

## The Political Economy of Renewable Energy Policies in Pakistan

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### Abstract

This review examines the reasons behind Pakistan's inability to harness its considerable renewable energy potential by analysing the political economy of its energy sector through the lenses of path dependency, rent seeking/state capture, and energy justice. In view of the academic and grey literature, it concludes that previous reforms and investments have established an expensive, fossil fuel-dependent system. Wealthy and influential elites in Pakistan exploit energy policies for their advantage, while institutional incapacities affect efficiency. As a result, technological advancements are slow-moving while millions are deprived of electricity and energy burdens are disproportionately distributed. This review consolidates these challenges to highlight the imperative for institutional reform and the need to address governance and distributional aspects in Pakistan's clean energy transition.

### Key policy implications

- Long-term contracts of Independent Power Producers (IPPs) skew the market and inhibit the growth of renewables; therefore, energy policy reform must address this and curb the elite's interest.
- Provinces need to be empowered enough so that they can regulate and initiate or implement their renewable energy projects independently.
- For consistent and sustainable investment, it is crucial to stop and discourage abrupt policy changes and tariff modifications.
- International donors and foreign funding should work beyond giving technical solutions and should advocate for structural reforms promoting transparency, regulatory autonomy, and fair energy governance.
- Regional disparities within Pakistan must be tackled while engaging marginalized population, such as Balochistan province, in the decision-making process.

### Introduction

The **energy sector in Pakistan** has faced many challenges for years, including limited sources of energy, supply shortages, and inefficiency. According to Nicholas et al. (2018), the energy sector has traditionally faced inadequate generation capacity to satisfy increasing demand, exacerbated by significant technical and financial losses. In addition, it significantly relies on fossil fuel imports and large hydro elective power systems, resulting in price fluctuations while lacking sustainable policies.

Asim et al. (2022) explain that although the capacity to generate electricity reached around 33 GW by 2018, there are considerable transmission and distribution (T&D) losses, between 18% and 21%, showing severe deficits in power/energy delivery. These fundamental challenges have led to ongoing energy instability in the country and obstructed initiatives aimed at creating a more robust and diverse power sector.

Furthermore, **inefficiencies in Pakistan's energy sector** disproportionately impact rural areas, where around fifty percent of individuals have access to reliable power/electricity (Nicholas et al., 2018). Simultaneously, the nation's energy composition has experienced a significant alteration. Being, historically dependent on expensive imported oil and gas, Pakistan has recently transitioned towards coal and Liquefied Natural Gas (LNG). Despite having the abundant solar and wind resources, renewable energy accounts for approximately 7% of the overall electricity generation mix (Nazir et al., 2019), underscoring the sluggish embedding of renewable energy (RE) in national planning.

This literature review employs a political economy lens to assess the slow-moving transition to renewable energy in Pakistan and inadequacies observed in the associated policies, emphasising the impact of power dynamics, institutional fragmentation, and historical legacies on policy development, implementation, and outcomes. It examines the intricate interactions of state institutions, corporate entities, international donors, and provincial administrations in influencing the course of energy reforms. This approach elucidates both the factors contributing to the sluggish adoption of renewable energy and the distributional ramifications of existing policy decisions.

The review addresses following three main themes:

1. Structure and governance within Pakistan's energy sector
2. Theoretical frameworks based on path dependency, rent seeking/state capture, and energy justice
3. Political economy analyses based on interconnected components including elite capture and rent-seeking, donors/foreign funding, and provincial volatility.

In view of these themes, this review presents arguments that the primary obstacles to RE adoption in Pakistan stem from the political economy, influenced by historical path dependencies, rent seeking, and energy justice rather than from technical or cost considerations. More specifically, it presents political economy analyses based on elite capture, donors/foreign funding, and provincial asymmetries and policy volatility. While recognizing the scarcity of peer-reviewed current data, it utilizes a mix of peer-reviewed literature and reputable grey sources.

This review is especially pertinent for decision makers, practitioners, policymakers, politicians, and development partners aiming to comprehend the reasons behind the frequent stagnation of well-intentioned energy reforms in Pakistan, as well as the institutional, political, and regulatory measures required to facilitate a just and sustainable energy future.

