
GEODYN
SOLUTIONS
250 MW POWER GENERATION PROJECT FOR PUERTO RICO
250 MW POWER GENERATION PROJECT FOR PUERTO RICO
www.geodynsolutions.com

EXECUTIVE SUMMARY

Geodyn Solution proposes a 250 MW power generation project for Puerto Rico, featuring 6 Geodyn 30 MW natural gas turbines, one 37.5 MW steam turbine, and an Organic Rankine Cycle (ORC) system. Priced at $0.19 per kWh, the project has a total CapEx of $500 million, including $68 million in contingent fees, and an OpEx of $24 million annually. It generates a gross profit of $308.5 million per year, achieving payback in approximately 1.6 years. The initiative creates 175 jobs, requires 25 acres, and incorporates carbon sequestration for a sustainable 12-year return.

PROJECT OVERVIEW

Objective: Deliver 250 MW of efficient, reliable power to Puerto Rico using Geodyn's proprietary turbine technology and waste heat recovery systems.

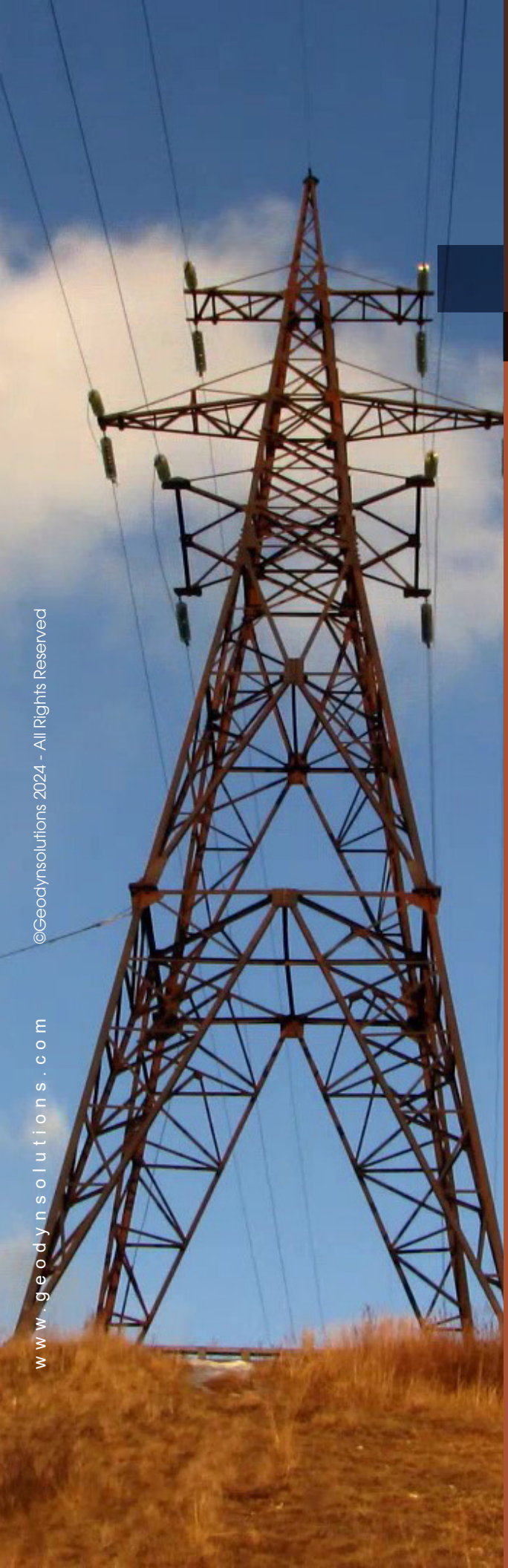
Components:

- 6 Geodyn 30 MW Natural Gas Turbines: 180 MW total.
- Steam Turbine: 37.5 MW, utilizing exhaust heat from gas turbines.
- Organic Rankine Cycle (ORC) System: 32.5 MW, recovering additional waste heat.

Location: Distributed sites across Puerto Rico, optimized for grid connectivity.

Timeline: Full operation by March 2026 (12 months from contract signing).

Land Requirement: Approximately 25 acres (4-5 acres per turbine unit, 5 acres for steam/ORC, plus buffers).



TECHNICAL SPECIFICATIONS

Geodyn 30 MW Natural Gas Turbines (180 MW)

- **Output:** 30 MW per unit, 6 units total.
- **Efficiency:** 37% simple cycle; 55% combined cycle with steam/ORC integration.
- **Fuel:** Natural gas (primary), with flexibility for LPG/distillate backup.

Steam Turbine (37.5 MW)

- **Output:** 37.5 MW from gas turbine exhaust heat.

ORC System (32.5 MW)

- **Output:** 32.5 MW from low-grade waste heat recovery, scaled to match 250 MW total capacity.

