



**GHANA PORTS AND  
HARBOURS AUTHORITY'S**

# **DECARBONISATION AND SUSTAINABLE ENERGY EFFORTS**





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The Ghana Ports and Harbours Authority (GPHA) has demonstrated a strong commitment to climate action and sustainable port operations through a bold and forward-thinking decarbonisation agenda. Central to this effort is a comprehensive strategy to transition the Port of Ghana (Tema and Takoradi) into a low carbon, energy efficient and environmentally responsible maritime hub.





## Strategic Renewable Energy Partnerships

As part of its clean energy transition, GPHA is partnering with Independent Power Producers (IPPs) to develop large-scale solar power infrastructure to support port operations.

Under this arrangement, the IPPs will finance and construct the required infrastructure, including solar system, power lines and substations without any upfront capital commitment from GPHA. The cost recovery mechanism is structured through a tariff-based model, ensuring financial sustainability while reducing emissions.

The Authority has already attracted strong private sector interest, with five IPPs expressing readiness to participate in the initiative. This collaboration underscores GPHA's commitment to leveraging innovative Public-Private Partnership (PPP) models to accelerate its decarbonisation drive.





## Progress in Solar Energy Deployment

GPHA has begun implementing solar energy solutions across critical operational areas. Some parts of the Headquarters building are already powered by solar energy, demonstrating early success in integrating renewable energy into administrative operations. Plans are at an advanced stage to expand solar deployment further across additional facilities, including the Head Office complex.

In addition, the Authority has commenced the installation of solar-powered street lighting systems to improve energy efficiency and environmental sustainability within the port environment. Notably, the fruit terminal at the Port of Tema is already operating on solar energy, reflecting GPHA's commitment to embedding green energy solutions across its operational footprint.



*Installation of Street Lights within Port Environment*

# Electrification of Port Equipment and Fleet

A key pillar of GPHA's decarbonisation strategy is the progressive electrification of port equipment and logistics fleets.

At Terminals 1 and 2, the Authority has, so far, deployed Eight (8) electric reach stackers and Thirty (30) three-tonners.

This transition significantly reduces reliance on fossil fuels and lowers greenhouse gas emissions from cargo-handling operations.

As part of its ambitious Green Terminal initiative and firm commitment to environmental stewardship, Terminal 3 at the Port of Tema, has initiated a significant investment in state-of-the-art

electric terminal equipment and just received 20 trucks and heavy-duty trailers to roll-out for the container handling operations.

This strategic investment marks a major milestone in Tema Port's long-term sustainability journey, reinforcing its position as a leading terminal operator that is shaping the future of port logistics in West Africa through innovation and responsible operations.

The newly acquired electric terminal trucks are a vital step towards reducing the port's carbon footprint, contributing to Ghana's broader climate goals and aligning with the global shipping industry's transition to low-emission logistics.

Again, in line with its sustainability strategy and commitment to reducing carbon emissions, Terminal 3 at Tema Port has commenced the implementation of a solar power project.



*Electric 3 Tonner Forklifts*

The initiative aims to diversify energy sources, lower long-term electricity costs, reduce the terminal's environmental footprint, and further strengthen the Port of Tema's sustainability performance.



Electric Reach Stackers

# Shore Power Development and Future-Ready Infrastructure

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Looking ahead, GPHA is exploring the implementation of shore power infrastructure as part of its broader sustainability agenda. This initiative will enable vessels to plug into onshore electricity while at berth, significantly reducing emissions from ship engines and enhancing air quality within the port environment.





## Responding to Growing Energy Demand

As a result of its electrification and operational expansion, the Port of Tema has experienced a substantial rise in electricity demand. Over the past five years, demand has increased by approximately 138%, reaching an average load of 18.6 MWp by the end of 2025.

This figure is projected to grow further to about 35 MWp by 2028, driven by ongoing electrification of equipment, fleet operations and the anticipated introduction of shore power systems.

Terminal 3 alone accounts for approximately 46% of the Port's total power demand, reflecting its advanced level of electrification and modern operational standards.

Recognising the implications of this growth, GPHA is proactively addressing potential constraints in the existing power infrastructure, which is projected to become insufficient within the next two years without strategic upgrades.



# Scaling Renewable Energy Capacity

In response, GPHA has developed a long-term energy plan centred on renewable generation and infrastructure resilience. The Authority is pursuing the development of approximately 50 MWp of solar power capacity, with provisions to scale up to 80 MWp over the next two decades to meet future energy demands.

A significant portion, approximately 90% of this generation capacity is expected to be developed off-site and transmitted into the port enclave, ensuring efficient land use while delivering reliable clean energy.

## Regulatory and Market Leadership

A major milestone in this transition is GPHA's successful acquisition of Electricity Bulk Consumer status. This enables the Authority to procure power directly from IPPs, particularly renewable energy providers, enhancing energy security, cost efficiency and sustainability outcomes.

## Financing the Transition

Given the substantial capital requirements associated with electrification and energy infrastructure upgrades, GPHA is adopting a Public-Private Partnership (PPP) financing model to support implementation. This approach ensures effective risk sharing, mobilises private capital, and accelerates project delivery.

Subject to regulatory approvals and favourable investment conditions, the first phase of the solar project (50 MWp) is expected to be completed by the end of 2027, marking a significant milestone in the Authority's decarbonisation journey.

## Conclusion

Through a combination of strategic partnerships, technological innovation, and institutional commitment, the Ghana Ports and Harbours Authority is positioning itself as a leader in sustainable port development in Africa.

Its integrated approach encompassing renewable energy deployment, equipment electrification, infrastructure modernisation and forward-looking energy planning demonstrates a clear and measurable pathway toward decarbonisation.

GPHA's efforts not only reduce environmental impact but also enhance operational efficiency, strengthen energy resilience and contribute meaningfully to Ghana's broader climate and sustainable development goals.

This initiative represents a transformative model for green port development and a strong case for recognition under any decarbonisation-focused award programme.

