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ENERGY SECURITY CODEX FOR PAKISTAN

MAY, 2026

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Message from the CEO

Pakistan stands at an energy crossroads. The challenges are structural as well as institutional. Pakistan's circular debt burden exceeds Rs. 2.6 trillion. Transmission losses that hemorrhage more than a 6th of the generated electricity. Tariff structures render the industry uncompetitive. Dependence on the cost of imported fossil fuels can tip the national current account into crisis within a single commodity cycle. Yet the country possesses renewable endowments (RE uptake) of an extraordinary scale among the highest solar irradiance potential in Asia, vast wind corridors, and untapped hydropower reserves that remain only marginally mobilized. The chasm between resource abundance and energy poverty is a consequence of bad governance, marred by duplicity and policy instability.

It is against this backdrop that Alternate Development Services (ADS) presents the Energy Security Codex for Pakistan, 2026. This codex is the product of sustained analytical engagement with the energy system across its technical, fiscal, diplomatic, and civil-society dimensions. It is offered not as a catalogue of aspirations but as an operational framework. Grounded in evidence, sequenced with care, and oriented toward the concrete policy decisions it may determine whether Pakistan achieves genuine energy sovereignty within the coming decade.

The codex advances 3 interlocking arguments:

1. That the diversification of the energy mix anchored by utility-scale renewables, supported by gas-fired peaking capacity, and progressively integrated with battery storage and regional interconnection is both technically achievable and fiscally preferable to the current trajectory.
2. That institutional reform, encompassing the restructuring of DISCOs, the de-politicization of tariff-setting, and the realization of constitutionally mandated decentralized planning, is the essential precondition for sustainable investment.
3. That energy diplomacy, conducted with strategic coherence across the CPEC, Gulf, Central Asian, and multilateral dimensions, can unlock the concessional financing and technology transfer that the transition requires but cannot self-finance. ADS believes that civil society, investigative journalism, and community-based organizations are not peripheral actors in this architecture but constitutive elements of energy governance and energy transition.

The solar boom from 2022 to 2025, which mobilized approximately USD 18 billion in private investment and saved an estimated 12 billion dollars in foreign exchange, was not a product of state planning, but rather despite the state's shifting positions. It has been a market-driven move on the part of the frustrated and energy-starved citizens of Pakistan, as they have been determined to solve energy problems on their own. This codex calls on policymakers to honor people's own initiative. Nevertheless, building a transparent, predictable, and technically rigorous regulatory environment is quite important for the government.

I urge the policymakers, regulators, development partners, and civil society organizations to consider it as a shared reference for evidence-based energy reform. The challenges are formidable, but the conditions for decisive progress are more favorable today than at any previous moment in history. What is desired now is the strategic coherence and institutional commitment to act on them.

Amjad Nazeer

Alternate Development Services

Acknowledgements

Once US-Iran issue de-escalates, GCC region will require more and not less workforce - a bright opportunity for Pakistan! - *Dr. Vaqar Ahmed (Senior Economist)*

Pakistan's Solar Boom is an ideal case study for the world when in the real sense, people drive the market. - *Svitlana Romanko (Founder/Executive Director, Razom We Stand)*

The leadership in Pakistan has been working actively towards aligning the country's policies with its role as a 'Net Regional Stabilisor'. The real test now is whether Islamabad can convert its present diplomatic capital into sustained economic linkages. - *Arhama Siddiqa (Research Fellow, Institute of Strategic Studies Islamabad)*

We clearly need to know that Transition is about the discipline and not at all about the speed - *Asad Mehmood (Global Consultant/Mechanical Engineer)*

Without a well-thought "basket approach" in our energy mix, the argument of Renewables will keep getting weaker itself. - *Syed Muhammad Osama Rizvi (Analyst/Strategist & Founder, Rizvi Insights)*

BESS installed at distributed and utility scale, will prove to be an antidote for ailing Pakistan's power sector. - *Dr. Omais Abdur Rehman (Lead Coordinator, Pakistan Renewable Energy Coalition)*

In journalism, truth and the national interest always come at the top. Everything else has to follow. - *Mahnoor Qureshi (Anchor/Journalist, Pakistan TV)*

Alternate Development Services (ADS) acknowledges all the correspondents, analysts, and researchers who helped the ADS jot down the Codex in its tautology along with the experts who presented their opinion and proposed plausible pathways for Pakistan

ENERGY SECURITY CODEX FOR PAKISTAN, 2026

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Chapter One: Framing Pakistan's Energy Security

Pakistan's energy security challenge is not reducible to a single dimension. It is, at its core, a compound problem that straddles fiscal fragility, geopolitical exposure, institutional inertia, and the rapidly shifting landscape of global energy markets. The country entered 2026 carrying the weight of chronic circular debt exceeding PKR 2.6 trillion, a national grid plagued by transmission losses exceeding 17 percent, and an industrial base increasingly rendered uncompetitive by the cost of electricity. These are not isolated data points; they are symptoms of a system that was designed for a different era and has not been restructured to meet the demands of the twenty-first century.

At the same time, Pakistan possesses extraordinary endowments that are yet to be fully mobilized. Its solar irradiance potential, estimated at over 2.9 million megawatts across the southern and western belt, is among the highest in Asia. Its wind corridors in Sindh and Balochistan, its hydropower potential in Khyber Pakhtunkhwa and Gilgit-Baltistan (yes, it is easier to say in a booklet like this, but holds a great debate potential in real), and its geothermal reserves remain substantially unexploited. The contradiction between resource abundance and energy poverty is not merely an economic puzzle. It is a governance failure, and one that demands a codified policy response grounded in evidence, sequenced with care, and implemented with institutional commitment. This codex is premised on the understanding that energy sovereignty, the capacity of a state to meet its population's energy needs through diversified, domestically anchored, and fiscally sustainable sources, is the foundational precondition for economic development. Without a reliable and affordable energy supply, no industrial policy, no export diversification strategy, and no poverty reduction programme can achieve its intended outcomes. The evidence is unambiguous: countries that have secured their energy base have systematically outperformed those that have not, both in terms of gross domestic product growth and in terms of human development indices.

Pakistan's vulnerability is compounded by a phenomenon that official statistics have historically obscured. Approximately 43 percent of the population lives in a condition of hidden poverty – a form of deprivation that encompasses energy poverty, nutritional insecurity, and limited access to productive economic opportunities, but which is not captured by conventional income-based poverty lines. This hidden poverty is spatially concentrated in rural Punjab, interior Sindh, and the

tribal belt, precisely the regions that remain most distant from the national grid and most dependent on expensive and polluting biomass energy. Any energy security framework that does not address this structural reality is, at best, incomplete.

The codex advances a framework built on three interlocking pillars. The first is the diversification of the energy mix, which must encompass renewable energy at scale, gas-based peaking capacity for grid stability, and strategic petroleum reserves. The second is institutional reform, encompassing the restructuring of the distribution companies, the depoliticization of tariff-setting, and the integration of decentralized planning as mandated by the 18th Amendment to the Constitution. The third pillar is diplomatic and financial engineering, which must leverage Pakistan's geopolitical location, its relationships within the Shanghai Cooperation Organisation, the Gulf Cooperation Council (GCC), and Central Asian states, to secure concessional financing, technology transfer, and market access for its energy exports.

The role of journalism and civil society in this architecture must also be explicitly acknowledged. Media institutions that uphold the standards of evidence-based reporting, while keeping the imperatives of national interest at the centre of their editorial choices, serve as essential accountability mechanisms. When energy tariffs rise without adequate public justification, when contracts are signed without competitive bidding, or when transmission infrastructure fails due to deferred maintenance, it is investigative journalism that surfaces these failures and compels institutional response. The codex therefore frames a free, responsible, and technically literate press not as a peripheral actor but as a constitutive element of energy governance.

