



Executive Feasibility Briefing: Kurnool 600 MW Solar Project

**Technical Validation, Carbon Economics,
and Financial Return Architecture**

Project Ref: P-001 | **Client Ref:** C-001

Location: Kolimigundla, Nandyal, Andhra Pradesh

Prepared By: Aravinthraajan Energy Systems

The Executive Scorecard: Bottom-Line Metrics

**Technical
Scale**

**600
MW AC**

(720 MW DC)

1,078 MKWH
Annual Net
Generation

**Capital
Requirement**

**₹19.3
Billion**

(Total Project
Cost incl. IDC)

\$341.18 / kW
Installed Cost

**Equity Returns
(Levered)**

**38.78%
IRR**

2.58 Years
Payback Period

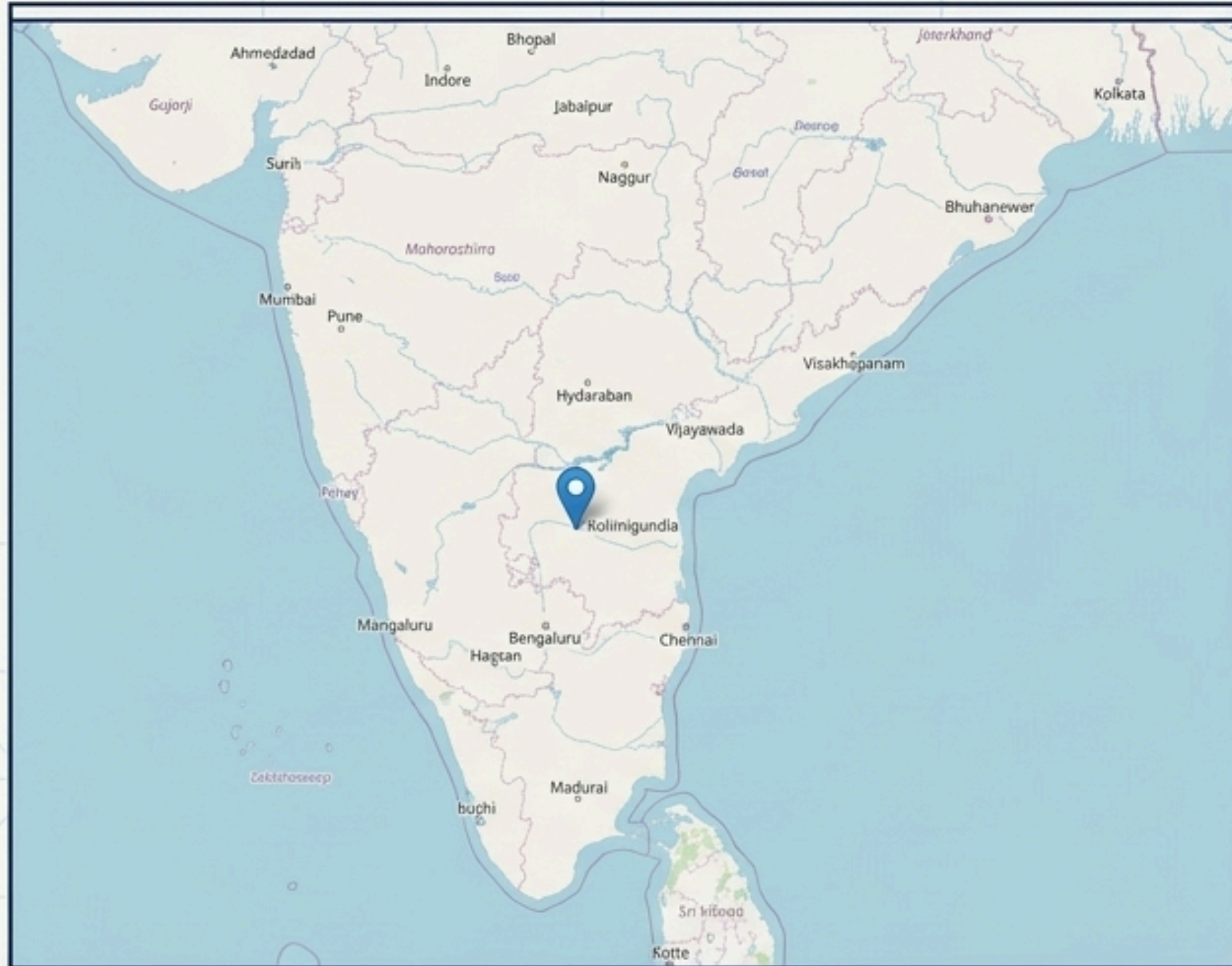
**Carbon
Economics**

**924,154
Tons**

CO₂e Avoided
/ Year

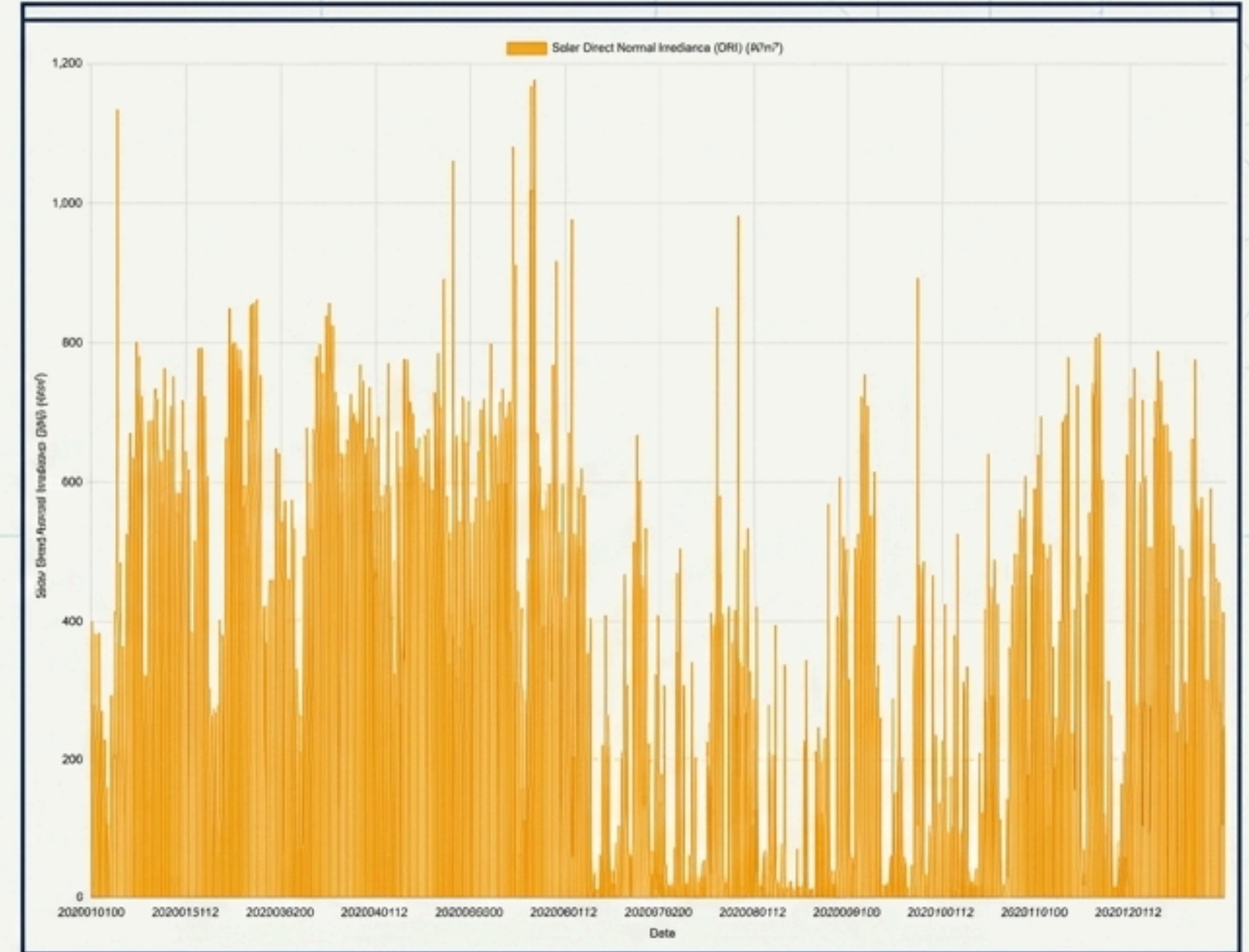
₹871.8M
Annual Carbon
Credit Revenue

Site Viability: Kolimigundla, Andhra Pradesh