Total Capacity:

180 MW (gas) + 37.5 MW (steam) + 32.5 MW (ORC) = 250 MW

FINANCIAL ANALYSIS

Capital Expenditure (CapEx)

- **Geodyn 30 MW Turbines:** $1,300/kW × 180,000 kW = $234,000,000
- **Steam Turbine:** $1,200/kW × 37,500 kW = $45,000,000
- **ORC System:** $1,500/kW × 32,500 kW = $48,750,000
- **nstallation and Infrastructure:** $104,250,000 (adjusted to reach total CapEx of $500 million).
- **Contingent Fees:** $68,000,000 (covering unexpected costs, delays, or regulatory hurdles).
- **Total CapEx:** $234,000,000 + $45,000,000 + $48,750,000 + $104,250,000 + $68,000,000 = $500,000,000

Operational Expenditure (OpEx)

- **Fuel Costs:** $6/MMBtu natural gas, 55% efficiency, 7,000 hours/year, for 250 MW = $17,000,000
- **Maintenance:** $0.01/kWh × 250 MW × 7,000 hours = $17,500,000
- **Labor:** 25 staff × $80,000/year = $2,000,000
- Total OpEx: $24,000,000/year

Revenue

- **Electricity Sales:** 250 MW × 7,000 hours × $0.19/kWh = $332,500,000/year
- **Gross Profit:** $332,500,000 (revenue) - $24,000,000 (OpEx) = $308,500,000/year

Return on Investment (ROI)

- **Initial Investment:** $500,000,000 (CapEx).
- **Annual Gross Profit:** $308,500,000 (revenue minus OpEx, before taxes/ depreciation).
- **Payback Period:** $500,000,000 ÷ $308,500,000 = 1.62 years (approximately 19.5 months).
- **Annual ROI:** ($308,500,000 ÷ $500,000,000) × 100 = 61.7% per year.
- The payback period remains 1.62 years, consistent with the $500 million CapEx and $308.5 million annual gross profit, offering strong profitability.

12-Year Return with Carbon Sequestration

- **Cumulative Gross Profit (12 Years):** $308,500,000/year × 12 = $3,702,000,000
- **Carbon Sequestration Addition:** CO_2 capture at $50/ton, targeting 50% of emissions (0.7 million tons CO2/year × 0.5 = 350,000 tons/year for 250 MW).
- Annual Capture Cost: 350,000 tons × $50 = $17,500,000/year
- **Revenue from Carbon Credits:** 350,000 tons × $40/ton = $14,000,000/year
- **Net Sequestration Cost:** $17,500,000 - $14,000,000 = $3,500,000/year
- **Adjusted Annual Profit:** $308,500,000 - $3,500,000 = $305,000,000/year
- **2-Year Adjusted Profit:** $305,000,000 × 12 = $3,660,000,000
- **Total ROI Over 12 Years:** ($3,660,000,000 - $500,000,000) ÷ $500,000,000 = 632% (or 52.7% annualized).

ECONOMIC AND ENVIRONMENTAL IMPACTS

JOB CREATION

- **Construction: 100 temporary jobs (12 months).**
- **Operations: 25 permanent jobs.**
- **Indirect: 50 jobs (supply chain, services).**
- **Total: 175 jobs.**

LAND USE

- **Requirement: 25 acres (6 turbines at 4-5 acres each, 5 acres for steam/ORC, plus access roads).**
- **Mitigation: Use brownfield or industrial sites to minimize ecological disruption.**

ENVIRONMENTAL EFFECT

Baseline Emissions:

250 MW × 7,000 hours × 0.4 tons CO_2/MWh = 700,000 tons CO_2/year.

With Sequestration:

50% reduction = 350,000 tons CO_2/year emitted, 40-50% better than diesel (0.9 tons/MWh).

Additional Benefits:

Reduced particulates/NOx; ORC enhances efficiency, lowering fuel use.

IMPLEMENTATION PLAN

PHASE 1 (MONTHS 1-3):
SITE SELECTION (25 ACRES), PERMITTING, ENVIRONMENTAL STUDIES.

PHASE 2 (MONTHS 4-6):
MANUFACTURE AND PROCURE GEODYN TURBINES, ORC, AND EQUIPMENT.

PHASE 3 (MONTHS 7-11):
INSTALL UNITS ACROSS SITES.

PHASE 4 (MONTH 12):
COMMISSIONING, 250 MW ONLINE BY MARCH 2026.

RISK MITIGATION

Fuel Supply: Long-term natural gas contracts; turbine fuel flexibility as backup.
Land Acquisition: Early engagement with local authorities for zoning.
Cost Overruns: $68 million contingent fees cover delays or unforeseen expenses.
Environmental Compliance: Carbon sequestration ensures regulatory alignment.

Geodyn Solution’s 250 MW project, powered by 6 of our 30 MW turbines and a 37.5 MW steam turbine, offers a $500 million investment with a 19.5-month payback and $3.66 billion profit over 12 years with carbon sequestration. Requiring 25 acres, it creates 175 jobs and delivers sustainable power at $0.19/kWh, enhancing Puerto Rico’s energy resilience.

GEODYN™
SOLUTIONS

www.geodynsolutions.com