The structure of this document is deliberately sequenced. It begins with Pakistan's global exposure, moves through the architecture of clean energy transition, addresses the diplomatic and financial dimensions, and concludes with a comprehensive set of evidence-based recommendations organized around the Alternate Development Services (ADS)’s pathway. The intent is to produce a document that serves both as an analytical reference and as an operational guide for policymakers, regulators, civil society organizations, and development partners working within Pakistan's energy ecosystem. The objective is not energy idealism; it is energy security.

Chapter Two: Global Energy Crisis and Pakistan's Exposure

The global energy order is in the midst of a structural reconfiguration without historical precedent. The convergence of the post-pandemic supply shock, the geopolitical fracture produced by the US-Iran and Russia-Ukraine conflict, the accelerating pace of renewable technology cost reduction, and the intensifying pressure of climate-induced extreme weather events has produced a world in which energy security and energy transition are simultaneously urgent imperatives. For a country like Pakistan, which occupies a structurally exposed position in global energy markets due to its dependence on imported fossil fuels, this reconfiguration is both a threat and an opportunity.

Pakistan imports approximately 10 to 11 million tonnes of liquefied natural gas (LNG) and petroleum products annually, at a cost that fluctuated between 14 and 19 billion dollars per year between 2021 and 2025. The country's current account vulnerability to energy price spikes has been demonstrated repeatedly: the 2022 global energy price surge contributed directly to a balance of payments crisis that required emergency International Monetary Fund (IMF) intervention. The lesson is structurally important. A country that finances more than a third of its import bill through energy purchases, in a currency that has depreciated approximately 65 percent against the dollar over the preceding five years, carries an asymmetric exposure to global commodity markets that no macroeconomic stabilization programme can fully mitigate without an accompanying restructuring of the energy base.

Pakistan's exposure is further compounded by the terms of its Power Purchase Agreement (PPA) contracts with independent power producers, many of which are indexed to the dollar and structured around capacity payments that must be made regardless of actual electricity dispatch. These PPA contracts, with their dollar indexation, have created a structural fiscal liability that transfers exchange rate risk from the private sector to the public exchequer and ultimately to the consumer. Between 2015 and 2025, capacity payments exceeded 1.4 trillion Pakistani rupees, a figure that has contributed substantially to the accumulation of circular debt. The restructuring of these contractual arrangements, within the bounds of international investment law and bilateral treaty obligations, is a priority that cannot be deferred.

The global dimension of Pakistan's exposure also includes the trajectory of LNG markets. The post-2022 LNG price surge has moderated somewhat, but structural tightness is expected to persist

through the decade as European demand remains elevated following the disruption of Russian pipeline gas. Pakistan, which lacks long-term LNG supply contracts of sufficient scale and which has historically relied on spot market purchases, faces a pricing environment that is both volatile and trending upward in real terms. The ramp rates of LNG-fired plants, however, offer a significant technical advantage for grid stability: because gas turbines can be brought from cold start to full output within fifteen to forty minutes, they are well suited to complement variable renewable generation and to buffer the intermittency of solar and wind. This operational characteristic makes gas not merely a transitional fuel but a structurally necessary component of a renewable-dominant grid architecture.

The global energy crisis has also produced a set of instructive case studies in energy security architecture. Ukraine's experience is particularly relevant. Prior to the 2022 conflict, Ukraine had constructed a three-level protection framework for its energy security: diversification of supply sources, strategic gas storage infrastructure with a capacity exceeding 31 billion cubic metres, and a partially decentralized energy system that included distributed generation assets. Despite this preparation, the conflict exposed critical substation infrastructure to deliberate attack, and the destruction of transmission assets has required reconstruction investments estimated in the billions of dollars. The lesson for Pakistan is that energy security requires redundancy at the physical infrastructure level, not merely at the policy level. Critical substations must be identified, hardened, and protected through both physical and cybersecurity measures.

Ukraine's experience also illuminates the human cost of energy insecurity. With approximately 35 percent of the population in certain eastern and southern regions earning below 1.5 dollars per day during the conflict period, the correlation between energy access and poverty is stark. The Ukrainian government's decision to remove bureaucratic red tape from solar rooftop installation procedures represented a recognition that decentralized energy generation offers resilience precisely because it cannot be targeted as effectively as centralized infrastructure. Pakistan's policymakers should draw from this example the principle that regulatory simplification for distributed solar is not merely an administrative convenience but a national security imperative.

Within this global context, the Prosperity Paradox confronts Pakistan directly. Countries rich in conventional energy resources have often failed to translate those resources into sustained human development – a dynamic well documented in the resource curse literature. Pakistan's own

experience with natural gas, which was systematically underpriced and inefficiently allocated over decades, illustrates this paradox. The discipline imposed by the current crisis may, paradoxically, represent an opportunity to restructure the energy system on more rational and sustainable foundations, provided that the political economy of reform is managed with sufficient skill and institutional capacity.

The global transition has also created a new dimension of trade policy competition. Countries that succeed in establishing clean energy manufacturing capacity: solar panels, battery storage systems, electrolyzers for hydrogen production, are acquiring structural advantages in trade that compound over time. Pakistan has an opportunity, within the framework of CPEC 2.0 and its relationships with Chinese technology suppliers, to develop domestic manufacturing capacity in at least some segments of the clean energy supply chain. This opportunity requires deliberate industrial policy, concessional financing, and joint venture arrangements for technology transfer. It will not emerge spontaneously from market forces alone.

Chapter Three: Clean Energy Narrative Beyond 2030

The dominant energy discourse in Pakistan has, for much of the past decade, framed renewable energy as a future aspiration rather than a present operational reality. This framing is increasingly untenable. The solar photovoltaic industry has delivered cost reductions of more than 90 percent over the past fifteen years, making utility-scale solar, in many Pakistani contexts, the cheapest source of new electricity generation. Wind energy costs have followed a similar trajectory. The Levelized Cost of Energy (LCOE) from solar plants installed in Pakistan in 2024 fell to between 3.5 and 5.2 cents per kilowatt-hour, figures that are substantially below the variable cost of operating existing thermal plants fueled by imported LNG. This cost consolidation reflects durable improvements in manufacturing scale, technology efficiency, and project finance conditions.

The most significant development in Pakistan's energy landscape is the spontaneous solar adoption that occurred between 2022 and 2025. Driven by the combination of historically high grid electricity tariffs, and a regulatory environment that was permissive even if not actively facilitative, Pakistani households and businesses installed approximately 12 gigawatts of rooftop and distributed solar capacity during this period. Independent analyses have estimated that this Solar Rush saved approximately 12 billion dollars in foreign exchange that would otherwise have been spent on LNG imports. Total private investment in solar during this period reached approximately 18 billion dollars, making it the largest single investment in any energy technology in Pakistan's history. This is a remarkable achievement of market-driven energy transition, and it deserves to be recognized as a structural asset rather than treated as a regulatory inconvenience by distribution companies seeking to protect their revenue base.

The narrative of clean energy beyond 2030 must, however, be constructed on a more sophisticated analytical foundation than the simple proposition that renewables will displace everything else. The scholarly debate on this question has been advanced by analysts who argue that policy discourse must speak of energy transitionS, in the plural, rather than a single energy transition. This formulation is analytically precise. What the evidence supports is not a single linear shift from fossil fuels to renewables but a series of simultaneous and overlapping transitions: from centralized to decentralized generation architectures; from fuel-dominated to capital-dominated cost structures; from passive consumers to active prosumers; and from nationally siloed systems

to regionally integrated grids. Each of these transitions has its own timeline, political economy, and institutional requirements.

