STRATEGIC WORKSHOP

Environmental Sustainability in the Manufacturing Industry

>> > Embedding accountability and creating mechanisms for environmental sustainability in the industry.

⏱️ 40 Minutes

Presented by:

Chika Ugochi Onyekwere

Senior Environmental Consultant

IPMC Limited

chika.onyekwere@ipmc-ng.com

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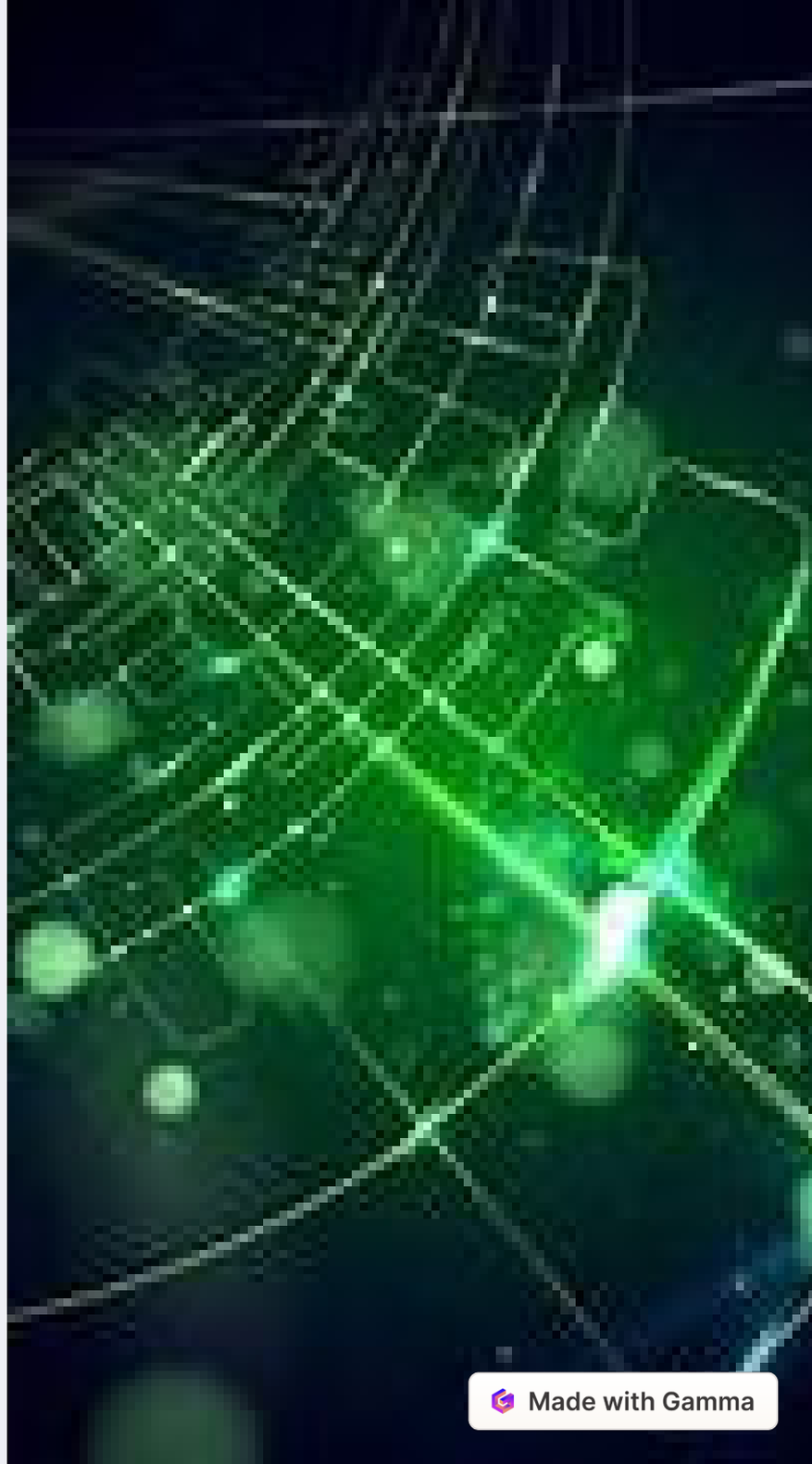


