KPMG

From Gateway to Greenway: Ports Leading the Energy Transition

Presentation by KPMG

—

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Necessity for the Maritime Sector to *'Go-Green'*

Main Menu

Necessity for Maritime Sector to go Green

International Maritime Organization **(IMO)** and the UNFCCC Conference in Glasgow, 2021 **(COP 26)** have released concerning **statistics regarding the current landscape of Global Shipping Industry:**

Adverse Effects observed in the sector:

1 Fossil Fuel Usage: Shipping

Fossil Fuels: **99%**

(Fuel oil & Maritime Gas Oil).

2 Projected Trends

GHGs could grow up to **250%** of current levels.

3 Global Warming Concerns

Contributes **~3%** of overall global emissions

Decarbonization of Maritime Sector

1 Primary Focus

- Limit Global **temperature rise to 1.5°C**
- **CO_2 levels approaching net-zero** by mid-century

2 Phase-Wise GHG Reduction

2050: **50%**

2100: **100%**

3 Ship-wise Energy Efficiency

Carbon intensity reduction by

2030: **40%**

2050: **70%**

India’s Green Maritime Vision

India – Maritime Connectivity: Central Node in Global Maritime Trade

- **Cape Route**
- **Suez Route**

Driving Sustainability in Ports: Challenges and India's Approach

Adverse Effects observed in the sector:

1 Construction Stage

- Habitat Destruction
- Air Pollution
- Water Pollution

2 Operations Stage

- Air Pollution
- Water Pollution
- Waster Generation
- Risk of Chemicals/Fuel Spill
- GHG Emission
- Impact on Marine Ecosystem

Pronged Intervention adopted by India

1 Land-based Activities

- Green Fuel Terminals (LNG, CNG)
- Electrification of Equipment's
- Innovative Solutions (G-H_2, G-NH_3)

2 Water-front Activities

- Truck to Ship
- Shore to Ship
- Ship to Ship

3 Policy Interventions

- National Green Hydrogen Mission
- Harit Sagar
- Harit Nauka

India's KPIs & Road Map for Sustainable Development of Green Ports

Key Objectives

Accelerate adoption of Green fuel and Green energy to reduce carbon emission

Encourage usage of recycled materials in construction of Ports & Related Infrastructure

Increase efficiency in port operation by making fully automated ports

KPI Targets

Metric	Status (as of 2025)	Target (2030)	Target (2047)
Carbon neutral ports (Major Ports)	4	1	**14**
Developing Hydrogen/ Ammonia Hubs at major ports	1	3	14
LNG Bunkering in major ports	2	4	8
Port equipment electrification (%) at all major ports	25%	50%	>90%
Area under green belt at all major ports* (%)	<10%	20%	33%
Share of renewable energy at all major ports (%)	<10%	>60%	>90%

(Blue text extracted from MIV) *(Red text extracted from MAKV)*

Roadmap for sustainable & Green Ports

MIV 2030

- Adoption of clean fuels
- >90% electrified port equipment
- 100% shore to ship power supply
- >60% share of renewable energy
- Circular Economy
  - Re-use of Dredged material
  - Re-use of Scrap metal
  - Re-use of Plastic

MAKV 2047

- Green Hydrogen fueled port vehicles
- >90% share of renewable energy
- Green Hydrogen Hubs
  - Production Units
  - Storage Hubs
  - Trading Centers
- Maritime industry symbiosis.

