



# 42nd PMAWCA ANNUAL COUNCIL MEETING

42<sup>o</sup>  
CONSELHO ANUAL  
AGPAOC

## Topic:

Challenges of Rapidly changing Energy Transformation to cushion the effects of climate and its effect on Port, Maritime and Logistics sustainability (priorities, resources and institutional framework)

by

Dr Awwal Bamanga

15 – 18 November 2022

**Luanda - Angola**

# Brief Profile of Presenter



## PERSONAL DATA

**Dr Awwal Bamanga**  
**Assistant Director**

(PhD Environmental Sciences & Sediment  
Geochemistry) United Kingdom



## SPECIALISATION

Marine Sediment & Biogeochemistry



## DEPARTMENT

Marine Environment Management Department,  
Nigerian Maritime Administration and Safety  
Agency (NIMASA)

## Professional Affiliations/Membership:

- Associate member, Institute of Marine Engineering, Science and Technology (AMIMarEST)
- Registered Environmental Specialist (RES) with National Registry of Environmental Professionals (NREP USA)
- Associate Member, Nigerian Institute of Safety Professionals (NISP)
- Member, Nigerian Environmental Society (NES)
- Published several works in peer reviewed journals

## Working Experience:

- Acquired over nineteen (19) years working experience as a pollution prevention, control and management officer within the maritime industry.
- TETFUND Resource Person

# PRESENTATION OUTLINE

## 1. Background

- ❑ Environmental settings within Maritime zonation
- ❑ Ports Environment
- ❑ Industrialization within the Ports Environment
- ❑ Benefits of developed ports for economic development
- ❑ The Nigeria Blue Economy
- ❑ Legal framework

## 2. Potential Sources of Air Emissions from the Ports

- ❑ Shipping source
- ❑ other sources or non shipping source

## 3. Challenges of mitigating air emissions from the Ports environment

## 4. Role of International Agencies in the control of Marine Environment pollution

## 5. Role of National Agencies in the control of Marine Environment pollution (Nigeria)

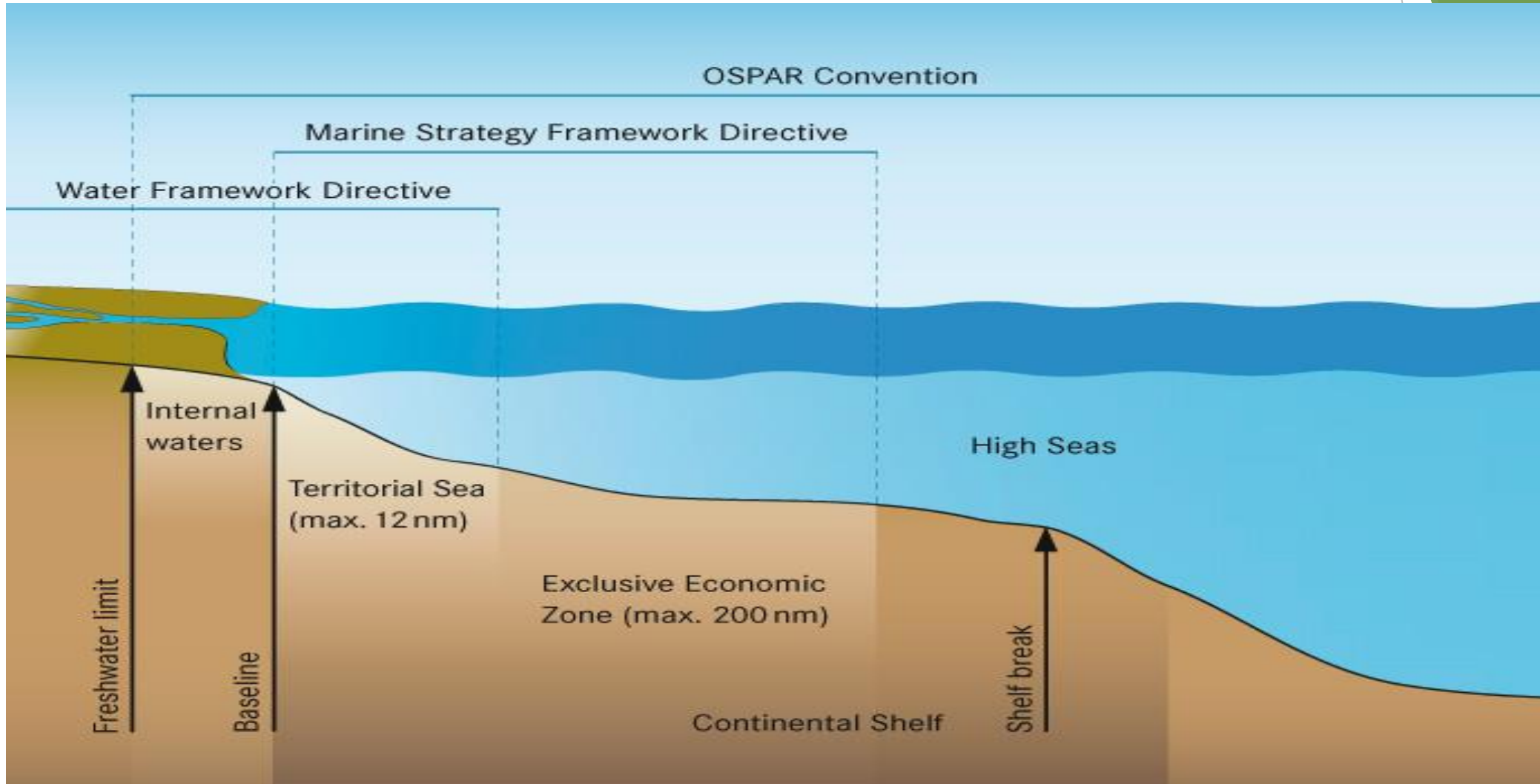
## 6. Potential sources of Air emissions from the ports