### **Structure and governance within Pakistan's energy sector**

To know major stakeholders and institutions, Nicholas et al. (2018) share details that the energy industry in Pakistan is governed by the Ministry of Energy (Power Division), which is responsible for developing national policy, ensuring power generation, distribution, and power rates. The Pakistan Electric Power Company (PEPCO) oversees state-owned generation and distribution companies (DISCOs). Electricity is predominantly produced by public thermal power stations and the Water and Power Development Authority (WAPDA), in conjunction with commercial Independent Power Producers (IPPs) under long-term agreements. The DISCOs are responsible for the provision of energy to end consumers while the National Transmission and Dispatch Company oversees bulk transmission at national level. For regulations and standards, the National Electric

Power Regulatory Authority (NEPRA) is responsible along with oversighting role. The Alternative Energy Development Board advocates for renewable energy initiatives (solar, wind, biomass), while provinces (after devolution) have their own energy departments for local projects. However, as stated above, developing of energy policies and large projects are retained under federal jurisdiction.

The **structural and financial limitations** are also major concerns in the country due to which the energy sector does not flourish in transitioning to RE at large scale. By March 2025, Pakistan's circular debt in the power sector reached up to Pakistani Rupees (PKR) 2.3 trillion, marking a slight increase of PKR 15 billion since November 2024 and this is due to ongoing inefficiencies, elevated transmission and distribution losses, and under-recoveries in the sector (Energy Central, 2025).

Despite the reduction in fuel import due to coal and LNG, the dependence of the country on global price volatility remains at large (IGC, 2023). Moreover, institutional disharmony (between national and sub-national) and policy uncertainty delays implementation, while inadequate enforcement compromises changes such as loss-reduction objectives (Nazir et al., 2019). Fossil fuel and industrial groups, particularly those associated with coal, gas, and cement, oppose decarbonisation (IGC, 2023). Aklin and Mildenerger (2020) observe that the efforts to tackle climate change policies including who gets subsidies and who bears the cost tend to affect the overall climate objectives. In Pakistan, conflicting interests about project advantages, such as land or subsidies, intensify delays. Ostrom (1999) emphasises that problems in community resource management, such as dam siting, illustrate these tensions. With contribution less than 1% of global greenhouse gas emissions, Pakistan's susceptibility to climate disturbances warrants its 2030 clean energy objective of 30% (IGC, 2023). However, Bättig and Bernauer (2009) contend that ambitious objectives are difficult to achieve without robust institutions, which Pakistan continues to lack.

### Theoretical Frameworks

There are various theoretical frameworks that can help us understand and explain the political economy of renewable energy policies in Pakistan. This review considers three primary interrelated theoretical frameworks, including path dependency, rent seeking and state capture, and energy justice.

Literature states that historical decisions often influence and limit future policy options by establishing embedded pathways that are challenging to change. **Path dependency theory** elucidates how initial policy and investment choices generate self-reinforcing effects that entrench specific developmental paths (Pierson, 2000). Pakistan's power sector has historically depended on large-scale fossil fuel and hydroelectric projects since the mid-20th century, resulting in institutional and technological growing returns that complicate policy changes (Salik, 2024). This has led to a carbon lock-in, wherein established generation infrastructure, knowledge, and laws sustain fossil-based systems even economically viable renewable alternatives exist (Unruh, 2000). This approach explains why, despite possessing huge RE potential, Pakistan has been slow in harnessing renewable resources (World Bank, 2024).

The powerful sources/entities often shape policies in their interest or for the prominent societal groupings. The political economy perspective on **rent-seeking and state capture** examines how influential entities exploit policies (state capture) to obtain economic advantages (rents) having no interest in public that such exploitation can affect them (Krueger, 2008; Tullock, 1967).

In Pakistan's energy sector, prolonged rent-seeking behaviour has skewed policy results and obstructed effective reforms. Inadequate institutions and ineffective administration have enabled politically affiliated individuals to get advantageous contracts and subsidies, obstructing the emergence of a competitive market (PIDE, 2021). Since the early 1990s, Pakistan has engaged Independent Power Producers (IPPs) with lucrative power purchase agreements that ensure substantial returns in US dollars, supported by sovereign guarantees (Mian, 2024).

The concept of energy justice provides a holistic understanding to the policy makers for analysing the effects of energy systems on individuals' lives while highlighting the significance of equal and equitable access. Jenkins et al. (2016) define **energy justice** as a complex, human-centred theoretical framework that confronts injustice and inequity within the energy sector. The authors further state that energy justice comprises three fundamental dimensions: distributional justice meaning who gets the energy resources, procedural justice meaning who decides (the decision-making authority in energy sector), and recognition justice meaning inclusion of diverse perspectives (whose voices are heard).