Latitude: 15.030029 | Longitude: 78.139211

Grid Transmission Losses: Capped at 2.0%

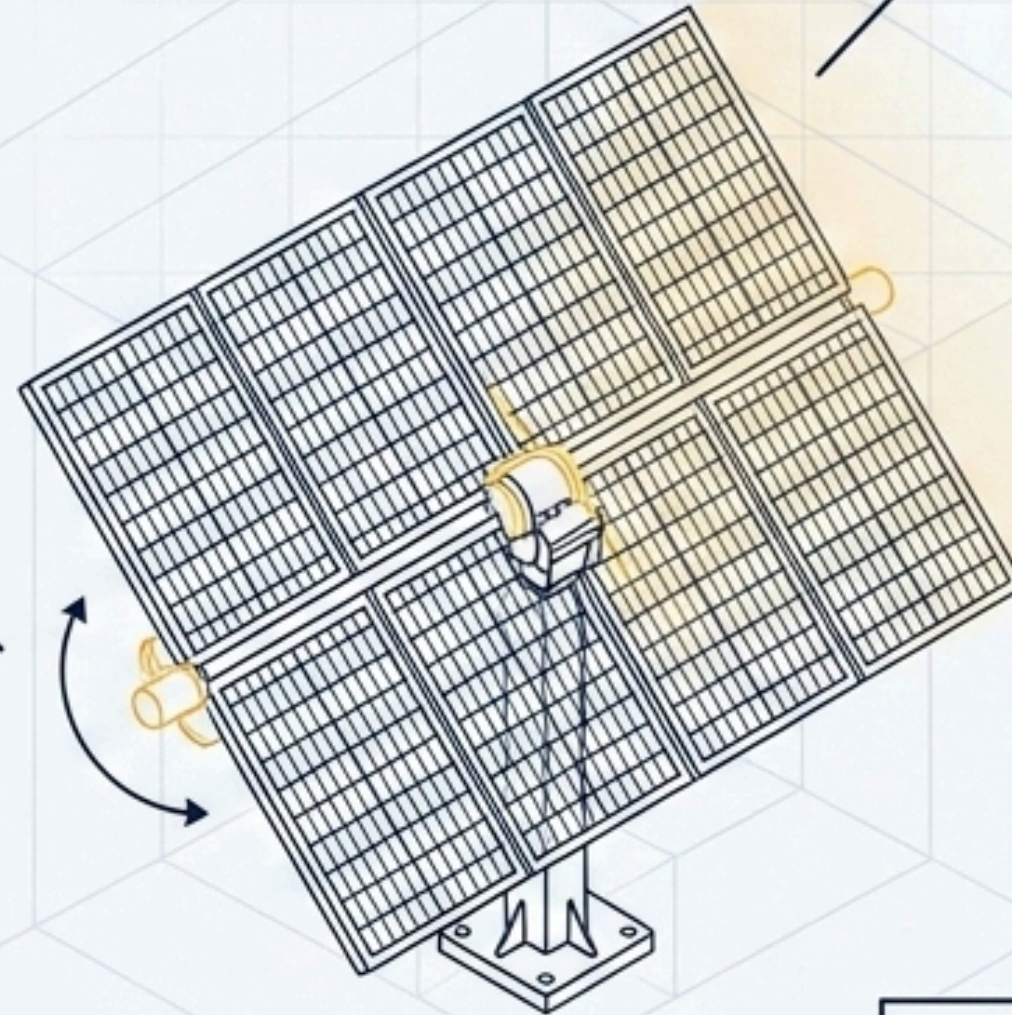


Average Global Horizontal Irradiance (GHI): 193.34 W/m²

Mean PV Cell Temperature: 34.76°C

System Loss Profile: Exceptional at only 0.895%

System Architecture: 600 MW Bifacial Array



System Mechanics

Tracking: 2-Axis (Tilt & Azimuth) |
Ground Coverage Ratio: 0.4
Inverter Efficiency: 98%