## 4. Strategy for mitigating Air Emissions from the Ports

- ❑ Use of current technologies
- ❑ Ports digitalization and automation.
- ❑ Capacity building
- ❑ Ports expansion on space and operations modalities.

## 4. Recommendations

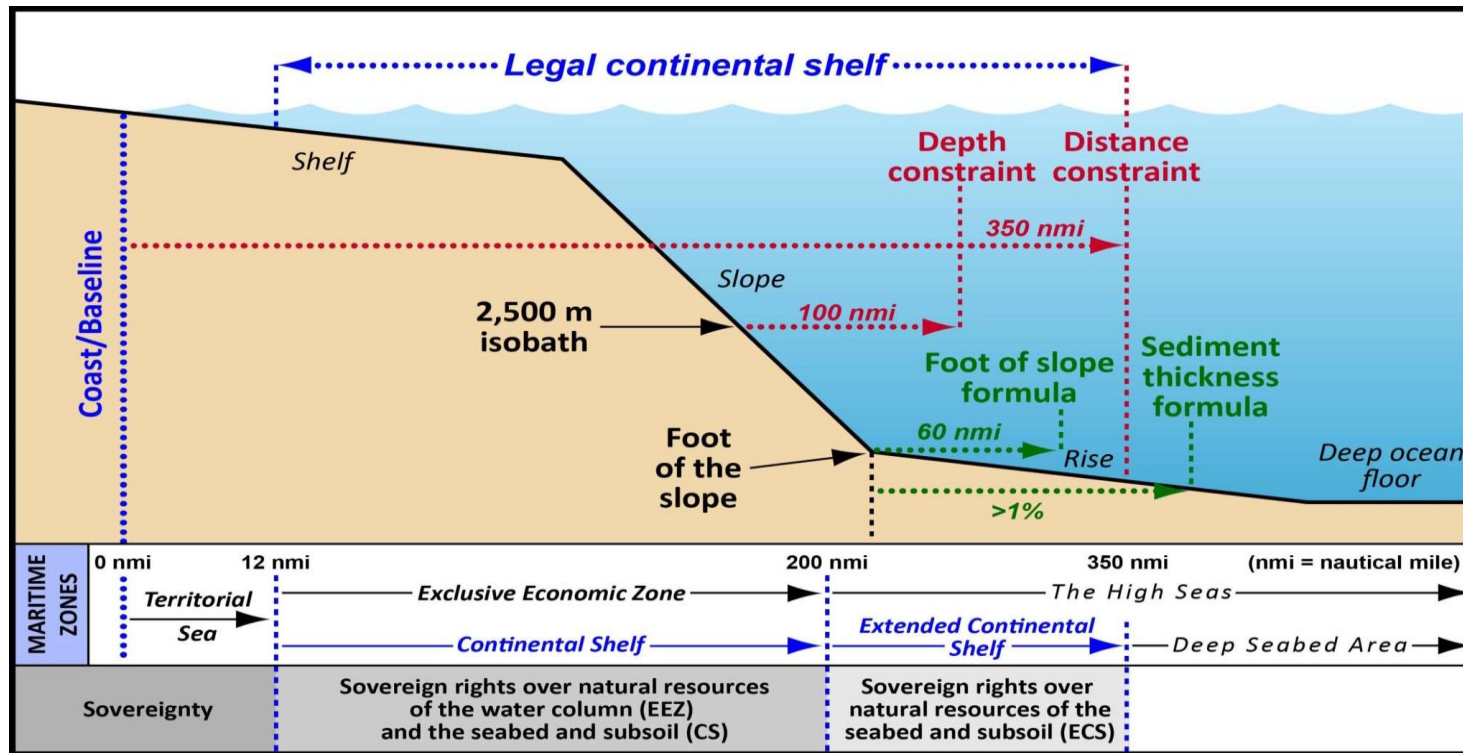
# Environmental settings of Maritime Zonation



\*OSPAR- Oslo/Paris convention (for the Protection of the Marine Environment of the North-East Atlantic)

# Background - Port Environment

- The coastal zone is influenced by human activities such as fishing, industries and shipping which can become venerable due to persistent anthropogenic actions
- A port is always located within the coastal zone or shore containing one or more harbours where ships can dock and transfer people or Cargo to or from land.



Maritime Zones

# Background - Industrialization within the Ports environment

- ▶ The port is the industrialized part of the maritime environment, because it houses terminals and jetties including other industries that are situated within.





# Background Cont.- Port Activities

- ▶ Ports serve;

