



Clean Green Energy Mission: **Project P-001**

Feasibility & Investment Strategy for the 200MW
Round-The-Clock (RTC) Firm RE Hybrid Plant

Location:	Gudha Malani Tehsil, Barmer, Rajasthan
Client:	AESPL (C-001)
Prepared By:	Aravinthraajan Energy Systems

Project P-001 integrates Solar, Wind, and BESS to deliver a highly lucrative 200MW firm power contract with a 22.26% IRR



Technical Viability



Contract: 200MW
Firm Power



Demand Fulfillment Ratio (DFR):
>90% Maintained



Grid Import Cap:
Capped at 5%



Financial Returns



Net Present Value (NPV): 59.06 Billion INR



Project IRR:
22.26%



Payback Period:
4.49 Years



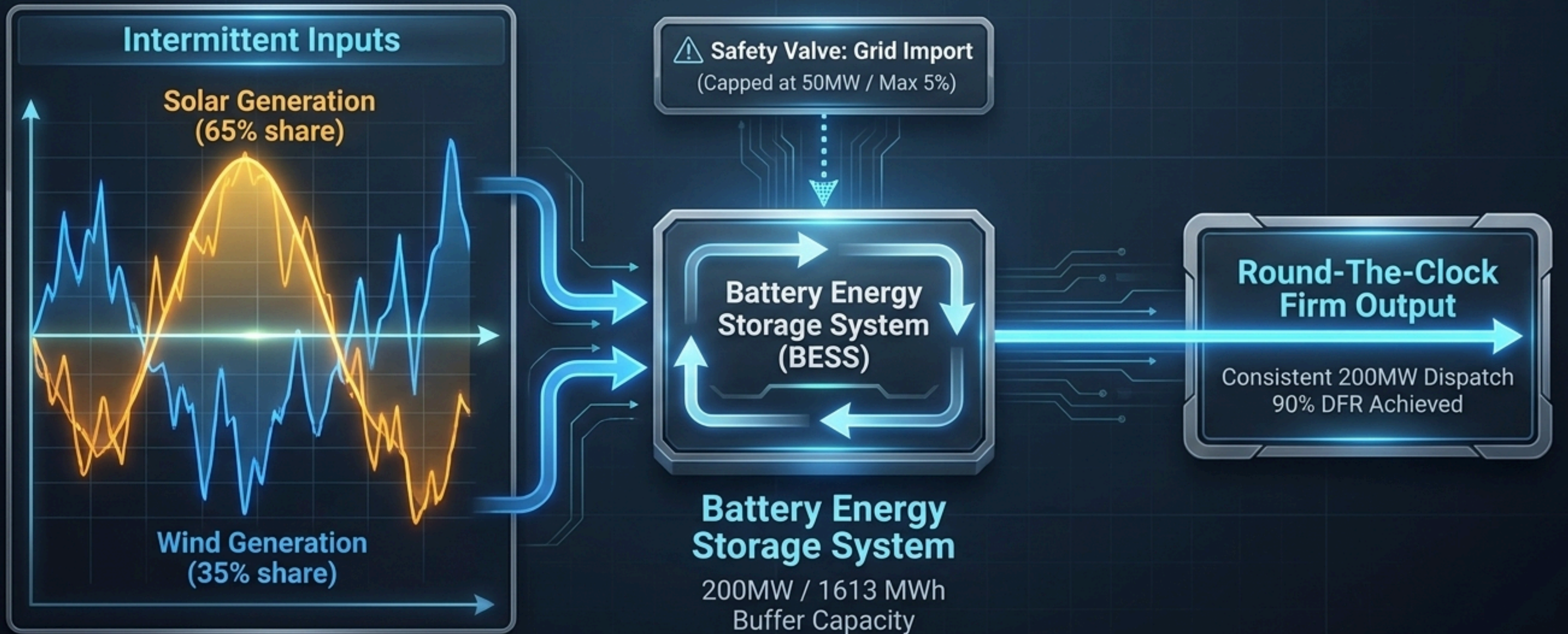
ESG Impact



Annual CO2 Reduction:
1.61M Tons



Carbon Credit Revenue:
1.52B INR / Year



Key Project Inputs & Constraints



Power & Grid Constraints

Target Contract Power:



Time Block Duration:
15 minutes (0.25 hours)



DFR Threshold:



Grid Import Limits:
Max 50 MW capacity / Max 5% total energy



System Design & Lifecycle

Energy Mix:

65% Solar / 35% Wind



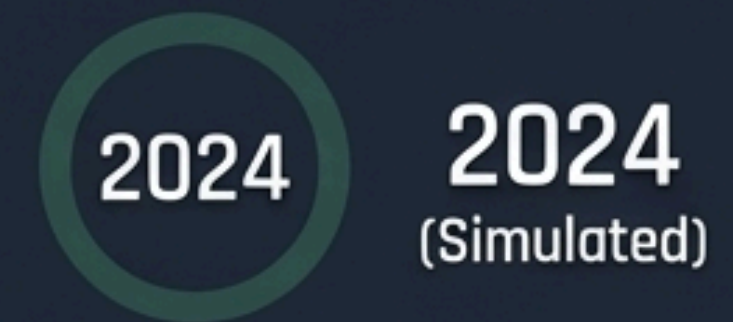
Plant Life:



Construction Timeline:



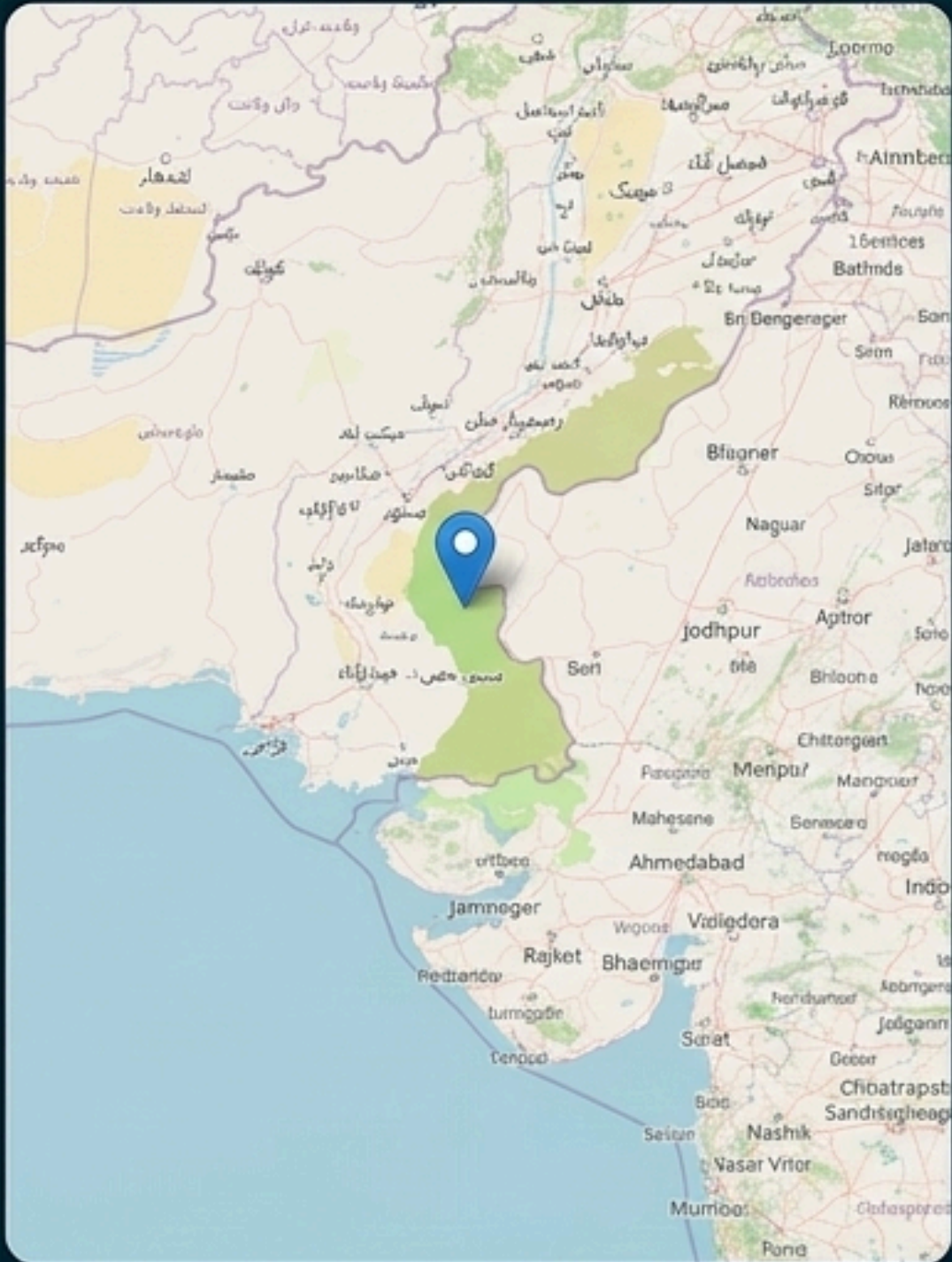
Year for Base Data:



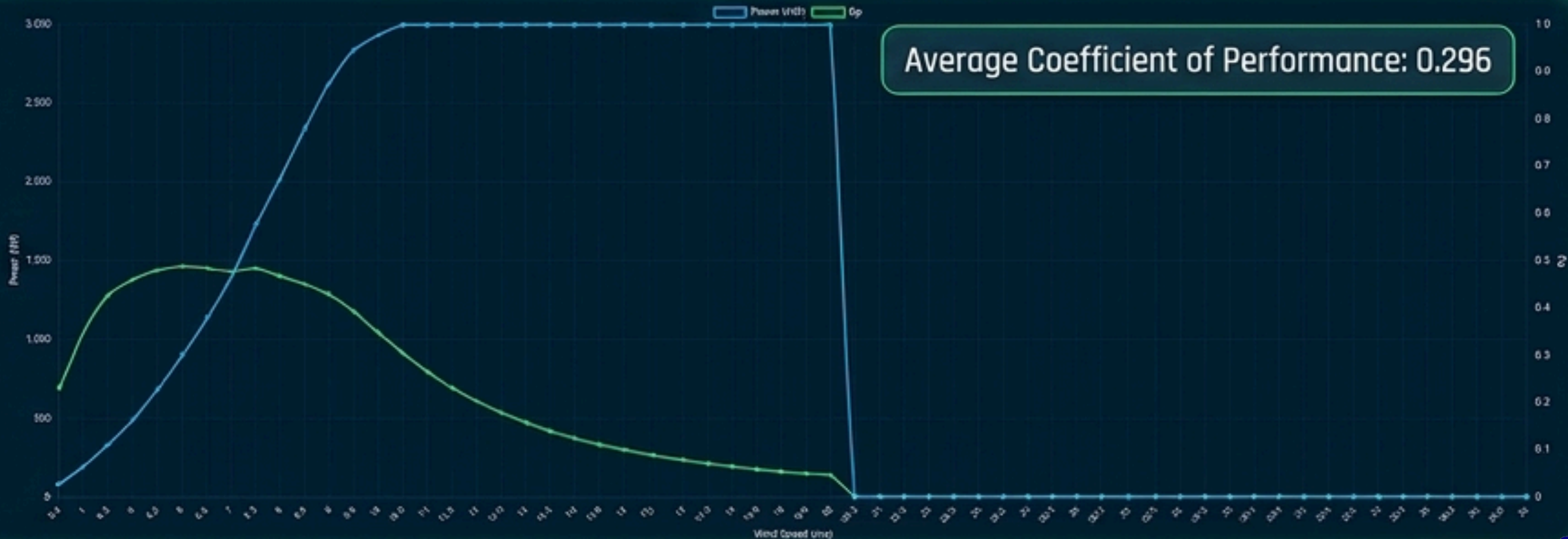
