GREENZO ENERGY INDIA LIMITED
ISO 9001-14001

GREEN HYDROGEN

MINI-GRID SOLUTIONS

Presented by

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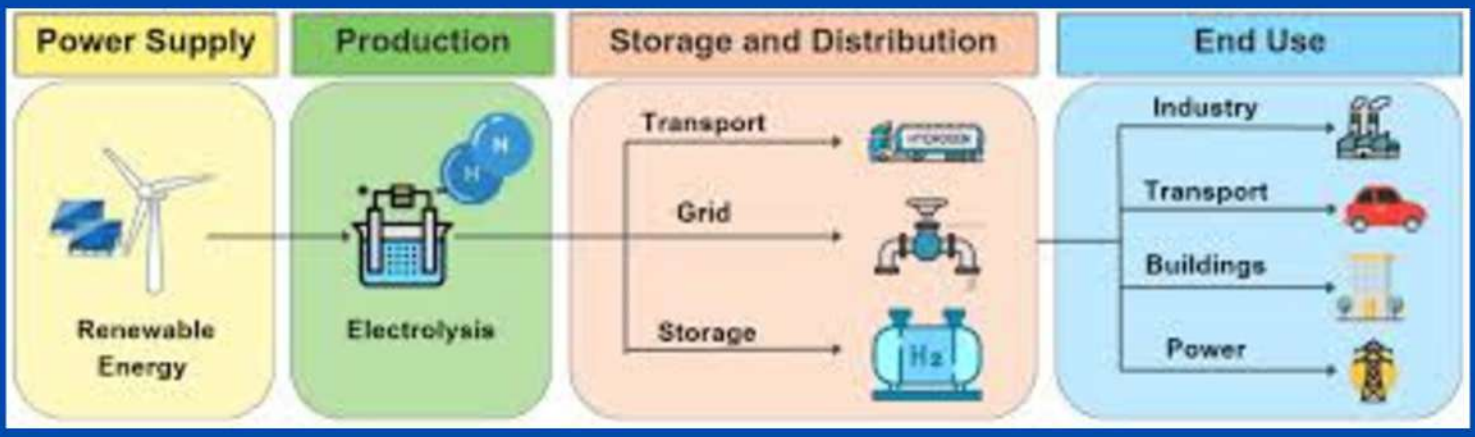

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MESSAGE FROM MD

At Greenzo Energy, we believe that the future of energy lies in decentralized, renewable, and sustainable solutions. Our hydrogen-based mini-grid systems demonstrate how clean technologies can provide reliable power, reduce dependence on fossil fuels, and empower communities in both rural and urban areas. By integrating hydrogen with renewable energy and battery storage, we are not just addressing today's energy challenges but building a resilient and carbon-free future.

