



# Clean Green Energy Mission: Solar-Wind Hybrid Power Generation

## Executive Feasibility & Investment Go/No-Go Report

### PROJECT REFERENCE

P-001 (HYBRID)

### CAPACITY

200MW Hybrid + 100MW BESS

### LOCATION

Gadag, Karnataka, India

### CLIENT

AESPL (C-001)

## TOTAL CAPITAL EXPENDITURE

# \$240.96M

## 22,948 Million INR

Capital Structure: 70% Debt / 30% Equity split over a 9-month construction schedule.

## LEVELIZED COST OF GENERATION (LCOG)

# 3.41 INR/kWh

## (\$0.04/kWh)

A highly competitive generation cost driven by optimal hybrid resource overlap.

## NET POWER EXPORT & EFFICIENCY

# 803.48 MKWH

## Total Annual Export

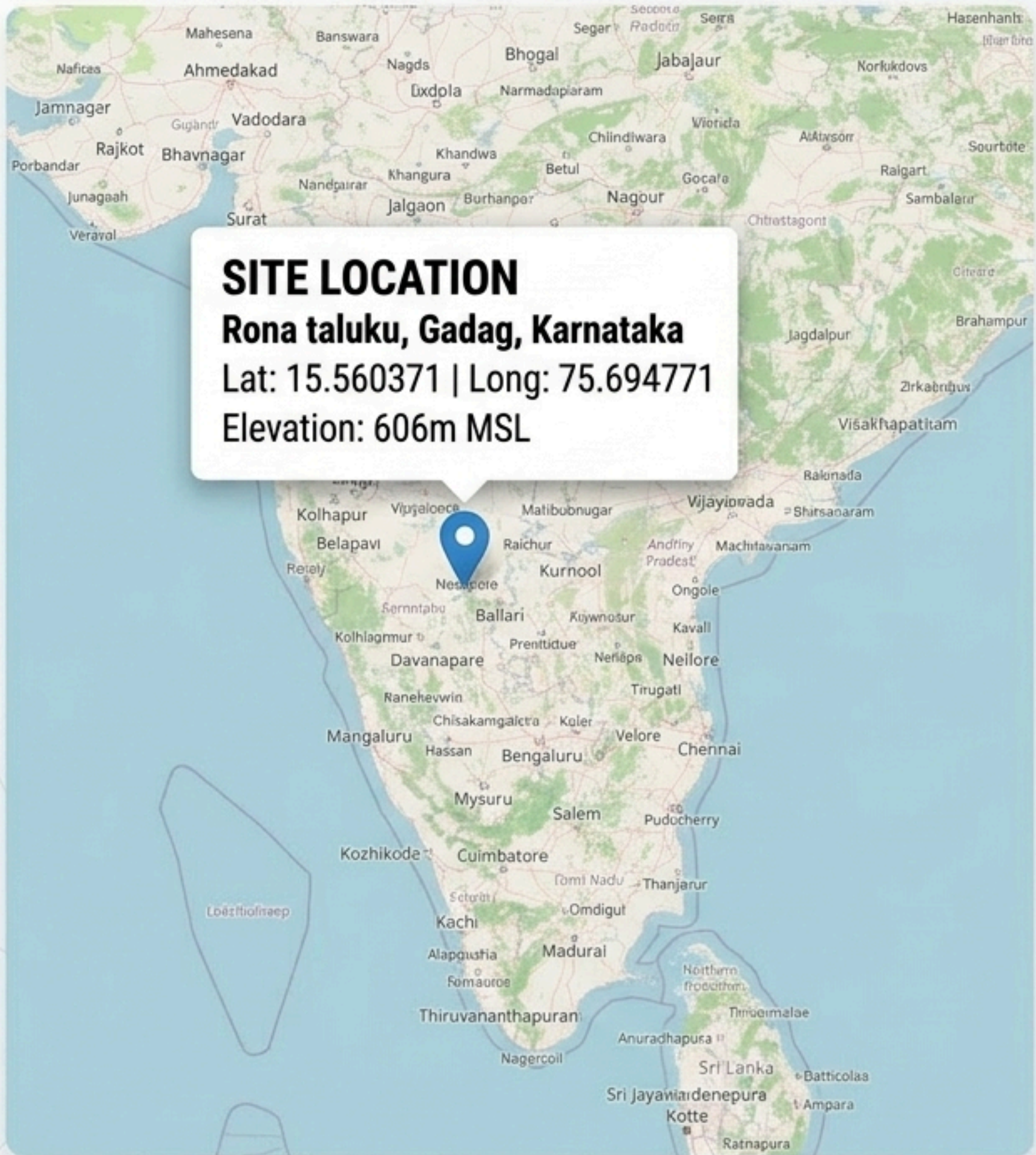
Achieving a 45.74% Net Hybrid Capacity Utilization Factor (CUF) via intelligent BESS peak shifting.

