

## Guyana High Voltage Power System



### Overview

Access to electricity is usually constrained by a country's level of income; however, in the case of Guyana, it is estimated that the electricity system in Guyana services only about 60 percent of the population, well below the level achieved by many regional peers. Similarly, while electrification is higher in coastal towns with a high industry concentration, there are vast areas of the country that appear underserved on this account. Even companies within regional access to the grid have to wait up to 99.

### Key Takeaways

Guyana is modernizing its high-voltage power system with 230kV and 69kV transmission lines, advanced substations, and a national control center to enhance grid reliability and integrate renewable energy.

Overview of the High-Voltage Grid

Guyana's electricity sector is dominated by Guyana Power and Light (GPL), a state-owned utility responsible for generation, transmission, and distribution. Historically, the system relied heavily on diesel-powered thermoelectric generators, with low reliability and high losses—total losses were close to 40%, and commercial losses around 30%. To address these challenges, the government has launched a comprehensive modernization program focusing on high-voltage infrastructure, grid stability, and renewable integration.

#### Transmission and Substations

The backbone of Guyana's high-voltage network now operates at 230kV, with additional 69kV lines connecting key regions. The modernization includes:



- Construction of new substations and upgrades to existing ones to handle higher loads and improve reliability .
  - Installation of double-circuit power cables across the Demerara River using horizontal directional drilling to protect against maritime disruptions .
  - Integration of battery energy storage systems and advanced metering to enhance grid responsiveness .
  - Expansion of high-voltage infrastructure to link new substations along the West Coast of Demerara, East Bank of Essequibo, and Bartica .
- #### National Control and Smart Grid

A state-of-the-art National Control Centre (GNCC) at Goedverwagting serves as the command hub for the high-voltage grid. It incorporates:

- SCADA (Supervisory Control and Data Acquisition) and Energy Management Systems for real-time monitoring and automated control .
- Centralized supervision of 230kV and 69kV transmission systems, power plants, and 13.8kV feeder heads.
- Predictive analytics and outage-management platforms to reduce downtime and improve fault detection .

#### Renewable Energy Integration

The high-voltage system is being upgraded to accommodate renewable energy sources, including:

- Hydropower (e.g., 2.2 MW at Kumaka)
  - Solar energy (1 MW in Lethem)
  - Diesel generation for backup
- These measures aim to diversify energy sources and reduce reliance on imported petroleum.

#### Training and Workforce Development

To support the high-voltage network, Guyana Electric has launched specialized training programs for medium and high-voltage cable terminations, joints, and switchgear installation. Certified training ensures a skilled workforce capable of constructing and maintaining the sophisticated grid infrastructure .

#### Investment and Expansion

The government has allocated over \$69 billion in 2026 for grid upgrades, including transmission, distribution, and modernization projects . Key projects include:

- The 300 MW Wales Gas-to-Energy (GTE) plant, with modern control systems and battery storage .

- Phase Two expansion adding another 300 MW and full integration with the national grid at 230kV and 69kV .
  - System-wide reinforcement along critical corridors, such as Wales–Garden of Eden–East Coast, to support industrial and residential growth .
- Impact

These upgrades are expected to:

- Reduce outages and voltage instability
  - Cut total grid losses by over 50%
  - Lower operational costs and electricity tariffs
  - Enable reliable power for industrial, commercial, and residential users
- Guyana's high-voltage power system is transitioning from a radial, blackout-prone network to a redundant, modern, and resilient grid, positioning the country for sustainable economic growth and energy security.

## Article Content

New transmission network to strengthen national grid, support growth ...

Together, the new transmission lines, substations and national control centre are expected to modernise Guyana's

Electricity sector in Guyana

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GPL National Grid Code | PDF | Electrical Grid | Electric Power ...

The document outlines Guyana Power & Light's National Grid Code which establishes technical rules and guidelines for connecting

Analysis of Bartica Grid Stability, Region No. 7

Bartica Power Sector is operated by the Guyana Power and Light Inc (GPL), which is a vertically integrated power company that

GUYANA POWER & LIGHT INC. DEVELOPMENT AND

The Transmission and Distribution section of GPL's electric power system comprises three main voltage levels; 69 kV

What We Do

This system is called the National Grid. Currently in GPL the transmission voltage is 69KV and this network

Guyana's energy future will require a more resilient, efficient ...

They can damage circuit segment cables, fuses and transformers, and cause voltage variability and outages across

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Guyana -Renewable Energy

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#### STIMULATING FUTURE GROWTH: CLEAN ENERGY – Guyana

Without this transition away from today's energy sources, both greenhouse gas emissions and consumer costs will stay very high

Guyana continues to pursue sustainable energy future

The electrical network interconnects the system to the public/community buildings via a 13.8

#### GUYANA

Guyana Power Generation Expansion Study 9 2016 This update of the 2016 Guyana Power Generation Expansion Study,

Gas-To-Energy Project: US\$422M in contracts signed to overhaul

over 320 km of high voltage power lines to be installed As the Government of Guyana continues its infrastructure

New transmission network to strengthen national grid, support growth ...

Guyana's electricity network is undergoing one of its most significant transformations with the construction of more than

#### Guyana

OpenInfraMap Stats Guyana Guyana has 7 power plants totalling 149 MW and 8 km of power lines mapped on

#### Guyana Power and Light

Guyana Power and Light (GPL) is a publicly owned utility company in Guyana, providing electric power in the country. Domestic

Gas-to-Energy is just the first step to a better electricity grid

THE Gas-to-Energy (GTE) project remains a significant flagship initiative for the government, with the administration

#### GUYANA

Guyana National Energy Information System In 2022 the Green State Development Strategy: Vision 2040 was replaced with the

#### Who We Are

The voltage distribution system of GPL is quite unique since it delivers both 50 and 60 cycle power. Prior to 1st October, 1999, the

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Hinterland Electrification

The importance of this wind tower is to yield quality wind data, which can be used by wind project investors to develop

GPL grid now generating 265MW of electricity as 2nd power ship

Together, they will pump 110 MW of power to the national grid, in a bid to ensure stable electricity supply to the

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Voltage in Guyana

What are the voltage requirements in Guyana? What is the state of the electricity power supply in Guyana?

2023 Guyana Energy Report Card

GUYANA Introduction This is the Energy Report Card (ERC) for 2023 for Guyana. The ERC provides an overview of the energy

Hydro - Guyana Energy Agency

The hydropower station was designed and built by the Chinese through a joint arrangement between the Governments of Guyana

Development & Expansion Programme 2023-2027

The current transmission and distribution systems comprises three main voltage levels; 69 kV for bulk power transfer,

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STIMULATING FUTURE GROWTH: CLEAN ENERGY - Guyana

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Hinterland Electrification

Over the next six months the Hinterland Electrification Company will be installing three (3) more wind towers to

Guyana High Voltage Equipment Market (2025-2031) | Trends & Industry

The high voltage equipment market in Guyana faces several challenges, including limited infrastructure and a lack of skilled

Govt to plant cable under Demerara River to transmit more power

The Government plans to install a high voltage cable linking the Vreed-en-Hoop Substation on the west bank of the

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