



BEYOND FORECASTING:

Making Integrated Energy Planning Work for Pakistan's Economic Resilience

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Pakistan has planned its energy future before. The opportunity today is to make Integrated Energy Planning more than a projection of demand and supply—to make it a framework for preparing the economy for geopolitical shocks, technological change, the energy transition and regional competition.

For Pakistan, economic resilience is increasingly tied to energy resilience. An energy shock rarely stays within the energy sector. A disruption in international fuel markets can raise the import bill, put pressure on the exchange rate, and increase the domestic cost of energy. These pressures eventually reach businesses and households, affecting production, exports, and growth³⁵.

The Russia–Ukraine war showed how quickly geopolitical tensions can disrupt energy markets and supply chains³⁶. Continuing instability in the Middle East offers another reminder that energy security is closely linked to both geopolitics and its economic consequence.

For an energy-importing country, energy security is therefore about more than having sufficient energy. It is also about the economy's ability to absorb an external energy shock without compromising competitiveness or macroeconomic stability. Energy resilience is, in this sense, part of economic resilience.

35. Malik, S., Qasim, M., Saeed, H., Youngho, C., & Taghizadeh-Hesary, F. (2019). Energy security in Pakistan: A quantitative approach to a sustainable energy policy (No. 1024). ADBI Working Paper Series.

36. International Energy Agency. World Energy Outlook 2022. Paris: IEA, 2022.

This is why Pakistan's emerging Integrated Energy Plan (IEP) matters. The National Electricity Policy 2021 calls for power-sector planning to be integrated with the wider energy value chain. The National Electricity Plan 2023–27 builds on this approach by linking IEP with long-term planning, investment and the energy transition. The task now is to make IEP more than a projection of future energy demand and supply. A forecast tells us what energy requirements might look like. Planning must go a step further: what should Pakistan invest in today if demand, fuel prices, energy transition, technology or geopolitics take a different path tomorrow?

That is the real challenge for Pakistan's emerging integrated energy plan. It cannot predict or prevent every future energy shock. However, it can help ensure that when a shock occurs, it does not turn into an economic crisis. The IEP should consider the following areas that will shape Pakistan's energy future.

From Forecasting to Resilience

Pakistan has not lacked energy plans. It has developed the Energy Security Action Plan 2005–2030 and the Pakistan Integrated Energy Model, alongside subsequent electricity generation-expansion plans³⁷. The problem has been less the absence of planning than the weak connection between planning, investment and implementation. Pakistan's earlier experience offers an important lesson: a model has limited value if its findings do not translate into actual policy and investment decisions³⁸.

The challenge now is not simply to develop a better energy model. It is to integrate the analysis into an ongoing decision-making process. A long-term plan built around a single forecast can quickly lose relevance. Demand may grow faster or slower than expected; electric vehicles may expand more rapidly; distributed solar and batteries may change how consumers use the grid; international oil and LNG prices may remain high; and climate conditions may affect hydropower. Technological change could also make some investments less economical before the end of their expected life.

Pakistan's energy planning needs to look beyond the conventional low, medium, and high demand scenarios. It should also examine how changes in fuel prices, technology, climate, geopolitics, and consumer behavior could alter the energy system. It should test several plausible futures and identify investments that continue to make economic sense as conditions change. This means considering not only the expected cost of an investment, but also the cost of getting the assumptions wrong.

Forecast accuracy will always matter, but it is not enough. A good plan should also help policymakers distinguish between investments that remain valuable across different futures and those that depend heavily on uncertain assumptions. This is particularly important when large, long-lived infrastructure investments are involved, because the wrong decision can create costs that persist for decades. Pakistan's experience with Independent Power Producers (IPPs) illustrates why these decisions matter.

Integrated Energy Planning should therefore do more than tell Pakistan how much energy it may need. It should help the country decide what to invest in, what risks to prepare for, and how to keep the energy system adaptable as conditions change.

Connecting Pakistan's Energy System with the Region

Pakistan's energy resilience will increasingly depend on how effectively it connects with regional energy markets. Its geographical location offers opportunities to connect with Central Asia, China, South Asia and the Middle East. However, geography alone is not enough. Regional energy trade requires investment for reliable domestic networks, and cross-border infrastructure. Pakistan will also need investment in energy storage, transmission, distribution and grid flexibility as its energy system changes.

37. Asian Development Bank, Pakistan: Integrated Energy Model, Technical Assistance 4982-PAK; and Bashir et al. (2022).

38. Bashir, S., Kanwal, S., Zeb, H., Baber, Z. B., & Majeed, A. (2022). Integrated energy planning and modeling (IEPM) for sustainable electricity generation in Pakistan: Challenges and limitations. *Energy Exploration & Exploitation*, 40(6), 1806-1836.

Some of these opportunities are already on the table, and their record so far is instructive. The CASA-1000 transmission project, intended to bring surplus hydropower from Central Asia into Pakistan, remains incomplete years after its original timeline, showing how financing gaps and security constraints on the Afghan transit route can stall connectivity even when the underlying economic logic is sound³⁹. The long-discussed Iran-Pakistan gas pipeline illustrates a related constraint: Pakistan has reportedly moved to shelve the project over the threat of US sanctions, while leaving the door open to revive it should a sanctions waiver be granted⁴⁰. Both cases show that regional energy connectivity is not simply a construction challenge; it depends on sustained diplomacy, workable financing structures and active risk management alongside the physical infrastructure itself.