Module Specs

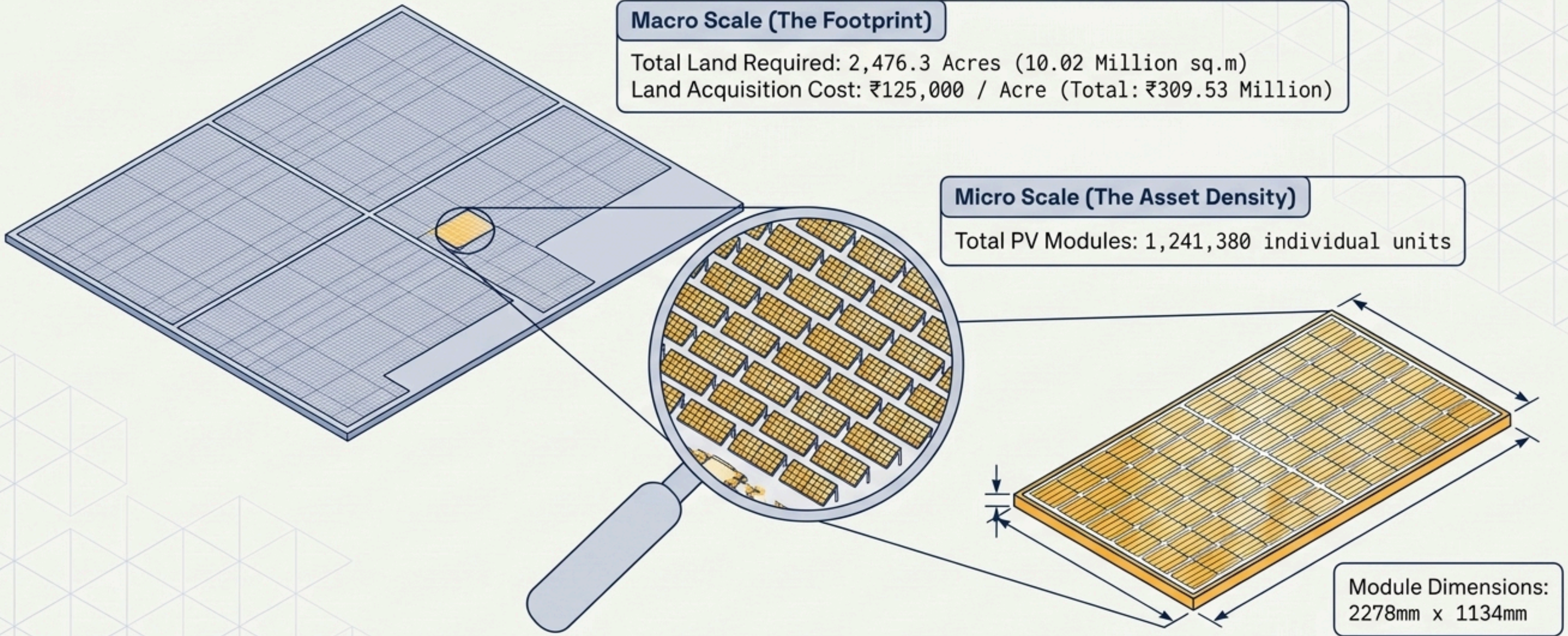
Tech: Bifacial N-Type TOPCon
Make: Saatvik Green Energy Ltd (580W)
STC Efficiency: 22.45% | Bifacial Power Gain: 10%

Degradation Profile

First Year Degradation: 1.0% | Annual Thereafter: 0.40%
Product Warranty: 12 Years | Power Warranty: 30 Years

Note: No BESS provided in this configuration.