The basket approach to energy mix planning is superior to a renewables-only doctrine for several reasons. First, no grid can maintain frequency and voltage stability without sufficient dispatchable capacity, and current battery storage costs and technology limitations preclude the rapid replacement of dispatchable thermal generation with storage at the scale required. Second, fertilizer manufacturers and transport sector depend on hydrocarbons for feedstock and fuel in ways that cannot be decarbonized within a ten-year horizon without prohibitive cost. Renewables can, however, be made a no-compromise option for industrial and residential electricity consumers, with the transport and fertilizer sectors addressed through dedicated transition pathways that are sequenced over a longer timeframe. Third, the transition of Pakistan's refining capacity, which remains structurally inadequate relative to domestic demand, forcing continued reliance on refined product imports, requires a separate and parallel policy track.

Energy storage issues represent perhaps the most technically complex dimension of Pakistan's clean energy future. The intermittency of solar and wind generation creates ramp-rate challenges that must be managed through a combination of solutions: grid-scale battery energy storage systems, pumped hydropower storage, demand response programmes, and the strategic deployment of gas peaking plants. The Renewable Competitive Energy Tariff (RCET) tariff structure has established a framework for procuring renewable energy competitively, but it has not yet been extended to encompass storage procurement in a systematic way. The next generation of procurement frameworks must integrate Battery Energy Storage Systems as a co-located or standalone asset class, with business-to-business trading mechanisms that allow BESS operators to arbitrage between peak and off-peak periods, providing both revenue certainty for investors and grid services for the system operator.

The framework for microgrids and Virtual Power Plants represents a third pillar of Pakistan's clean energy architecture beyond 2030. Microgrids, islanded or grid-connected local energy systems that can operate autonomously during grid outages, offer particular value in rural and peri-urban areas where grid reliability is lowest and where the poverty concentration is highest. VPPs aggregate distributed assets – rooftop solar, small-scale storage, demand response resources – into a coordinated virtual entity that can participate in wholesale electricity markets and provide ancillary

services to the grid. Several regulatory and commercial prerequisites must be met before VPPs can function effectively in Pakistan: real-time metering, standardized interconnection agreements, a functioning balancing market, and legal recognition of aggregated distributed resources as market participants.

The decentralized energy planning mandate established by the 18th Amendment to the Constitution provides a constitutional basis for provincial governments to develop their own energy plans, procure their own resources, and regulate their own distribution sectors on equal grounds with the federal government. This framework has been underutilized. Provinces possess the regulatory authority and, in some cases, the fiscal capacity to lead transformative energy investments, particularly in solar and small hydropower. A coherent national energy strategy must integrate provincial plans rather than supersede them, creating an architecture of integrated energy planning that is decentralized in execution while unified in standards and data.

The clean energy narrative must also confront the climate-economics nexus with more intellectual honesty than has historically been exhibited. Climate change cannot be isolated from economics; the costs of inaction, through agricultural disruption, water stress, heat mortality, and infrastructure damage are real, quantifiable, and ultimately borne disproportionately by the poorest segments of Pakistani society. The 2022 floods, which inundated one-third of Pakistan's territory and caused economic losses exceeding 30 billion dollars, are the most visceral recent illustration of this reality. Energy transition that reduces Pakistan's carbon intensity is therefore simultaneously an economic imperative, a social equity objective, and a climate obligation. These three rationales reinforce each other and should be presented as an integrated argument rather than competing priorities.

Chapter Four: Diplomacy as a Tool for Energy Security

Energy diplomacy has emerged, across the past two decades, as one of the most consequential domains of foreign policy practice for resource-importing developing nations. The capacity to negotiate favorable terms of energy supply, to attract concessional financing for domestic energy infrastructure, to participate productively in multilateral energy governance forums, and to build regional coalitions that reduce the costs of energy transition has become as strategically significant as conventional defense and trade diplomacy. Pakistan's foreign policy establishment, currently, has demonstrated a level of sophistication in this domain that is, by regional standards, very close to the optimal achievable given the country's structural constraints.

The foundational premise of Pakistan's energy diplomacy must be the explicit recognition that clean energy is a trade policy, not merely an energy policy. The countries that will prosper in the post-2030 global economy are those that have positioned themselves as producers and exporters of clean energy technology, clean energy services, and clean electrons – whether through direct electricity interconnection or through energy-intensive exports such as green hydrogen, green steel, or green cement. Pakistan has the renewable resource endowment to pursue this agenda. What it requires is a diplomatic strategy that frames clean energy investment not as a development objective but as a commercial and geopolitical asset.

The hedging strategies available to Pakistan in energy diplomacy span three dimensions. The first is supply-side hedging: diversifying the sources of imported energy to reduce dependence on any single supplier or transit corridor. Pakistan's agreements with Azerbaijan and Central Asian states, particularly Uzbekistan and Kazakhstan under the framework of emerging Central Asia-South Asia energy corridors – represent progress on this dimension. The Central Asia-South Asia (CASA) electricity transmission project, which would enable Pakistan to import up to 1,300 megawatts of Central Asian hydropower, is a particularly significant development that deserves accelerated diplomatic attention. These relationships must be nurtured through regular high-level engagement, technical cooperation agreements, and, where appropriate, joint investment vehicles.

The second dimension of hedging is financial: reducing the exposure of energy imports to dollar-denominated volatility by negotiating payment arrangements denominated in alternative currencies, by pursuing deferred payment schemes, and by building strategic petroleum reserves

that buffer against short-term price spikes. The proposition that Pakistan should actively pursue oil supply on deferred payment terms from Saudi Arabia – following the precedent established during the 2018 to 2019 arrangement – deserves serious diplomatic re-engagement. Saudi Arabia's Vision 2030 programme has created a strategic imperative for Riyadh to maintain constructive economic relationships with its largest South Asian partners, and Pakistan's diplomatic leverage in this relationship, while asymmetric, is not negligible. The GCC labor market is also expected to expand significantly over the coming decade, and the remittance flows generated by Pakistani workers in Saudi Arabia, the United Arab Emirates, Qatar, and Kuwait represent both a source of foreign exchange and a diplomatic bond that can be leveraged in energy negotiations.

The third dimension of hedging is geopolitical: maintaining the capacity to balance relationships across competing power centres in ways that maximize Pakistan's strategic autonomy. Pakistan's position at the intersection of the SCO and its historically close relationship with the United States creates a complex but potentially valuable diplomatic space. Balancing the SCO relationship which encompasses China, Russia, and Central Asian states with the US relationship requires deliberate management, including the avoidance of zero-sum framings that would force Pakistan to align exclusively with either bloc. Energy cooperation, precisely because it is grounded in concrete commercial interests rather than ideological alignment, offers a domain in which Pakistan can simultaneously advance relationships with both the SCO and US-aligned investment frameworks such as the Partnership for Global Infrastructure and Investment.

The CPEC 2.0 framework offers the most immediately consequential diplomatic lever for Pakistan's energy security. The first phase of the China-Pakistan Economic Corridor delivered approximately 6,000 megawatts of coal and gas-fired capacity, which addressed Pakistan's immediate power shortfall but created long-term liabilities in the form of dollar-indexed capacity payments and carbon lock-in risks. The second phase offers an opportunity to reorient the energy component toward renewable capacity, transmission infrastructure, and energy storage. Chinese companies are global leaders in solar manufacturing, battery storage, and smart grid technology. Joint ventures for technology transfer in renewable energy uptake – structured to ensure genuine knowledge and capability transfer to Pakistani counterparties, rather than mere equipment supply, represent the most productive framework for this phase of CPEC energy engagement.