The IEP should therefore look beyond domestic energy demand and supply. It should identify opportunities for regional energy connectivity, the infrastructure required, and the investment needed to develop them. This would allow Pakistan to prepare for regional energy opportunities rather than respond only when they emerge.

Regional energy links could diversify energy sources and markets, support industrial competitiveness, and reduce exposure to external shocks. For Pakistan, regional connectivity is therefore an important part of energy security and a source of greater energy resilience.

Climate Risk and Energy Planning

Climate change is another reason Pakistan's energy planning must look beyond historical patterns. Rising temperatures can increase electricity demand, while changes in rainfall and water availability can affect hydropower. Floods and extreme weather can also damage transmission and distribution infrastructure.

These risks matter for long-lived energy investments. An energy infrastructure built today may operate for decades under very different climate conditions. IEP should therefore consider climate risks when deciding where, when, and what

to invest in. This includes assessing the resilience of infrastructure, the reliability of different energy sources, and the need for storage and grid flexibility.

Climate change also affects the economics of the energy transition. Renewable energy can reduce fuel-import dependence, but integrating more variable generation will require stronger networks, and storage and system flexibility⁴¹. For Pakistan, the task is not simply to add cleaner energy, but to build an energy system that remains reliable as climate conditions change.

Planning for a Changing Energy System

Pakistan's energy system is changing on both sides of the market. The Competitive Trading Bilateral Contract Market (CTBCM) is introducing greater competition in electricity⁴². Rooftop solar, captive generation, and battery storage are changing how consumers produce and use electricity. Electric vehicles could shift some transport demand from oil to electricity. Pakistan will also remain exposed to changes in international oil and gas markets.

These developments are increasingly connected. More EVs could increase electricity demand. Solar and captive generation could reduce purchases from the grid. Batteries could change when consumers draw electricity. Changes in gas supply or LNG prices could affect power generation and industrial costs. Investment needs will therefore change across the energy system, not just within individual sectors.

IEP should bring these developments into a common planning framework. It should consider how electricity, oil, and gas markets may evolve alongside new technologies and consumer choices. Pakistan needs to plan where and when energy will be produced, stored, and consumed, while keeping investment flexible enough to respond as the system changes.

39. World Bank, Updated Q&A on CASA-1000 Resumption in Afghanistan, January 2026.

40. Malik, M. (Federal Minister for Petroleum), statement to the National Assembly on the Iran-Pakistan Gas Sales and Purchase Agreement, reported in Dawn, 2023; Pakistan Today Profit, 'Pakistan might shelve the Iran-Pakistan Gas Pipeline project', January 2026.

41. International Energy Agency. World Energy Outlook 2022, discussion of energy security and clean-energy transitions.

42. National Electric Power Regulatory Authority (NEPRA).

Lessons from International Experience

International experience shows that energy planning works when it is linked to actual decisions and can adapt when conditions change. Australia provides a useful example. Its Integrated System Plan is updated regularly and links generation, storage, and network investment. It also considers different future conditions before setting investment priorities.

Brazil offers another lesson. Its Ten-Year Energy Expansion Plan is prepared annually and takes an integrated approach with different energy sources. This gives investors clearer signals about future system needs and allows capacity to adjust as demand and market conditions change. South Africa provides a cautionary example. Its Integrated Resource Plan provides a framework for long-term electricity planning. However, its experience also shows the difficulty of keeping long-term planning aligned with implementation and wider policy as conditions change.

Energy planning is ultimately tested when the assumptions behind the original plan no longer hold. Energy prices can rise sharply, supplies can be disrupted, technology can change investment choices, and climate change can affect energy demand, availability, and affordability. A resilient plan should provide direction without locking Pakistan into investments that no longer make economic sense.

The lesson for Pakistan is clear. A good energy plan cannot end with projections. It must guide investment, infrastructure and policy, while allowing decisions to change when circumstances change. The real test of IEP will be whether it can provide long-term direction without losing the flexibility to respond to a changing energy system.

Strengthening the Role of IEP

Pakistan's energy challenge is no longer simply about adding supply. The country must decide where to invest, which technologies to support, how energy use will change, and how to remain competitive as the regional and global energy landscape evolves. These choices will shape the

economy for decades. The emerging IEP offers an opportunity to consider these choices together. Its value will depend on whether it helps Pakistan avoid costly and inflexible investments, respond to changing conditions and make better use of public and private capital.

The IEP should also serve as a shared planning framework. Its robustness will depend on meaningful input from the Power Division, Petroleum Division, Ministry of Climate Change and Planning Commission. These institutions should also use the IEP in their policy and investment decisions. Coordination among them has faltered before, and not primarily for lack of technical capacity: these institutions operate under separate mandates, budgets and reporting lines, which gives each one limited incentive to align its decisions with a shared plan. Strengthening the role of IEP will therefore require a governance mechanism with real authority to enforce coherence across these institutions, such as a standing inter-ministerial committee or an empowered secretariat, rather than one that simply collects their input. The plan should be reviewed periodically and updated as conditions change.

The benefits will extend beyond the energy sector. Reliable and affordable energy supports industrial production and exports. Greater diversification can reduce exposure to external shocks. Regional energy links can open new opportunities. A more flexible system can also make the transition towards cleaner energy less disruptive. Together, these measures can strengthen Pakistan's economic resilience.

Pakistan should not judge its IEP by the precision of its projections alone. Its real value will be measured by the choices it helps the country make today, and the room those choices leave for tomorrow. That is how an energy plan can become a foundation for economic resilience.

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