Sandeep Agarwal
Founder & Managing Director

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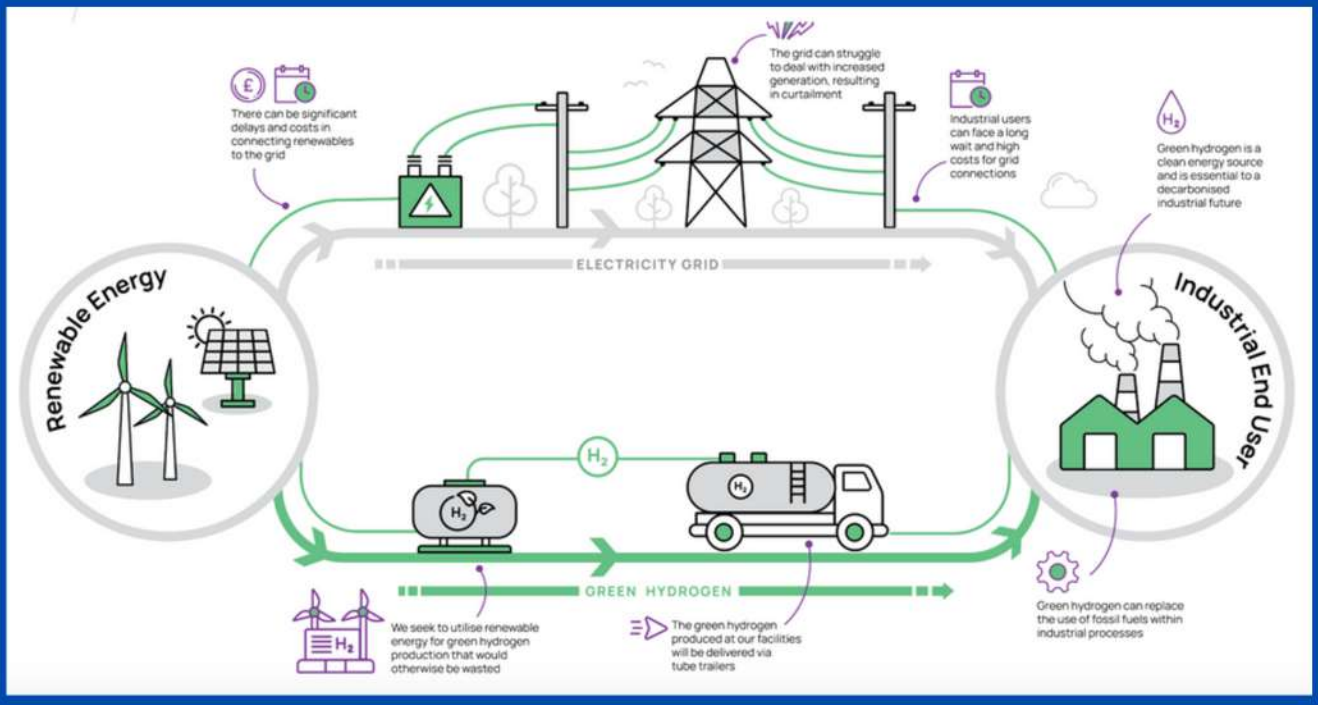
1. EXECUTIVE SUMMARY

Greenzo Energy is pioneering the development of 100% renewable energy-based stand-alone microgrids powered by advanced hydrogen and battery storage technologies. By integrating solar, wind, and hybrid renewable systems with hydrogen as an energy carrier, Greenzo delivers reliable, sustainable, and cost-effective power solutions even in remote or off-grid locations.

Hydrogen plays a dual role as both an energy storage medium and a clean fuel, ensuring stability for variable renewable resources while enabling long-duration storage. When combined with robust battery systems, it creates a resilient hybrid energy storage solution that balances energy supply and demand effectively.

Greenzo's microgrid solutions are designed to electrify rural and urban communities, reduce dependence on fossil fuels, and contribute significantly to carbon footprint reduction. By offering tailor-made, techno-economically optimized configurations, Greenzo Energy positions itself at the forefront of the transition to a sustainable and self-reliant clean energy future.



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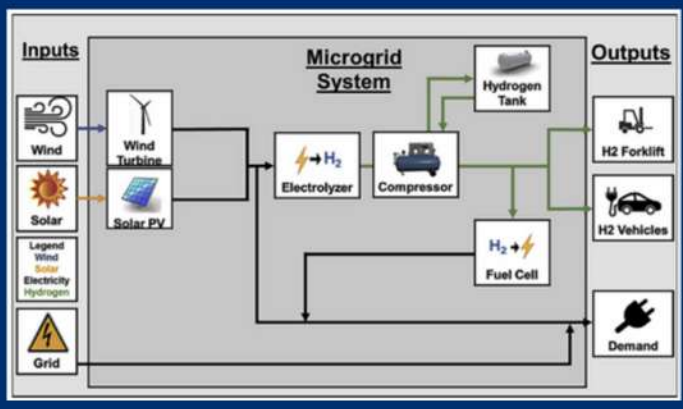
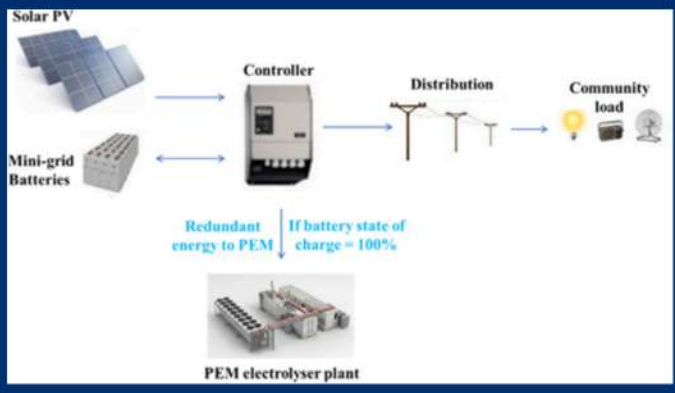
2. THE USE OF HYDROGEN IN POWER GRID

