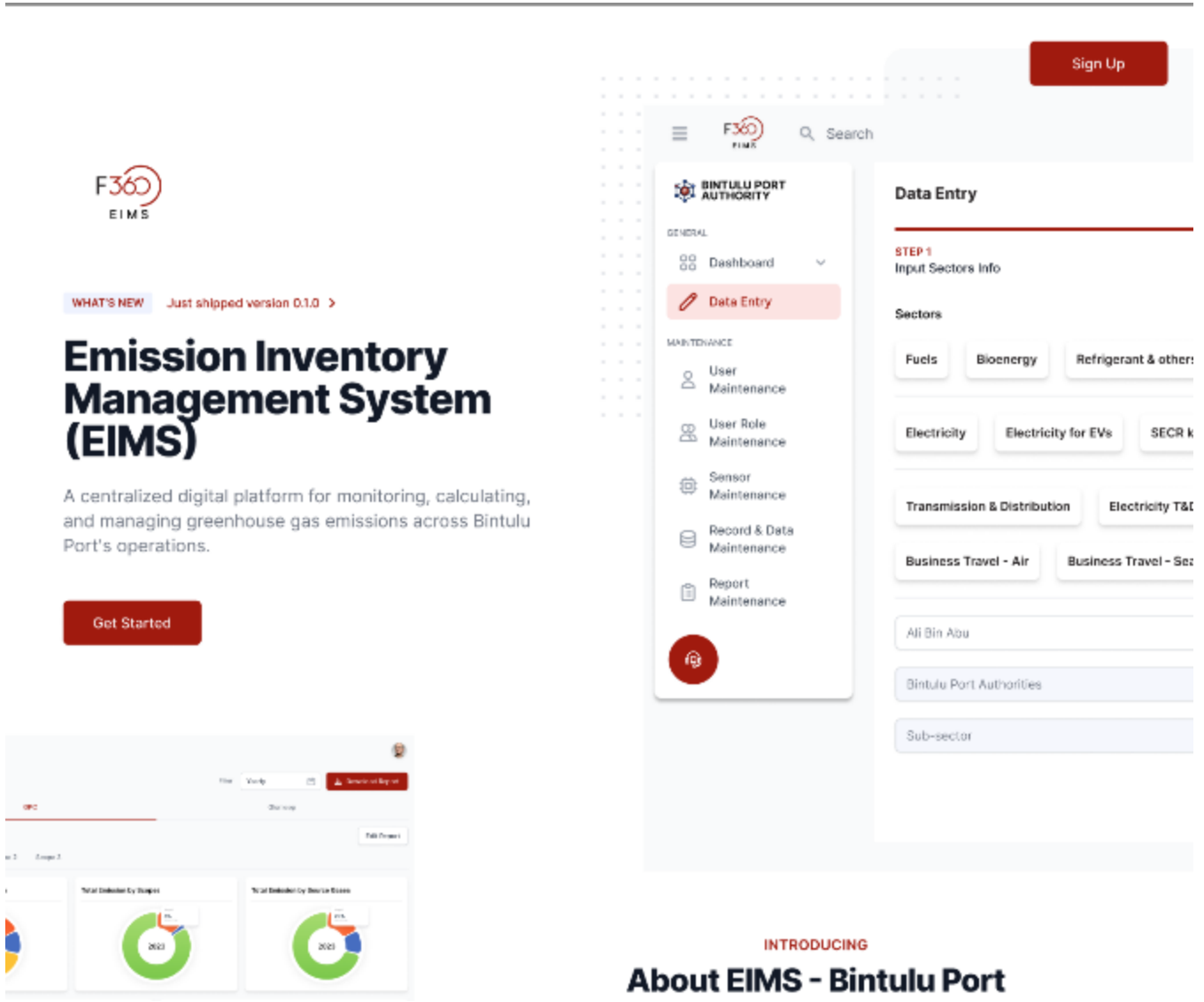


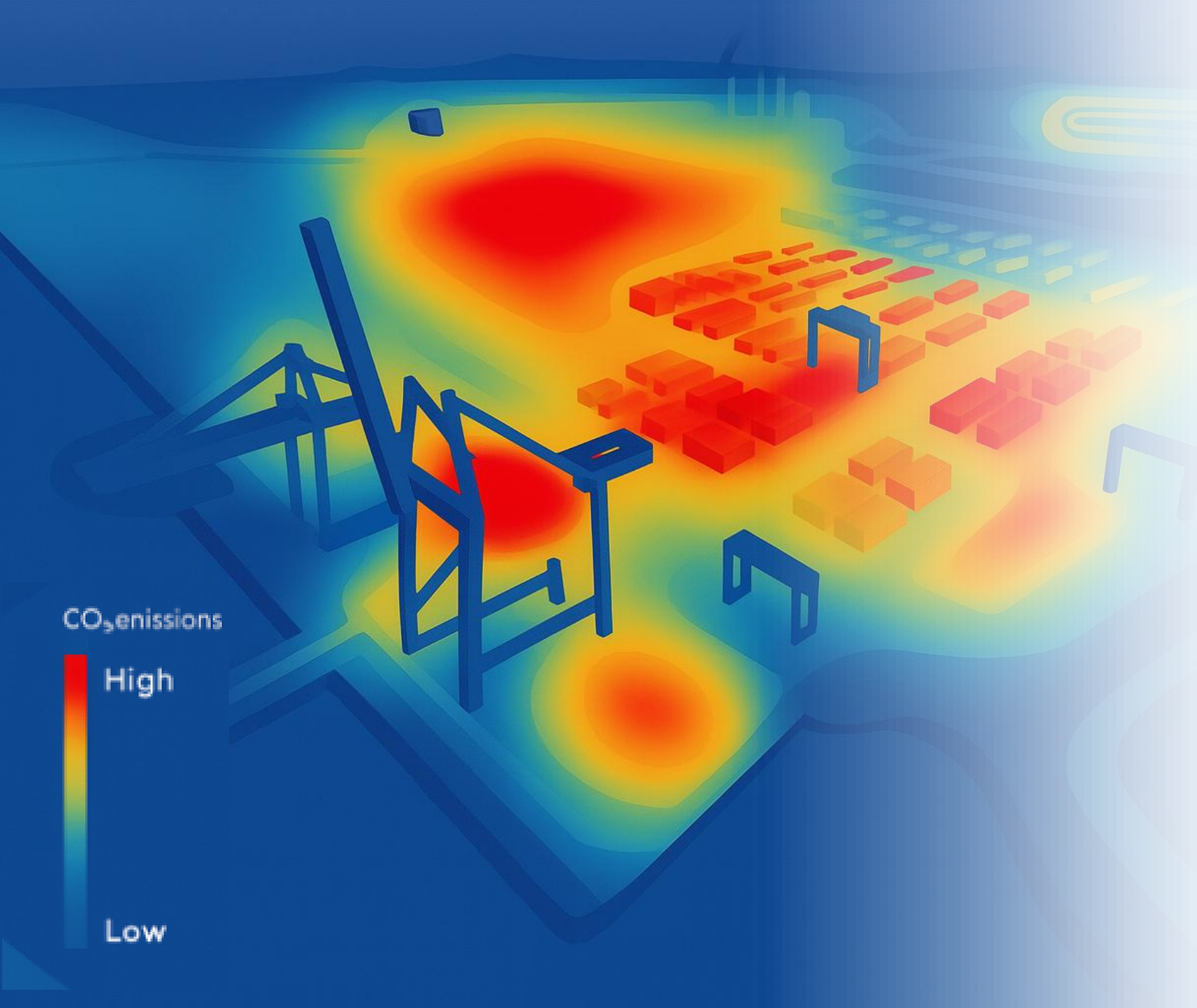
Why Ports Need Emission Inventory Systems

- High emissions from cranes, vehicles, vessels, and shore activities
- Increasing regulatory pressure (IMO, EU ETS, national laws)
- Stakeholders demand ESG transparency and accountability
- Certification – Green Port and Smart Port