Aim of Learning

- Understand the importance of environmental sustainability in the industry
- Gain knowledge on mechanisms to achieve environmental sustainability
- Identify the role of regulatory compliance in environmental accountability
- Recognize the risks and consequences of non-compliance
- Explore the concept of greenwashing and its impact
- Develop strategies to promote green manufacturing and mitigate environmental risks

Nigeria’s rapid industrialization and manufacturing growth: An Overview

Nigeria’s industrialization emphasizes non-oil sectors like manufacturing, which is key for economic diversification and sustainable resource management. Despite a marginal decline to **$64.25 billion** post-COVID, the sector is vital for health, striving to meet global environmental commitments, and managing CO2 emissions. However, it still faces challenges like pollution, carbon emissions, and resource depletion, with impact on the environment and the underscoring need for sustainable practices.

Introduction

What is Environmental Sustainability?

Environmental sustainability in the manufacturing industry refers to the **creation of products** through **processes or operations** that are not only **economically viable** but also **minimize negative environmental impacts**.

This involves **conserving energy** and **natural resources**, **reducing emissions and waste**, and **enhancing** the **safety** of employees, communities, and products.

What is Environmental Accountability?

Environmental accountability in the manufacturing industry is the obligation to manage operations in a manner that reduces environmental impact.

It encompasses:

Clear Goals

Ownership of business decisions, actions and environmental targets

Compliance

Adherence to regulations

Transparency

Reporting environmental policies, practices and performance

Continuous Improvement

Minimizing emissions, waste, resource use

Assessing Environmental Compliance

1 Audits

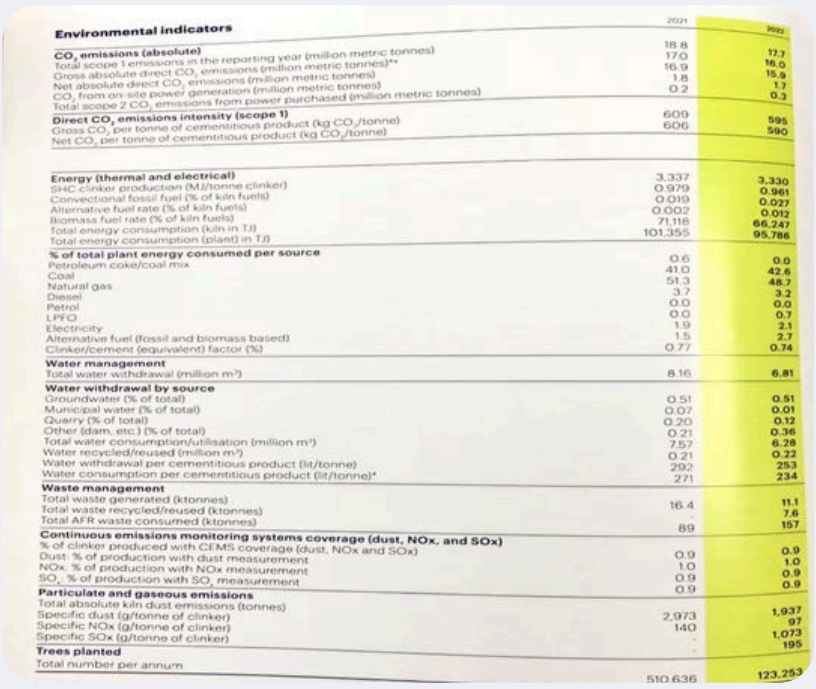
Regular inspections and monitoring, and stakeholder engagement