## ENVIRONMENTAL TRANSFORMATION

# 742,983 Tons

## CO<sub>2</sub>e Emission Reduction Annually

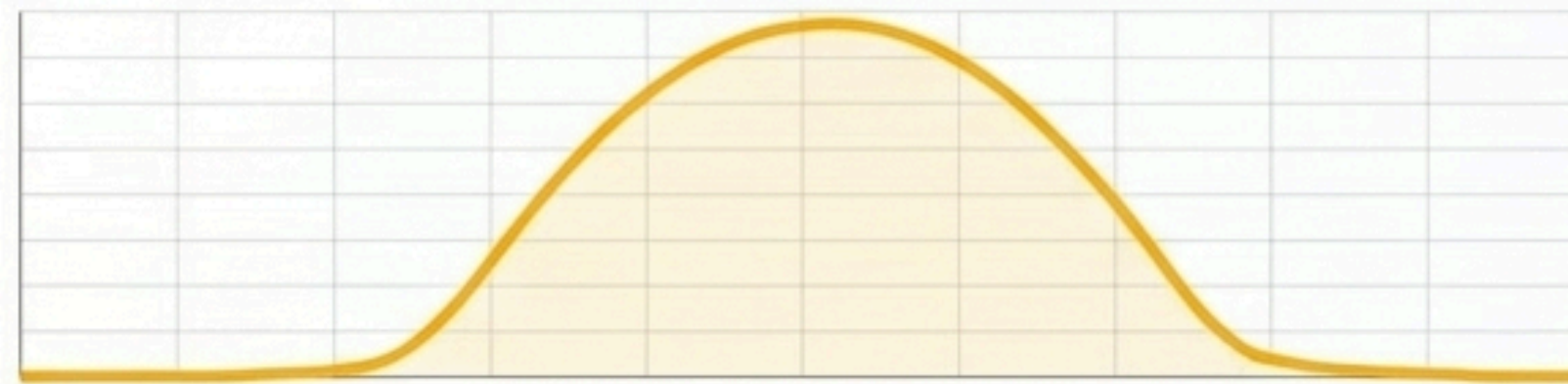
Unlocking premium ICM Carbon Credit revenues for the 20-year project lifecycle.



## SOLAR RESOURCE TELEMETRY

Maximum GHI:  
**1,309.08 W/m<sup>2</sup>**

Average GHI:  
**187.59 W/m<sup>2</sup>**



## WIND RESOURCE TELEMETRY

IEC Classification: **Medium Wind Site II**      Turbulence Intensity: **Low (0.036 at 15m/s)**