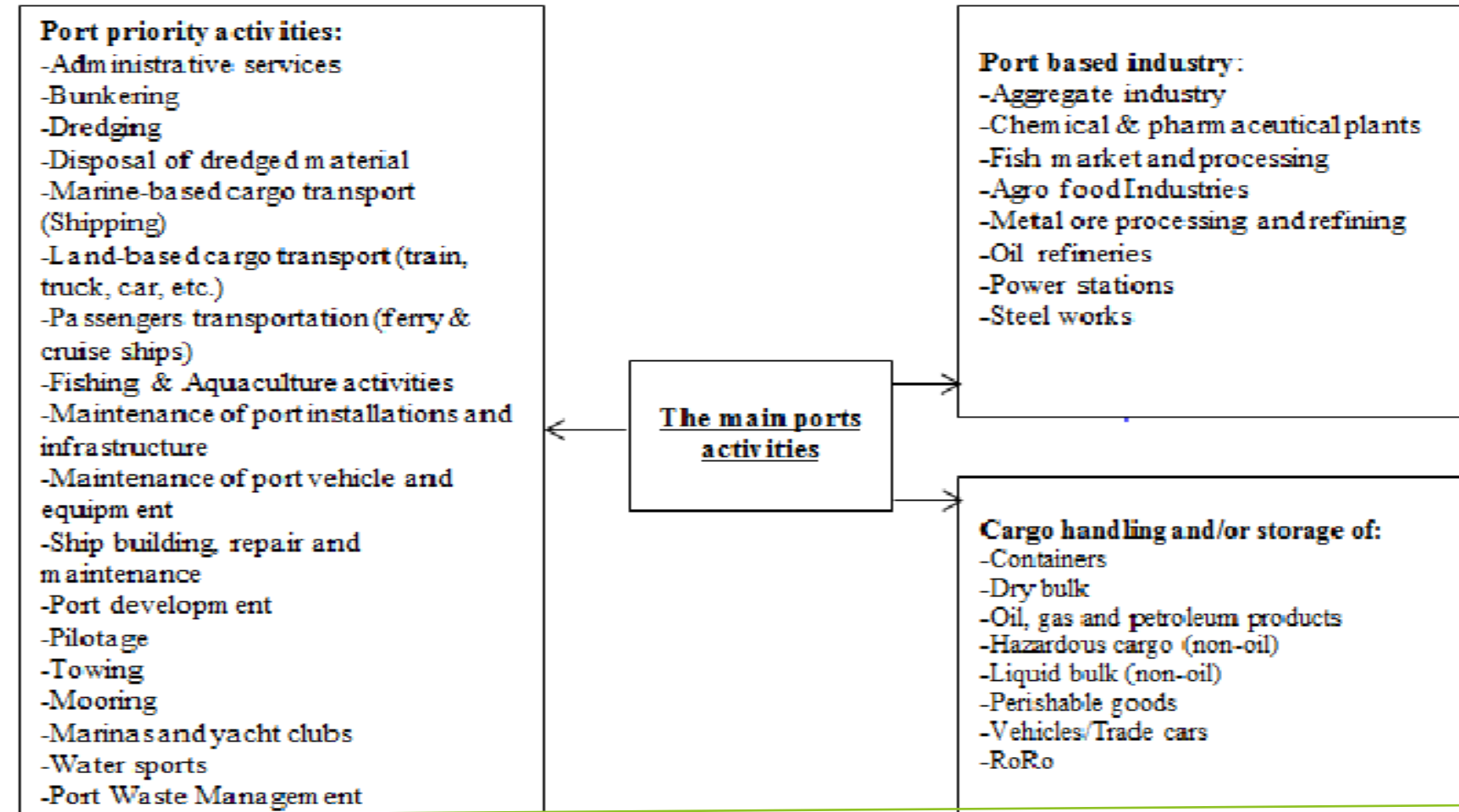
- ▶ transportation hubs for goods movement,
- ▶ the distribution of freight for;
  - ▶ raw materials,
  - ▶ parts and finished consumer products

by all modes of transportation including marine, air, rail and truck, to businesses in local communities and worldwide.

- ▶ by all modes of transportation including marine, air, rail and truck, to businesses in local communities and worldwide