Applying the energy justice framework as explained above, the literature reveals substantial differences in Pakistan. In this context, the World Bank (2023) policy note "Achieving Sustainable Energy" explains that energy access and affordability in Pakistan are clearly inequitable which means that urban and wealthy consumers get access to more reliable power, whereas rural and low-income communities endure energy poverty and disproportionately face pollution and load-shedding. Historically, powerful groups have been obliged through favourable policies, such as providing electricity subsidies for large farmers' tube wells, whereas ignoring to facilitate the poor (World Bank, 2023). Jenkins et al. state that energy justice compliments the path dependency and rent-seeking approaches by incorporating people centred approach while valuing the voices of poor.

### **Political Economy Analysis**

Elite Capture and Rent-Seeking: The **high payments or charges** that government of Pakistan must pay to the IPPs to generate electricity even if not being used hinders the development of RE initiatives. Such payments show the presence of rent-seeking behaviour and are called capacity payments as stated in the report published in 2024 by Institute of Energy Economics and Financial Analysis (IEEFA). The report shows evidence that capacity payments to IPPs have reached to approximately PKR 2.1 trillion in 2024, which is a huge amount significantly limiting the budgetary allocations for renewable energy development. Moreover, this amount puts a massive burden on public and taxpayers as this must be paid even if electricity is not generated by the IPPs obliging the contract agreements (PRAC 2024). Therefore, these payments reduce the government's financial flexibility to invest in long-term infrastructure and renewable energy initiatives. Earlier, the 2020 report of the inquiry commission on IPPs by the government of Pakistan also provides evidence that capacity payments had reached up to PKR 900 billion and were anticipated to surpass PKR 1.4 trillion by FY 2024. However, this concern seems to be not considered seriously the capacity kept on increasing year by year more than it was projected.

Efforts to amend the IPPs contracts or implement competitive pricing have encountered significant opposition from influential interests. Analyses indicate that these dollars-indexed, high-return agreements for IPPs remain on high profits ignoring how the economic conditions of the country are, and negotiation attempts have encountered resistance from influential political and commercial elites having success to sustain most agreements (Waleed, 2024). This exemplifies traditional elite capture as policies, to support the public (such as reducing capacity fees), are challenging to implement because of few well-connected elites. Due to this, the government remains "entrenched in unsustainable energy expenses while consumers face high tariffs" (Waleed, 2024) demonstrating how rent-seeking by IPP and their benefactors adversely affects the economy.

The energy sector in Pakistan is also affected by the **political interference** that cause delays while disadvantaging RE investors compared to fossil fuel power companies. To ensure equitable pricing and unbiased regulation in energy sector, the National Electric Power Regulatory Authority (NEPRA) was established in Pakistan. However, its efficacy has been compromised by persistent political interference and regulatory control, and its autonomy was further diminished in 2016 when

government transferred NEPRA from the Cabinet Division to the Ministry of Energy (Shahab, 2019). This was done with the aim that NEPRA decisions, ideally to remain autonomous, should be aligned with government policies and therefore, allowing political interference to affect regulatory decisions while compromising transparency and accountability (Shahab, 2019).

Aized et al. (2021) and Malik et al. (2020) echo similar political interference in energy regulatory agencies. They contend that regulatory agencies like NEPRA hinders prompt tariff approvals and independent planning for RE expansion. This results in administrative delays, uncertainty and limited access to grid dispatch for the RE investors. On the other hand, these challenges are not faced by the fossil fuel investors. A more relevant example is the NEPRA interruption on feed-in tariff system in 2017. In response to political pressure to implement competitive bidding, NEPRA suspended new tariff approvals, causing the delay of several renewable projects in Sindh and Punjab provinces of Pakistan. The prolonged wait, spanning several years, discouraged investment and resulted in project cancellations (Aized et al.,2021). Such tactics exhibit the state capture and procedural injustice where state owned authority uses its power to benefit those that are politically powerful.

Another example of the elite capture in Pakistan is the ongoing marginalisation of decentralised RE systems, including rooftop solar, which challenges the centralised authority upheld by DISCOs. According to Ministry of Energy in Pakistan, the “DISCOs are state owned companies which are responsible for distribution of electricity to its consumers.” However, according to Naqvi (2022), these companies, politically connected, have opposed reforms that would enable customers to independently generate and sell electricity. This opposition is not only institutional inertia but signifies a profound path-dependent trajectory, wherein previous investments and policy decisions have solidified centralised power networks and impeded structural innovation.

Naqvi (2022) further explains that the hesitance of DISCOs to adopt decentralised renewable energy options has significantly hindered the growth of net metering, despite its official inception in 2015. This resistance is rooted in rent-seeking behaviour and state capture, when influential entities within the energy bureaucracy and associated business actors aim to maintain revenue sources and regulatory power by hindering consumer-driven energy alternatives. The World Bank (2024), while agreeing on this argument, highlights the perpetuating centralised monopolies that impedes the shift towards a more democratic energy sector. This is also an example of energy injustice where the advantages of renewable technology are limited or denied to consumers, particularly marginalised populations.