**Note - National level target, since port level target can vary basis land availability, soil fertility.*

Best Practices Adopted

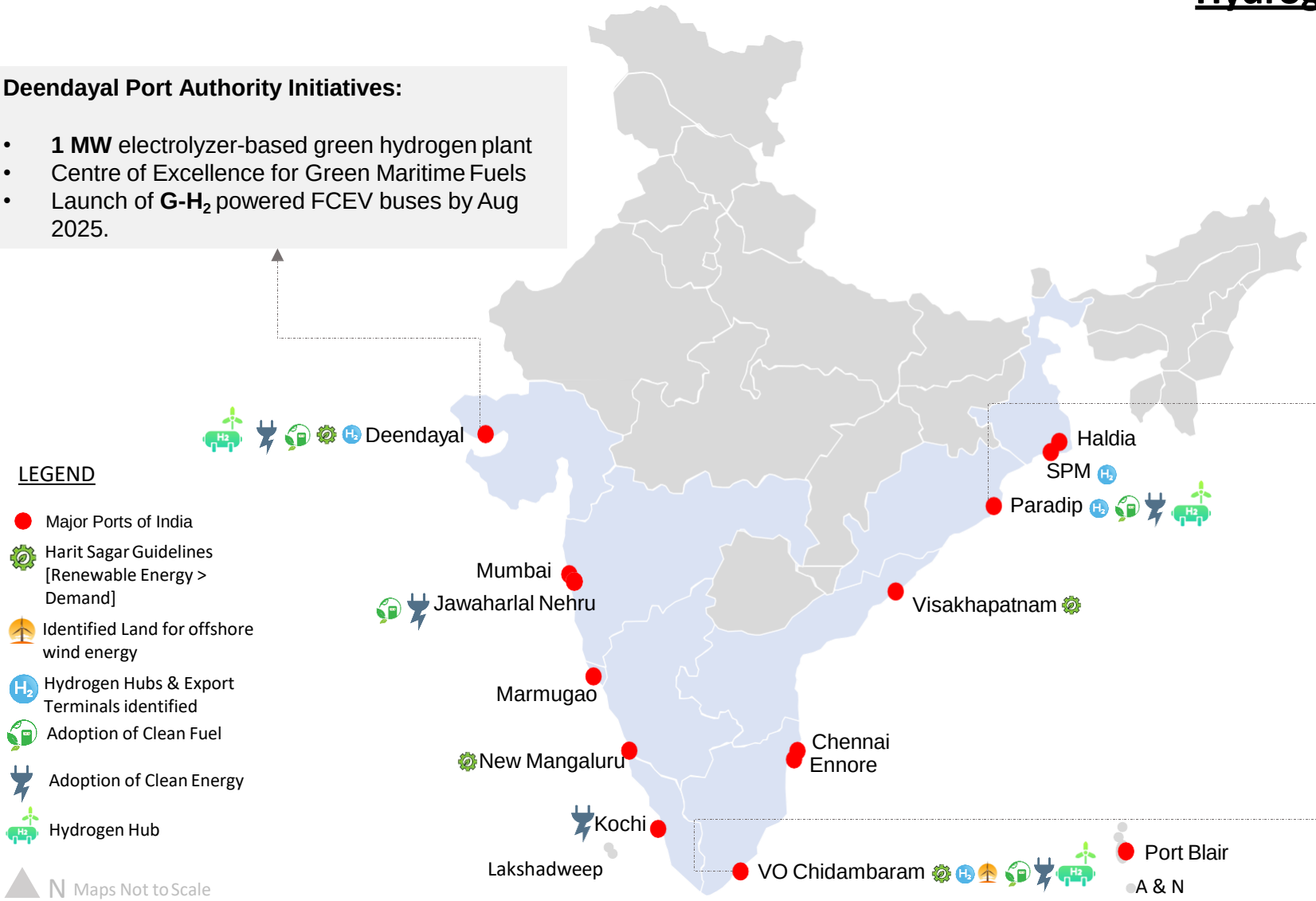
Adaptation of Clean Fuel, Clean Energy & Hydrogen Hubs

Deendayal Port Authority Initiatives:

- **1 MW** electrolyzer-based green hydrogen plant
- Centre of Excellence for Green Maritime Fuels
- Launch of **G-H_2** powered FCEV buses by Aug 2025.

Paradip Port Authority Initiatives:

- Completion of Dedicated Terminal for Green Hydrogen (**G-H_2**)/ Ammonia by **2027**.



VO Chidambaram Port Authority Initiatives:

- **G-H_2** Demo Project: **10 Nm^3** capacity @ **₹3.8 Cr**
- **G-H_2** Bunkers & Refueling: **₹35 Cr** sanctioned by MNRE

1st of its kind in Ports sector

Achievements in Green Shipping [Make in India]

100% **Renewable Energy Use** achieved at major ports:
New Mangalore Port, **Deendayal Port**, **VO Chidambaram Port**, and **Visakhapatnam Port.**

33% **Of global ship recycling handled by India.**
2nd largest share in the **Global Ship Recycling Market.**

Key Green Maritime Projects

- **Hybrid Electric Ferries** for **Kochi Water Metro** – developed by **Cochin Shipyard Ltd.**
- **Hydrogen-powered 50 Pax Ferry** for **Varanasi** – Indigenous innovation by CSL
- **Autonomous Electric Vessels** delivered to **ASKO Maritime, Norway.**
  - Project value: $ 15.05 million (~₹132 Cr)
- **World's 1st Zero-Emission Feeder Container Vessel** powered by **Hydrogen Fuel Cell** – by CSL.