**CONCLUSION:** Optimal dual-resource overlap ensures maximum base utilization before BESS application

# 3-PILLAR ASSET MATRIX



## SOLAR PV ENGINE



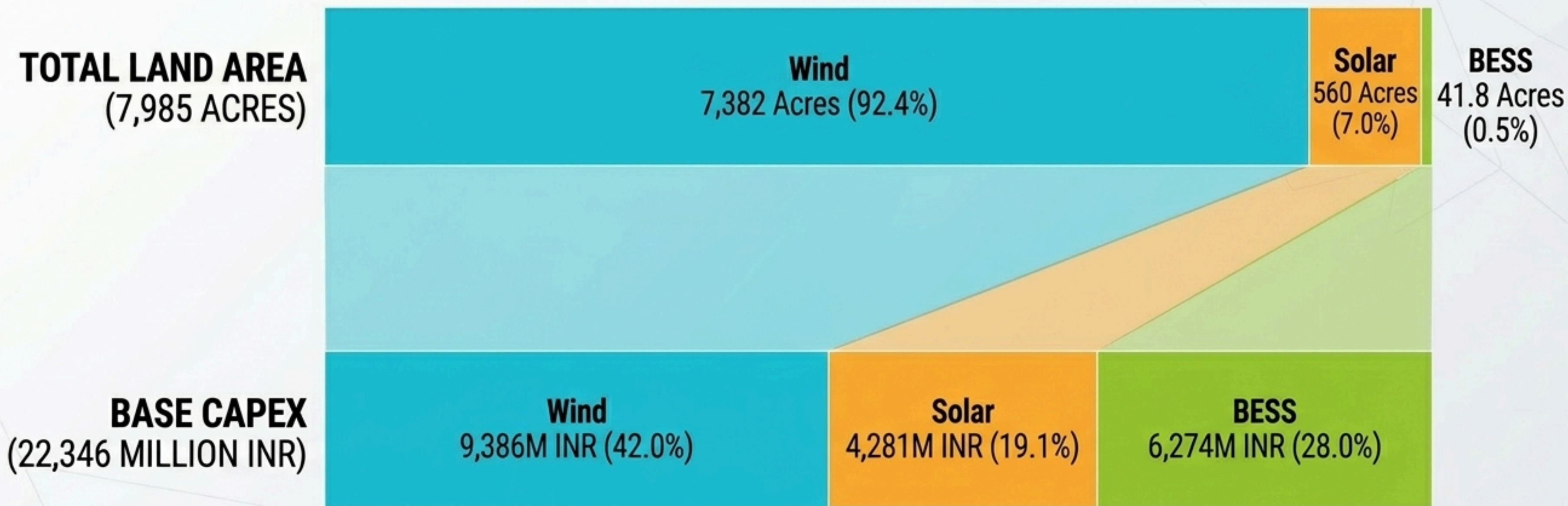
## WIND WEG ENGINE



## BATTERY ENERGY STORAGE (BESS)

<ul style="list-style-type: none"> <li>• <b>Capacity:</b> 140.16 MWp</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Capacity:</b> 140.8 MW</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Capacity:</b> 100 MW Load / 806.67 MWh</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Hardware:</b> 233,600 Avaada Monocrystalline Bifacial N-Type TOPCon modules</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hardware:</b> 44 GE Vernova 3.2-130 Turbines</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hardware:</b> LFP Lithium-Ion</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Specification:</b> 720 Wp</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Specification:</b> 130m rotor, 155m hub height</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Specification:</b> 6 hours autonomy</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Efficiency:</b> 23.18% STC Efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Efficiency:</b> Medium Wind Site II Optimized</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Efficiency:</b> 90% Round Trip Efficiency</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Base CUF:</b> 19.52%</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Base CUF:</b> 49.64%</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Lifecycle:</b> 11-Year Replacement Cycle</li> </ul>

# SPATIAL-TO-FINANCIAL TRANSLATION: LAND VS. CAPEX



**INSIGHT:** Land footprint does not equal capital density. Wind dominates the physical space due to layout spacing, while the BESS drives over a quarter of the project cost within less than 1% of the spatial footprint.

