PROPOSAL FOR A 168 MW LNG DUAL-FUEL POWER PLANT IN ZAMBIA

www.geodynsolutions.com

CAPEX:
$1.75 MILLION PER MW
(TRANSFORMERS + GRID
INTERCONNECTION INCLUDED)

TOTAL CAPACITY:
168 MW

TOTAL CAPEX:
$294 MILLION

EXECUTIVE SUMMARY

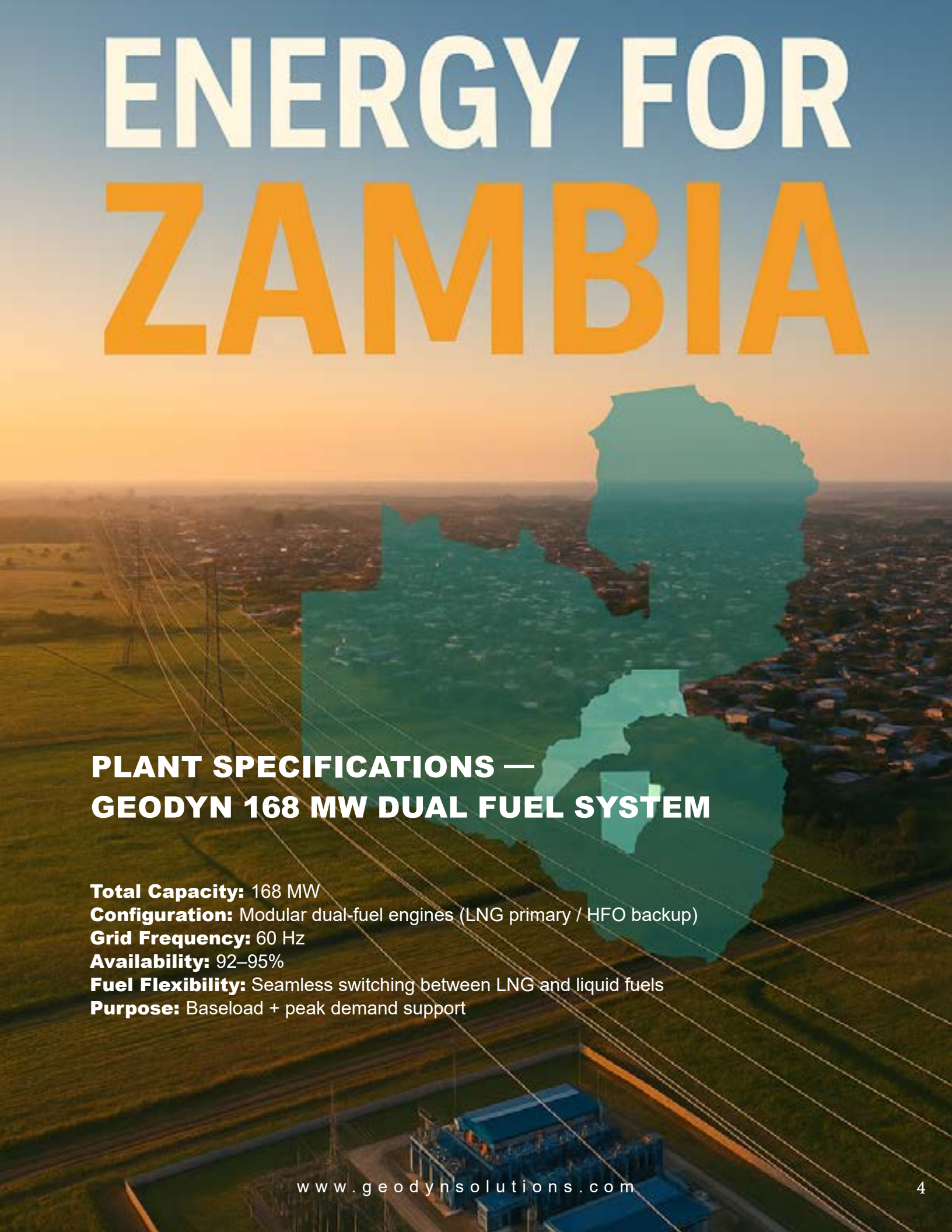
Geodyn Solutions proposes the development of a 168 MW dual-fuel (LNG + HFO backup) power plant in Zambia to provide clean, reliable, and financially strong baseload electricity. This project uses the Geodyn 168 MW High-Efficiency Modular Power System, designed to operate primarily on LNG, with heavy fuel oil only as a backup.

