Policy Brief

# Towards a Resilient Energy Future: Pakistan’s Pathway to Sustainable Transformation

## Context

Pakistan faces a critical energy challenge. With rising demand, heavy dependence on imported fossil fuels, circular debt surpassing trillions of rupees, and vulnerability to global price shocks, the country’s energy security remains fragile. Simultaneously, Pakistan is among the top ten countries most affected by climate change, necessitating a rapid transition toward sustainable and low-carbon energy systems.

Energy transformation is no longer optional for Pakistan—it is an imperative for economic stability, environmental sustainability, and national security.

## Key Challenges

* Overdependence on Fossil Fuels: More than 60% of Pakistan’s power generation comes from imported oil, gas, and coal.
* Circular Debt Crisis: Inefficient billing, governance deficits, and transmission losses have created a systemic financial crisis.
* Climate Vulnerability: Floods, heatwaves, and glacial melt underscore the urgency of adopting clean energy systems.
* Underutilized Renewable Potential: Despite vast solar (2.9 million MW), wind (346,000 MW), and hydropower resources, renewable penetration remains below 5%.
* Technological Gaps: Limited local R&D and absence of energy storage and smart grid technologies hinder efficiency.

## Strategic Opportunities

* Harnessing Renewables: Large-scale solar and wind corridors (e.g., Jhimpir and Gharo) can drastically reduce import bills.
* Hydropower Optimization: Modernizing dams and micro-hydel projects can support rural electrification and water management simultaneously.
* China-Pakistan Energy Cooperation 2.0: Under CPEC’s “Green Corridor,” Chinese expertise in solar parks, wind farms, ultra-high-voltage transmission, and battery storage offers transformative potential.
* Decentralized Solutions: Mini-grids, rooftop solar, and community-based energy projects can empower local communities.
* Digitalization & Smart Grids: Adoption of AI-driven demand forecasting and grid management systems can cut line losses and improve efficiency.

## PPRII’s Policy Proposals

* National Energy Transformation Framework 2035: Define clear renewable energy targets (at least 30% by 2030, 50% by 2035).
* China-Pakistan Joint Energy Innovation Fund: Facilitate R&D collaboration in energy storage, smart grids, and hydrogen energy.
* Decentralized Renewable Energy for Rural Pakistan: Incentivize off-grid solar and micro-hydel systems to reduce dependence on fossil fuels.
* Green Financing & Policy Incentives: Introduce carbon pricing, green bonds, and fiscal incentives for renewable investors.
* Energy Efficiency & Governance Reforms: Modernize transmission lines with smart grid technologies and reform DISCOs.

## Policy Recommendations

For the Government of Pakistan: Prioritize energy transition as a national security issue; align energy policy with climate commitments and CPEC Phase-II opportunities.
For Academia & Think Tanks: Develop joint research with Chinese partners on clean energy models tailored for Pakistan’s socio-economic context.
For the Private Sector: Leverage Chinese investment in renewable energy supply chains, manufacturing, and digital energy services.
For Civil Society: Promote behavioral change and grassroots energy solutions to ensure inclusivity and social acceptance of renewable transformation.

## Conclusion

Pakistan’s energy transformation is central to its economic sovereignty, climate resilience, and social development. By embracing a forward-looking strategy, leveraging China’s technological expertise, and aligning national priorities with global sustainability goals, Pakistan can move toward a resilient, affordable, and green energy future.

The Perspective Policy Research Institute Islamabad (PPRII) stands ready to facilitate policy dialogue, collaborative research, and innovation partnerships with Chinese institutions and global stakeholders to shape Pakistan’s sustainable energy transition.

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