The Spatial Model: Translating Acreage to Output



The Conversion Metric: Yielding a net Capacity Utilization Factor (CUF) of 20.05%, translating spatial footprint into 1078.04 MKWH of net exportable power annually.

Carbon Footprint Mitigation & Real-World Equivalencies



Equal to
the petrol
consumption of
215,328
passenger cars
for one year.

924,154
Tons

of CO₂e Avoided
Annually

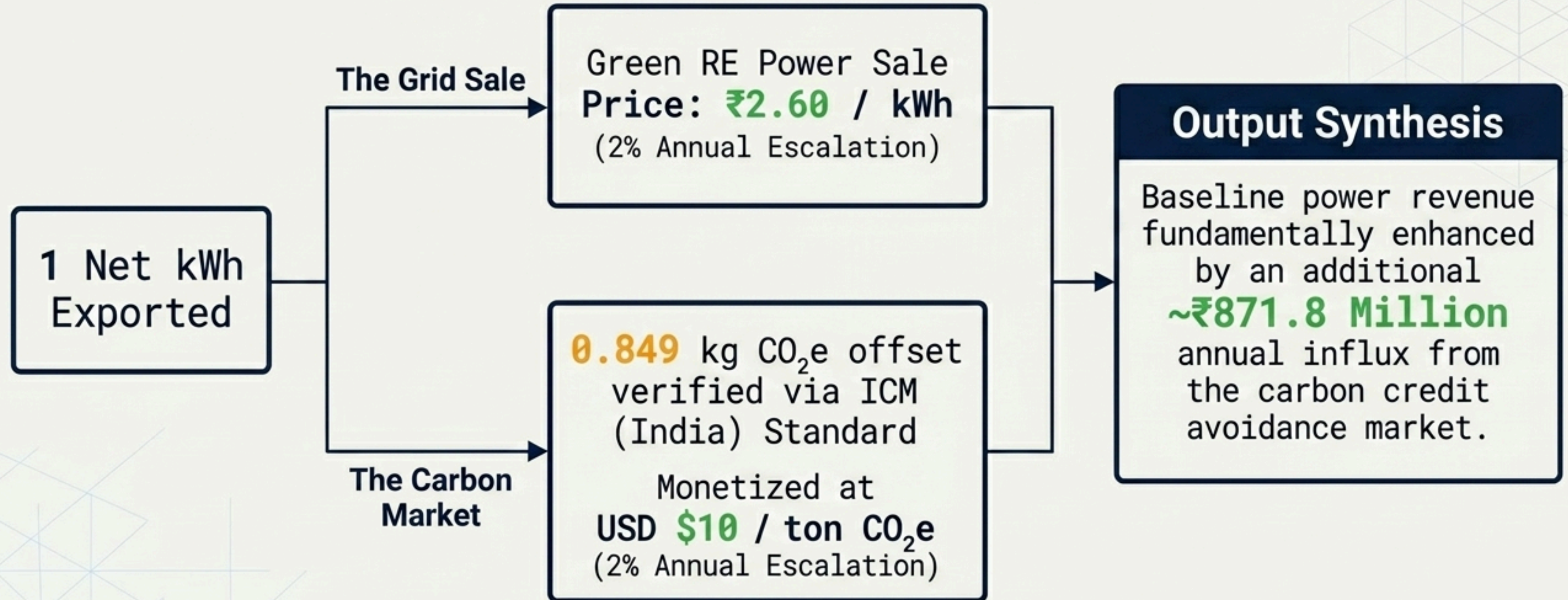
Net Emission Reduction:
0.849 kg CO₂e per kWh of RE Power