Benefits of Emission Inventory Management

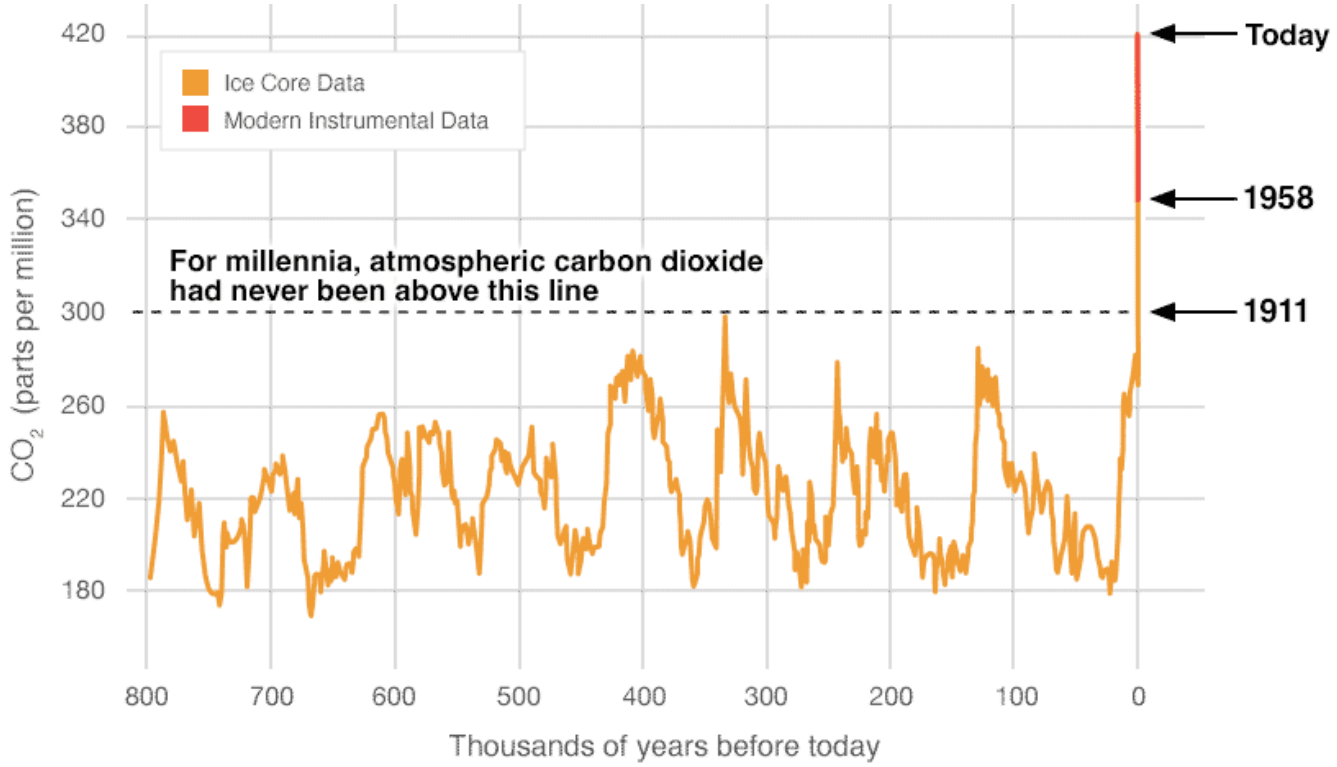
- Accurate Emission Tracking
- Informed Decision-Making
- Regulatory Compliance
- Operational Efficiency
- Enhanced Stakeholder Trust
- To align with the State Post-COVID-19 Development Strategy (PCDS) and Smart Sarawak Blueprint





Emission Hotspots in Port Operations

- Cargo handling equipment
- Vessel berthing and auxiliary power
- Truck and rail operations
- On-site power generation
- Building energy consumption