# THE GENERATION ENGINE: GE VERNOVA 3.2-130 CAPABILITY

## CUT-IN SPEED



**3.0**  
m/s

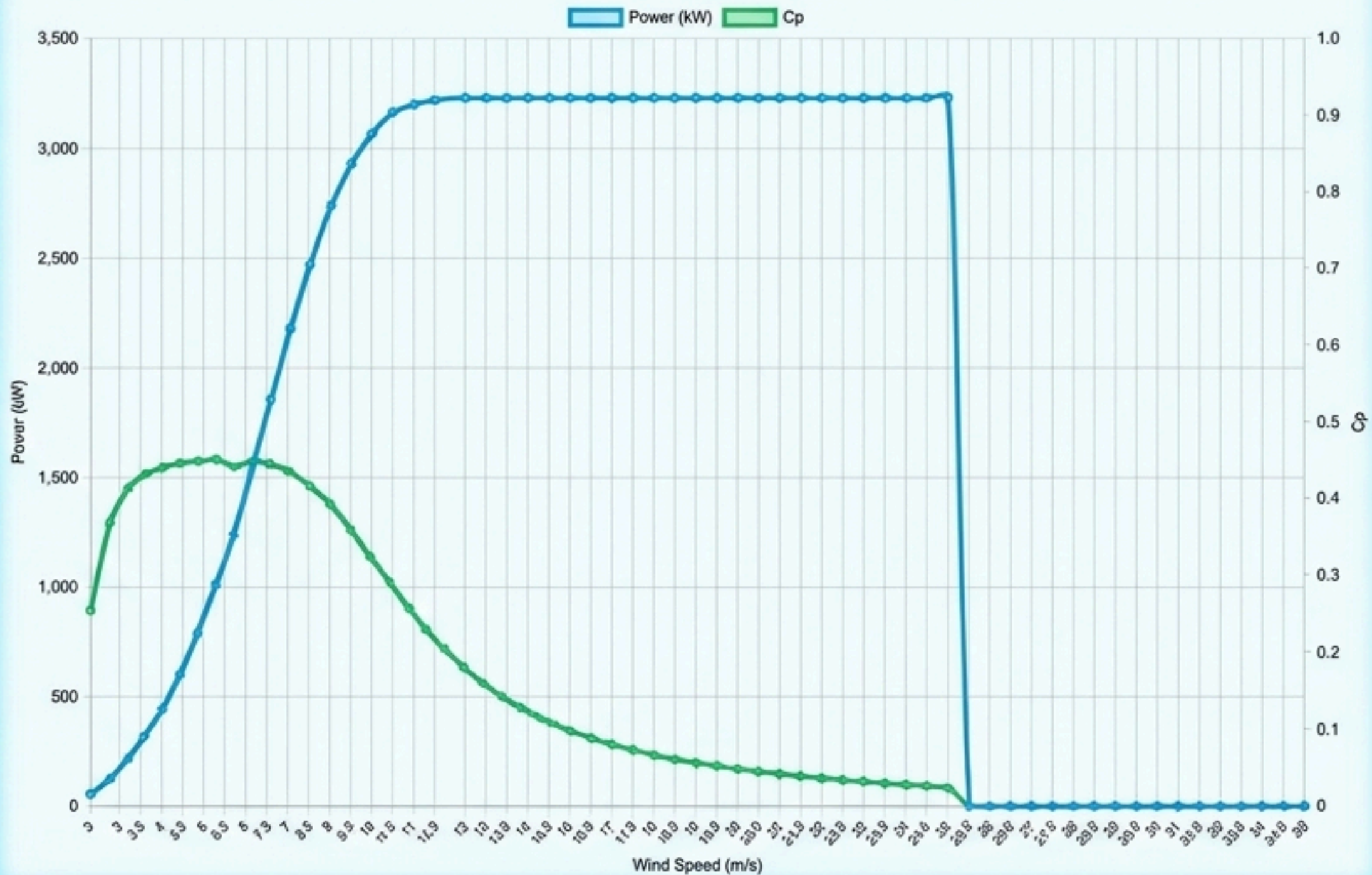
Commencement of generation.

## RATED SPEED



**12.5**  
m/s

Peak turbine efficiency threshold.



## CUT-OUT SPEED



**25.0**  
m/s

Safety shutdown threshold.

## SYSTEM LOSS



**0%**

Estimated hardware loss.

**TAKEAWAY:** The GE Vernova 3.2 MW model perfectly aligns with the site's Class II medium-wind profile to sustain a massive 49.64% utilization factor.