2 KPIs, Benchmarking and Continuous Improvement

Tracking environmental performance

3 Case Studies (KPIs)

Dangote Cement's sustainability reporting



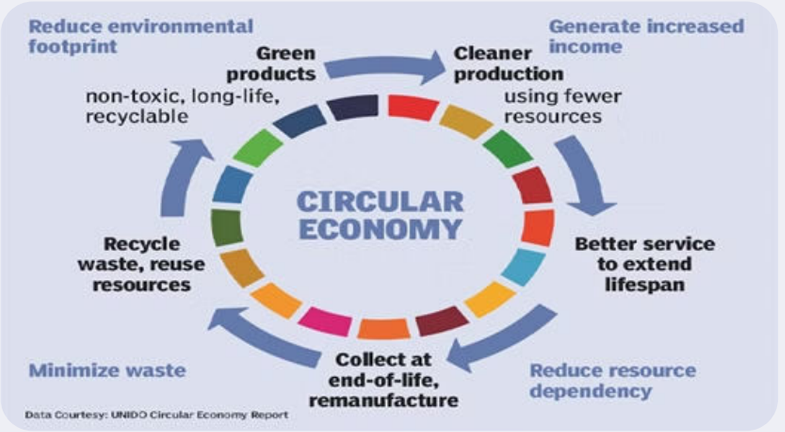
Environmental indicators	2021	2022
CO_2 emissions (absolute)		
Total scope 1 emissions in the reporting year (million metric tonnes)	18.8	17.7
Total scope 1 emissions (million metric tonnes)**	17.0	16.0
Gross absolute direct CO_2 emissions (million metric tonnes)	16.9	15.9
Net absolute direct CO_2 emissions (million metric tonnes)	1.8	1.7
CO_2 from on-site power generation (million metric tonnes)	0.2	0.3
Total scope 2 CO_2 emissions from power purchased (million metric tonnes)		
Direct CO_2 emissions intensity (scope 1)		
Gross CO_2 per tonne of cementitious product (kg CO_2/tonne)	609	595
Net CO_2 per tonne of cementitious product (kg CO_2/tonne)	606	590
Energy (thermal and electrical)		
SHC clinker production (MJ/tonne clinker)	3,337	3,330
Convectional fossil fuel (% of kiln fuels)	0.979	0.961
Alternative fuel rate (% of kiln fuels)	0.019	0.027
Biomass fuel rate (% of kiln fuels)	0.002	0.012
Total energy consumption (kiln in TJ)	71,118	66,247
Total energy consumption (plant) in TJ)	101,355	95,786
% of total plant energy consumed per source		
Petroleum coke/coal mix	0.6	0.0
Coal	41.0	42.6
Natural gas	51.3	48.7
Diesel	3.7	3.2
Petrol	0.0	0.0
LPFO	0.0	0.7
Electricity	1.9	2.1
Alternative fuel (fossil and biomass based)	1.5	2.7
Clinker/cement (equivalent) factor (%)	0.77	0.74
Water management		
Total water withdrawal (million m^3)	8.16	6.81
Water withdrawal by source		
Groundwater (% of total)	0.51	0.51
Municipal water (% of total)	0.07	0.01
Quarry (% of total)	0.20	0.12
Other (dam, etc.) (% of total)	0.21	0.36
Total water consumption/utilisation (million m^3)	7.57	6.28
Water recycled/reused (million m^3)	0.21	0.22
Water withdrawal per cementitious product (lit/tonne)	292	253
Water consumption per cementitious product (lit/tonne)*	271	234
Waste management		
Total waste generated (ktonnes)	16.4	11.1
Total waste recycled/reused (ktonnes)	-	7.6
Total AFR waste consumed (ktonnes)	89	157
Continuous emissions monitoring systems coverage (dust, NOx, and SOx)		
% of clinker produced with CEMS coverage (dust, NOx and SOx)	0.9	0.9
Dust: % of production with dust measurement	1.0	1.0
NOx: % of production with NOx measurement	0.9	0.9
SO_x: % of production with SO_x measurement	0.9	0.9
Particulate and gaseous emissions		
Total absolute kiln dust emissions (tonnes)	2,973	1,937
Specific dust (g/tonne of clinker)	140	97
Specific NOx (g/tonne of clinker)	-	1,073
Specific SOx (g/tonne of clinker)	-	195
Trees planted		
Total number per annum	510,636	123,253