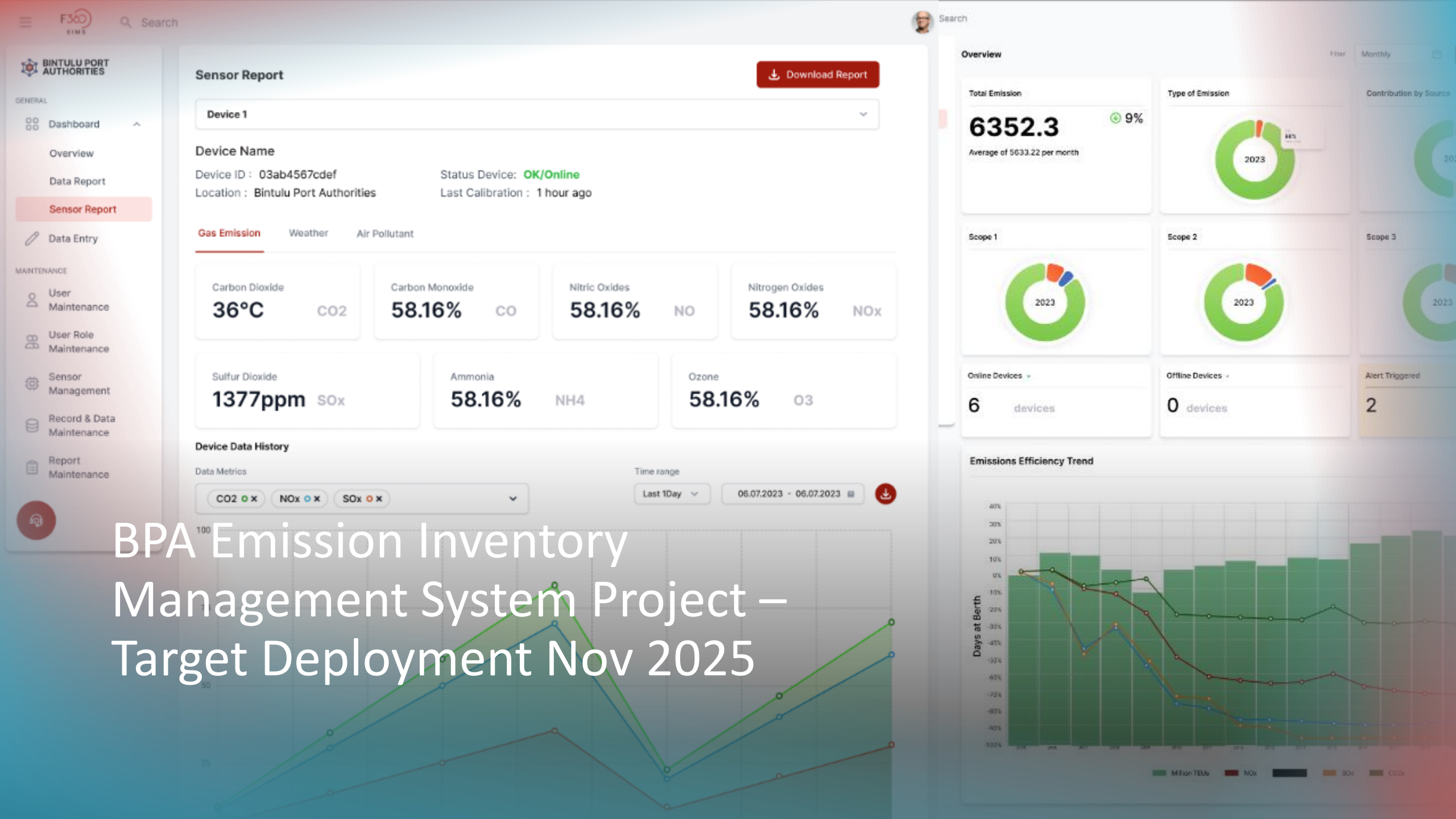


Enhancing Productivity with Emission Data

- Identify inefficiencies (e.g., fuel overuse, idle times)
- Optimize scheduling and equipment utilization
- Reduce energy waste = cost savings + lower emissions
- Comparison against Standards and Good Practices of other ports

Compliance & Reporting Advantages

- Meet international standards: IMO DCS, EU MRV.
- Green Port & Smart Port
- Automate reporting with integrated software
- Avoid fines and improve eligibility for green certifications