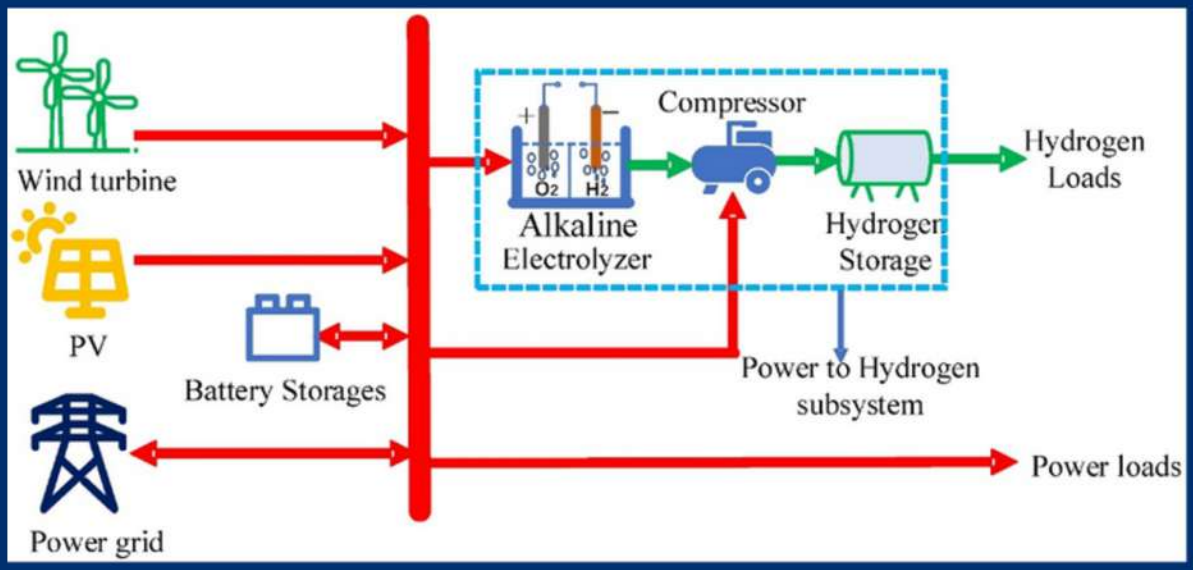
Hydrogen plays a crucial role in modern micro-grid projects by acting as a clean, flexible energy carrier and storage solution. Surplus electricity generated from renewable sources such as solar or wind can be converted into green hydrogen through water electrolysis, storing energy efficiently for later use. This stored hydrogen can then be reconverted into electricity during periods of low renewable generation, ensuring a stable and uninterrupted power supply. By integrating hydrogen, mini-grids not only enhance reliability and energy security but also reduce carbon emissions, supporting a sustainable and resilient energy ecosystem for communities.





3. HOW HYDROGEN CAN BE USED IN MICROGRID

The micro-grid system integrates multiple renewable energy sources—solar PV, wind turbines, and the main power grid—alongside battery storage to provide a reliable and flexible energy supply. Excess electricity generated from renewables is directed to an alkaline electrolyser, where water is split into hydrogen and oxygen. The produced hydrogen is compressed and stored for later use, either to meet hydrogen-specific loads or to be converted back into electricity when renewable generation is low. By combining batteries and hydrogen storage, the system ensures continuous power supply, enhances grid stability, and supports a sustainable, low-carbon energy ecosystem