Regional coalitions within South Asia and extended into Central Asia must also be made and activated with greater urgency than has been exhibited by the current diplomatic architecture. The South Asian Association for Regional Cooperation has consistently failed to deliver on its energy integration potential due to bilateral tensions between India and Pakistan. An alternative architecture, one that builds on the existing CASA-1000 framework, expands it to include Afghanistan once conditions permit, and establishes a separate Pakistan-Central Asia energy corridor – would bypass the SAARC impasse while delivering the economic benefits of regional integration. This architecture would also create structural incentives for political stability in Afghanistan, since transit revenues from energy corridors provide a tangible economic stake in regional peace.

Pakistan must also engage more strategically with multilateral energy governance institutions, including the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), and the Clean Energy Ministerial. Membership and active participation in these institutions provide access to technical data, best practice knowledge, and informal diplomatic networks that can facilitate bilateral energy agreements. Pakistan's diplomatic representation in these forums has historically been below the level of engagement warranted by its strategic significance. Elevating the quality and continuity of this engagement, by deploying technically trained officials rather than generalist diplomats, is a straightforward and low-cost reform with potentially significant returns.

Chapter Five: Bretton Woods Institutions and Fiscal Trade-Offs

Pakistan's relationship with the International Monetary Fund (IMF) and the World Bank Group has been one of the defining structural features of its macroeconomic management over the past four decades. The country has entered IMF programmes on twenty-three occasions since 1958, each time accepting a package of fiscal consolidation, exchange rate adjustment, and structural reform conditions in exchange for balance of payments support. The most recent Extended Fund Facility, concluded in 2024, provided approximately seven billion dollars in support and imposed a set of conditions that have had direct and significant implications for energy sector policy, including the rationalization of electricity subsidies, the adjustment of gas tariffs toward cost recovery levels, and the restructuring of the circular debt.

The fiscal trade-offs embedded in the IMF programme create genuine tensions for energy policy. On one dimension, the programme's insistence on energy tariff rationalization is analytically correct: subsidized energy prices that do not reflect the cost of supply create distortions that discourage investment, reward inefficiency, and disproportionately benefit middle and upper-income consumers who consume more energy. On another dimension, however, the pace and sequencing of tariff adjustment matter enormously for energy poverty. Rapid tariff increases imposed on a population that lives in a condition of multiple deprivations including energy insecurity can produce acute welfare losses that undermine both the political sustainability of reform and the actual livelihoods of the most vulnerable households.

The resolution of this tension requires a more sophisticated analytical framework than the IMF has historically applied to Pakistan's energy sector. The standard fiscal accounting approach, which treats energy subsidies as an undifferentiated fiscal cost to be minimized, does not adequately capture the welfare economics of targeted support for low-income consumers, the investment economics of infrastructure development, or the macroeconomic benefits of reliable energy supply for industrial competitiveness. A more nuanced engagement with the IMF, one that presents Pakistan's energy reform programme as a coherent strategy for structural transformation rather than a reactive compliance exercise would require Pakistan to develop and articulate a credible long-term energy plan that demonstrates fiscal sustainability through the expansion of the revenue base rather than solely through expenditure reduction.

The World Bank and the Asian Development Bank have historically been important sources of concessional financing for Pakistan's energy infrastructure. Maintaining the quality of the World Bank and ADB project pipeline requires improvements in the procurement processes of energy sector agencies, the elimination of rent-seeking behaviour in project approvals, and the development of institutional capacity within NEPRA and the Ministry of Energy to manage complex project structures.

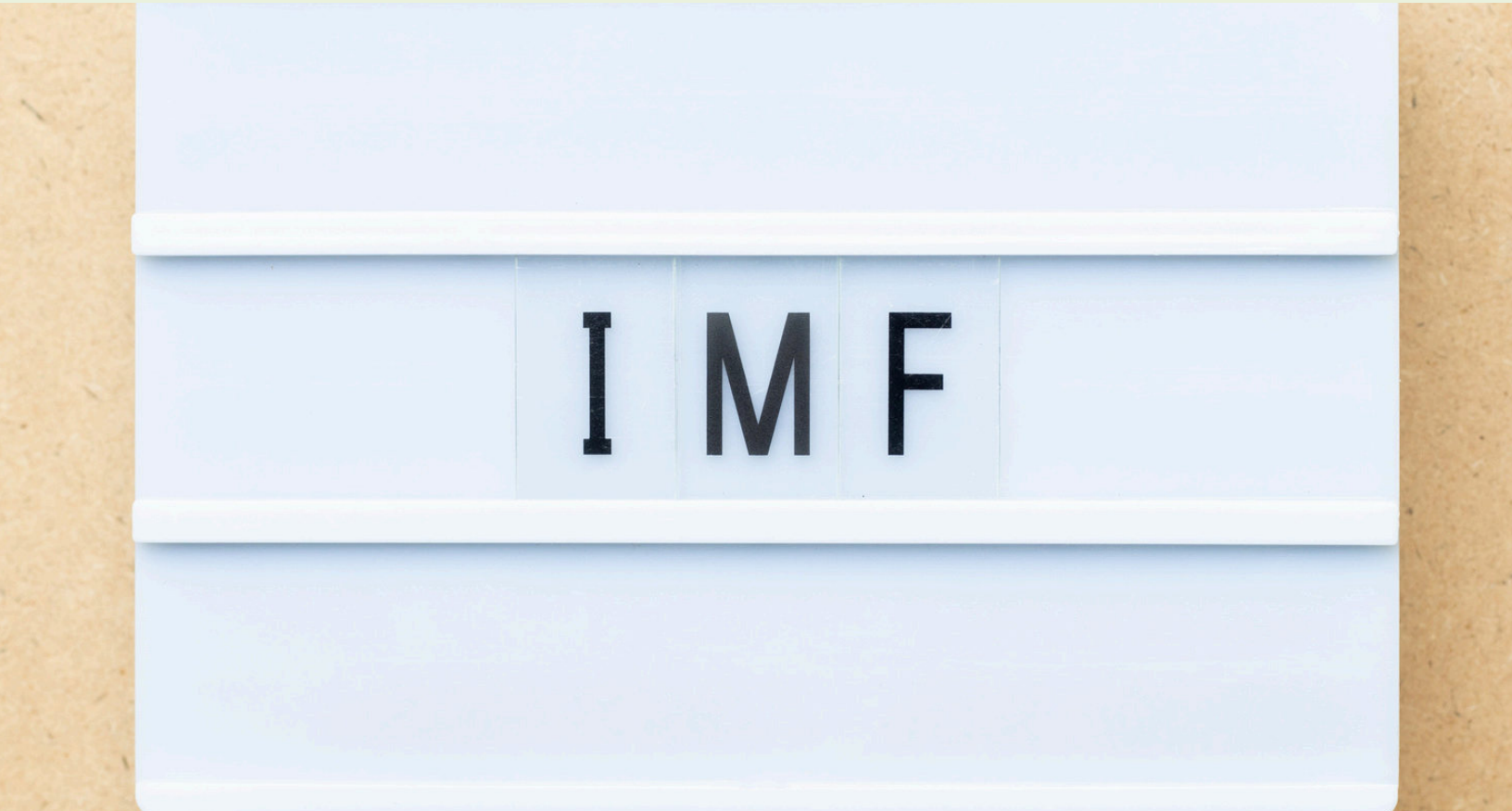
Blended finance represents a critical instrument for bridging the gap between the scale of Pakistan's energy infrastructure needs and the availability of concessional public resources. Blended finance structures use small amounts of concessional funding from official development assistance, development finance institutions, or climate funds such as the Green Climate Fund and the Climate Investment Funds to crowd in larger volumes of commercial capital by improving the risk-return profile of investments. For Pakistan, which has a large pipeline of renewable energy projects that are technically bankable but commercially unattractive due to currency risk, political risk, and off taker credit risk, blended finance instruments offer a viable pathway to accelerating the investment programme. The critical precondition is the development of standardized project structures, transparent tender processes, and robust regulatory frameworks that give commercial investors confidence in the predictability of returns.

