



**SDPI**  
Sustainable Development Policy Institute

**SUSTAINABLE DEVELOPMENT POLICY INSTITUTE**  
Islamabad, Pakistan

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# Pakistan's Energy Economics Geopolitical Oil Shock of 2026

*A Seven-Theorem Diagnosis of Structural Failure and a Reform Architecture for Energy Sovereignty*



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# Abbreviations & Acronyms

<b>APTMA</b>	All Pakistan Textile Mills Association	<b>LCOE</b>	Levelised Cost of Electricity
<b>BoP</b>	Balance of Payments	<b>LNG / RLNG</b>	Liquefied / Re-gasified Liquefied Natural Gas
<b>CD</b>	Circular Debt	<b>MMBtu</b>	Million Metric British Thermal Units
<b>CERC</b>	Central Electricity Regulatory Commission (India)	<b>MW / GW</b>	Megawatt / Gigawatt
<b>CPPA-G</b>	Central Power Purchasing Agency (Guaranteed)	<b>NEPRA</b>	National Electric Power Regulatory Authority
<b>CPP</b>	Capacity Purchase Price	<b>NTDC</b>	National Transmission & Despatch Company
<b>DISCO</b>	Distribution Company (Pakistan)	<b>OGRA</b>	Oil & Gas Regulatory Authority
<b>DSS</b>	Debt Servicing Surcharge	<b>PPA</b>	Power Purchase Agreement
<b>FCA / QTA</b>	Fuel Cost Adjustment / Quarterly Tariff Adjustment	<b>PLAC</b>	Part Load Adjustment Charges
<b>GWh / TWh</b>	Gigawatt-hour / Terawatt-hour	<b>SBP</b>	State Bank of Pakistan
<b>IEA</b>	International Energy Agency	<b>SDPI</b>	Sustainable Development Policy Institute
<b>IPP</b>	Independent Power Producer	<b>SoIR</b>	State of Industry Report (NEPRA)
<b>ICSID</b>	International Centre for Settlement of Investment Disputes	<b>SPR</b>	Strategic Petroleum Reserve

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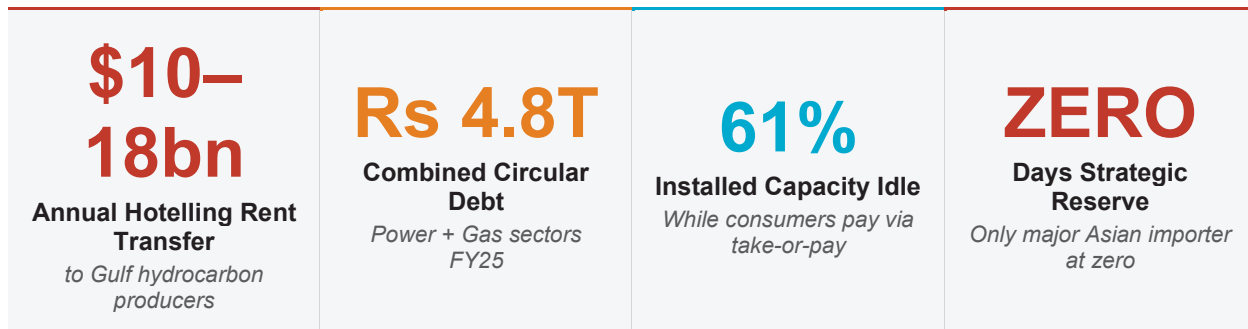
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## 01 EXECUTIVE SUMMARY

# Pakistan's Seven Structural Failures, Compressed into One Acute Crisis



The energy crisis of March 2026 is not an exogenous shock striking an otherwise functional system. It is the simultaneous activation of seven deeply embedded structural failures, each mappable to a canonical problem in energy economics literature, that the US-Iran war and the Strait of Hormuz closure have compressed into a single acute episode. Operation Epic Fury, the US-Israel strike on Iranian nuclear and military infrastructure that commenced on 28 February 2026, has done what decades of policy critique could not: it has made Pakistan's structural vulnerability undeniable, fiscally quantifiable, and politically unavoidable. The question before policymakers is whether this moment produces genuine institutional transformation or whether it becomes yet another wasted crisis absorbed through demand suppression, IMF conditionality, and the slow passage of time.

The compound verdict is stark. Pakistan pays an estimated \$10 to 18 billion annually in Hotelling resource rents to Gulf hydrocarbon producers, a pure capital transfer generating zero domestic return. It carries combined power and gas sector circular debt exceeding Rs 4.8 trillion, accumulated not through fiscal accident but through deliberate suppression of price signals that generated liabilities too large for the annual budget to absorb. It operates 61 percent of its installed generation capacity in idle mode while consumers pay for it through take-or-pay contracts that have no parallel in any comparable energy market. And it has failed to build a single day of strategic petroleum reserve, an omission without precedent among major Asian energy importers.