At a Power Purchase Agreement (PPA) price of $0.17/kWh, the project delivers:

- Outstanding profitability (ROI 34–44% on LNG)
- Short payback period (2.4–3.0 years)
- High availability (92–95%)
- Significant emissions reduction vs HFO
- 600–900 total job creation opportunities
- A rapid 12–16 month deployment timeline

This plant strengthens Zambia's energy security, reduces dependence on hydropower during drought cycles, and supports industrial growth.

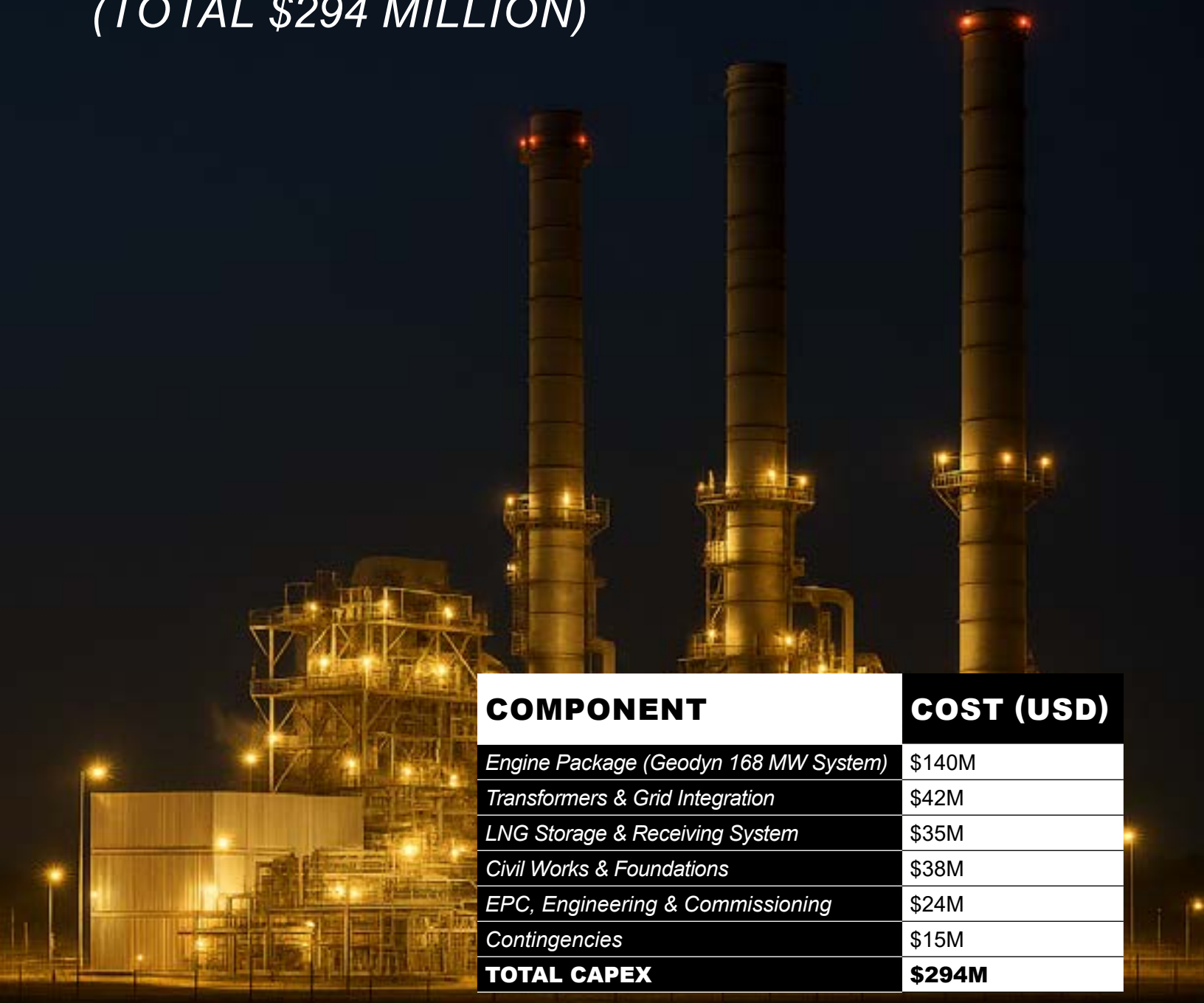
ENERGY FOR ZAMBIA



PLANT SPECIFICATIONS — GEODYN 168 MW DUAL FUEL SYSTEM

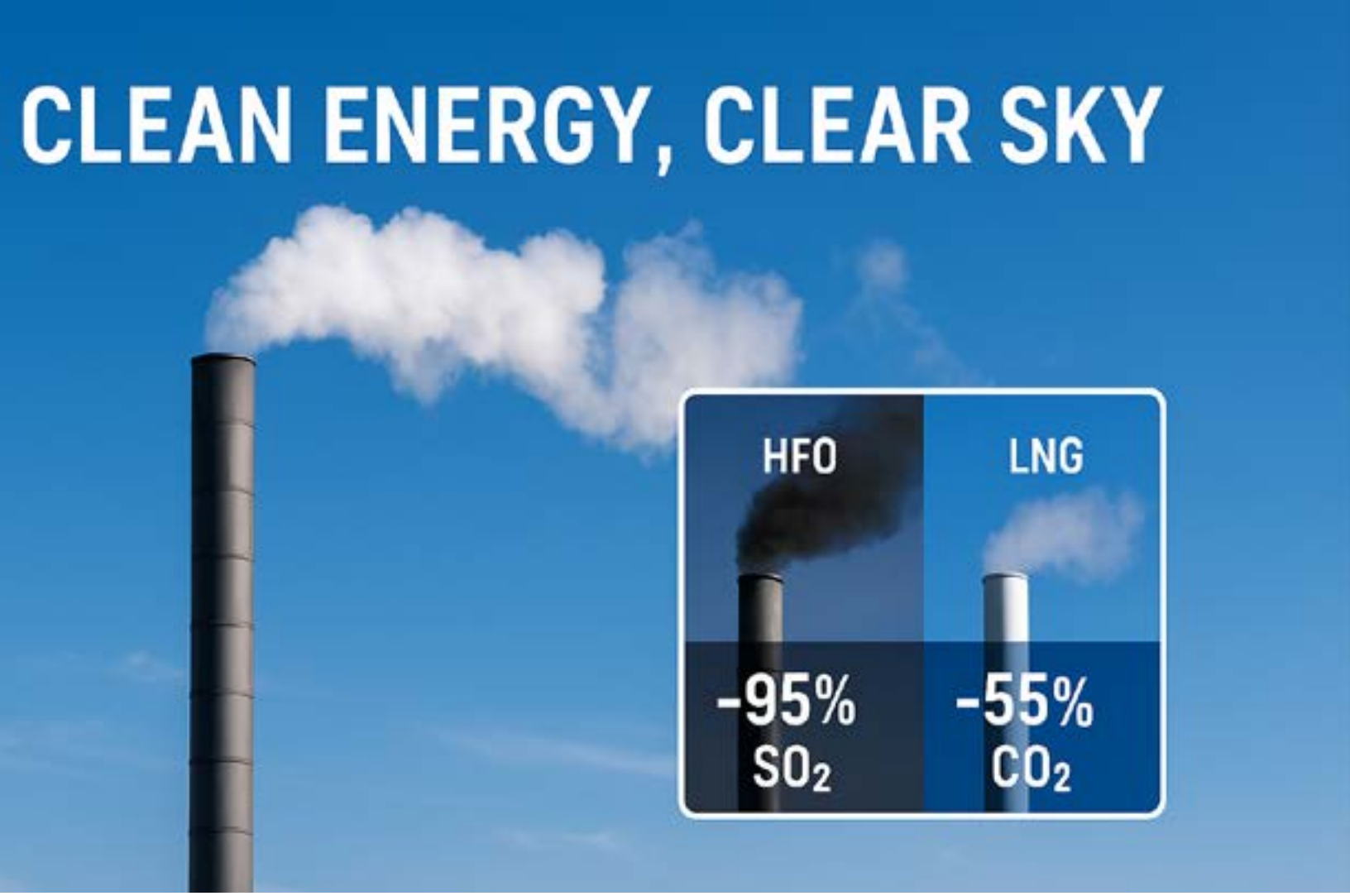
Total Capacity: 168 MW
Configuration: Modular dual-fuel engines (LNG primary / HFO backup)
Grid Frequency: 60 Hz
Availability: 92–95%
Fuel Flexibility: Seamless switching between LNG and liquid fuels
Purpose: Baseload + peak demand support