Currency risk management is central to the fiscal trade-off in energy investment. The dollar indexation embedded in the existing PPA contracts has been a primary driver of tariff escalation, as the depreciation of the rupee has mechanically translated into higher consumer tariffs. Future contracts, to the extent possible, should be structured in local currency, with the exchange rate risk managed through hedging instruments provided by multilateral financial institutions or through the development of a local currency bond market for energy project finance. Schemes to stabilize the value of the rupee for the purpose of attracting remittances and investment – including the development of diaspora bonds, the expansion of Pakistan Remittance Initiative incentives, and the negotiation of currency swap arrangements with key bilateral partners – would also reduce the fiscal burden imposed by exchange rate volatility on the energy sector.

The Conference of Parties (COP) process under the United Nations Framework Convention on Climate Change has, despite its institutional prominence, consistently failed to deliver the volume and quality of climate finance required to support the energy transition in developing countries.

The fundamental problem is a stringent money-oriented mindset among developed country contributors, who have been reluctant to provide finance in the grant-equivalent or highly concessional form that genuine climate vulnerability would justify, and who have repeatedly counted market-rate commercial finance as part of their climate finance commitments. Pakistan, as one of the countries most exposed to climate change despite being responsible for less than one percent of global cumulative emissions, is well positioned to make this argument at international forums. However, making the argument effectively requires that Pakistan present a credible domestic energy transition plan that demonstrates absorptive capacity and governance quality sufficient to deploy climate finance at scale.

The overall fiscal architecture for Pakistan's energy transition must rest on the recognition that climate cannot be isolated from economics. The costs of climate inaction are real, growing, and regressive in their distributional impact. An energy investment programme that reduces Pakistan's vulnerability to fossil fuel price volatility, reduces its carbon intensity, and expands access to affordable energy is simultaneously a fiscal sustainability measure, a poverty reduction strategy, and a climate adaptation investment. Framing it as such – in negotiations with the IMF, the World Bank, bilateral donors, and private investors – is the most powerful argument available to Pakistan's economic diplomacy.



Chapter Six: Civil Society and Advocacy in Energy Transition

Civil society organizations occupy a structurally significant position in Pakistan's energy governance landscape that has not been adequately recognized in formal policy frameworks. Think tanks, research institutes, community-based organizations, consumer advocacy groups, environmental NGOs, and the professional associations of engineers, economists, and lawyers collectively perform functions that state institutions alone cannot: they generate independent analysis, translate technical complexity into public discourse, hold regulators accountable, and represent the interests of communities that are systematically underrepresented in formal policymaking processes. Understanding this role clearly, and building the conditions for its effective performance, is a prerequisite for successful energy transition.

The journalism dimension of civil society's energy governance role deserves specific attention. Pakistan's media landscape includes a significant number of outlets and journalists that cover energy policy with serious investigative intent. When the national interest demands transparent accounting of how tariff revenues are spent, when the terms of power purchase agreements require public scrutiny, or when the performance of distribution companies against regulatory benchmarks must be assessed, investigative journalism serves as a critical accountability mechanism. The role of journalism in upholding truth while keeping national interest at the top of its editorial priorities is not merely a normative aspiration; it is a functional requirement of a governance system in which formal accountability mechanisms – parliamentary oversight, regulatory review, judicial scrutiny – are themselves operating under various constraints.

The effectiveness of civil society advocacy in the energy domain is, however, highly contingent on the quality and accessibility of data. NEPRA publishes significant volumes of data on generation, transmission, and distribution performance. Oil and Gas Regulatory Authority (OGRA) maintains records on gas sector operations. NEPRA's annual State of Industry Reports represent a valuable public data resource. However, the consistency, granularity, and timeliness of this data remain uneven, and the absence of standardized machine-readable formats limits the ability of independent analysts to perform rigorous cross-temporal analysis. The key to the success of civil society advocacy is redundancy and consistency in data: organizations that maintain longitudinal databases, cross-reference multiple official data sources, and track metrics over time are able to

identify patterns that point-in-time analyses miss. This is the analytical foundation on which credible advocacy rests.

Community-based energy governance has emerged as a practical reality in parts of Pakistan, most notably in the off-grid areas of Gilgit-Baltistan, Azad Jammu and Kashmir, and Khyber Pakhtunkhwa where community-managed micro-hydropower systems have been providing electricity for decades. These systems – often established with initial support from development organizations and subsequently managed by local committees – embody the decentralized energy planning principles at the provincial level. They demonstrate that communities, given adequate technical support, governance training, and access to appropriate financing, can manage energy infrastructure effectively and sustainably. The policy implication is that community energy governance is not a marginal or experimental phenomenon but a proven model that should be systematically scaled.

The advocacy of civil society organizations in Pakistan's energy sector has increasingly intersected with the global climate policy debate. Pakistan's engagement at successive COPs has included a growing contingent of civil society observers who have contributed to the framing of Pakistan's national positions and who have engaged directly with international climate negotiators. This engagement is valuable, but it requires a more coordinated architecture to be maximally effective. A national civil society coordination mechanism for climate and energy advocacy – one that brings together research institutions, community organizations, professional bodies, and media representatives around a shared evidence base and a unified national position – would significantly amplify Pakistan's voice in international forums.

The relationship between civil society and regulatory institutions in Pakistan's energy sector has historically been characterized by a degree of mutual suspicion. Regulators have sometimes perceived civil society advocacy as politically motivated or technically uninformed; civil society organizations have sometimes regarded regulatory processes as captured by industry interests. Bridging this gap requires deliberate institutional design: structured consultative processes that give civil society organizations meaningful input into regulatory decisions, clear feedback mechanisms that explain how public comments have influenced regulatory outcomes, and investment in the technical capacity of civil society organizations to engage substantively with

complex regulatory dossiers. NEPRA's public hearing processes represent a partial model, but their accessibility and effectiveness could be substantially improved.

Youth organizations and educational institutions represent anunderutilized civil society resource in Pakistan's energy transition. The country's demographic structure–with approximately 64 percent of the population below the age of thirty – creates both a challenge andan opportunity. The challenge is that the energy transition must deliver economic opportunities for a rapidly growing youth labour force; the opportunity is that young Pakistanis are disproportionately receptive to clean energy technologies, are early adopters of solar installation and energy efficiency measures, and constitute a powerful political constituency for ambitious energy reform. Vocational training programmes, university research partnerships, and youth entrepreneurship schemes focused on clean energy applications can simultaneously build technical capacity, create employment, and cultivate the social support base that ambitious energy reform requires. Embedding gender inclusion in these initiatives, through equal access to training, targeted mentorship for women in STEM, and gender-sensitive policy design, ensures that young women are not sidelined in the energy transition but are empowered as innovators, entrepreneurs, and decision-makers.