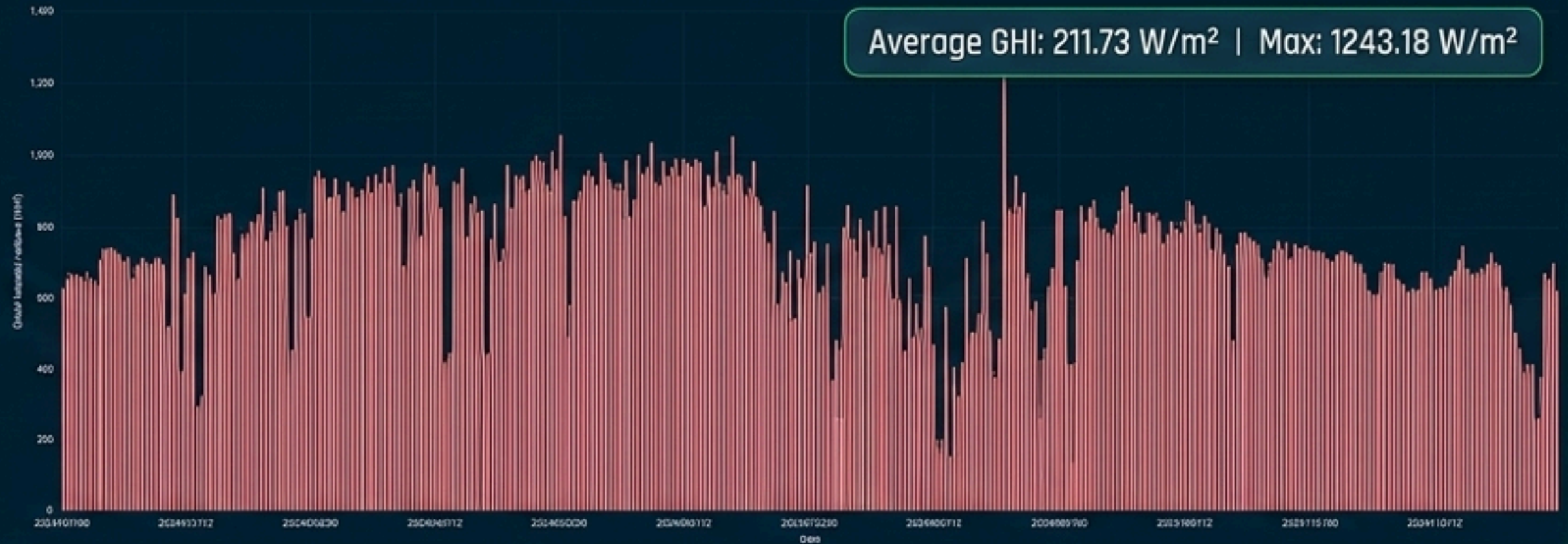
Asset Configuration Matrix