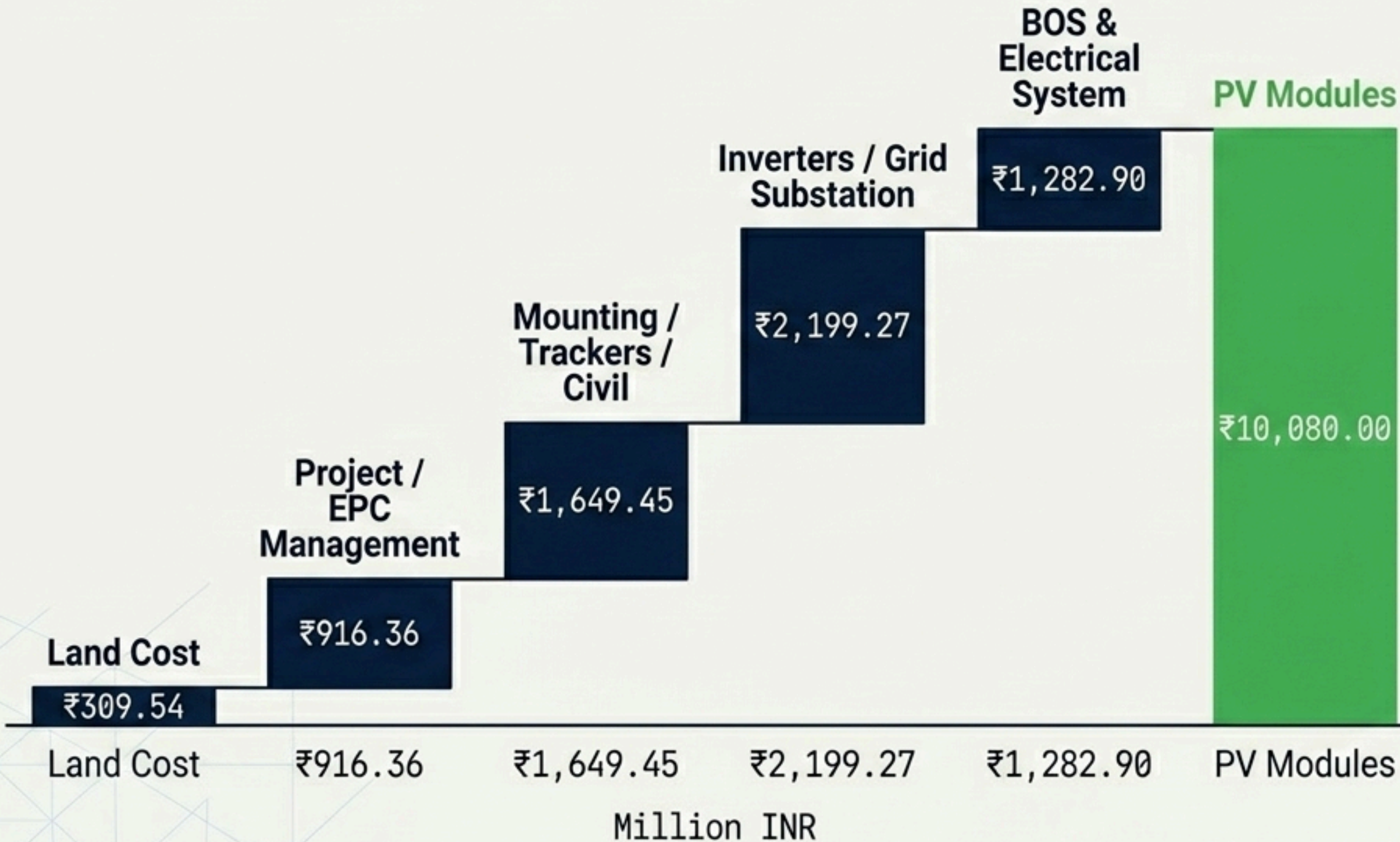
Equal to the
consumption of
2,125,554
barrels of oil.

*Offsetting an
equivalent of*
465.7 Million kgs
of coal burned.

Dual-Revenue Unit Economics: Power + Carbon Credits



Capital Expenditure Allocation (Investment Waterfall)



Gross Project Cost
excluding IDC:
₹18,636.54 Million.