4. STRATEGIC OPPORTUNITIES

4.1 Battery Energy Storage Systems (BESS)

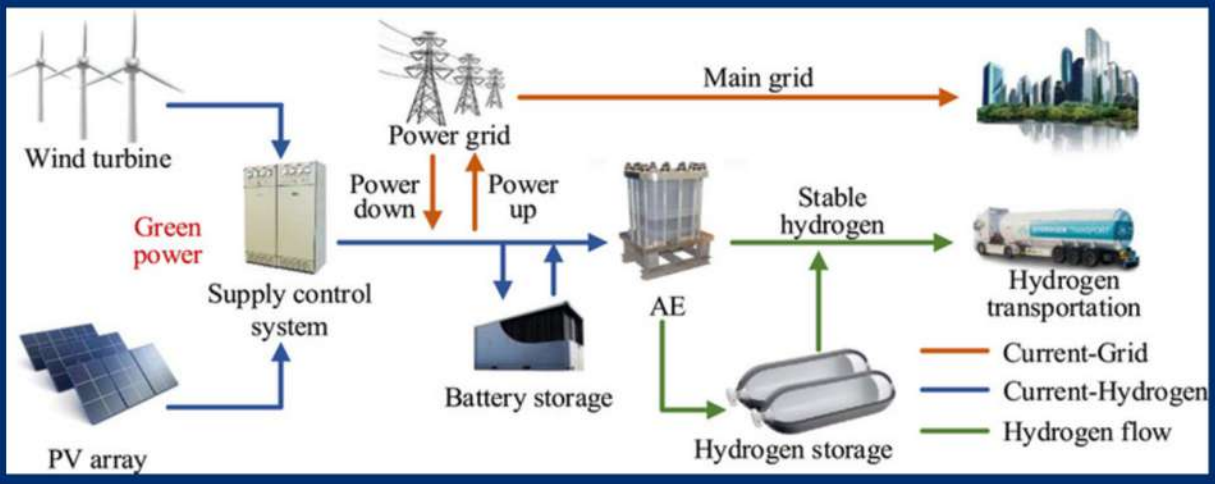
Large-scale energy storage is essential to address solar and wind intermittency, ensure system stability, and reduce reliance on conventional fuels. Utility-scale BESS also provides ancillary services such as frequency regulation, load shifting, and peak shaving, improving overall grid reliability.

4.2 Smart Grid Integration (SGI)

Deployment of advanced smart meters and digital grid systems enhances demand-side management, reduces imbalances, and empowers consumers to actively participate in the clean energy transition.

4.3. Interconnector Expansion / Grid Resilience

Developing stronger grid interconnections and resilient microgrid designs is key to balancing variability, enhancing flexibility, and strengthening energy security in renewable-based systems.



5. GREENZO'S PROPOSAL

At Greenzo Energy, we recognize the distinctive challenges and opportunities in today's energy landscape — from dependence on fossil fuels and lack of long-term storage to the rapid growth of renewable energy penetration.

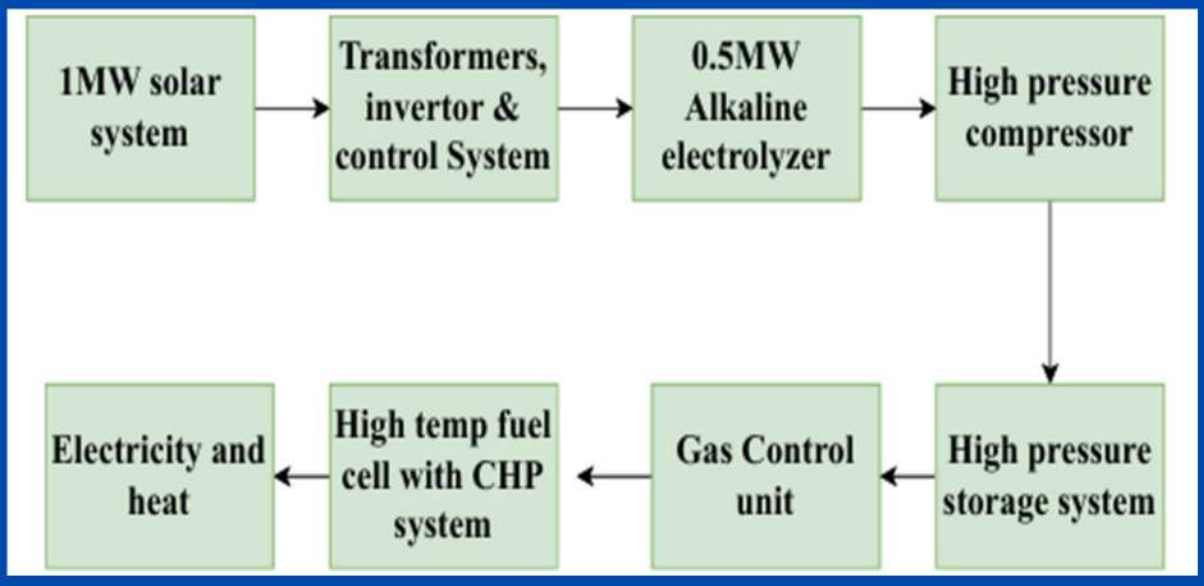
Our proposal delivers a holistic green energy solution that combines:

- Advanced hydrogen technology for storage and clean fuel applications
- Renewable integration through solar, wind, and hybrid systems
- Battery Energy Storage Systems (BESS) for short-term balancing
- Smart grid innovations for efficient energy distribution and demand management.

By leveraging these integrated solutions, Greenzo Energy positions itself as a leader in developing renewable-powered microgrids, ensuring reliability, affordability, and sustainability for both rural and urban communities, while paving the way toward a green hydrogen economy.

5.1. Greenzo Energy – Renewable Microgrid with Hydrogen Integration

The philosophy ensures optimal utilization of solar power, hydrogen production, battery storage, and grid stabilization, delivering a round-the-clock renewable energy supply.



a) Solar Power Generation

A 1MW solar PV system generates power during 8 peak sunlight hours. The generated power is intelligently distributed between the alkaline electrolyser, battery storage system, and power grid for maximum efficiency.

b) Alkaline Electrolyser Operation

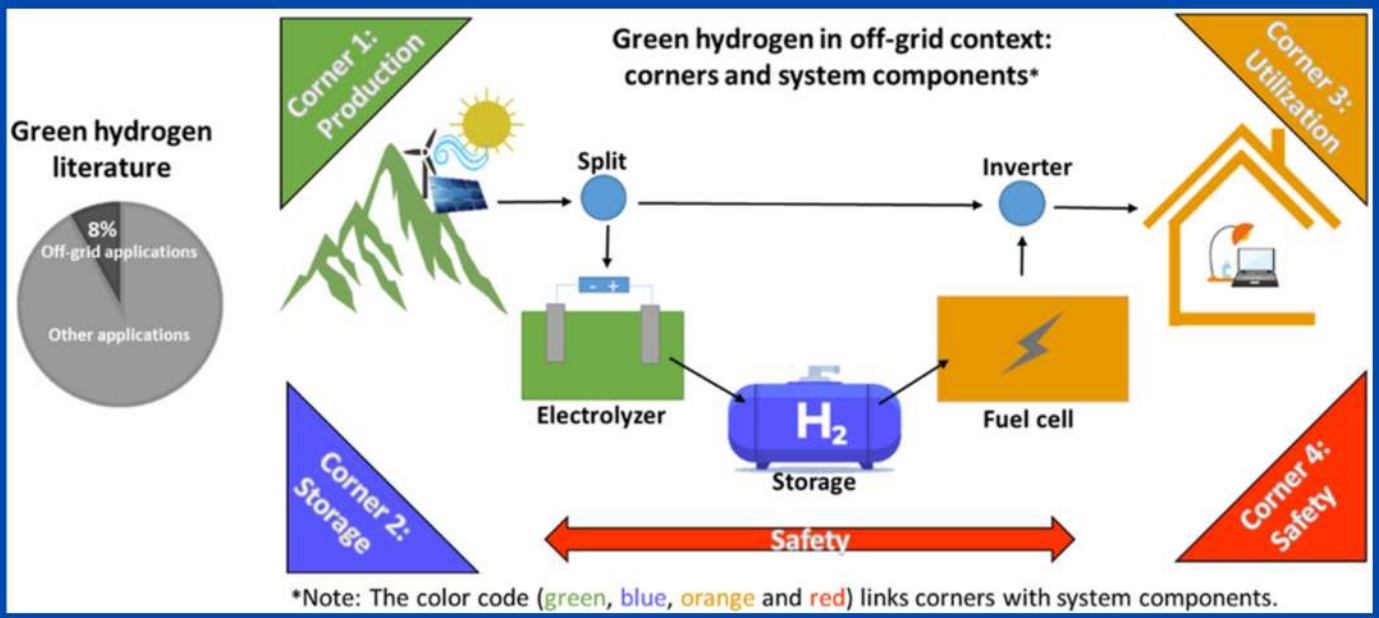
A 0.5MW alkaline electrolyser consumes a part of solar electricity, producing around green hydrogen. This hydrogen is directed to buffer storage tanks for fuel cell applications and backup supply.