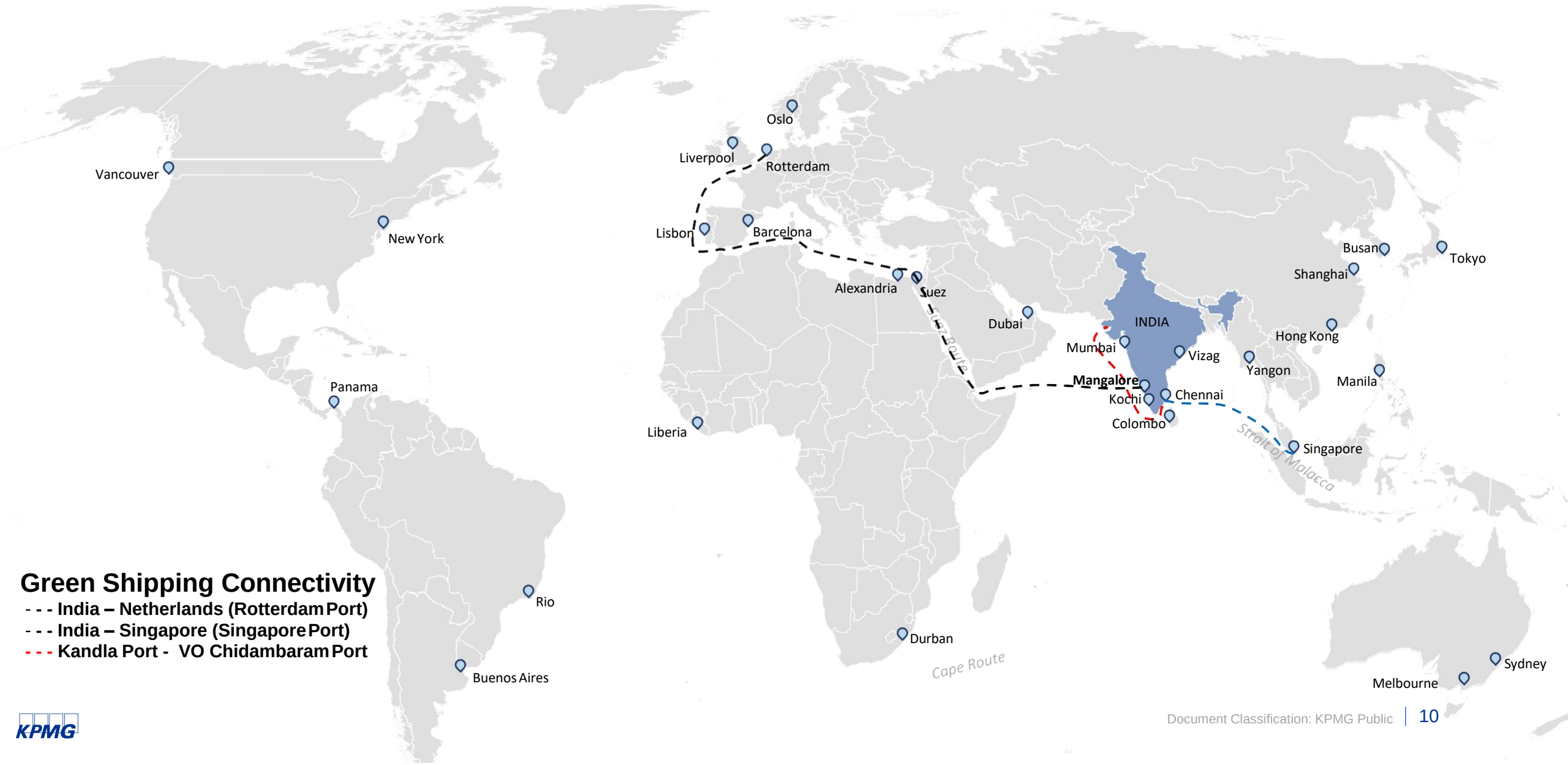
Financial Boost to Maritime Sector

- **Maritime Development Fund (MDF)** – ₹25,000 Cr announced in **Union Budget 2025-26.**
  - Expected to **mobilize ₹1.5 lakh Cr** investment in shipping by 2030
- **Up to 30% Subsidy** under Shipbuilding Financial Assistance Policy