Case study/Source: Dangote Cement's sustainability report (Environmental Indicators)

Assessing Risks and Mitigation

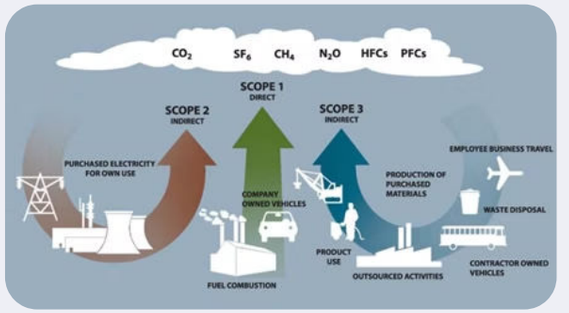
Supply Chain Risks

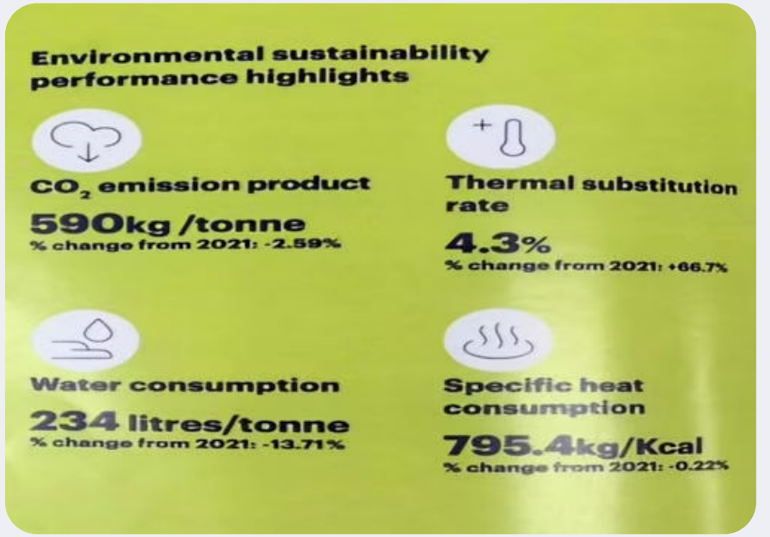
Sustainability and green loops



Operational Risks

Greenhouse gas emissions scoping





Case study/Source: Dangote Cement's sustainability report (Performance Highlights)

Mitigation Strategies

• **Cross-functional teams for risk assessment**

. **Scenario planning and contingency plans**

Scenario planning is a strategic approach that helps organizations consider possible future events, enabling them to develop effective long-term plans, incorporating trend analyses and qualitative information.
(ALTERNATIVES/SOLUTIONS TO WORST CASE SCENARIOS)

Contingency planning is the process of creating backup plans or multiple possible strategies to prepare for unexpected events, ensuring organizations can respond effectively to various scenarios. (**BACK-UP PLANS** FOR OPERATIONAL RISKS)

Horizon scanning is a strategic process used by organizations and individuals to identify and analyze emerging trends, developments, and potential disruptions that could have significant impacts in the future.
(IDENTIFYING, MONITORING & RESEARCHING EMERGING TRENDS, DEVELOPMENTS & DISRUPTIONS)

While **scenario planning** focuses on developing alternative future scenarios to inform strategic decisions, **horizon scanning** involves systematically monitoring and identifying emerging trends, risks, and opportunities.