The relationship between civil society advocacy and media coverage requires careful management. Sensationalist or technically inaccurate energy reporting – including stories that misrepresent the costs or capabilities of renewable energy, that attribute power outages to incorrect causes, or that amplify misinformation about particular policy decisions – can significantly complicate the policy environment for energy reform. Professional associations, research institutions, and regulators all have a role to play in improving the quality of energy journalism, through media training programmes, the proactive provision of accurate technical information, and the cultivation of relationships with journalists that are based on mutual respect and shared commitment to evidence-based public discourse.

Chapter Seven: Industrial Decarbonization and Competitiveness

Pakistan's industrial sector accounts for approximately 27 percent of national electricity consumption and a substantially larger share of natural gas consumption, with the textile, cement, steel, fertilizer, and chemical industries constituting the five dominant energy-consuming subsectors. The decarbonization of this industrial base is simultaneously a climate obligation, a trade policy imperative, and a competitive necessity. As the Carbon Border Adjustment Mechanism (CBAM) and analogous instruments under development in other jurisdictions begin to apply carbon prices to the embodied emissions of imported goods, Pakistani exporters who continue to rely on carbon-intensive production processes face a growing competitive disadvantage in the most important export markets. The response to this challenge must be both ambitious and strategically sequenced.

The textile sector, which accounts for approximately 60 percent of Pakistan's export earnings, is the most immediate priority for industrial decarbonization. The sector's exposure to carbon border adjustments is direct and significant: European buyers of Pakistani garments and home textiles are already requiring Scope 1 and Scope 2 emissions disclosures from their suppliers, and preferential market access arrangements including the EU's GSP+ status increasingly incorporate sustainability conditions. Pakistani textile manufacturers who invest in rooftop solar, energy efficiency improvements, and the electrification of process heat are therefore making commercially rational decisions that simultaneously reduce carbon exposure and lower production costs. Policy support for this transition – through concessional financing, facilitated access to equipment, and simplification of net metering regulations – would accelerate the pace of investment.

The cement sector presents a more complex decarbonization challenge, because a significant fraction of cement's carbon emissions arises from the calcination of limestone – a process chemistry emission that cannot be eliminated by switching to renewable electricity. Advanced decarbonization pathways for cement, including clinker substitution, carbon capture and utilization, and the development of low-carbon cement formulations, require technology development and deployment at a scale that individual Pakistani companies cannot pursue in isolation. Joint ventures for technology transfer in renewable energy uptake, extended to encompass broader industrial decarbonization technologies, represent the most viable pathway for

Pakistani cement producers to access the advanced technologies that will be required for long-term competitiveness.

The steel sector, which in Pakistan is predominantly based on electric arc furnace technology rather than blast furnace production, is comparatively well positioned for decarbonization through renewable electricity. The substitution of grid electricity – currently dominated by expensive and carbon-intensive sources – with directly consumed solar power represents an immediate opportunity that several large Pakistani steelmakers have already begun to exploit. Expanding this model, including through the development of on-site solar installations, power purchase agreements with renewable generators, and eventually the use of green hydrogen as a reducing agent for direct reduced iron production, constitutes a credible ten-to-fifteen-year decarbonization pathway for the sector.

The fertilizer sector deserves special analytical attention because of the dual role that natural gas plays as both a feedstock and a fuel for ammonia and urea production. The substitution of natural gas feedstock with green hydrogen produced from renewable electricity is technically feasible but currently uneconomic at scale, with green hydrogen costs remaining two to three times above the cost of natural gas-derived hydrogen in most markets. The policy implication is that the fertilizer sector cannot be decarbonized within the same timeline as the power sector; it requires a dedicated transition pathway that includes research investment, pilot projects, and a carbon pricing mechanism calibrated to gradually incentivize the transition without disrupting the agricultural supply chain. In the interim, renewables serve as a no-compromise option for electricity consumed in plant operations, even where gas remains the feedstock.

The international experience of Ukraine, where industrial decarbonization programmes are projected to generate 6.5 million jobs across five major industrial sectors over a ten-year horizon, provides a relevant benchmark for Pakistan's employment-oriented case for industrial transformation. The sectors driving this employment projection include renewable energy manufacturing, energy efficiency services, clean building construction, green transport infrastructure, and decarbonized industrial supply chains. Pakistan's policy framework for industrial decarbonization should incorporate an explicit employment modelling exercise that quantifies the job creation potential of the transition by sector, region, and skill level, and uses this

analysis to build the political coalitions necessary to sustain reform through multiple electoral cycles.

Private sector investment by domestic industrial conglomerates represents a critical and undervalued resource for Pakistan's energy transition. The investment of local private owners such as the Lucky Group, Shams Power, and other pioneering domestic enterprises in the mining and energy sectors is highly commendable and encouraging. These investments demonstrate that domestic capital is available, that Pakistani entrepreneurs have the risk appetite and the technical judgment to pursue large-scale energy projects, and that policy environments that provide adequate regulatory certainty and commercial returns can unlock substantial private investment. The policy response should be to systematically identify and remove the barriers that prevent this investment from scaling further: cumbersome project approval processes, inadequate transmission infrastructure, the absence of bankable offtake agreements, and currency risk.

The LCOE metric has been transformed by the solar revolution. LCOE and cost consolidation analyses now consistently demonstrate that new solar capacity, in Pakistan's irradiance conditions, is the cheapest source of electricity available, often by a factor of two or more compared with new thermal capacity. Embedding this analytical framework into Pakistan's integrated resource planning process, replacing the historical approach of negotiated bilateral contracts with competitive procurement based on rigorous cost-of-supply analysis, is a governance reform that would simultaneously improve the efficiency of capital allocation and reduce the scope for rent-seeking in the energy procurement process. The transition to a genuinely competitive, cost-reflective, and transparent procurement architecture is the single most important institutional reform available to Pakistan's energy policymakers.

Chapter Eight: Long-Term Diplomatic Strategy

Pakistan's long-term diplomatic strategy for energy security must be grounded in a clear-eyed assessment of the country's structural assets and vulnerabilities, and must be designed to maximize the former while systematically reducing the latter. The structural assets are significant: a geographic location at the intersection of Central Asia, South Asia, and the Middle East; a young and increasingly skilled workforce; deepening relationships with both Chinese and Gulf-based investors; membership in the Shanghai Cooperation Organisation; and a demonstrated capacity for constructive multilateral diplomacy that has been recognized by partners across ideological divides. The vulnerabilities are equally significant: fiscal fragility, political instability, institutional capacity constraints, and an energy infrastructure that remains structurally misaligned with the requirements of the twenty-first century economy.

The long-term diplomatic strategy must address five geographic dimensions simultaneously. The first is the China dimension, which is managed primarily through the CPEC framework. CPEC 2.0 must incorporate energy cooperation provisions that go beyond simple project financing and encompass technology partnership, industrial cooperation, and the development of clean energy manufacturing capacity on Pakistani soil. Chinese companies' leadership in solar manufacturing, battery storage, and electric vehicle supply chains creates opportunities for joint venture arrangements that would transfer technical and managerial knowledge to Pakistani counterparts while providing Chinese companies with access to a growing South Asian market. These arrangements must be structured to ensure genuine capability transfer, with contractual milestones tied to the progressive indigenization of technology and employment.