The seven theoretical failures identified in this brief are not independent pathologies. They form an interlocking system of compound dysfunction in which each failure amplifies the others. Hotelling rents bleed the current account, reducing the fiscal space needed to build the public goods that Samuelson-Olson theory prescribes. Arthur-Unruh institutional lock-in sustains the IPP take-or-pay architecture that prevents the renewable substitution Hotelling economics demands. Stiglitz-Weiss credit rationing taxes every renewable investment at 500 to 900 basis points above regional peers, slowing the transition that Grubb-Pindyck option value theory now makes economically compelling. And Thirlwall's balance-of-payments growth ceiling tightens with every cycle of fossil fuel import expansion, reducing the sustainable growth corridor precisely when Pakistan most needs room to invest in structural transformation.

**GEOPOLITICAL CONTEXT: OPERATION EPIC FURY**

The US-Israel strike on Iran (28 February 2026) triggered the most consequential energy supply disruption since the 1973 Arab oil embargo. The Strait of Hormuz, through which 20 million barrels of oil and significant LNG volumes transit daily, was effectively closed to commercial shipping. Pakistan, importing over 80% of its oil needs and sourcing 99% of its LNG from Qatar and the UAE through this chokepoint, faced not a partial supply disruption but a near-total severance of its primary energy supply chain. The macro-financial consequences, petrol prices rising 20.7%, LNG spot prices surging 50–65%, QatarEnergy declaring force majeure, and the current account facing \$5–7bn in annualised additional stress, represent a structural test of Pakistan's energy governance whose results are now visible in their full severity.

**Short-Term Reforms (0–6 Months): Crisis Triage**

The immediate imperative is crisis containment without compounding the institutional failures that produced the crisis. Fuel allocation must be tiered by economic priority, agriculture first, then freight, then industry, then personal vehicles, since transport accounts for approximately 80 percent of petroleum consumption and blanket austerity measures address the wrong 20 percent. Emergency LNG spot procurement must be activated from Atlantic Basin suppliers including the US Gulf Coast and West Africa, on Hormuz-independent Cape of Good Hope routing, to substitute for the QatarEnergy force majeure. The petroleum levy must be restructured to allow full cost pass-through to consumers above the bottom two income quintiles, with targeted cash transfers protecting vulnerable households, avoiding the suppression of price signals that historically generated circular debt at source. SBP bilateral swap lines with Saudi Arabia, the UAE, and China must be activated immediately to pre-empt rupee pressure before imported inflation compounds the current account deterioration. Rooftop solar and battery storage deployment must be accelerated through the removal of NEPRA net-metering caps, since every megawatt of behind-the-meter solar installed during the crisis period directly reduces LNG spot purchase requirements.

**Medium-Term Reforms (6 Months–3 Years): Structural Diversification**

The structural diversification imperative requires that Pakistan fundamentally redesign its energy supply chain architecture so that no single chokepoint, whether the Strait of Hormuz, Qatar's LNG terminals, or a single IPP contractor, can again replicate the March 2026 shock. LNG procurement must be diversified across US Sabine Pass, Australian, and East African suppliers on Hormuz-independent routing, reducing Qatar's share from 99 percent to below 40 percent of imports. A sovereign energy security fund, capitalised through a ring-fenced petroleum levy, must establish a 30-day strategic petroleum reserve by 2028, extending to 60 days by 2032 and financed through AIIB and IsDB energy security windows. The IPP take-or-pay contractual architecture must be replaced with competitive Contracts for Difference auctions on the UK model, directly addressing the Arthur-Unruh lock-in that currently forces consumers to pay for 61 percent idle capacity. Critically, the US-Iran conflict has altered the geopolitical calculus around TAPI pipeline diplomacy and Article 6.2 ITMO bilateral agreements, both of which must be advanced with renewed urgency.

**Long-Term Reforms (3–15 Years): Energy Sovereignty**

The long-run objective is energy sovereignty, defined as the structural elimination of Pakistan's dependence on imported hydrocarbons as the binding constraint on economic growth. A legally binding 60 percent renewable electricity target by 2035 must be established with enforcement mechanisms, not aspirational policy statements. An independent regulatory authority modelled on India's CERC, with genuine statutory independence and binding dispute resolution powers, must be created to eliminate the Stiglitz-Weiss premium that currently prices renewable energy finance at 14 to 17 percent annually. Domestic manufacturing of solar panels, wind components, and Sodium-ion battery cells, using Pakistan's indigenous mineral resource base to eliminate lithium import dependency entirely, converts the energy transition from a source of import pressure

into a source of industrial value creation. A 30 percent reduction in the income elasticity of energy imports, achievable through this reform architecture in full, would expand Pakistan's sustainable growth rate by an estimated 1.5 to 2 percentage points without any deterioration in the balance of payments, permanently relaxing the Thirlwall constraint that has defined the ceiling of Pakistan's economic development for three decades.

