Integration of Power Generation Projects with Modular Refineries & Mini-Grids Network

Project Overview The proposed project seeks to integrate Nigeria's current power generation assets, including hydroelectric, gas, and renewable energy sources, into a unified network of modular refineries and mini-grids. This network will be designed to optimize power distribution to the main national grid and enhance energy export capacity to neighboring countries within the West African region. The project will focus on developing a decentralized and modular energy infrastructure that addresses Nigeria's power challenges by ensuring more reliable electricity supply across urban and rural areas. Additionally, it will support the country's existing energy sector by linking modular refineries to the grid, thereby improving efficiency in crude oil processing and reducing energy losses.

Project Components

Modular Refineries Integration

• Deployment of modular refineries that are linked to power generation units (gas or renewables) to reduce energy consumption inefficiencies and supply power to the national grid.

Mini-Grids for Off-Grid Areas

• Construction of mini-grids powered by renewable energy (solar, wind, hydro) in underserved rural areas, linked to the main grid, offering reliable electricity to remote communities and industries.

Export of Power to Neighboring Countries

Grid Infrastructure Upgrades

10

• Modernizing Nigeria's transmission infrastructure to integrate decentralized mini- grid systems, reducing transmission losses, improving grid reliability, and enhancing the capacity for crossborder power trade. Establishing cross-border transmission
connections to export surplus power to neighboring
West African countries, leveraging existing
partnerships such as the West African Power Pool
(WAPP).



Project Timeline

1

2

3

Phase 1: Feasibility Study and Regulatory Framework (1-2 years)

Comprehensive feasibility studies, policy formulation, and agreements with neighboring countries for cross-border energy exports.

Phase 2: Infrastructure Development and Pilot Projects (3-5 years)

Deployment of modular refineries and establishment of the first batch of mini-grids in key rural and industrial zones.

Phase 3: National Rollout and Grid Integration (5-10 years)

Full integration of all power generation assets and grid infrastructure upgrades, followed by cross-border transmission deployment.

Total Project Duration: 8-12 years for full implementation.

Estimated Cost:

The estimated cost for the entire project, including the modular refinery setup, mini-grids deployment, grid infrastructure upgrade, and cross-border transmission systems, is approximately \$10-15 billion. Funding could come

from a mix of government investments, international development banks, private sector partners, and publicprivate partnerships (PPPs).

Benefits:

Increased Energy Security

By linking mini-grids and refineries, Nigeria can ensure consistent power supply, reduce reliance on the central grid, and provide energy to remote areas.



Enhanced Grid Reliability

Modernizing the grid and integrating multiple decentralized power sources will lead to fewer outages, less transmission loss, and greater overall grid efficiency.



Economic Growth and Job Creation

Local industries will benefit from stable energy access, fostering economic growth, job creation, and improved industrial output in the country.



Energy Exports and Regional Influence

By exporting surplus power to neighboring countries, Nigeria can become a regional energy hub, improving foreign exchange earnings and strengthening regional cooperation.

Conclusion:



Environmental and Social Impact

The focus on renewable mini-grids and efficient power generation through modular refineries will reduce Nigeria's carbon footprint and help meet international environmental goals. This will also improve the quality of life for millions of Nigerians, especially in underserved communities.

This prospective project represents a transformative initiative to revitalize Nigeria's energy sector. The integration of modular refineries, mini-grids, and the main grid will provide a sustainable, reliable, and economically viable power solution for Nigeria and its neighbors. The overall benefits will be reflected in improved energy security, economic development, regional power trade, and environmental sustainability.

Links to PHC Scalped Lists

- 1
- 01 Schedule Items

P004_Power_Integration_Schedule_Activities.pdf

2 02 - Concerns

P004_Power_Integration_Concerns.pdf

- 3 03 Actions
 P004_Power_Integration_Actions.pdf
- 4 04 Locations

P004_Power_Integration_Locations.pdf

- 5 0
 - 05 People
 - P004_Power_Integration_People.pdf
- **6** 06 Events

P004_Power_Integration_Events.pdf

7 07 - Deliverables
P004_Power_Integration_Deliverables.pdf