c) Battery Energy Storage System (BESS)

The BESS absorb surplus solar energy. It operates on a daily charge-discharge cycle, ensuring flexibility. The system targets 20% minimum charge, with up to 80% depth of discharge daily, ensuring grid stability and continuous supply.

d) Hydrogen Buffer Storage

Hydrogen is stored in tanks of 432 L each, enabling 3-day storage capacity. This ensures uninterrupted supply to fuel cells during low solar generation or peak demand.



e) Fuel Cell Operation

Fuel cells (1 MW each) collectively deliver output. Powered by hydrogen from buffer storage, they provide stable electricity during peak grid demand or solar downtime, enabling 24/7 renewable supply.

f) Grid Interaction

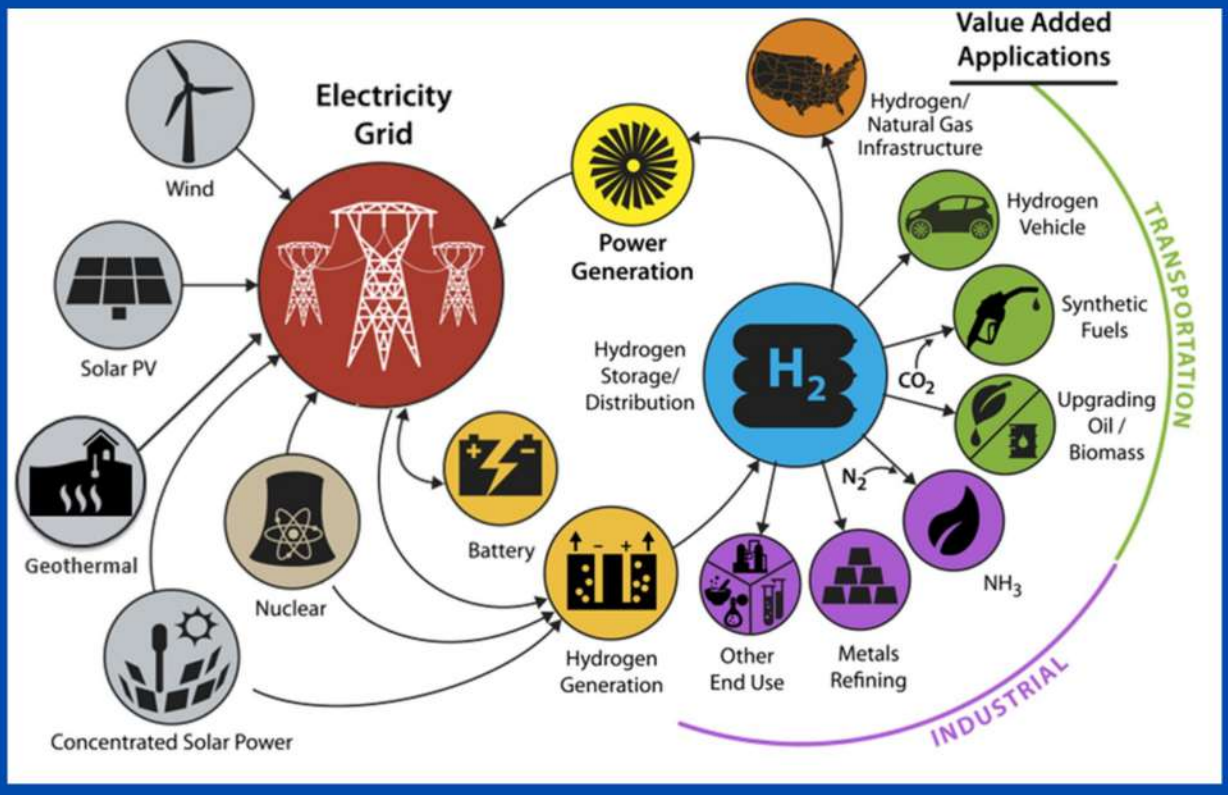
- Surplus power exported to the grid.
- Fuel cells and BESS act as grid stabilizers, managing fluctuations and ensuring reliability.
- Grid consistently receives renewable electricity from solar, hydrogen, and batteries.