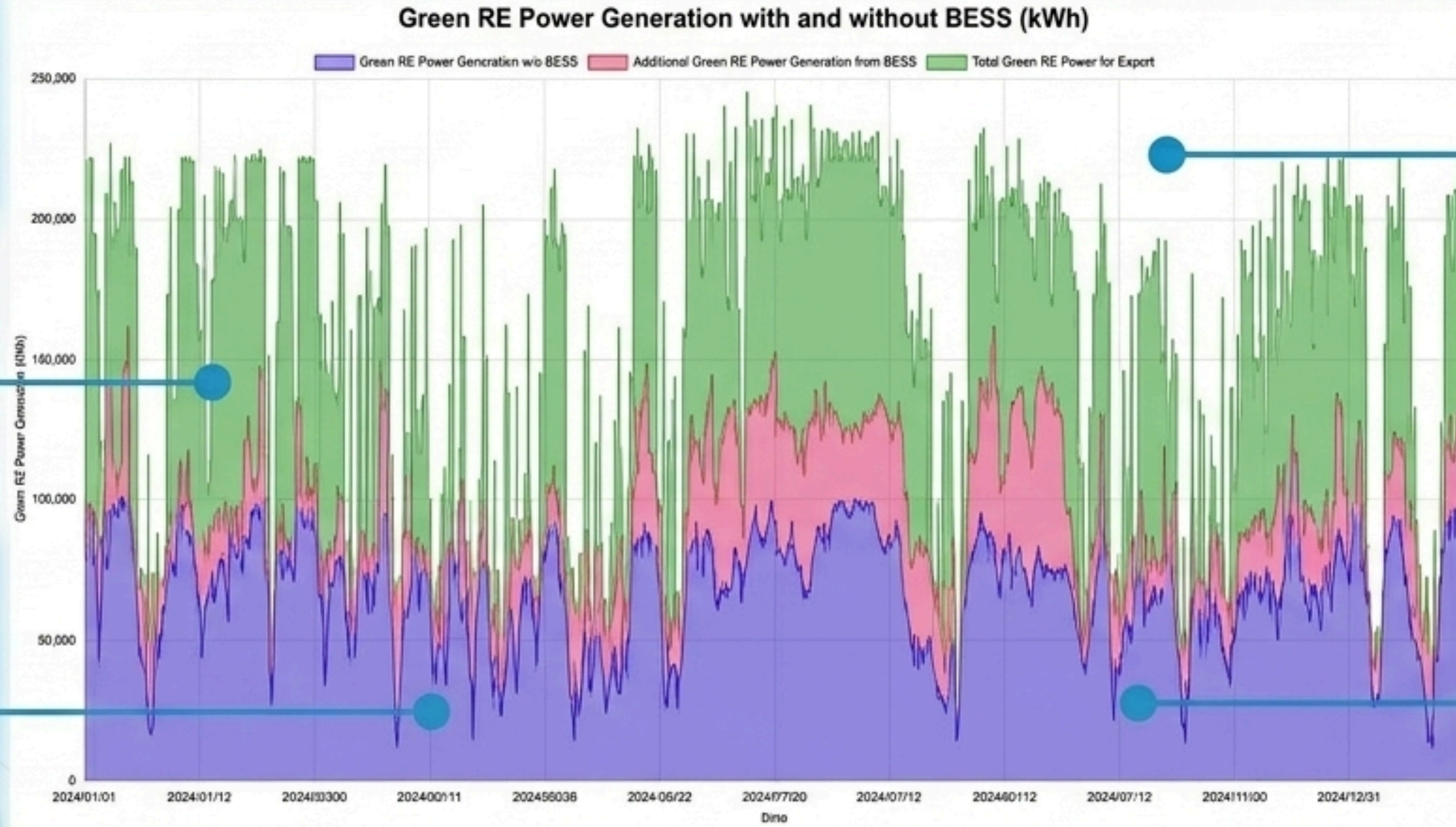
# POWER BALANCE & 17-HOUR PEAK SHIFTING

## 1. BASE GENERATION

Solar + Wind alone yields a 34.17% Capacity Utilization Factor (CUF).

## 2. THE BESS CHARGE

172.61 MKWH of power is stored in the LFP array during periods of low demand and high solar/wind generation.



## 4. THE NET RESULT

BESS elevates the Hybrid Net CUF to 45.74%, fundamentally transforming intermittent renewables into reliable baseload power.