# Background Cont.- Port Activities



Major Activities in the Ports



# BENEFITS OF DEVELOPED PORTS FOR ECONOMIC DEVELOPMENT

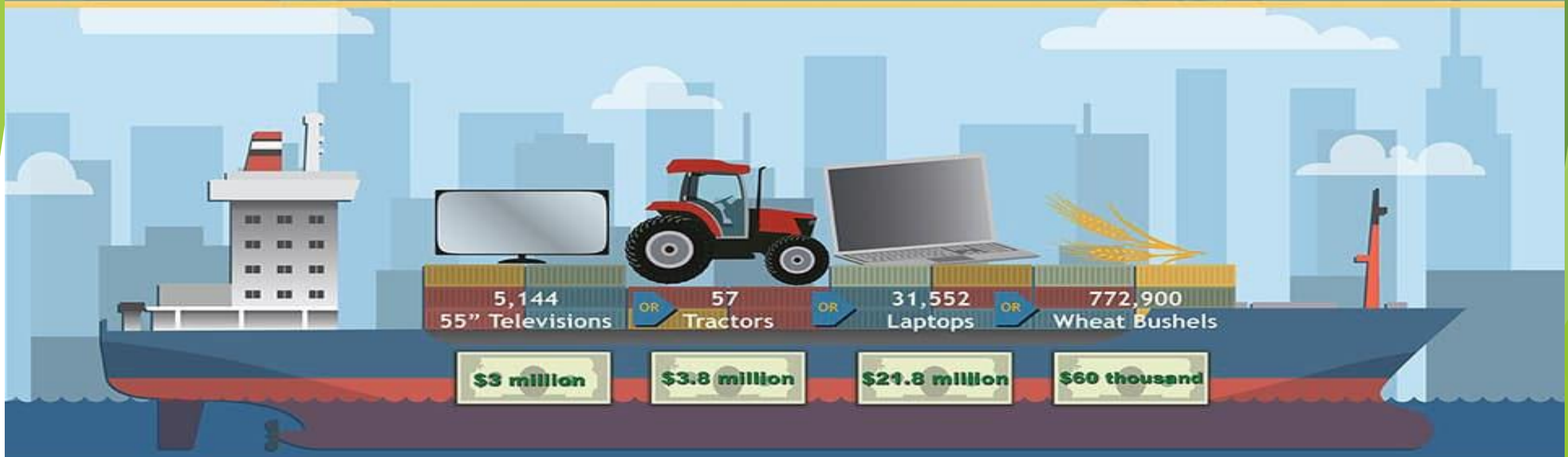
## DEEPER PORTS, DEEPER POCKETS

One more inch of water in a port means larger ships can enter, bringing millions of dollars worth of additional cargo.

And, carrying more goods in one trip means fewer total trips to ship the same amount of stuff.

With one more inch of depth in a port, a cargo ship could carry about 50 more tractors, 5,000 televisions, 30,000 laptops, or 770,000 bushels of wheat.

Below, see about how much more cargo a ship can carry—and what it's worth—with one more inch of depth in a port.



# The Nigerian Blue Economy

- ▶ Inefficiency as a result of low level of technology application in ship processing.
- ▶ Old and badly maintained port facilities, while marine shorelines are highly polluted from industrial effluence and waste.



Figure: Slow cargo transfers at Apapa port, Lagos  
Source; Businessday.ng

# Background Cont.

- ▶ In ports we encounter negative environmental impact by emissions of noise, odors, volatile organic substances, and pollution of water and soil by oil chemicals, hull paint and other hazardous materials.
- ▶ Of a challenge now is the contribution of port to air emissions and to global warming.



# Legal Frame work

- ▶ MARPOL 73/78 Annex VI Prevention of Air Pollution from Ships (entered into force 19 May 2005)
  - ▶ Sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts.
  - ▶ Designated emission control areas (ECA) set more stringent standards for SO<sub>x</sub>, NO<sub>x</sub> and particulate matter. - Nigeria not among.
- ▶ Article 212 of the 1982 UNCLOS titled “Pollution from and through the atmosphere” addresses this source of marine pollution.
- ▶ European Eco-Management and Auditing Scheme (EMAS) or the ISO 14001 EMS.
- ▶ Sustainable development goals applicable by port:
  - ▶ Goal 7: Affordable and clean energy
  - ▶ Goal 9: Industry, Innovation and Infrastructure
  - ▶ Goal 11: Sustainable cities and communities
  - ▶ Goal12: Responsible consumption and production
  - ▶ Goal17: Partnerships for the goals



# Role of International Agencies in the control of Marine environment pollution

S/N	International Organization	Key Roles/Responsibilities
1	United Nations Environmental Program (UNEP)	Formulate international policy with respect to UNCLOS (United Nation's Law of the Sea)
2	International Maritime Organization (IMO)	Formulate international maritime conventions/protocols that promote safety and prevention of marine pollution e.g SOLAS (Safety of life at sea) and MARPOL (Marine Pollution)
3	Maritime Organization for West and Central Africa (MOWCA)	Formulate regional policy towards enhancing shipping activities in the West & Central Africa.
4	African Union (AU)	Formulate policies on African strategies towards enhancing Ocean governance within the African continent.
5	European Union	Formulate policy for the protection of oceans and seas within the European communities.