CAPEX BREAKDOWN *(TOTAL $294 MILLION)*



COMPONENT	COST (USD)
Engine Package (Geodyn 168 MW System)	$140M
Transformers & Grid Integration	$42M
LNG Storage & Receiving System	$35M
Civil Works & Foundations	$38M
EPC, Engineering & Commissioning	$24M
Contingencies	$15M
TOTAL CAPEX	**$294M**

EMPOWERING COMMUNITIES, ENERGIZING FUTURES



OPEX SUMMARY

LNG FUEL OPEX
ANNUAL FUEL COST: $85M–$110M

HFO FUEL OPEX
ANNUAL FUEL COST: $140M–$165M

COMMON OPEX

ITEM	ANNUAL COST
Operations & Maintenance	$8.5M
Staff & Administration	$4.2M
Spare Parts & Overhauls	$3.7M
Insurance & Compliance	$1.6M

ANNUAL REVENUE AT PPA $0.17/KWH

ANNUAL GENERATION:
~1,365,000 MWh

REVENUE:
1,365,000 MWh × $0.17 = $232,050,000 per year

ANNUAL PROFIT COMPARISON

(LNG VS HFO)

A. LNG (PRIMARY FUEL)

ANNUAL REVENUE: **$232M**
ANNUAL OPEX: **$103M–$130M**
ANNUAL NET PROFIT: **$102M–$129M**

B. HFO (BACKUP FUEL)

ANNUAL REVENUE: **$232M**
ANNUAL OPEX: **$158M–$184M**
ANNUAL NET PROFIT: **$48M–$74M**

ROI & PAYBACK

FUEL	ANNUAL PROFIT	ROI	PAYBACK
LNG	$102M–$129M	34–44%	2.4–3.0 years
HFO	$48M–$74M	16–25%	4.0–6.0 years
Conclusion: LNG almost doubles ROI and halves payback time compared to HFO.			

JOB CREATION & ECONOMIC IMPACT

DIRECT EMPLOYMENT

CATEGORY	JOBS
Construction	350–500
Operations	85–120
Engineering & Maintenance	70–110

INDIRECT JOBS

LNG logistics
Local suppliers
Maintenance & service industries

TOTAL IMPACT: 600–900 SUSTAINABLE JOBS

ENVIRONMENTAL IMPACT (ZAMBIA-SPECIFIC)