Solar PV Plant	Wind Energy Generator Plant	Battery Energy Storage System
DC: 715.22 MW / AC: 596.02 MW	156 MW	200 MW / 1613 MWh
Monocrystalline (650 Wp), 2-axis tracking	Suzlon S133/3000 (3000 kW Rated)	6 Hours Autonomy, 90% Round Trip Efficiency
1.1 Million Modules	52 Turbines (133m Rotor, 160m Hub)	IEC Low Wind Site III Class
97% Inverter Eff, 1.5% LID	0% Assumed WEG System Loss	1% Annual Degradation, 80% EOL SOH

Site Resource Potential: Sun & Wind



Site: Gudha Malani Tehsil, Barmer, Rajasthan
Coordinates: Lat 25.319822, Lon 71.653347
Elevation: 60m MSL



Power Generation & Dispatch Dynamics

Total Gross Available:
1,850.21 Million kWh



Solar: 1,199.85
MKWH/year
(23.38% CUF)

Wind: 650.36
MKWH/year
(48.18% CUF)

Gross Net Generation

The RTC Dispatch Reality



The BESS absorbs excess daytime peaks and discharges during nighttime troughs, successfully smoothing raw generation into a firm 200MW output.

Land Estimation & Spatial Footprint

Total Project Area: 4,798.84 Hectares (11,858 Acres)

Wind Plant

Area: 3,694.13 Hectares (9,128 Acres).

Note: Requires vast spatial layout for turbine spacing, but minimal actual ground disruption.

Land Cost: 1,141.04 Million INR

Solar Plant

Area: 1,070.83 Hectares (2,646 Acres).

Note: High density footprint.

Land Cost: 330.76 Million INR

BESS Plant

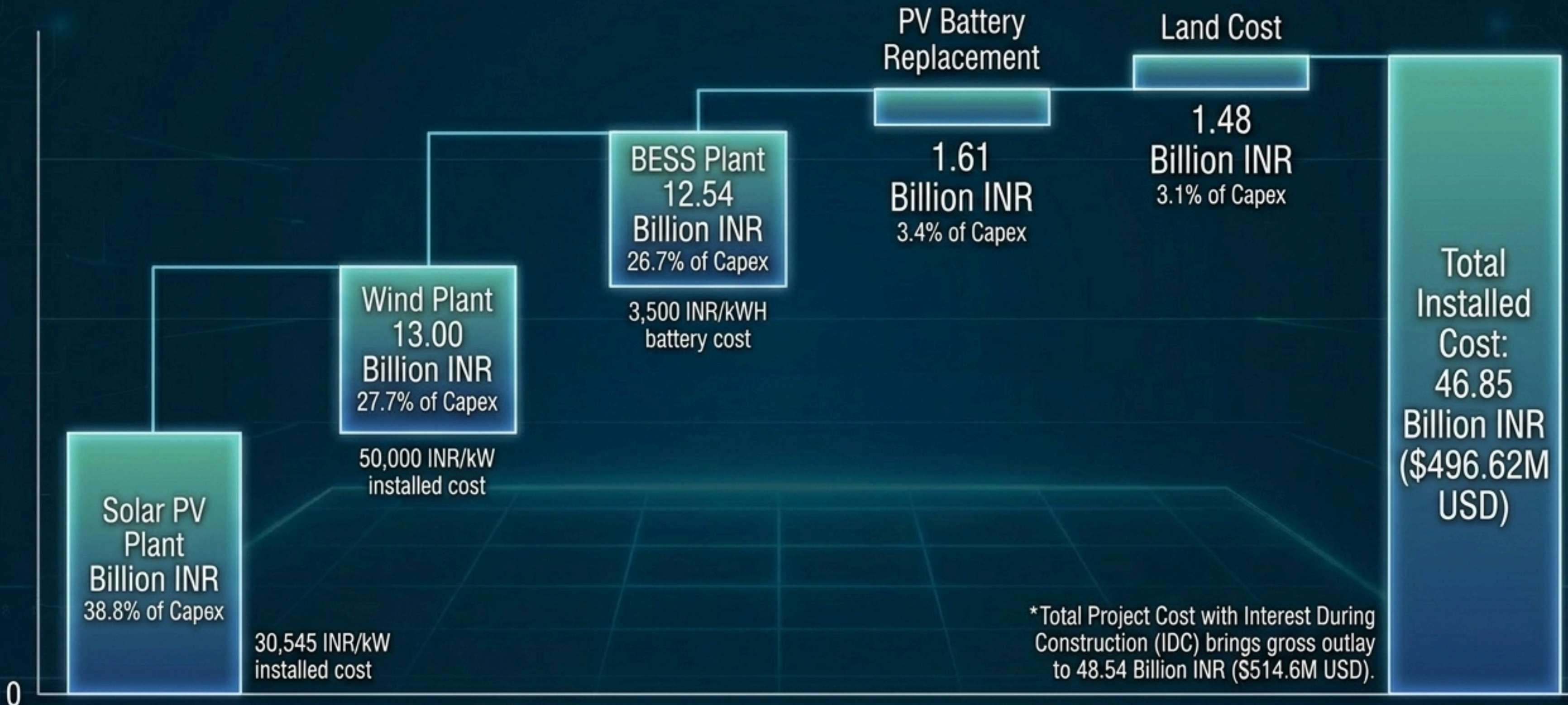
Area: Just 33.88 Hectares (83.72 Acres).

