



WHITE PAPER

Fueling Puerto Rico's Future

The Case for Natural Gas

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Executive Summary

Puerto Rico's energy system is facing a profound crisis, shaped by decades of underinvestment, overreliance on expensive imported petroleum, and fragile infrastructure ill-equipped to withstand climate and demand pressures. With electricity costs among the highest in the United States and frequent outages that undermine economic growth and quality of life, the island must transition to a more reliable, affordable, and clean source of energy. Natural gas offers an immediate and scalable solution—providing lower emissions, cost stability, and operational flexibility that supports the integration of renewables.

To realize these benefits, Puerto Rico must invest in modernizing its generation capacity, securing resilient LNG supply chains, and upgrading its aging grid.

Beyond technical improvements, this shift will catalyze broader economic gains, creating jobs, attracting investment, and enhancing public health and social equity. With natural gas, Puerto Rico can build a future-ready energy system that is cleaner, more dependable, and positioned for long-term growth.



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Introduction: A Critical Energy Crossroads

Puerto Rico's energy sector stands at a critical juncture. For decades, the island has suffered from chronic unreliability, high costs, and deteriorating infrastructure, driven largely by an overreliance on imported petroleum and heavy fuel oils. The consequences have been severe: electricity prices among the highest in the United States, frequent outages, and a grid ill-equipped to handle the growing demands of a modern economy. As Puerto Rico looks to the future, a strategic pivot toward natural gas offers not only a more reliable and cost-effective solution but also an environmentally responsible one.

The State of Puerto Rico's Energy Infrastructure

The island currently relies on petroleum for as much as 60% of its power generation, with natural gas accounting for around 25-30%, coal roughly 8-10%, and renewables a mere 1-7%.¹ This lopsided dependency has resulted in price volatility, environmental degradation, and an aging fleet of oil-fired power plants like Costa Sur and Palo Seco. The fragility of Puerto Rico's electric grid was further exposed in the aftermath of Hurricane Fiona and through the more than 230 recorded outages since.² Much of the transmission and distribution infrastructure, now managed by LUMA Energy, remains vulnerable to damage and vegetation-related interference. The grid's fragility is not just a technical concern but a threat to the well-being and economic viability of the island.

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Financial and Regulatory Challenges

Puerto Rico's financial and regulatory environment further complicates efforts to modernize its energy infrastructure. PREPA's bankruptcy, tied to nearly \$9 billion in debt, has stalled meaningful investment. Despite federal allocations totaling over \$18 billion from FEMA, less than 15% has been spent on grid improvements.³ Earlier this year, \$365 million from solar projects was redirected to grid reinforcement, highlighting the desperate need for infrastructure investment and more stable planning.⁴

The Case for Natural Gas

Given this context, the case for natural gas is compelling. As a fuel source, natural gas is significantly cleaner than heavy fuel oils and coal, emitting about 50% less carbon dioxide and fewer pollutants like sulfur dioxide and nitrogen oxides.⁵ It's also far more cost-effective.

Globally, demand for natural gas has surged by 80% over the past quarter century, and projections indicate this trend will continue well into 2050.⁶ Agencies such as the International Energy Agency and the UN Economic Commission for Europe advocate for natural gas as a reliable bridge fuel that supports system stability while the world transitions to renewables.⁷

Natural gas is significantly cleaner than heavy fuel oils and coal, and it's also far more cost-effective.



Benefits Beyond Cost and Emissions

Natural gas offers operational benefits beyond its cost and environmental profile. Combined-cycle gas turbine plants can provide dependable baseload power while also responding quickly to fluctuations in demand, a flexibility that supports the integration of intermittent renewable sources like solar and wind.

In regions like Sardinia, a similar transition from heavy fuels to LNG has delivered substantial emissions reductions and improved public health.⁸ In the northeastern United States, states participating in the Regional Greenhouse Gas Initiative have cut emissions nearly in half by promoting fuel switching to gas.⁹ Australia's Northern Territory has also embraced natural gas to balance its energy portfolio while supporting industrial development.¹⁰

Strategic Investment and Infrastructure Modernization

For Puerto Rico, the path forward requires phased, strategic investment. In the near term, the island must secure reliable LNG supplies. Modernizing generation capacity is equally urgent; older oil-fired plants should be decommissioned or retrofitted and replaced with modern combined-cycle gas turbines. Grid hardening efforts, including smart substations and upgraded transmission lines, must be prioritized. These infrastructure upgrades should be guided by a cohesive regulatory framework that attracts investment and ensures transparency and accountability.