Autonomous/Unmanned Electric Vessel to M/s ASKO Maritime, Norway

*1 USD = 87.65 INR (As on 14 August 2025)

Green Shipping Corridors



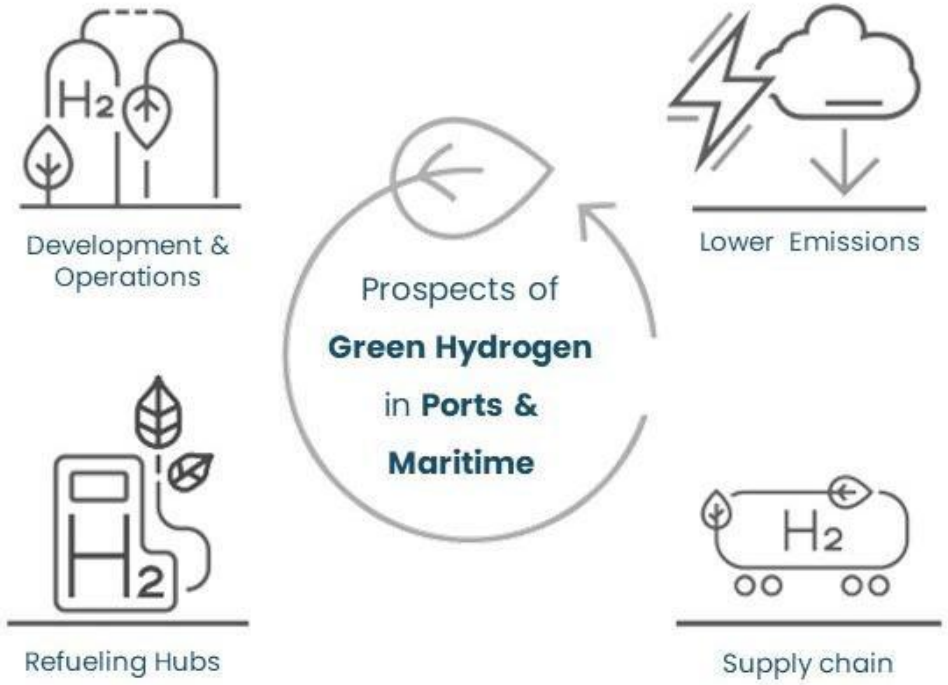
Green Shipping Connectivity

- - - India – Netherlands (Rotterdam Port)
- - - India – Singapore (Singapore Port)
- - - Kandla Port - VO Chidambaram Port

National Green Hydrogen Mission

National Green Hydrogen Mission Overview

India's 2023 Union Budget announced the **National Green Hydrogen Mission**, with the objective of making **Aatmanirbhar Bharat** & a **Global hub** for **Green Hydrogen production and export.**