BPA Emission Inventory Management System Project – Target Deployment Nov 2025

F360 EIMS

Search

BINTULU PORT AUTHORITY

GENERAL

Dashboard

Overview

Data Report

Sensor Report

Data Entry

Overview

Filter: Monthly

Download

Total Emission

6352.3

9%

Average of 5633.22 per month

Type of Emission

Contribution by Source

Scope 1 by Gases

Scope 2 by Gases

Scope 3 by Gases

Online Devices

6 devices

Offline Devices

0 devices

Alert Triggered

2

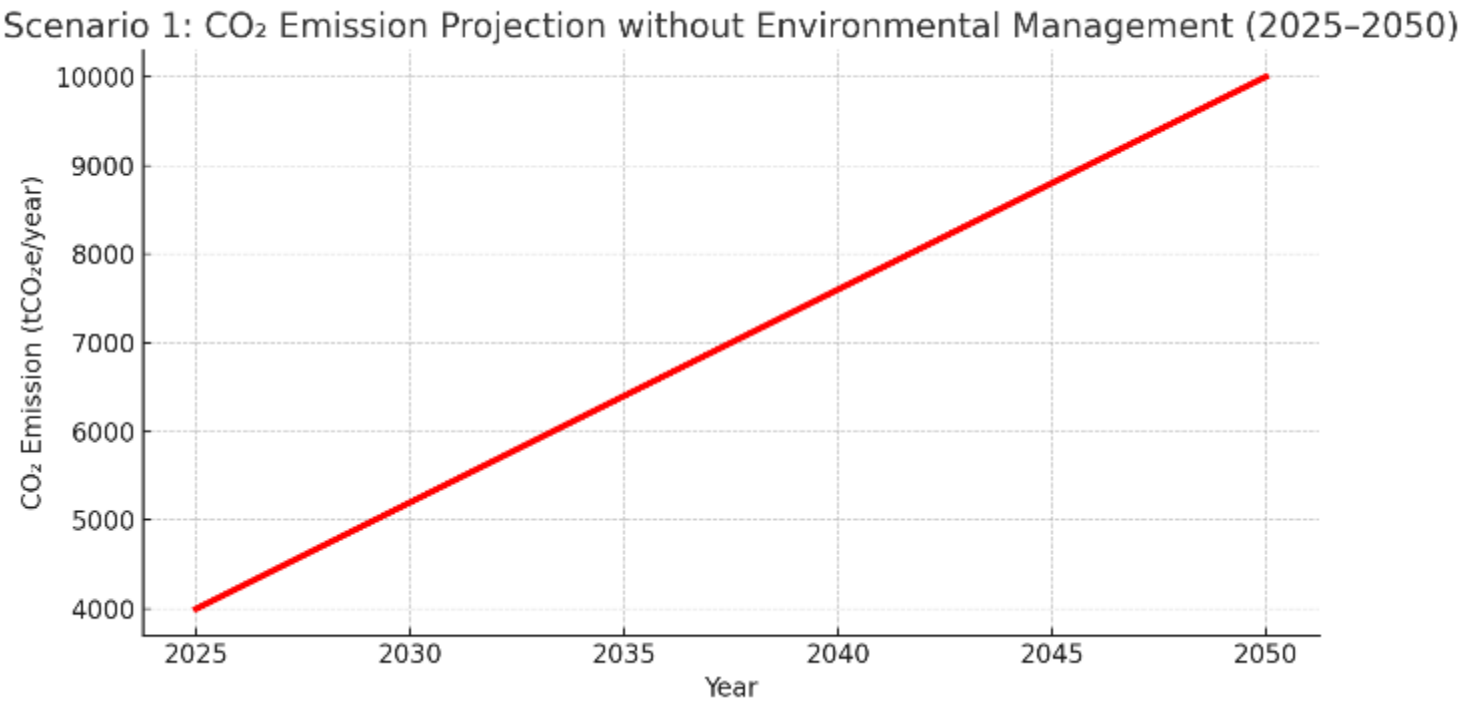
Key Takeaways

- GHG inventory systems are essential for sustainable port operations
- They improve compliance, reduce costs, and support ESG goals
- Aligning environmental tracking with productivity makes ports more competitive

