

Hybrid Plant Simulation Report

Generated on: 2025-08-10 08:21:41

Mixed End-Use Hybrid Plant with Renewable Energy Integration

Executive Summary

Total Renewable Capacity: 90,000 MW

Total Storage Capacity: 100,000 MWh

Total Capital Cost: 360,620,750 Rs./kW (32,455,867,500 Rs./kW)

System Overview

Wind: 50,000 kW

Pv: 40,000 kW

Battery: 20,000 kW

Large Energy Storage: 80,000 kW

Electrolyzer: 25,000 kW

Fuel Cell: 20,000 kW

Hydrogen Storage: 5,000 kW

Load Profiles

electric_load_hybrid.csv: Peak Electricity Demand = 33,000 kW

heat_load_hybrid.csv: Peak Heat Demand = 22,000 kW

hydrogen_demand_hybrid.csv: Peak Hydrogen Demand = 1,700 kg/h

Production Data Sources

Solar Data Sources: 2

Wind Data Sources: 8

SS01-KAT_H1: Max=232.49 A/m², Avg=52.22 A/m²

SS01-KAT_H2: Max=217.48 A/m², Avg=42.12 A/m²

WS01-OTT_Q01: Max=3569.47 kW, Avg=1510.63 kW

Technology Costs

PV: 45,000 Rs./kW (4,050,000 Rs./kW)

wind: 65,000 Rs./kW (5,850,000 Rs./kW)

battery: 36,000 Rs./kW (3,240,000 Rs./kW)

large_energy_storage: 27,000 Rs./kW (2,430,000 Rs./kW)

electrolyzer: 135,000 Rs./kW (12,150,000 Rs./kW)

fuel cell: 225,000 Rs./kW (20,250,000 Rs./kW)

hydrogen_compressor: 67,500 Rs./kW (6,075,000 Rs./kW)

hydrogen_storage: 20,250 Rs./kW (1,822,500 Rs./kW)

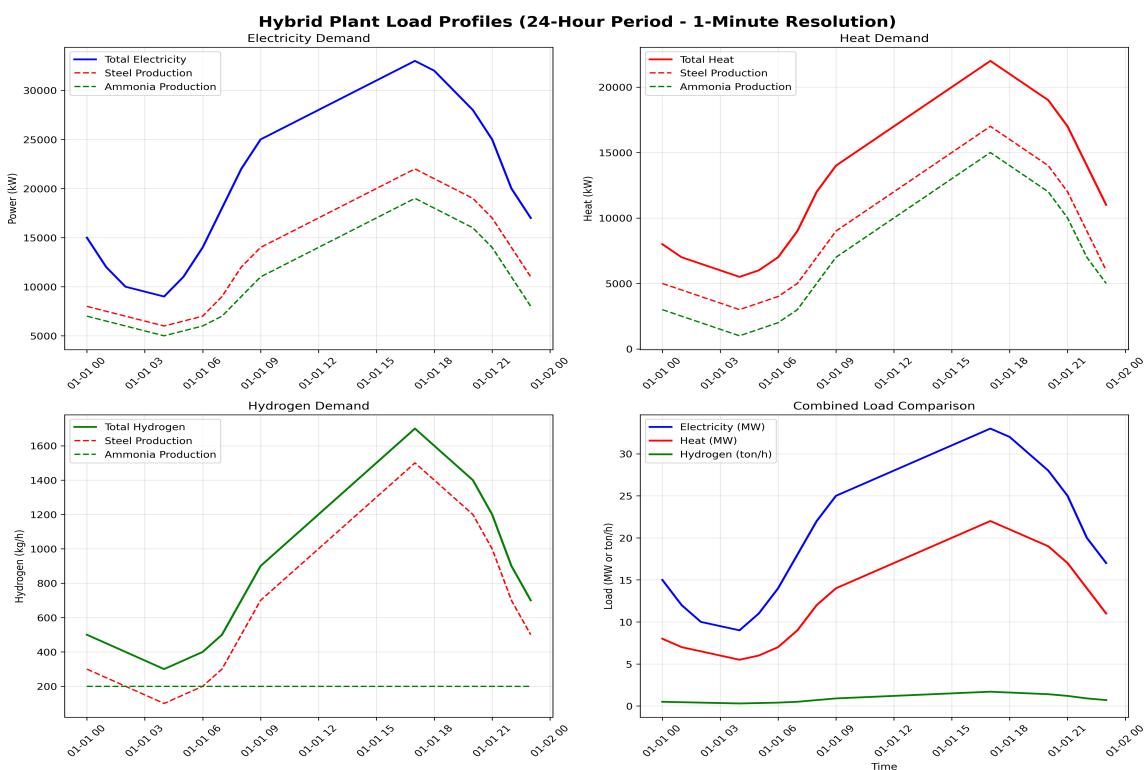
steel_production: 225,000,000 Rs./kW (20,250,000,000 Rs./kW)