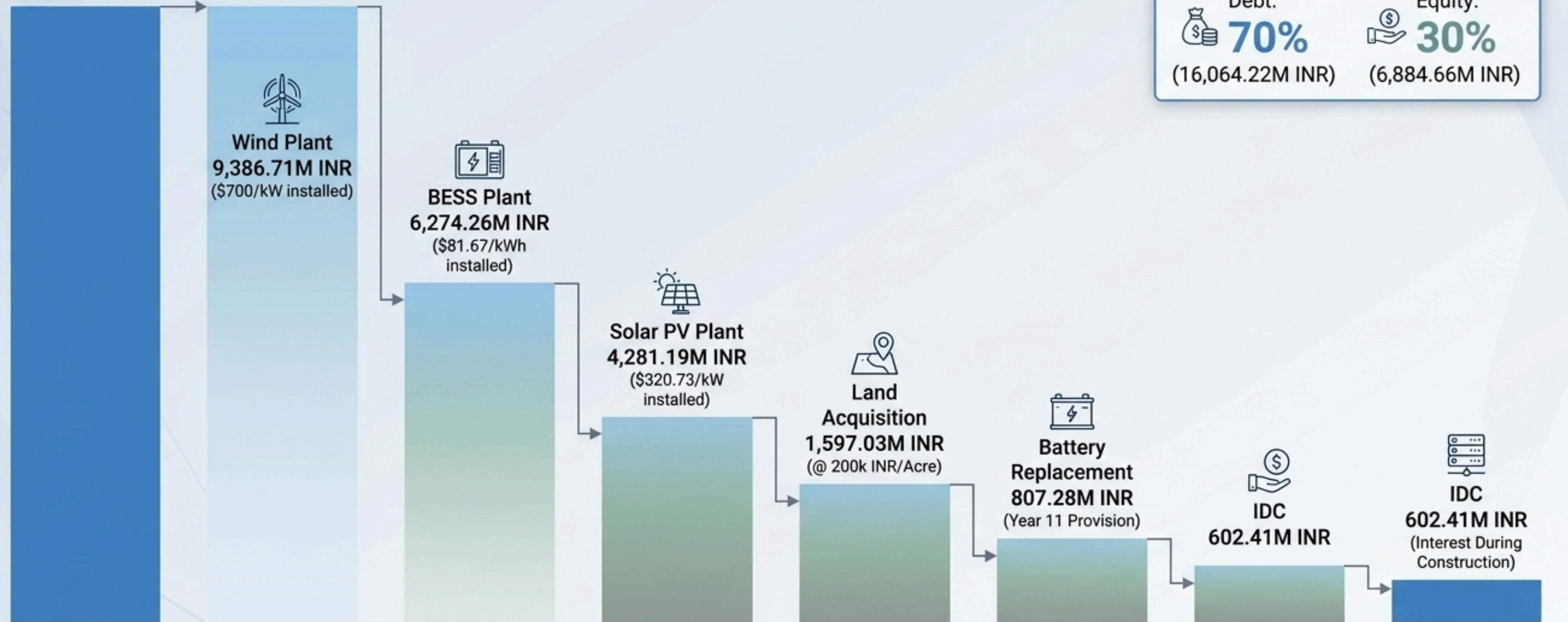
## 3. EVENING PEAK SHIFT

The BESS discharges during the 17-hour evening peak, maintaining a consistent, dispatchable 100 MW output.

# CAPITAL EXPENDITURE (CAPEX) DECONSTRUCTION

Total Investment: 22,948.88 Million INR (\$240.96M)

Total Investment  
22,948.88 M INR



## FINANCING STRUCTURE

Debt: **70%**  
(16,064.22M INR)

Equity: **30%**  
(6,884.66M INR)

# ENVIRONMENTAL & ESG IMPACT

## REFORESTATION EQUIVALENT



Equal to the carbon sequestered by **12.25 Million** tree seedlings grown for 10 years

**742,983 TONS**  
**CO<sub>2</sub>e Reduced**  
**Annually**

(0.9 kg baseline vs 0.03 kg lifecycle intensity)