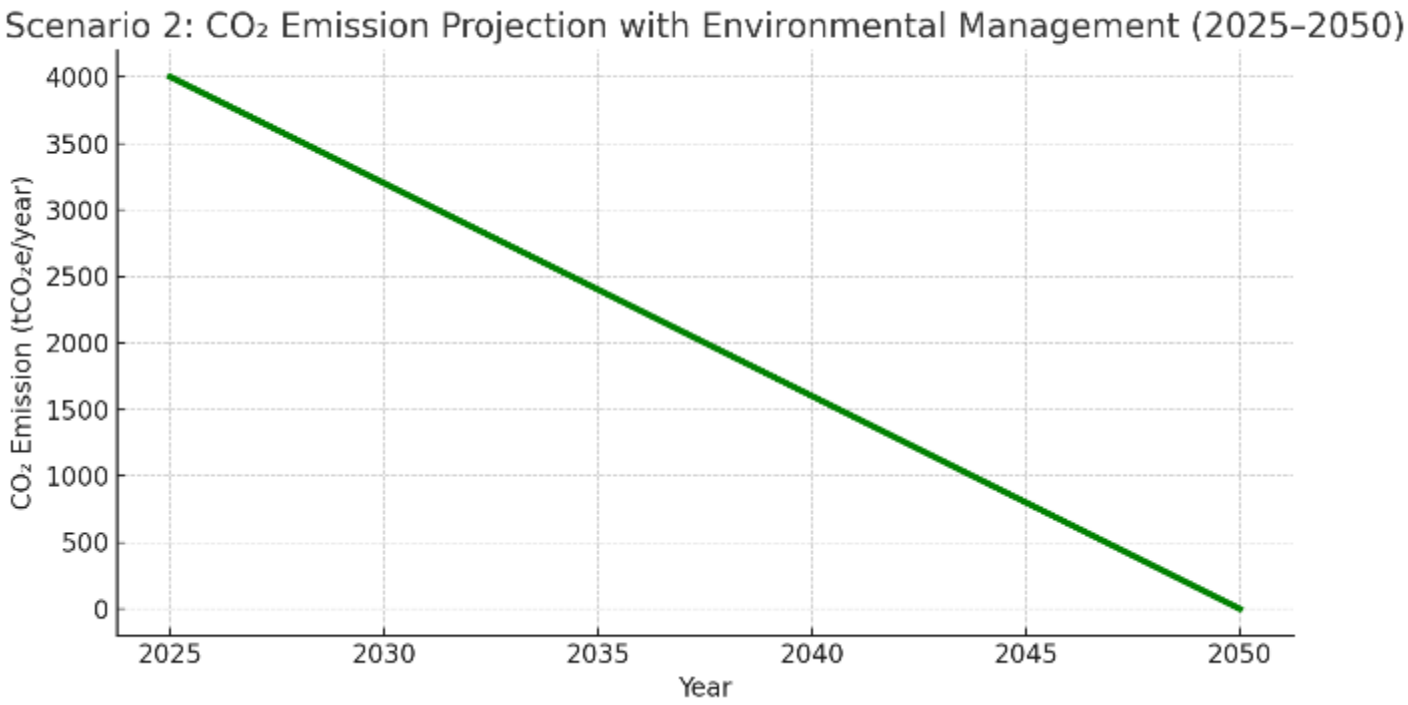
Next Steps

- Assess current GHG tracking capabilities
- Identify emission sources and data gaps
- Implement or upgrade to a scalable GHG inventory system
- Train teams and integrate into decision-making