## 02 THE CRISIS SNAPSHOT

# What the Hormuz Closure Did to Pakistan

*A quantitative baseline of the immediate supply shock and its transmission into Pakistan's economy, the empirical foundation upon which the seven-theorem diagnosis rests.*

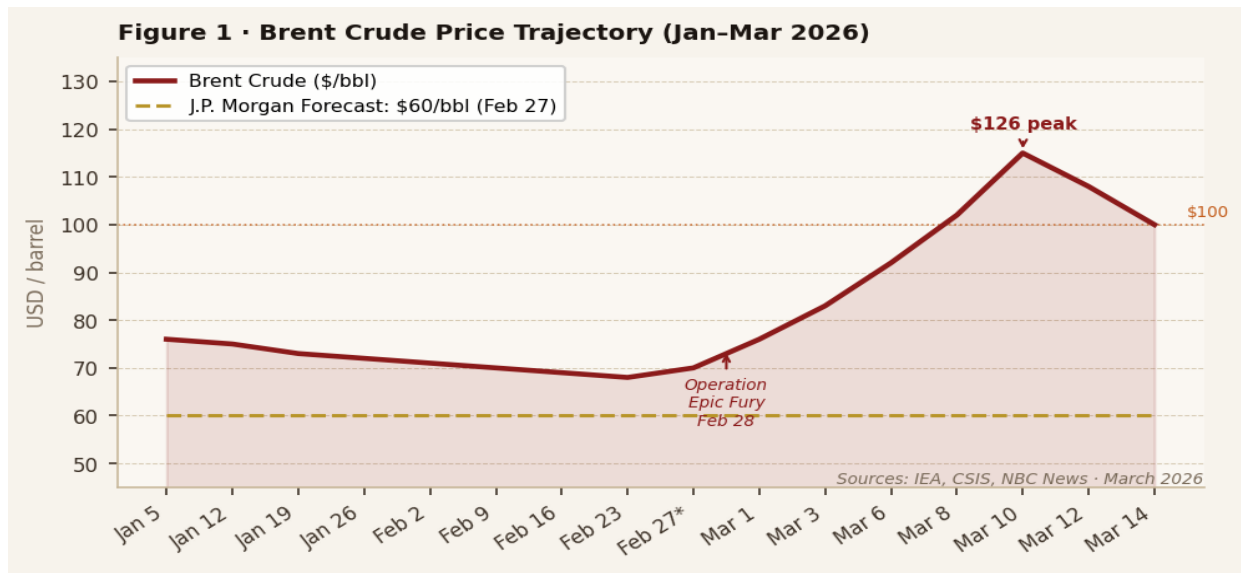


Figure 1 · Brent Crude Price Trajectory (January–March 2026): From J.P. Morgan's \$60/bbl consensus forecast to historic supply disruption following Operation Epic Fury (28 February 2026).

Operation Epic Fury, the US-Israel strike on Iran that commenced on 28 February 2026, triggered an immediate and cascading energy supply shock that struck Pakistan with particular severity. Within days of the strikes, the closure of the Strait of Hormuz, through which approximately 20 million barrels of oil and significant volumes of LNG transit daily, transformed a distant geopolitical development into a direct fiscal emergency for a country that imports over 80 percent of its oil needs and sources nearly all of its LNG from Qatar via this chokepoint. The speed and scale of the shock were without modern precedent in Pakistan's post-liberalisation energy history. Within a single trading week, petrol rose 20.7 percent while diesel surged 22 percent, the largest single fuel price increase in Pakistan's recorded history. LNG spot prices on the Japan-Korea Marker benchmark jumped between 50 and 65 percent. More critically, QatarEnergy declared force majeure on all exports following Iranian drone strikes on the Ras Laffan industrial complex. Since Qatar and the UAE together account for 99 percent of Pakistan's LNG imports, the supply disruption was effectively total rather than partial.