## AUTOMOTIVE IMPACT



Replaces **173,115** petrol cars

OR

Powers **656,055** electric cars for one year

## FOSSIL FUEL OFFSET

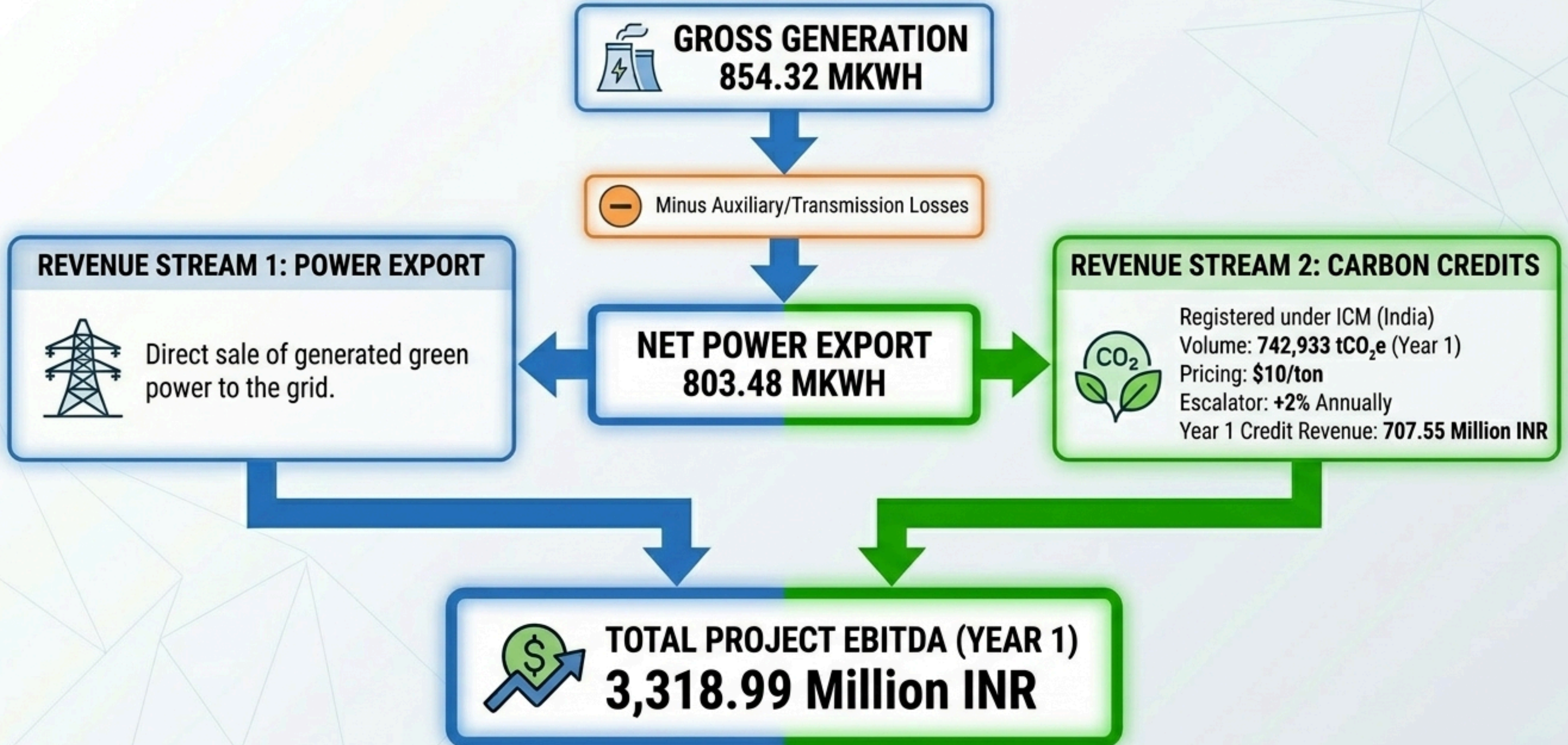


Avoids burning **1.7 Million** barrels of oil

OR

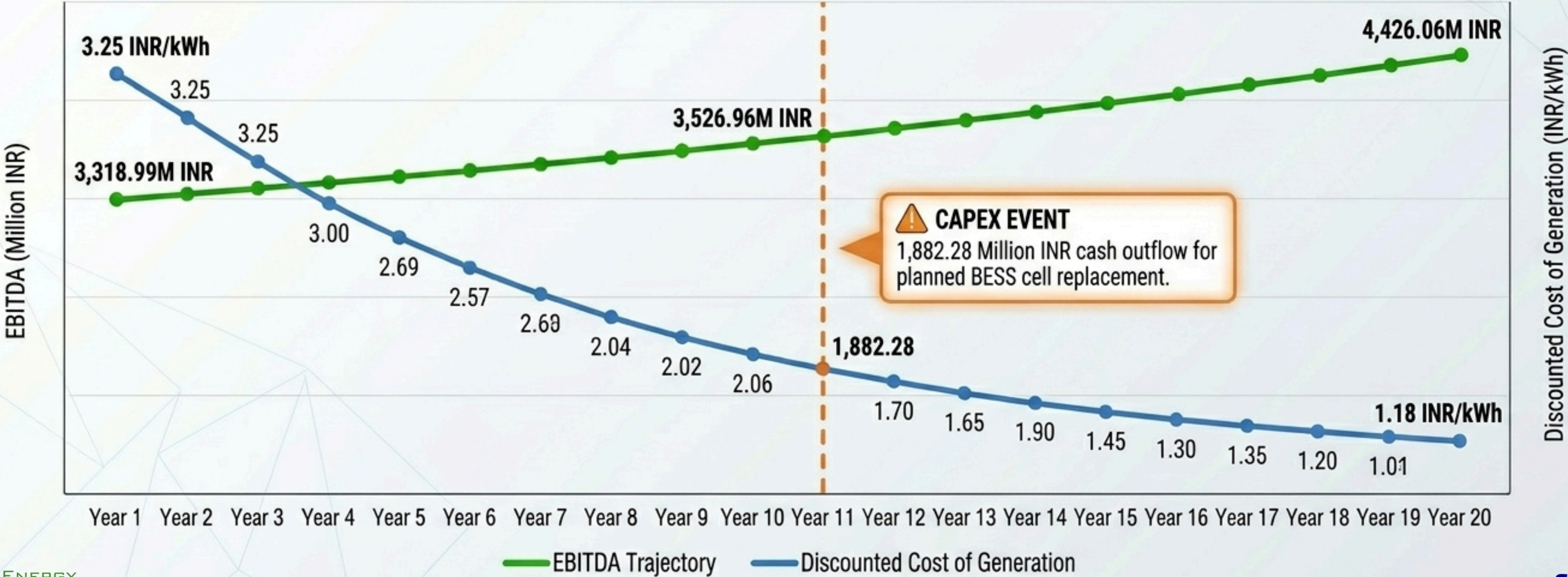
Avoids burning **374.4 Million** kgs of coal

# DUAL-REVENUE ARCHITECTURE (YEAR 1)



# FINANCIAL FEASIBILITY I: 20-YEAR PROFITABILITY HORIZON

**LEVELIZED COST OF GENERATION (LCOG)**  
**3.41 INR/kWh**  
 Stable, long-term generation efficiency.



# FINANCIAL FEASIBILITY II: BANKABILITY & RETURNS

## FINANCING ARCHITECTURE

-  Total Borrowing: **16,666.63 Million INR**
-  Repayment Period: **10 Years**
-  Working Capital: **1% for Spares | 1 Month O&M  
1 Month Receivables**

## DEBT SERVICE COVERAGE RATIO (DSCR)



**Highly robust DSCR.**

EBITDA safely covers the 10-year debt servicing requirement, isolating lenders from default risk.

## INTERNAL RATE OF RETURN (IRR) & NET PRESENT VALUE (NPV)



**Parameters successfully clear executive hurdle rates.**

## EXECUTIVE VERDICT



**GO-DECISION JUSTIFIED**

The Rona Taluku Hybrid + BESS project represents a technically optimal, high-yield asset perfectly calibrated to capture peak pricing and carbon premiums.

# 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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✉ [cgem@aessoft.in](mailto:cgem@aessoft.in) | [sales@aessoft.in](mailto:sales@aessoft.in)

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