# Role of National Agencies in the control of Marine pollution (Nigeria)

S/N	National Organizations	Key Roles/Responsibilities
1	Nigerian Maritime Administration and safety Agency (NIMASA)	Regulate shipping activities in line with safety, marine pollution, local content & maritime labour.
2	Nigerian Ports Authority (NPA)	Provide ports, regulate port operations for ships.
3	National Inland Waterways Authority (NIWA)	Regulate and promote maritime activities within the inland waterways.
4	Nigerian Institute for Oceanography And Marine Research (NIOMAR)	Initiate local research on Ocean science
5	Department of Petroleum Resources (DPR)	Regulates Oil & gas activities both onshore and offshore.
6	River Basin Development Authority	Appropriate water resources for various use such as irrigation



# Potential Sources of Air Emission from the Ports

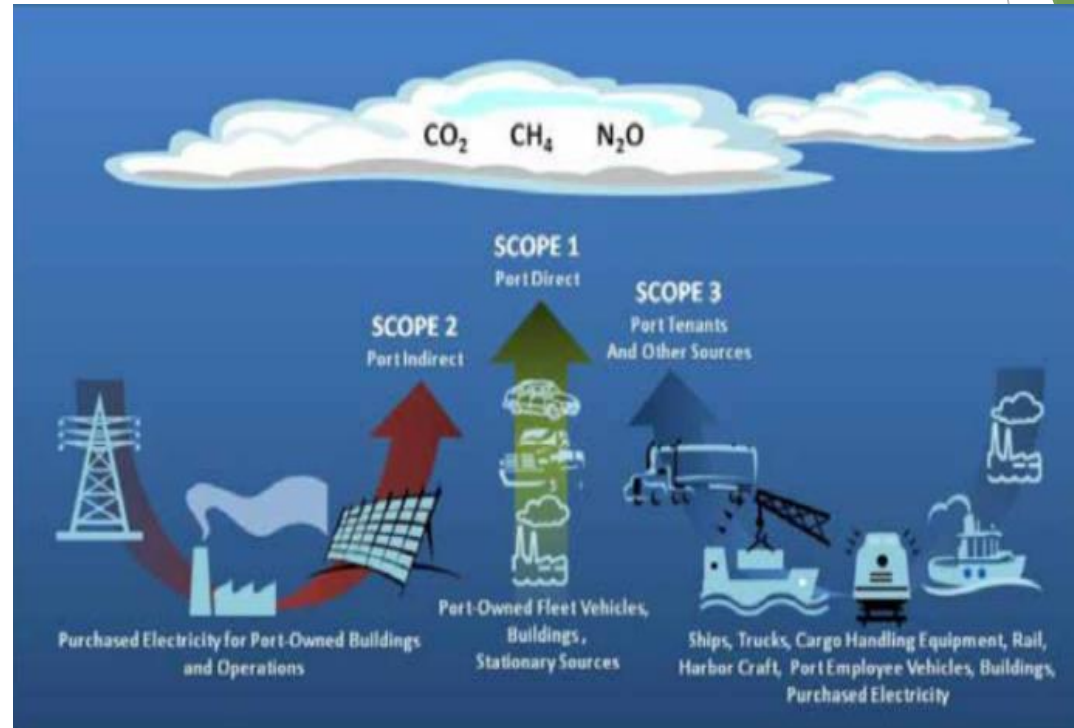
## ► What are sources of emission?

### ► The Vessels:

- emissions from shipping contribute to the release of greenhouse gases.
- The SO<sub>2</sub> content of Heavy Fuel Oil used by vessels is 2700 times higher than road fuel!
- shipping ranks the highest in terms of SO<sub>x</sub> emissions, at least in the northern hemisphere.