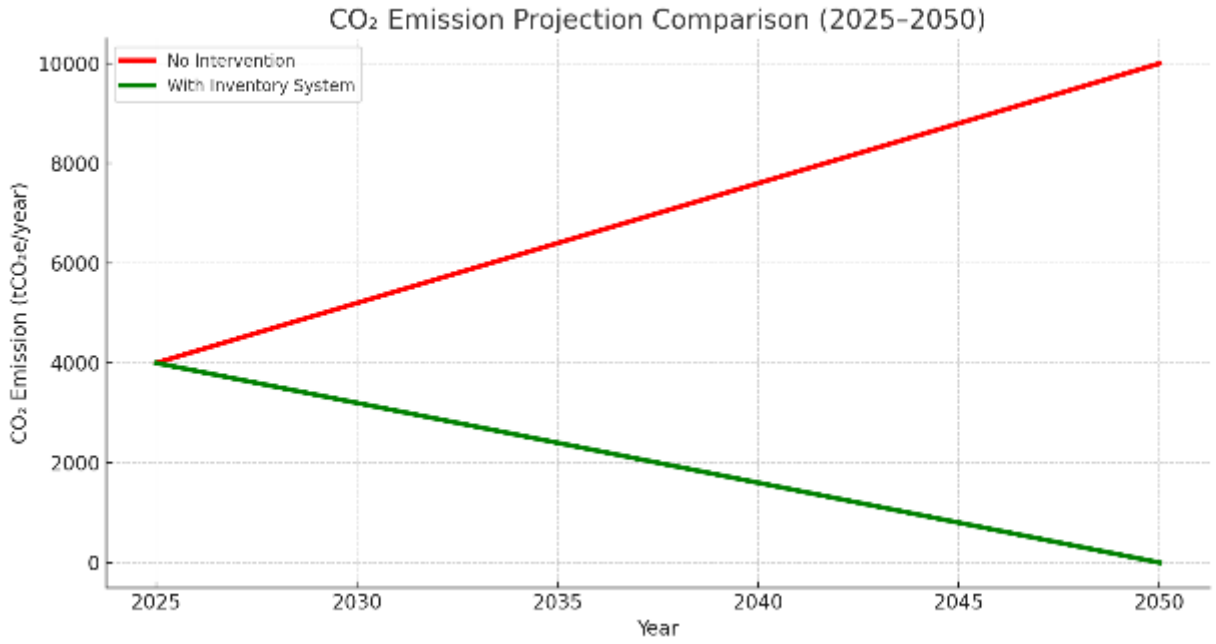
Scenario 1: CO_2 Emission Projection without Environmental Management (2025–2050)



Scenario 2: CO_2 Emission Projection with Environmental Management (2025–2050)



Scenario Comparison: CO_2 Emission Projection (2025–2050)



BPA EIMS Future Upgrades:

- Connect GHG inventory tools with Port Community Systems (PCS)
- Support predictive analytics and long-term planning

Challenges Ahead: Sustaining CO_2 Reduction Over the Next 25 Years vs. Investment Costs from the Port's Perspective

- Challenges Ahead: Sustaining CO_2 Reduction Over the Next 25 Years vs. Investment Costs from the Port's Perspective

Key Deliverables

- Identify CO_2 Hotspots

- Focus on vessel idle time, slow berth turnaround, and inefficient cargo handling.

- Mitigation Strategy

- Improve vessel turnaround time through better scheduling.

- Deploy high-efficiency, low-emission equipment (e.g., electric cranes, hybrid RTGs).

- Capital Cost Recovery

- Introduce a premium port tariff to recover the upfront investment in green infrastructure.

- Shipper Gains

- Lower overall CO_2 logistics footprint

- Premium pricing for low-emission cargo in export markets

- Avoidance of CO_2-related import taxes

Premium Tariff Leveraging Green Inventory: A Win-Win for Shippers & Port

1. Green Gas Inventory
- 📊 CO_2 Hotspot Identification
- 📦 Vessel Idle Time
- 🔍 Cargo Handling Review

2. Premium Port Tariff
- 💸 Cost Recovery Mechanism
- ✅ Shipper Buy-in
- 📘 Regulatory Compliance

3. Sustainable Growth
- 🌱 Green Infrastructure
- 🌐 ESG Export Access
- 🚀 Net Zero Supply Chain

4. Port Advantage
- 🌱 Avoid CO_2 tax penalties
- 💸 Infra cost recovery via tariff
- 🚀 Green port brand uplift

5. Shipper Advantage
- 📦 Low-emission cargo labeling
- ♻️ Carbon offset certification
- 🌐 ESG buyer access

6. Market Advantage
- 📈 Net Zero-driven trade lanes
- 🌍 Global throughput assurance
- 🎯 Long-term volume growth

✅ *Result: Green Infra Drives Efficiency. Premium Tariff Unlocks Growth.*
💼 *Next Step: Align stakeholders to adopt tariff model in next investment cycle.*

Q&A

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