g) Control & Automation

An advanced SCADA system integrates all subsystems, enabling:

- Real-time monitoring of solar generation
- Electrolyser operation
- Battery SOC (State of Charge)
- Hydrogen storage levels

This ensures seamless automation, efficiency, and stability across the microgrid.



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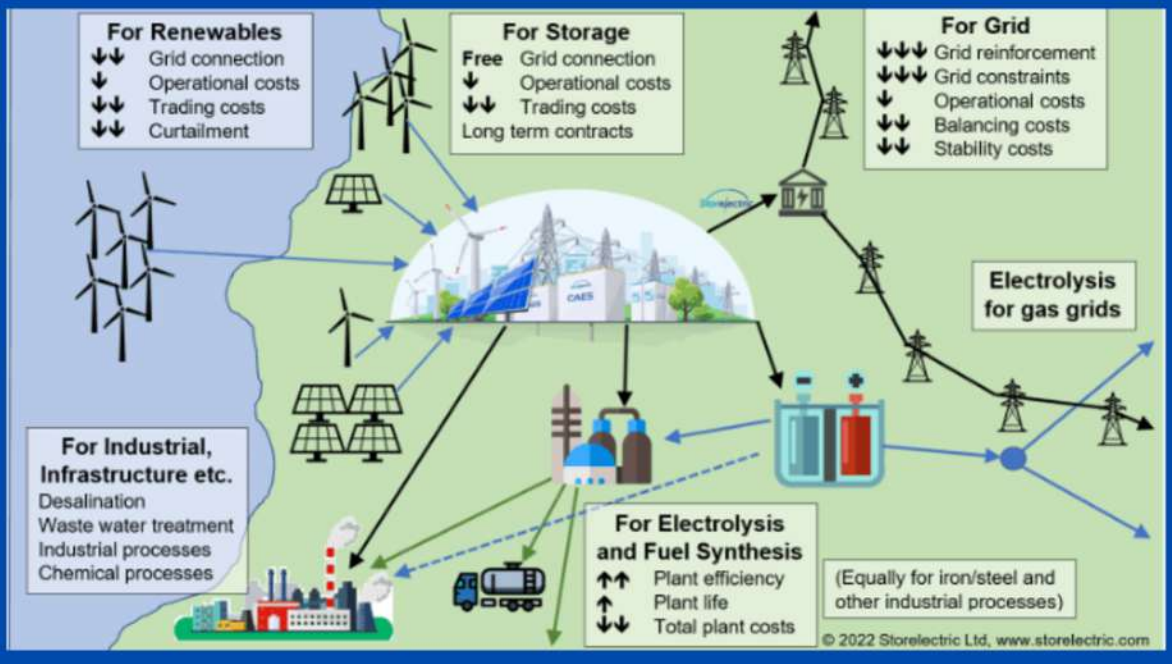
6. CONCLUSION

At Greenzo Energy, we believe the future of power lies in integrated renewable ecosystems where solar, wind, hydrogen, and advanced storage solutions work seamlessly together. By developing smart microgrids and hydrogen-ready infrastructures, we are not just providing clean electricity — we are enabling energy independence, reliability, and sustainability for communities and industries alike.

With our indigenous electrolyser technology, advanced battery systems, and end-to-end EPC expertise, Greenzo is driving the global transition toward a green hydrogen economy. Our solutions are built to deliver round-the-clock renewable energy, reduce carbon footprints, and create a resilient foundation for a net-zero future.



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