WIND + SOLAR
HYBRID SOLUTIONS



Maximum Energy Generation with Hybrid Renewable Systems

A Wind + Solar Hybrid Power System integrates wind turbines and photovoltaic solar technology into a unified renewable energy solution, maximizing energy production by utilizing complementary natural resources. While solar panels generate peak power during daylight hours, wind turbines continue producing electricity during cloudy weather, evenings, and periods of strong wind, ensuring a more consistent power supply.

WHAT IS SOLAR WIND HYBRID?

A Solar + Wind Hybrid system combines solar photovoltaic and wind energy to deliver consistent and reliable power. The hybrid system ensures maximum energy generation and reduces dependency on the grid.

Technical Advantages of Solar + Wind Hybrid Systems

1. Complementary Generation Profiles (Reduced Intermittency)

- **24/7 Energy Potential:** Solar generation peaks during clear daytime hours, whereas wind energy is often stronger during late afternoons, evenings, nights, and cloudy conditions.
- **Smoother Power Output:** Combining both sources offsets the natural variability of each individual generation type, yielding a more stable baseline output profile throughout the day and across seasons.

2. Higher Capacity Utilization Factor (CUF)

- **Integrates dual resource streams into a single grid connection to achieve a substantially higher Capacity Utilization Factor (CUF) compared to standalone solar or wind facilities.**
- Yields significantly higher total energy output (kWh) per unit of land.

3. Balance of System (BoS) & Infrastructure Optimization

- **Shared Transmission & Substation Costs:** Solar arrays and wind turbines share common Balance of Plant (BOP) infrastructure—including evacuation cables, transformers, switchyards, and grid interconnection lines.
- **Land Co-Location Efficiency :** Solar arrays can be installed in the open space between wind turbine towers without causing structural interference, maximizing total land usage efficiency.

4. Grid Stability & Advanced Controls

- **Better Power Quality:** Modern smart hybrid controllers and central inverter setups actively regulate variable frequency/voltage output to stabilize grid frequency.
- **Reduced Grid Congestion & Curtailment:** Multi-source input allows for optimized load balancing and minimizes forced generation curtailment during localized peak-generation windows.

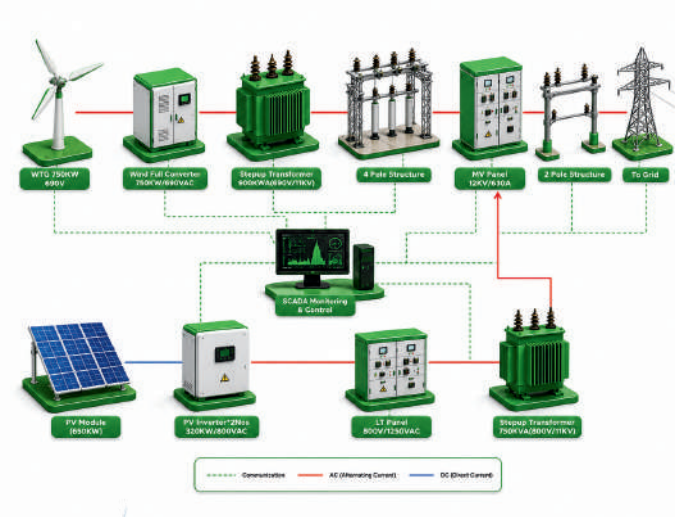
5. Synergy with Battery Energy Storage Systems (BESS)

- **Smaller Battery Footprint:** Because generation is distributed more evenly across 24 hours, the required energy storage capacity (BESS) needed to achieve firm continuous power is reduced compared to single-source installations.

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INDUSTRIES WE SERVE





HYBRID WIND + SOLAR SOLUTIONS

KEY BENEFITES

- **Complementary Day/Night Generation:** Solar yields peak power during clear daylight hours, while wind energy typically peaks during late afternoons, evenings, and stormy weather, bridging energy gaps.
- **Higher Capacity Utilization Factor (CUF):** Combining dual resource streams on the same site produces a significantly higher and smoother overall continuous output than single-source renewable plants.
- **Shared Infrastructure & Lower CapEx:** Both systems share common civil works, transformers, substations, control units, and grid evacuation lines, cutting baseline development and balance of system (BoS) costs.

SYSTEM SPECIFICATIONS

Specification	Details
Solar Capacity	50 kW – 5 MW+
Wind Capacity	750 kW – 3 MW+
Inverter	Hybrid / Grid Tie
Controller	Smart Hybrid Controller
Transformer	As per Requirement
SCADA	Real-time Monitoring
Protection	Advance Protection
Mounting	Fixed / Tilt / Custom
Life	25+ Years
Grid Connection Type	On-Grid, Off-Grid
Mounting & Structure	Fixed