The second geographic dimension is the Gulf, which is critical both as a source of concessional financing and as an export market for Pakistani labour. The GCC states are undertaking historically unprecedented transformations of their domestic economies under frameworks such as Saudi Vision 2030, UAE Net Zero 2050, and Qatar National Vision 2030. These transformation programmes require skilled workers, construction capacity, and managerial expertise that Pakistan can supply. The GCC labour market is expected to increase significantly over the coming decade, and Pakistan's competitive position in this market can be enhanced through bilateral labour agreements, skills certification programmes, and diplomatic engagement that frames Pakistani

labour as a high-quality, well-trained resource rather than merely a low-cost commodity. The remittance flows generated by this engagement – currently running at approximately 27 billion dollars per year – are a strategic asset that must be managed with care, including through schemes designed to stabilize the value of the rupee for attracting and retaining remittances within the formal financial system.

The third geographic dimension is Central Asia, where Pakistan's diplomatic and commercial engagement has historically been limited, and still is, by the physical barrier of Afghanistan. The developing transport and energy corridors through Afghanistan – the CASA-1000 electricity transmission project, the Turkmenistan-Afghanistan-Pakistan-India gas pipeline concept, and various road and rail linkages – have all been held hostage to the security situation in Afghanistan, and indeed the stringent relationship troika of India-Pakistan-Afghanistan. A long-term diplomatic strategy must develop Pakistan's relationship with Central Asian states independently of the Afghan transit question, through direct bilateral engagement, through SCO multilateral frameworks, and through the development of maritime and air connectivity options that reduce dependence on Afghan land routes. Pakistan's agreement with Azerbaijan and Central Asian states represents a foundation upon which this architecture can be built.

The fourth geographic dimension is the United States and Western powers, whose engagement with Pakistan in the energy sector has historically been conditioned by a complex set of security and geopolitical considerations. Balancing the SCO relationship with the US relationship is a strategic imperative that demands consistent and sophisticated diplomatic management. The framing of clean energy investment as a domain of cooperation that transcends geopolitical rivalry, a genuinely non-zero-sum proposition, given that both US and Chinese companies have commercial interests in Pakistan's energy market – offers a pathway to maintaining productive relationships with both power centers. Pakistan's diplomacy in this domain should resist the pressure to frame energy relationships as a choice between alternative patrons, instead presenting an open and competitive investment environment that welcomes capital from all sources.

The fifth geographic dimension is the multilateral domain, encompassing the United Nations system, the Bretton Woods institutions, the G20, and the various climate governance forums. Pakistan's participation in these forums has been substantive and, at its best, genuinely influential: the country's leadership in framing the loss and damage debate at COP27 and its subsequent

advocacy for the Fund for Responding to Loss and Damage demonstrated the capacity of Pakistan's diplomatic establishment to shape international outcomes on issues of vital national interest. Sustaining and deepening this engagement – by developing a coherent, evidence-based national position that links energy security to climate vulnerability to development finance reform – would position Pakistan as a constructive and credible voice in global governance debates.

A unified national energy policy is the indispensable foundation for effective long-term energy diplomacy. The credibility of Pakistan's international commitments – whether under the Paris Agreement, CPEC energy annexes, or bilateral investment protection treaties – depends on the existence of a stable, coherent, and consistently implemented domestic policy framework. A unified national policy that establishes clear targets, transparent procurement rules, predictable regulatory processes, and effective enforcement mechanisms would create the conditions under which international partners can commit capital and technology with confidence. The current fragmentation of energy policymaking across federal ministries, provincial governments, and regulatory agencies, while partly a constitutional reality that must be respected – can be managed through a National Energy Council that provides strategic direction and coordinates implementation across institutional jurisdictions.

Regional coalitions must be made and activated with greater diplomatic urgency than has characterized Pakistan's regional energy engagement to date. The economic logic of regional energy integration is compelling: shared transmission infrastructure reduces the cost of serving any individual country's demand; trade in renewable energy – solar-rich countries exporting to hydro-rich or demand-rich neighbors – creates welfare gains for all participants; and shared energy security challenges create incentives for cooperation that transcend bilateral political difficulties. The architecture for regional energy cooperation in Pakistan's neighborhood exists in embryonic form, in the CASA-1000 project, in the ECO regional energy framework, and in the SCO energy working group. Developing this architecture into a functioning regional energy market is a long-term project that requires sustained diplomatic investment, but the returns – in terms of reduced energy costs, improved grid reliability, and enhanced energy security – justify the effort.

Chapter Nine: The ADS Pathway – Evidence-Based Recommendations

The pathway for Pakistan's energy sector is grounded in the proposition that the country possesses the resources, the relationships, and the analytical capacity required to achieve energy security within a ten-year horizon, provided that policy choices are made with strategic coherence, institutional reforms are implemented with genuine commitment, and the available international financial and technical resources are mobilized at scale. The recommendations set out in this chapter are organized across five domains: generation portfolio, grid infrastructure, regulatory reform, financial architecture, and diplomatic strategy. They are intended to be mutually reinforcing: the effectiveness of each recommendation is enhanced by the implementation of the others.

In the generation portfolio domain, the first recommendation is the establishment of a firm national target for renewable energy capacity: 40 gigawatts of solar, 5 gigawatts of wind, and 10 gigawatts of new hydropower by 2035, supplemented by 4 gigawatts of battery storage and 2,000 megawatts of expanded pumped hydropower capacity. This portfolio would reduce the country's dependence on imported fossil fuels by approximately 60 percent relative to 2024 levels, while maintaining sufficient dispatchable capacity to ensure grid frequency stability. The basket approach to energy mix must be maintained throughout the transition period, with gas-fired peaking capacity retained and optimized rather than prematurely retired. The ramp rates of LNG plants – their capacity to respond rapidly to fluctuations in renewable output – make them structurally indispensable for grid stability in a high-renewables scenario.

The second recommendation addresses energy storage issues with the specificity that the technical challenge demands. A dedicated Battery Energy Storage System procurement programme – structured under the RCET tariff framework and expanded to include storage-only and storage-plus-solar tenders – should target 2 gigawatt-hours of grid-connected storage capacity by 2028 and 6 gigawatt-hours by 2032. These tenders should incorporate B2B trading provisions that allow BESS operators to participate in both the wholesale energy market and the ancillary services market, creating diversified revenue streams that improve project bankability. The framework for microgrids and VPPs should be codified in a dedicated regulatory instrument, establishing

standardized interconnection procedures, metering requirements, and participation rules for aggregated distributed resources.

The third recommendation concerns the regulation of industrial and residential electricity supply. Renewables must be made a no-compromise option for industrial and residential consumers through a combination of mandatory renewable purchase obligations, competitive renewable energy procurement by the distribution companies, and the facilitation of direct corporate power purchase agreements between renewable generators and large industrial offtakers. The transport and fertilizer sectors require dedicated transition pathways, as discussed in Chapter Seven, but these sector-specific pathways should not be allowed to delay the broader decarbonization of the electricity system. Pakistan's refining capacity, which is currently inadequate to meet domestic demand for refined petroleum products, requires parallel investment that is distinct from the electricity sector transition but equally urgent for energy security.

In the grid infrastructure domain, the first recommendation is a comprehensive audit of critical substations across the national transmission network, followed by a structured investment programme to upgrade, harden, and where necessary, duplicate the most strategically important nodes. The redundancy principle – ensuring that the failure of any single infrastructure element does not cascade into system-wide disruption – should be embedded in grid planning standards as a mandatory technical requirement rather than a discretionary engineering preference. The NTDC and provincial transmission entities should publish annual reports on grid resilience metrics, including the number of substations with redundant supply paths and the progress against critical substation hardening targets.