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About the Scheme

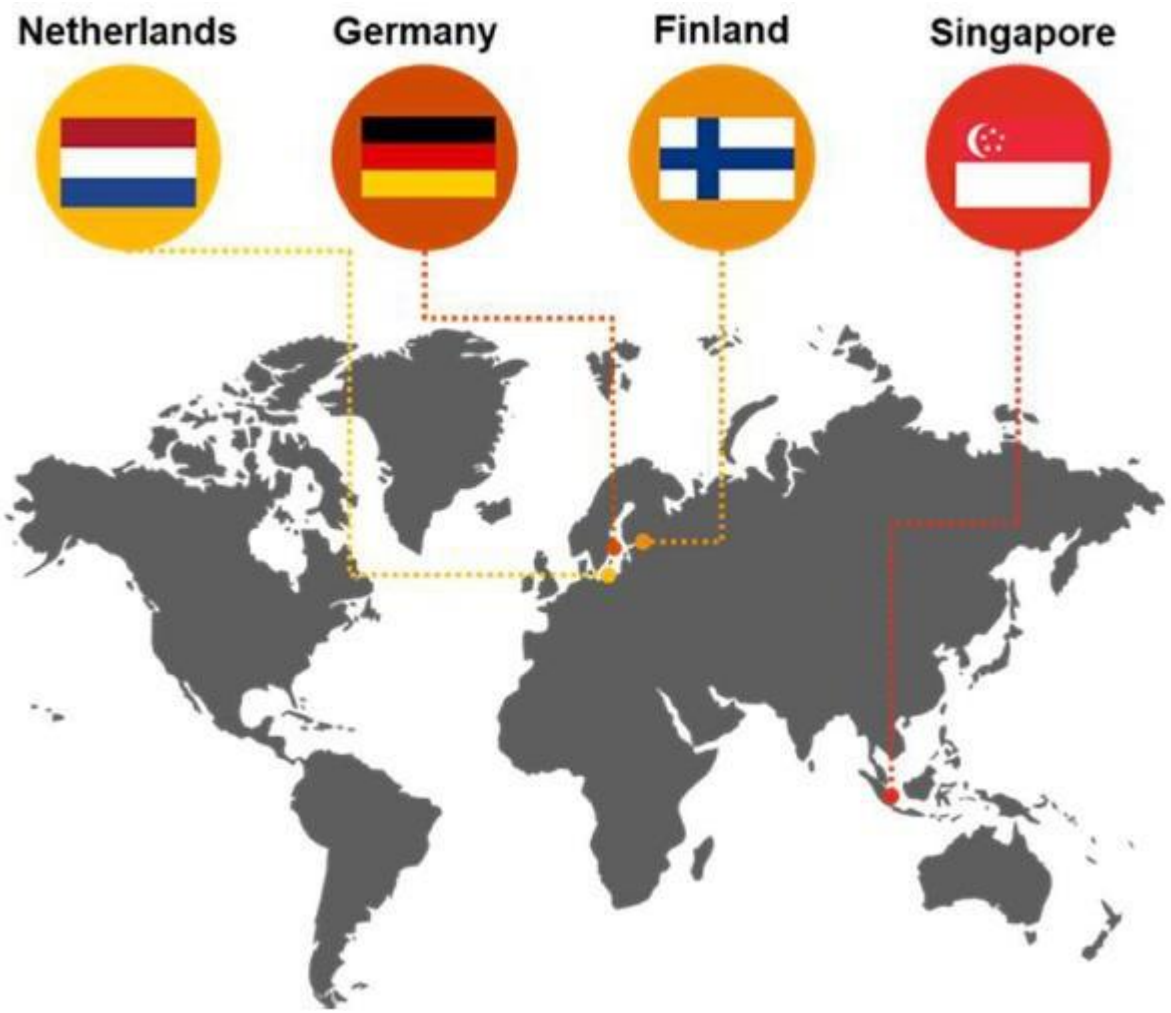
₹ 19,744 crore ($2.25 billion) initial outlay forthe Mission

- **₹ 17,490 crore ($ 1.99 billion)** Strategic Interventions for Green Hydrogen Transition (SIGHT) programme
- **₹ 1,466 crore ($ 165 million)** for pilot projects
- **₹ 400 crore ($ 45.63 million)** for Research and Development (R&D)
- **₹ 388 crore($ 44.26 million)** towards other Mission components

Source: Ministry of New and Renewable Energy, Government of India

Thank You

Global Success Stories



Port of Rotterdam by 2050	• Storage/ use of captured CO_2 • Gas and offshore wind power for electricity generation • International recycling, biomass & hydrogen hubs
Port of Hamburg by 2040	• Shore power facilities by 2030 • Green electricity for Quayside facility • Emissions reduction certificates to compensate CO2
Port of Helsinki by 2035	• Shore power capabilities • Incentives for low-emission vehicles • Electrification of machine • Use of biofuels, LED & solar panels
Singapore decarbonization strategy 2050	• Low/ zero carbon energy sources • Carbon accounting & reporting • Decarbonization R&D hub