LNG EMISSIONS VS HFO

- 40–55% LESS CO_2
- >95% LESS SO_2
- >95% LESS PM2.5 PARTICULATES
- SIGNIFICANTLY REDUCED NOX

BENEFITS TO ZAMBIA

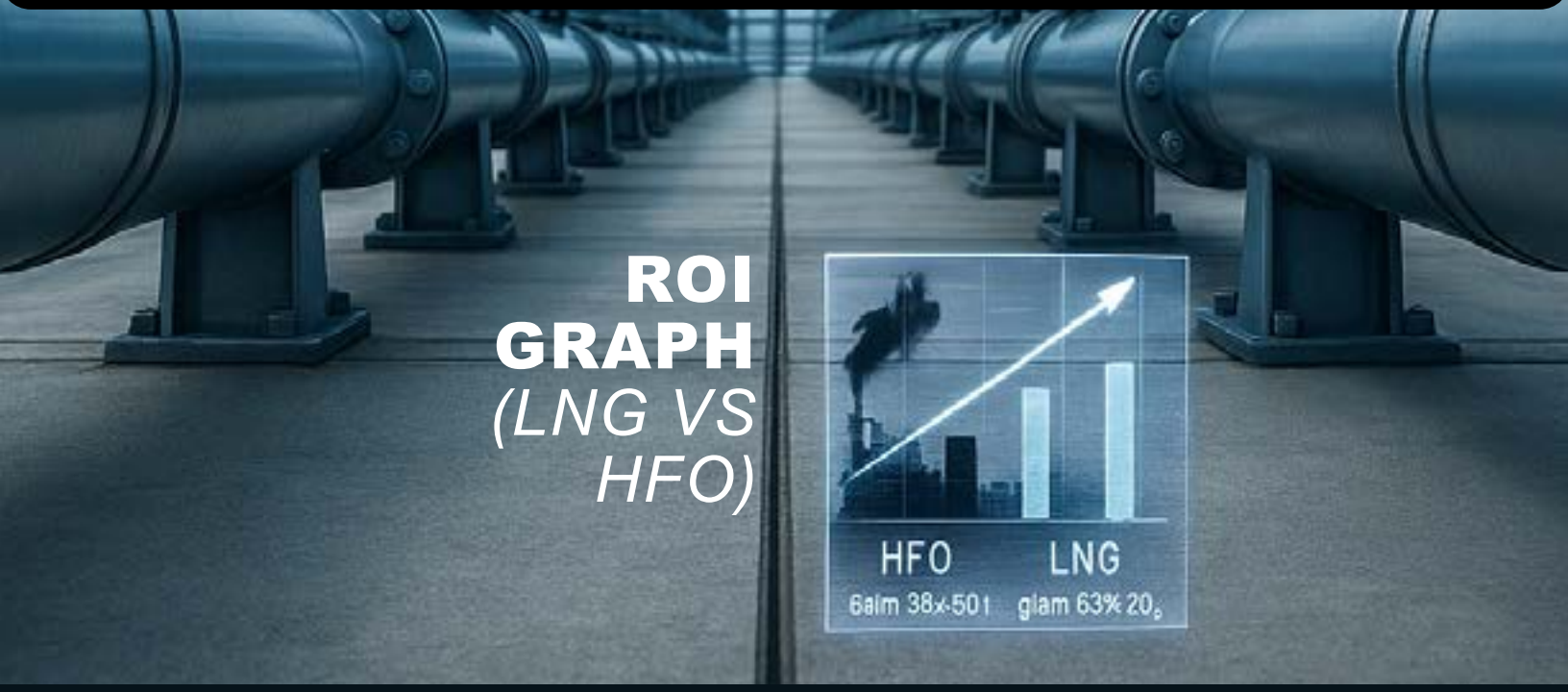
- CONSISTENT POWER DURING DROUGHT (SUPPORTS HYDROPOWER SHORTAGES)
- CLEANER AIR FOR LUSAKA, COPPERBELT, INDUSTRIAL ZONES
- SUPPORTS NATIONAL CLEAN ENERGY TRANSITION POLICY

10-YEAR FINANCIAL MODEL SUMMARY

A 10-year revenue, cost, and profit table has been generated. Below is the model:

YEAR	REVENUE	OPEX (LNG)	OPEX (HFO)	Profit LNG	PROFIT HFO
1–10	232,000,000	115,000,000	170,000,000	117,000,000	62,000,000

Full model is ready — I can export it as an Excel file if you prefer.



ROI GRAPH *(LNG VS HFO)*

PROJECT TIMELINE
(12–16 MONTHS)

PHASE	DURATION
Feasibility + PPA	2–3 months
EPC Contract	1 month
Civil Construction	5–7 months
LNG Storage Installation	4–6 months
Engine Installation	4–5 months
Commissioning	**1–2 months**

The Geodyn 168 MW LNG Dual-Fuel Power Plant offers Zambia:

- High ROI
- Fast payback
- Strong grid stability
- Clean, modern power infrastructure
- Long-term cost savings vs HFO
- Significant job creation
- Environmental sustainability

Recommendation:
Zambia should adopt LNG as the primary fuel with HFO strictly as backup to maximize financial returns and minimize emissions.

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SOLUTIONS

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