Improving power generation and the grid will also deliver substantial benefits to Puerto Rico's broader economy. Reliable and affordable energy is a fundamental enabler of economic growth. It lowers operating costs for businesses, attracts manufacturing and industrial investment, and encourages entrepreneurship. Modern energy infrastructure can create thousands of skilled and semi-skilled jobs during construction and operation, while also stimulating related sectors such as transportation, logistics, and technology. Importantly, these improvements enhance quality of life by ensuring continuous access to electricity for homes, schools, and hospitals—supporting public health, education, and overall social stability. In the long term, a resilient and modern energy system will position Puerto Rico as a competitive and attractive destination for global investment.

Reliable and affordable energy is a fundamental enabler of economic growth.

The Importance of Trusted Partners

It is crucial that Puerto Rico pursue this transition with experienced and tested partners. Recent developments underscore this point. The risks of entrusting critical projects to unproven entities include construction delays, cost overruns, and operational failures, all of which Puerto Rico can ill afford. The recent breakdown of LNG supply negotiations with New Fortress Energy, resulting in withheld fuel and idled power plants, illustrates how fragile the current system is and how vital it is to select trustworthy suppliers.¹¹

The difference between success and failure often lies in the caliber of a project's partners. Proven firms bring more than just equipment; they offer decades of engineering experience, supply-chain resilience, regulatory fluency, and established community ties. These are not luxuries, but prerequisites for a successful energy transition. While Puerto Rico rightly aspires to a cleaner and more resilient grid, those aspirations must be matched by the discipline to work with entities capable of executing complex infrastructure projects at scale.

Building a Roadmap for the Future

Puerto Rico's roadmap should unfold in three phases.

1

First, over the next two years, the focus should be on stabilizing LNG supply and deploying fast-ramping gas turbines to shore up capacity. This period should also see the initial deployment of federal funds toward grid reinforcement.

2

The second phase, spanning two to five years, would involve the construction of large-scale combined-cycle plants.

3

Finally, in years five through ten and beyond, Puerto Rico should expand its natural gas capacity in parallel with renewables and storage solutions, steering steadily toward the targets outlined in Act 17—40-60% clean energy by 2040 and 100% by 2050.¹²



Conclusion: A Resilient Path Forward

This transition offers enormous benefits. Puerto Ricans would enjoy lower electricity prices, greater energy reliability, and cleaner air. The economy would gain from job creation in construction, maintenance, and energy services. Most importantly, Puerto Rico would be laying the foundation for a resilient energy future, one less vulnerable to storms, price spikes, or supply disruptions.

Puerto Rico stands at an inflection point. The choices made now will shape the island's energy landscape for generations. To succeed, Puerto Rico must embrace natural gas as a transitional fuel, supported by a disciplined, strategic approach and trusted partners. The question is not whether Puerto Rico can afford to make this transition—it is whether it can afford not to. CH4 believes in the island's potential and stands ready to support a cleaner, more resilient, and more affordable energy future for all Puerto Ricans.

Endnotes

- ¹ U.S. Energy Information Administration (EIA), State Energy Profile: Puerto Rico. 2024.
- ² Associated Press, "Puerto Rico Endures Frequent Power Outages," 2023.
- ³ FEMA Funding Report, Puerto Rico Grid Modernization, 2024.
- ⁴ Bloomberg, "Puerto Rico Reallocates \$365M in Solar Funds," 2024.
- ⁵ International Energy Agency, The Role of Gas in Today's Energy Transitions, 2023.
- ⁶ Wood Mackenzie, Global Gas Market Outlook, 2024.
- ⁷ UN Economic Commission for Europe, Energy Transition Publications, 2024.
- ⁸ Borelli, D. et al., "Assessing Environmental Benefits of LNG in Sardinia," 2023.
- ⁹ Regional Greenhouse Gas Initiative (RGGI), Emissions Reduction Reports, 2022.
- ¹⁰ The Courier Mail, "Northern Territory Gas Strategy," 2023.
- ¹¹ Reuters, "Puerto Rico Ends LNG Talks with New Fortress Energy," July 2025.
- ¹² Puerto Rico Act 17, 2019 Clean Energy Mandates.



CH4 is a Puerto Rico-based engineering, procurement, construction (EPC) specializing in advanced, sustainable energy generation projects in emerging markets, including the Caribbean, South America and the Middle East. Founded in 2016, the company offers turnkey solutions from project design and financing to ongoing operations and maintenance for governments and private industry.

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