Note: Highly concentrated infrastructure.

Land Cost: 10.46 Million INR

Total Real Estate Acquisition Cost: 1,482.27 Million INR

CAPEX Estimation & Allocation



Carbon Footprint & ESG Economics

Planetary Impact

Annual Reduction:
1,616,026 Tons CO₂e

Calculated via baseline grid factor
(0.9 kg CO₂e/kWh) vs Life Cycle Intensity
(Solar 0.05, Wind 0.015).



Equivalency: Removing
376,534 petrol cars from
the road annually.

Financial Monetization

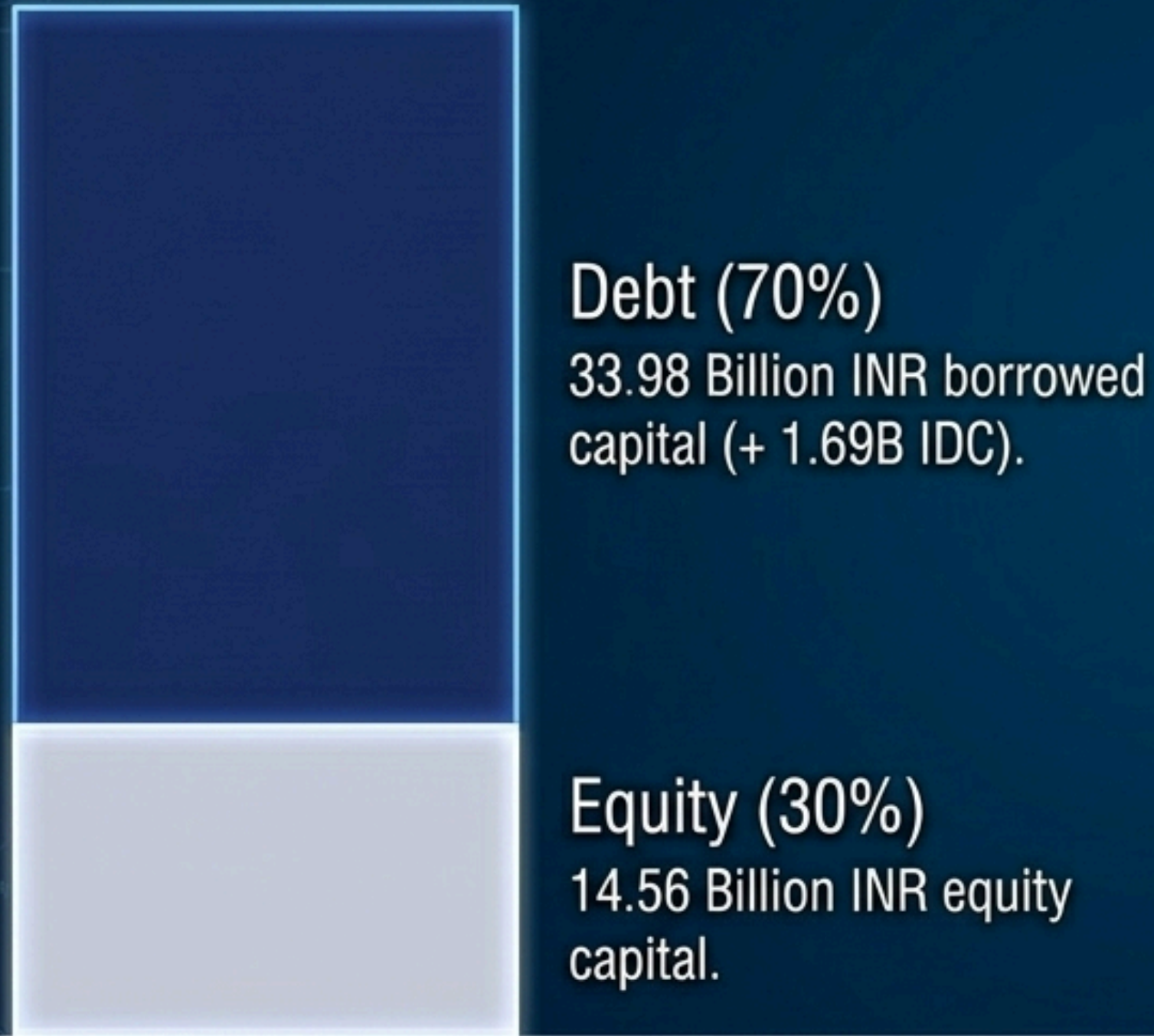
New Revenue Stream:
1.52 Billion INR / Year

