CHINA'S GREEN ENERGY TRANSFORMATION – ECONOMY

NEWS: China's transformation from the world's largest polluter to a global clean energy superpower is the result of decades of strategic planning, massive state investment, and technological dominance across the renewable energy supply chain.

WHAT'S IN THE NEWS?

What is Green Energy?

- **Definition**: Green energy refers to energy generated from natural, **renewable** sources that **do not emit greenhouse gases** or cause long-term environmental harm.
- **Examples**: Includes **solar**, **wind**, **hydropower**, **biomass**, and **geothermal** energy.
- **Importance**: It is a **cornerstone of sustainable development** as the world confronts the threats of **climate change**, **pollution**, and **energy insecurity**.

Global Landscape of Green Energy (2024 Highlights)

- **Record Share**: In 2024, **renewables contributed 40.9% of global electricity**—the highest since the 1940s.
- **Solar Leadership**: Solar added **474 TWh**, making it the **fastest-growing energy source** for the **20th consecutive year**.
- **Regional Trends**:
    - **USA & EU**: Investing billions in **reshoring clean energy manufacturing**.
    - **Brazil & Germany**: Expanding **bioenergy** and **offshore wind** infrastructure.
    - **Africa**: Emerging as a **new frontier for clean energy investments**.
    - **China**: Leading the world in **solar and nuclear energy capacity** expansion.

China's Green Energy Revolution

Why is China a Global Leader in Renewable Energy

Largest Installed Capacity

- China has the world's largest base for solar and wind energy.
- In 2024, China added 300 GW of solar capacity—more than the rest of the world combined.
- This scale ensures China's dominance in global renewable energy markets.

Complete Control Over Renewable Supply Chains

- China controls 80% of global solar panel production.
- It has significant influence over key battery materials like lithium and cobalt, crucial for electric vehicles and storage systems.
- China dominates the entire value chain—from mining to manufacturing and export.

Highest Global Investment in Clean Energy

- China invested $940 billion in renewable energy in 2024.
- This is nearly three times the investment made by the United States and over 250 times more than India.
- These investments are supported by subsidies, green bonds, and low-cost state financing.

State-Led Policy and Implementation

- China's renewable growth is driven by government mandates and State-Owned Enterprises (SOEs).
- Major SOEs like State Grid, Huaneng, and China Energy build and operate large wind, solar, and hydro projects.
- Government ensures fast-track approvals, funding access, and infrastructure expansion.

Global Export and Strategic Influence

- Under the Belt and Road Initiative (BRI), China exports renewable infrastructure to over 61 countries.
- Chinese firms are building solar parks in Africa, wind farms in Latin America, and hydropower stations in Asia.
- This strengthens China’s global influence in green technologies.

India’s Green Energy Progress and Learnings from China
India’s Learnings from China’s Renewable Energy Journey
Faster Deployment through Simplified Procedures

- India can replicate China’s project scale by reducing land acquisition delays and easing environmental clearances.
- In 2023, China added over 230 GW, while India’s additions were significantly lower.

Strengthening Public Sector Enterprises

- India should empower PSUs like NTPC and SECI to lead clean energy adoption.
- Public enterprises can help in achieving targets, as SOEs do in China.

Domestic Manufacturing Push

- India has already cut solar imports from China by 76% (2023) and imposed 40% duty on modules and 25% on cells.
- The PLI scheme for solar and batteries supports this push for domestic capacity.

Focus on Grid Modernization and Storage

- India is investing in Green Energy Corridors, battery storage, and pumped hydro projects (target: 51 GW by 2032).
- These steps ensure grid stability with intermittent solar and wind sources.

Promoting Decentralized Growth

- India avoids China’s centralised SOE model by focusing on inclusive solar deployment.
- Initiatives like PM Surya Ghar Yojana and PM-KUSUM promote rooftop and rural solar adoption.

Critical Minerals and Technology Independence

- India is developing a critical minerals framework to reduce dependency on China.
- 12 critical minerals and 35 capital goods are exempted from import duties to encourage domestic innovation.

India as an Emerging Renewable Energy Superpower

- **Solar Capacity Boom**: India has grown from **2.82 GW in 2014 to over 105 GW in 2025**.
- **Global Positioning**:
    - Committed to reaching **500 GW of non-fossil capacity by 2030**.
    - Hosting **International Solar Alliance (ISA)**.
- **Policy Frameworks**: Including **National Green Hydrogen Mission**, **Renewable Energy Development Plans**, and **Energy Storage Targets**.

Source: https://www.thehindu.com/business/Industry/how-is-china-leading-the-green-energy-sector/article69822897.ece