### ► The Industries within the Ports

- dust drifting from bulk cargo discharge
- Haulage/Trucking
- Tank farms



# Potential Sources of Air Emission from the Ports.. Cont.

- ▶ The Industries within the Ports:
  - ▶ Major air pollutants generated by port activities include
    - ▶ carbon monoxide (CO),
    - ▶ volatile organic compounds (VOCs),
    - ▶ nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>),
    - ▶ and particulate matter (PM).
    - ▶ dust drifting from bulk cargo discharge
- ▶ Haulage/Trucking
- ▶ Tank farms



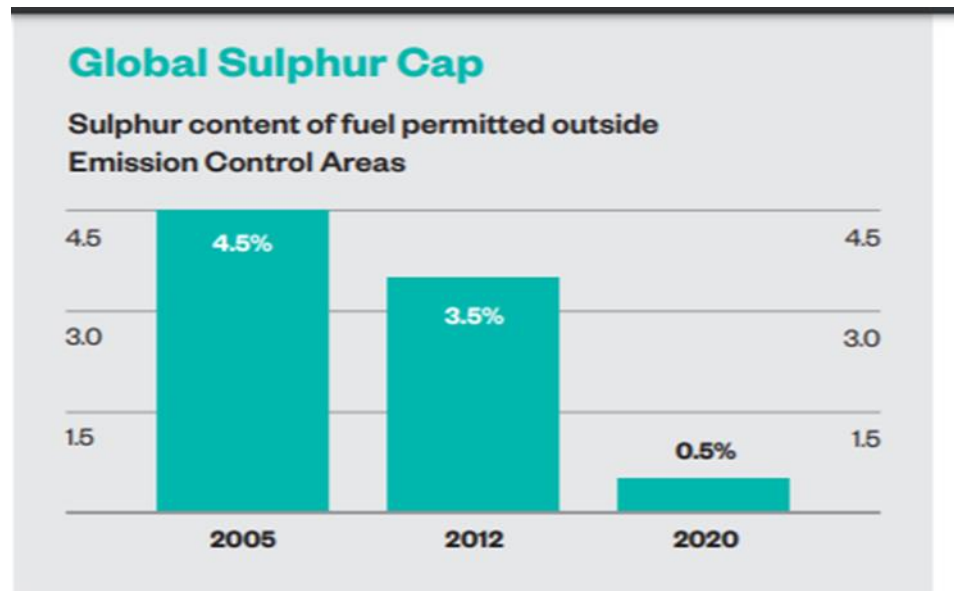
# Potential Sources of Air Emission from the Ports.. Cont.

## ► Monitor Emissions:

### ► From Vessels -

- We ensure that vessels comply with ANNEX VI, because this is mandatory from the IMO convention. Eg. on Sulphur Content

### ► Enforce Fuel sulphur content of 0.5% (m/m) - according to The UN's International Maritime organization (IMO)



Trend in enforcement of sulphur cap by the IMO over the years

# Challenges Causing Emissions from Ports

- ▶ Lack of ports Expansions in terms of space and operational development.
- ▶ Limited Planning strategy for transport system within the ports premises.
- ▶ Lack of consistent deployment of Modern technologies in the Ports operations.
- ▶ Absence of Harbour Management System in place as established by ports authorities.
- ▶ Continuous monitoring of the machineries efficiency operated by numerous factories owners within the ports towards minimizing air emissions in line with global best practices.
- ▶ There is no -law, even the IMO, have not established any convention that will directly guide the port.
- ▶ Absence of local law regulating ports operations.

# Strategy for mitigating these Emissions

- ▶ The law :
  - ▶ At the moment, there is no international law guiding the establishment of the port toward the reduction of emission.
  - ▶ There is no National Law by the government to guide port operations