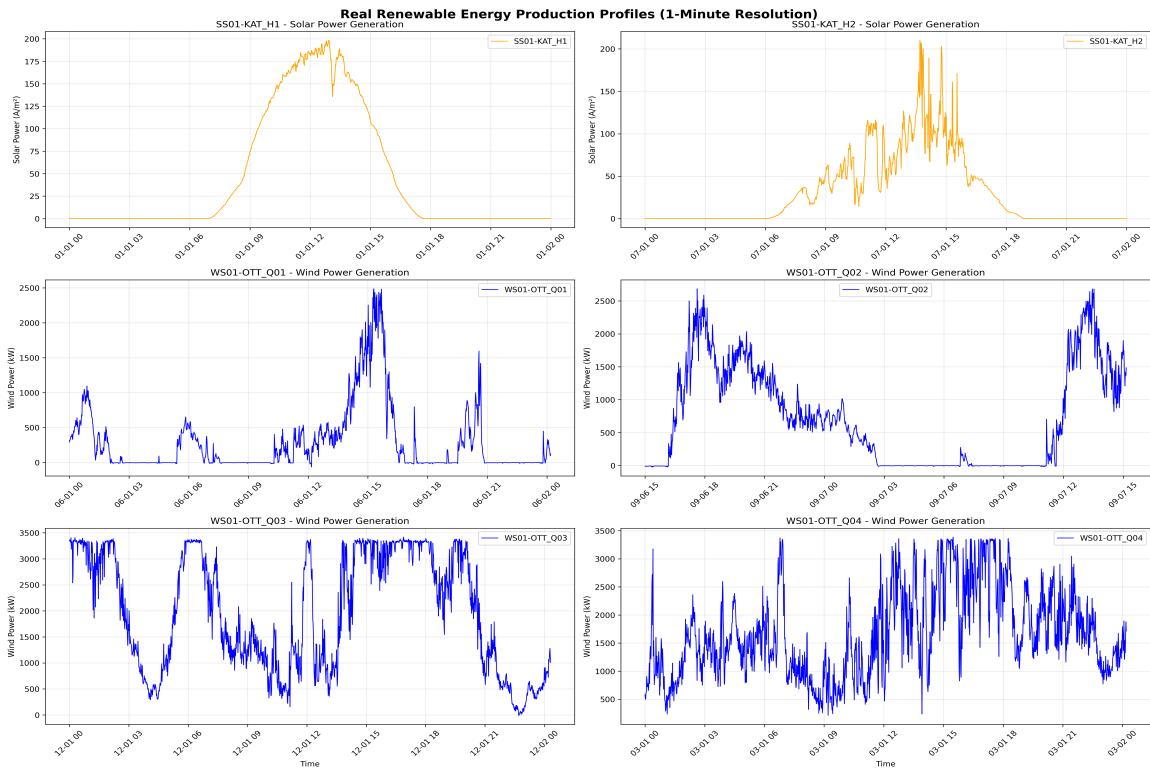
ammonia_production: 135,000,000 Rs./kW (12,150,000,000 Rs./kW)

Energy Market

Electricity Purchase Price: 0.12 Rs./kWh
Electricity Sale Price: 0.08 Rs./kWh
Hydrogen Purchase Price: 2.50 Rs./kg
Hydrogen Sale Price: 2.00 Rs./kg

Generated Analysis Plots





Hybrid Plant Energy Flow Diagram