Furthermore, in context of discouraging net metering, one of the relevant examples is the growing concern highlighted in April 2024 by the Business Recorder, a leading financial newspaper, that the government was considering a reduction of the net metering buyback rate from PKR 21 to PKR 11 per unit. This move was presented as justified that DISCOs have financial constraints. However, stakeholders of clean energy perceived it as a hindrance to the adoption of rooftop solar. This resistance to support roof top solar users for net metering showed the elite dominance in Pakistan's energy sector (Business Recorder, 2024)

Donors/foreign funding: In Pakistan, the shift to renewable energy is also supported by **foreign funding and international donors**. The China-Pakistan Economic Corridor (CPEC) programme is one of such examples showing that how foreign funding influence the domestic energy sector in Pakistan. According to Rehman & Walker (2020), approximately two-thirds of CPEC's first energy resources were allocated to coal-fired power plants which resulted in the addition of approximately 5 GW from six new coal facilities by 2019 giving temporary relief from energy shortages in Pakistan. However, the coal-dependent portfolio has created route dependency, solidifying reliance on fossil fuels and establishing financial and institutional lock-ins, such as long-term power purchase agreements, capacity fees, and coal-oriented infrastructure while impeding innovation in RE sector in Pakistan (Rehman & Walker, 2020).

As noted in the above paragraph, inclination towards strengthening coal-fired plants affects country's climate and energy commitments, including Pakistan's Intended Nationally Determined Contributions (INDCs) under the Paris Agreement, which aims to reduce emissions by 20% below business-as-usual levels conditional to international support (GoP, 2016), and Pakistan's Alternative and Renewable Energy Policy 2019, which aims for 30% of electricity to be sourced from renewables by 2030 (GoP, 2019). Significant coal investment under CPEC compromises these commitments by "entrenching Pakistan in a fossil fuel-dependent energy future," hindering its capacity to achieve environmental ambitions (Shaikh, 2024). This illustrates path dependency in energy infrastructure, wherein early conditions influence long-term technological selections and carbon trajectories (Unruh, 2000).

**International donors' involvement** to support Pakistan's energy sector have been ineffective in achieving sustainable reform, as technocratic solutions did not challenge bad governance and political interference, particularly if the overall donors support is assessed with the lens of rent-seeking and state capture. Nepal et al. (2022) present critical analysis of initiatives by the World Bank and the Asian Development Bank (ADB), emphasising that these institutions generally prioritise technocratic reforms that include provision of technical cost-reflective tariffs, training on smart metering systems and initiatives related to privatization targeting DISCOs. Moreover, the authors critique that despite donors aim to improve financial efficiency and sustainability, these donor-driven programs frequently neglect Pakistan's more profound governance issues.

To be more specific, Donor-driven reforms typically emphasise technical solutions and institutional restructuring, such as unbundling utilities or establishing independent regulators, while frequently neglecting local political contexts (Naqvi, 2016). Ullah et al. (2017) echo similar issue and observe that Pakistan's electricity reforms were compromised by inadequate governance and elite interests, insufficient local and provincial support, and a regulator devoid of genuine autonomy. In summary, donor-driven reforms in Pakistan unintentionally failed to tackle the underlying political economy challenges (Naqvi, 2016).

Provincial asymmetries and policy volatility: The RE policies framework in Pakistan has considerable **provincial disparities** as far as governance and autonomies are concerned, along with substantial policy instability that erodes investor trust. The 18<sup>th</sup> Amendment to the Constitution of Pakistan, which was enacted in 2010, has substantially reformed the nation's governance by decentralising authority from the federal government to the provinces and eliminating the President's unilateral power to dissolve parliament, thereby transitioning Pakistan towards a parliamentary republic (Abbas, 2023). The constitution authorises provinces to take independent decisions related to RE initiatives, however, lack of institutional capacities and political willingness have caused fragmented progress (Elahi et al., 2024).

Considering the autonomy that 18<sup>th</sup> constitution provides, Khyber Pakhtunkhwa (KPK) and Sindh provinces of Pakistan have demonstrated political commitment to commence renewable projects at the sub-national level, and Sindh even adopted its own incentive policy in 2015; however, these endeavours have been impeded by the **federal government's control over tariffs and grid infrastructure** (Heinrich Boll Foundation, 2017). This shows volatility of energy policy at the national level showing irrational control of Federal government after the 18<sup>th</sup> amendment constitution because provinces are not authorised in real terms. This situation also undermines investors' confidence in Pakistan's, particularly in provinces with high potential for creating RE projects, because abrupt policy changes and reversals has generated an erratic investment environment (Yar et al., 2022).