# Strategy for mitigating these Emissions Cont.

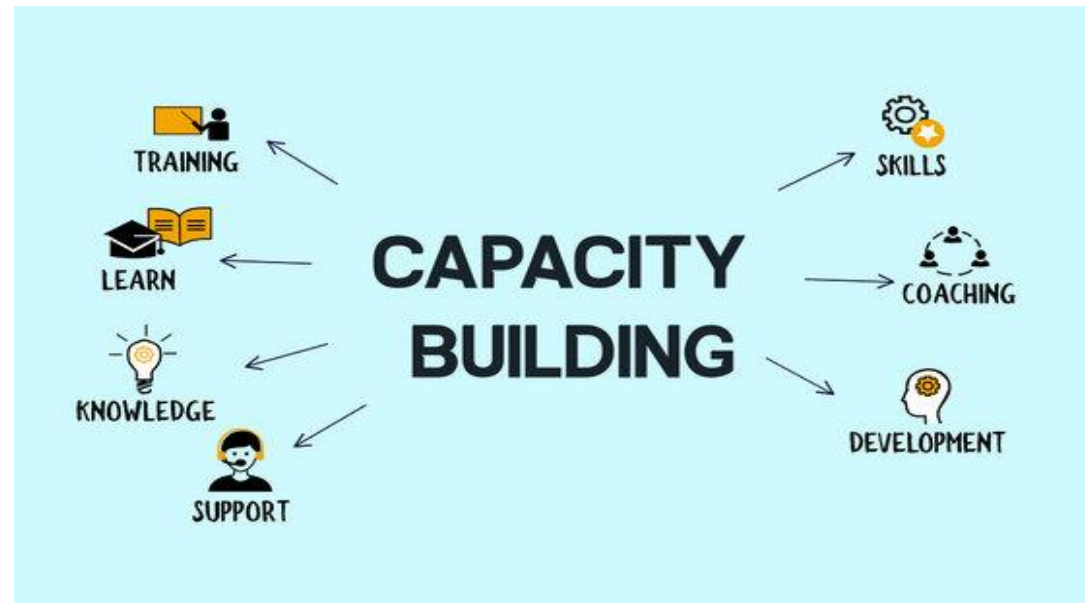
- ▶ From Factories within the Port on Emissions:
  - ▶ By Environmental Auditing - To reduce to the barest minimum levels the gases they emit.
- ▶ Research and Development:
  - ▶ We need to encourage research on;
    - how the port should be developed
    - how the ports operation should be monitored
    - how the ports operations should have current and feature data for planning



## Strategy for mitigating.. Cont.

### ► Capacity Building :

- Are the people managing port having the required training and re-training that is current technology driven that will enhance ports operations, particularly towards reduction of Air Emission .



# RECOMMENDATIONS

For efficient management of air emissions emanating from ports operation and other industrial activities, the following recommendations were highlighted:

- ▶ Establishment of Harbour Management system to guide in ports operations towards reducing air emissions.
- ▶ Encourage research and development in generating primary data that will enhance policy formulation for the proper management, hence, there is strong advocate for the ports management to set aside a dedicated funds for research purposes and also promote research collaboration with relevant institute in both National and International outfits.
- ▶ Continuous expansion of the ports environment to accommodate the current increase of fleets at the designated ports area due to increase in national and international trade.
- ▶ Regional collaboration to tackle air emissions as encouraged in the UN SDG (17) which is focused on partnerships. This can be done in the regional ports to enhance seamless operations within the region.

# RECOMMENDATIONS CONTD.

- ▶ Capacity building through training and retraining of ports personnel, maritime safety administration and other relevant stakeholders to cope with new modern technology driven approach.
- ▶ Provision of adequate platforms for monitoring, enforcement that will ensure Compliance on the laid down regulations from port operators towards mitigating air emission within the ports environment.
- ▶ Consider initiating National laws to guide ports operations and development that will ensure reduction of air emission from the ports environment and finally submit proposal to IMO with campaign on International convention in guiding ports operations specifically on climate change related issue.
- ▶ Establishment of standard laboratories to analyse constituent of Air pollutant including Sulphur contents before and after emissions within the port environment from both vessels and other industrial sources.

# Recommendation Cont.

## ➤ Digitalization:

- For easy accessibility for information.

## ➤ Ensuring compliance to pollution sources, pathways.

EXHIBIT 2 | Smart-Port Technologies Improve Operations for All Port Partners