Climate Change and Green Manufacturing

1 Weather Whiplash

Rapid shifts in weather conditions

Drought in northern Yobe state, Nigeria, 2023. Nigerians are experiencing alternating periods of drought and flooding, known as “weather whiplash.” Image by Hajjare via Wikimedia Commons (CC BY-SA 4.0).

2 Resource Scarcity

Water, energy shortages and affordability

Source: talkglitz.tv/ Fuel Scarcity: 13 Vessels with 650M Litres of Petrol Begin Discharge

Green Manufacturing Practices

Environmental Assessment

Environmental Assessment refers to the accounting of all of the environmental impact created by a product, both in its manufacture and distribution as well as its use and disposal, or of an operation(s).

- Energy-Efficient Processes
- Solar or gas-powered factories.
- Efficient machinery.
- Efficient operations
- Circular Economy Initiatives
- Recycling and reusing materials.
- Waste Reduction

Climate Disclosures Frameworks (Transparent Reporting)

- Global Reporting Initiative (GRI).
- IFRS
- CDP, etc.

Case Studies

Key Points

- Dangote Cement Group’s core sustainability reporting practice with key performance monitoring of their environmental indicators
- Nestle Nigeria’s pioneering step in supply chain sustainability through their introduction of Pure Life water bottles with 50% rPET (recycled polyethylene terephthalate) which significantly reduces the use of virgin plastics in their production.
- Coca-Cola’s energy, water, emissions and waste reduction strategies
- Innoson Motors: Electric vehicle production and Renewable Energy

Regulatory Compliance Frameworks

These are **sets of guidelines, rules, and principles** established **by regulatory bodies or governments** to **ensure** that specific **industries** or activities operate in compatible ways to **stay compliant** and operate **ethically**.

International

ILO Convention 155

National

NESREA, Labour Acts

Sub-national

LASEPA

Reasons for Non-Compliance

Cultural Resistance

Overcoming entrenched mindsets and habits within the ecosystem

Resource Constraints

Balancing short-term costs with long-term sustainability investments

Complexity and Uncertainty

Navigating the multifaceted nature of sustainability and accountability

Consequences of Non-Compliance

Legal Penalties

Fines and legal action

Reputational Damage

Loss of customer trust and investor confidence

Financial Losses

Reduced profits and investment

Greenwashing

Greenwashing is the practice of conveying a false impression or misleading information about how a company's products or operations are environmentally sound. It involves making unsubstantiated claims to deceive consumers, investors or regulators into believing that products or operations are more environmentally friendly than they actually are.

1 Deceptive Practices

Deceiving consumers, investors, regulators

2 Misleading Claims

Falsely portraying environmental credentials

3 Case Study

Volkswagen emissions scandal

The Volkswagen emissions scandal (Emissiongate/Dieselgate) started in 2015 when the US EPA accused Volkswagen of using a “defeat device” to cheat emissions tests. Millions of VW cars worldwide were affected, leading to legal consequences and damage to the company’s reputation.

****Impact (refer to Consequences of Non-Compliance)**

Recap

1 Environmental sustainability

Focuses on creating economically viable products or operations through processes that minimize negative environmental impacts.

2 Assessing compliance

Requires clear ownership of environmental targets, regular audits and inspections, and monitoring key performance indicators (KPIs).

3 Risk Assessment and mitigation

Requires efforts throughout the supply and value chain to enhance the circular economy and boost climate commitments. This includes Scenario planning, contingency plans and horizon scanning

4 Regulatory compliance

Is crucial in the manufacturing industry.

5 Greenwashing

Undermines climate change efforts and weakens the economy.

Key Takeaways

1

Accountability

Drives positive change

2

Sustainability

Is our shared responsibility

3

Growth

Ks the key driver of economies

Thank you!

I appreciate your time and attention

Any Questions?

IPMC Limited

www.ipmc-ng.com

18 B Olu Holloway, Ikoyi, Lagos State