Various literature and researchers echo the above that Pakistan's energy policies exhibit "policy inconsistency, implementation deficiencies, and a lack of cohesive energy planning" (Mirjat et al.,

2017). More focus is on short-term solutions in the energy sector, instead of a consistent long-term policy with successive administrations, resulting in fluctuating support for renewable energy. In 2010, the government implemented appealing upfront feed-in tariffs to stimulate renewable investment, however, abruptly discontinued the feed-in tariff system in 2016 (Elahi et al., 2024; IEEFA, 2023). The sudden policy shift, coupled with protracted delays in auction proceedings, resulted in a "policy vacuum" that significantly undermined investors' confidence as well as impeded the efforts for around 7 GW of anticipated wind and solar projects (IEEFA, 2023). Moreover, the policy volatility - sudden reversals while getting back from the generous incentives in policies - have put the country in credibility problems which discourage the investors, as they need long-term commitments and sustainable policies to invest in RE project (Elahi et al., 2024).

The Federal government attitude as explained above reflects political economy processes that are not supporting the poor. Looking this with the lens of theoretical frameworks, rent seeking (state capture) is especially apparent here. The energy sector in Pakistan has historically been controlled by powerful and well-established interests/elites, including the IPPs who are linked to fuel suppliers, leading to what experts describe as extractive institutions that favour elite benefits over the public good (Waleed, 2024). Moreover, the short-term approach for the immediate political gains has minimum interest in sustainable policies creating a pendulum of reforms and pushback situation (Xin et al., 2022).

### **Conclusion and future directions**

The review explains in detail that the transition to renewable energy in Pakistan is not only a technical transformation but also a significant political economy problem. Despite, significant economic and environmental motivations, the energy sector in Pakistan has faced many challenges for years, including limited sources of energy, supply shortages, and inefficiency. Moreover, the structural and financial limitations are also major concerns in the country due to which the energy sector does not innovate and flourish in transition to RE at large scale is not happening.

Historical decisions, including fossil fuel infrastructure, long-term power purchase agreements with IPPs, and subsidy frameworks, have established profound path dependencies that constrain policy flexibility. These structural lock-ins are exacerbated by rent-seeking behaviour and elite capture, wherein influential actors manipulate energy policy to safeguard their interests to the detriment of reform. Donor-driven interventions, despite their good intentions, frequently prioritise technical solutions over the political factors contributing to inefficiency, rendering them inadequate for sustainable transformation.

The RE policies framework in Pakistan has considerable provincial disparities. Lack of close coordination and disunity between federal and provincial authorities further undermines the efforts, especially in areas like as Balochistan province, which possess significant renewable potential yet face institutional and fiscal limitations. Failure to address these provincial disparities may further exacerbate regional inequality in Pakistan.

Nevertheless, significant potential for reform exists in Pakistan, particularly in renewables. Growing public awareness regarding climate change and energy affordability (net metering) indicate a transformation in both demand and supply side within energy sector. Provincial governments have been taking initiatives for RE development, presenting localised frameworks for the implementation of clean energy. However, there is limited empirical research to show the actual implementation procedures of renewable energy policies at the sub-national level, especially in marginalised provinces such as Balochistan. Many studies concentrate on federal dynamics or overarching political obstacles, neglecting the impact of local institutional capacity, political intent, and regional inequalities on outcomes.

Donor contributions are acknowledged at all levels in the energy sector, however, there is lack of proper study/research to assess the distinct ways various donors (e.g., World Bank, ADB, China)

influence policy decisions through technical assistance, financial instruments, or geopolitical affiliations. Therefore, there is a need of proper research on this matter.

For the future research, provincial-level case studies should be focused to evaluate the practical implementation of renewable energy projects, encompassing the involvement of provincial energy departments, local elites, and civil society participants. In addition, comparative political economy analyses should be conducted to investigate how Pakistan's energy transition aligns with those of other countries of global south. Moreover, increased emphasis must be placed on energy justice, particularly on the incorporation of gender, rural areas, and minority perspectives in energy planning. These directives may assist in reconceptualising renewable energy not merely as a climate or economic concern, but as a matter of fairness, governance, and accountability. Investor confidence can only be restored through inclusive and accountable government.

In preparing this review, lack of updated peer reviewed data was found as major limitation and therefore, it is mixture of old peer-reviewed data and updated grey literature.]

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