In the regulatory reform domain, the most consequential recommendation concerns the restructuring of PPA contracts. The dollar indexation embedded in existing contracts cannot be undone without engaging the complex web of international arbitration risk and bilateral investment treaty obligations. However, future contracts – for all technologies and all project sizes – should be structured in Pakistani rupees, with exchange rate risk managed through instruments provided by multilateral financial institutions or through the development of local currency energy bonds. NEPRA should develop and publish standardized PPA templates for solar, wind, storage, and hybrid projects that incorporate Pakistani rupee denomination, transparent indexation mechanisms, and termination provisions consistent with international best practice.

The financial architecture recommendations center on blended finance and the attraction of domestic and international private capital. The establishment of a dedicated Clean Energy Finance Facility – capitalized through a combination of government equity, multilateral development bank loans, and climate fund grants – would provide first-loss protection and partial credit guarantees to clean energy projects that are technically bankable but commercially marginal due to currency or off taker risk. JVs for technology transfer in renewable energy uptake should be incentivized through a tax framework that rewards genuine technology localization, including graduated local content requirements, research and development tax credits, and import duty exemptions for capital equipment used in the manufacture of renewable energy components. Lucky Group, Shams Power, and other domestic private investors who have demonstrated the capacity to execute large-scale energy projects should be engaged as preferred partners in blended finance structures, with the government providing facilitation rather than substituting for private initiative.

The diplomatic strategy recommendations build on the analysis of Chapter Eight. Pakistan should pursue the negotiation of oil on deferred payment terms from Saudi Arabia as an immediate priority, framing the request within the broader context of the bilateral relationship and the GCC's strategic interest in a stable Pakistan. Schemes to stabilize the value of the rupee for attracting remittances should be developed in coordination with the State Bank, including the expansion of initiatives like Roshan Digital Account and the negotiation of bilateral remittance agreements that reduce transfer costs. Pakistan's agreement with Azerbaijan and Central Asian states should be elevated to a comprehensive energy partnership framework, including joint working groups on electricity interconnection, gas transit, and renewable energy investment. The balance of SCO and US relations must be maintained through deliberate diplomatic management, with clean energy investment positioned as a zone of productive engagement that both power centres can support without strategic conflict.

Finally, the role of journalism and civil society must be institutionalized within the energy governance framework. A statutory obligation for NEPRA and the Ministry of Energy to publish quarterly performance reports in standardized, machine-readable formats would dramatically improve the data environment for independent analysis. Civil society organizations with demonstrated technical capacity should be formally incorporated into the consultative processes for major energy policy decisions, including resource planning, tariff review, and procurement

design. Media literacy programmes focused on energy sector reporting – developed in partnership with journalist associations, research institutions, think tanks and regulatory bodies – would improve the quality of public discourse on energy issues and strengthen the accountability functions that a free press performs.

Chapter Ten: Toward Energy Sovereignty

Energy sovereignty is a dynamic condition that must be continuously sustained through policy discipline, institutional adaptation, diplomatic engagement, and technological investment. Pakistan has never fully achieved energy sovereignty, and the structural factors that have prevented it, fiscal constraints, institutional fragmentation, geopolitical exposure, and the legacy of sub optimally designed energy contracts – remain present and consequential. However, the conditions for a decisive step toward energy sovereignty are more favorable in 2026 than they have been at any point in Pakistan's history, and the costs of failing to act are, in an era of accelerating climate change and energy market volatility, more severe than ever before.

The ten chapters of this codex have together constructed an argument that is simultaneously diagnostic and prescriptive. The diagnosis is clear: Pakistan's energy system is structurally misaligned with the requirements of energy security, economic competitiveness, and climate resilience. The misalignment is rooted in decades of underinvestment in infrastructure, poorly designed contractual arrangements that transferred risk to the state, inadequate regulatory capacity, insufficient attention to decentralized energy solutions, and a diplomatic strategy that was reactive rather than strategic. The 43 percent hidden poverty that characterizes the lived reality of a large portion of Pakistan's population is both a cause and a consequence of this misalignment, since energy insecurity perpetuates the cycle of limited economic opportunity, reduced human capital investment, and constrained productivity that defines structural poverty.

The prescription advanced in this codex rests on several foundational propositions that have been developed and evidenced across the preceding chapters. The first is that the basket approach to energy mix, balancing renewables with gas, hydro, nuclear, and strategic reserves, is analytically superior to any single-source doctrine, and that the evidence in support of this proposition is both technically rigorous and practically validated by the experiences of countries that have achieved genuine energy security. The second proposition is that integrated energy planning, implemented consistently and transparently across federal and provincial institutions is the essential organizational architecture for mobilizing Pakistan's distributed energy resources. The third proposition is that clean energy must be a trade policy, not merely an energy policy: the countries that prosper in the post-2030 global economy will be those that have used the energy transition as

a platform for industrial modernization, export diversification, and structural economic transformation.

The diplomatic architecture outlined in this codex is ambitious but attainable. Pakistan's diplomacy is, by objective assessment, very near to what is achievable given the country's structural position in the international system. The relationships with China, Saudi Arabia, the Gulf states, Central Asian states, and Western powers that Pakistan has cultivated over decades represent genuine diplomatic capital that can be deployed in the service of energy security. What has historically been missing is the coherent and sustained domestic policy framework that would give international partners the confidence to commit capital and technology at the scale required. A unified national energy policy, consistently implemented and transparently reported, would transform this diplomatic capital from a latent asset into an active instrument of energy security.

The civil society and media dimensions of energy governance are not peripheral to this agenda. Redundancy and consistency coupled with data are the keys to success of civil society in energy advocacy. Independent analysis, investigative journalism that upholds the truth while placing national interest at the centre of its editorial judgment, and community-based advocacy that represents the energy interests of populations that are not well served by formal political processes together constitute an essential accountability ecosystem. The energy transition in Pakistan will be durable only if it is understood, supported, and actively demanded by civil society. Creating the conditions for this engagement – through transparency, data accessibility, and genuine consultative processes – is as important as the technical and financial elements of the transition strategy.

The international context provides both urgency and opportunity. Climate change is accelerating, and the costs of delayed transition are compounding. At the same time, the pace of clean energy technology cost reduction has created investment opportunities that are economically attractive on commercial grounds alone, without requiring resort to arguments about moral obligation or climate risk. The Solar Rush that generated 12 billion dollars in foreign exchange savings and mobilized 18 billion dollars in private investment demonstrates that Pakistani actors are ready and willing to participate in the energy transition when the conditions are right. Policy must now create the conditions for this market energy to be channeled into a coherent national architecture rather than remaining a fragmented collection of individual decisions.

The ADS pathway recommendations set out in Chapter Nine are intended to be operational rather than aspirational. Each recommendation identifies a specific policy action, an institutional owner, a timeline, and a measurable outcome. The sequencing is deliberately front-loaded on regulatory and diplomatic reforms that create the conditions for investment, rather than on public spending that requires fiscal resources Pakistan does not currently possess. Blended finance, JVs for technology transfer, deferred payment oil arrangements, and the development of a local currency project finance market are all instruments that leverage Pakistan's diplomatic relationships and its growing renewable energy market into capital flows that do not add to the public debt burden.

Ultimately, energy sovereignty is the foundation on which Pakistan's broader developmental aspirations must be built. Without reliable, affordable, and sustainable energy, no industrial policy can succeed, no poverty reduction programme can be sustained, and no diplomatic ambition can be fully realized. The codex advanced here is a contribution to the analytical and policy architecture required to make energy sovereignty achievable. Its implementation will require political will, institutional capacity, and international partnership. None of these ingredients is absent from Pakistan's situation. What is required is the strategic coherence and sustained commitment to bring them together in the service of a national energy security agenda that is worthy of the country's potential and equal to the challenges of the age.

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