Monetized via ICM (India) Standard at
\$10 USD / Ton (with 2% annual escalation).

Adds \$16M USD in pure
bottom-line revenue directly from
environmental compliance.

Financial Structure & Operational Expenses

Capital Structure (48.54 Billion INR Total)



Operational Burn Rates (O&M)

Solar O&M Base Cost	600 INR/kW
Wind O&M Base Cost	1200 INR/kW
System Insurance Premium	0.25% of CAPEX

Optimized sizing across technologies ensures long-term operational burn rates remain low relative to system yield.

Levelised Cost of Generation & Revenue Economics



Revenue Security Details

1. RTC / Firm RE Green Power sold at 5.06 INR/kWh.
2. Balance/Merchant power clears at 4.03 INR/kWh.
3. The 1.03 INR margin is the engine of project profitability, protected by a 2% annual sale price escalation against a 4% WPI / 6% CPI.

Internal Rate of Return (IRR) & Net Present Value

Project IRR

22.26%

Net Present Value (NPV)

59,065
Million INR

Payback Period

4.49
Years

Year 4.49

Breakeven

The integration of low-cost solar, high-yield wind, and optimized battery sizing generates a payback period of under 5 years on a 25-year asset lifespan, resulting in exceptional long-term enterprise value.

Risk Mitigation & Debt Service (DSCR)

Average DSCR: 2.22

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Minimum DSCR: 1.51

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Debt Safety Margin (>50% buffer)

1.0 Threshold (Breakeven Danger Zone)

Debt Safety Guarantee: A minimum DSCR of 1.51 guarantees that even in the lowest-performing modeled years, operational cash flow exceeds debt service obligations by over 50%. The average year generates more than double the required debt service cash flow.

Feasibility Conclusion & Next Steps

	Technical Feasibility Confirmed 200MW Firm RTC achieved at >90% DFR. Variable weather constraints and max 5% grid import rules successfully managed.
	ESG Impact Confirmed 1.6M Ton CO2e removed annually. ICM credits successfully monetized as a 1.5B INR revenue stream.
	Financial Viability Confirmed 59B INR NPV unlocked with a rapid 4.49-year payback and completely secure debt coverage.

Clean Green Energy Mission Project P-001 is structurally sound, highly insulated from debt risk, and positioned to yield extraordinary equity returns.

RECOMMENDED ACTION: Board Approval for Final Engineering Procurement & Land Acquisition Release.

Experience Real Engineering

The Clean Green Energy Mission is more than a program – it is an ENGINEERING movement for Energy Transition!



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