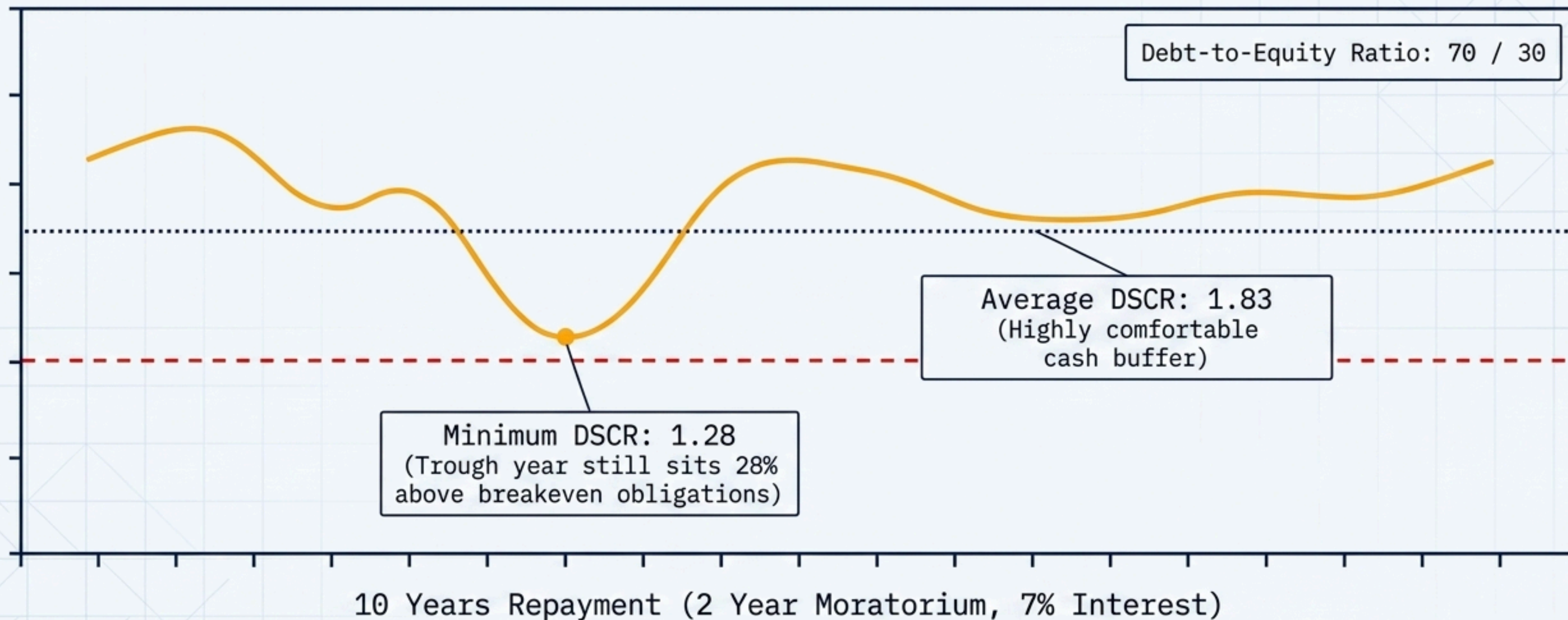
Total Project Cost
including Interest
During
Construction (IDC):
₹19,312.48 Million.

Operating Margin: Generation Cost vs. Targeted Sale Price



This baseline ₹0.41/kWh intrinsic margin is securely modeled prior to any carbon credit subsidization or wholesale price index escalations (WPI modeled at 4%).

Debt Service Lifecycle & Default Immunity



The robust generation yields and dual-revenue streams ensure cash flows easily service the ₹13.5 Billion borrowed capital without stressing operating reserves.

Financial Returns Matrix: Project vs. Equity Yields

Overall Project (Unlevered)

Initial Cash Outflow: ₹19,312.48 M

Net Present Value (NPV): ₹6,281.13 M

Internal Rate of Return (IRR): **17.30%**

Payback Period: **5.78 Years**

Equity Model (Levered at 70/30)

Equity Capital Outflow: ₹5,793.74 M

Net Present Value (NPV): ₹10,965.08 M

Internal Rate of Return (IRR):

38.78%

Payback Period:

2.58 Years

Conclusion: A Highly Viable, Risk-Optimized Asset



The Kurnool 600 MW framework presents a fully de-risked, dual-revenue green infrastructure asset ready for immediate capital deployment.

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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