The real-economy consequences compounded with alarming speed. Agritech Fertilizer, operating on Sui Northern's RLNG supply, shut down under force majeure on 4 March 2026, raising immediate concerns about fertilizer availability ahead of the Kharif sowing season, a second-order agricultural shock with distributional consequences that could outlast the conflict itself. RLNG accounts for 17.48 percent of total electricity generation, a share that became a critical vulnerability overnight. The current account, already under IMF programme pressure, faces an additional annualised stress of approximately \$1.5 to 2 billion for every \$10 increase in oil prices, at the crisis peak of \$100-plus Brent, the total annualised shock amounts to \$5 to 7 billion, equivalent to approximately two percent of GDP and two to three IMF programme tranches. Saudi Arabia agreed to reroute crude shipments via the Yanbu Red Sea terminal, providing a partial bypass at higher freight costs and with volumes insufficient to replace the full Hormuz-dependent supply chain.

**Table 1 · Immediate Shock Transmission: How the Hormuz Closure Hit Pakistan's Economy**

Channel	Pre-Crisis	Post-Crisis Impact	Change	Severity
<b>Petrol Price (Rs/litre)</b>	~290	~350	+20.7%	<b>Critical</b>
<b>Diesel Price (Rs/litre)</b>	~295	~360	+22.0%	<b>Critical</b>
<b>LNG Spot Price (\$/MMBtu)</b>	~\$9–10	~\$15 (JKM)	+50–65%	<b>Critical</b>
<b>Qatar LNG Supply</b>	~99% of imports	Force Majeure declared	Supply severed	<b>Critical</b>
<b>Agritech Fertilizer Output</b>	Operating	Shutdown Mar 4	100% halt	<b>Critical</b>
<b>Current Account Pressure</b>	Baseline	+\$5–7bn annualised	\$1.5–2bn per \$10 oil	<b>Critical</b>
<b>RLNG Electricity Share (FY25)</b>	17.48% of output	Supply-constrained	Load-shedding risk	<b>High</b>
<b>Installed Capacity (SoIR 2025)</b>	41,121 MW	Peak demand ~33,000 MW	8,121 MW surplus	<b>High</b>
<b>Saudi Oil: Yanbu Red Sea bypass</b>	Hormuz route	Partially activated	+freight cost	<b>High</b>
<b>Kharif Sowing Season</b>	Normal supply	Fertilizer shortfall	Second-order shock	<b>High</b>

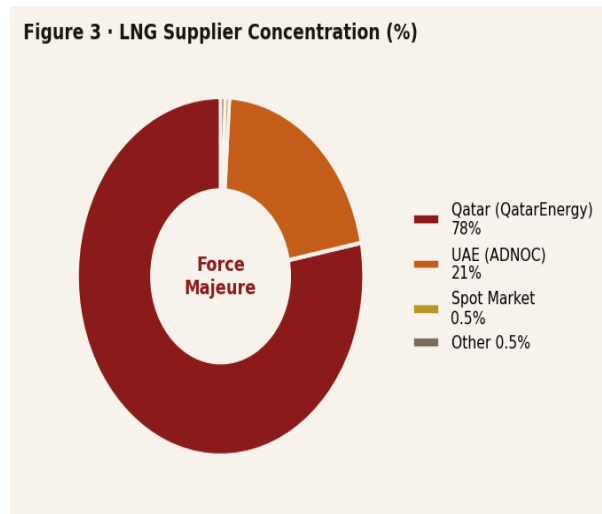
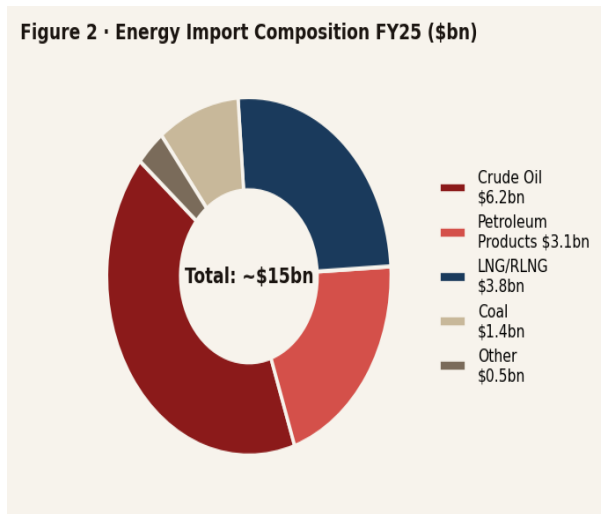


Figure 2 (left) · Pakistan Energy Import Composition FY25 (\$bn total ~\$15bn) | Figure 3 (right) · LNG Supplier Concentration: Qatar's 78% monopoly exposed by Force Majeure

### 03 THE SEVEN-THEOREM DIAGNOSIS

## Structural Failures Laid Bare

Each of Pakistan's energy sector pathologies is mapped onto its canonical theoretical framework from the energy economics and political economy literature, then grounded in empirical data from NEPRA's State of Industry Report 2025 and post-conflict market data from March 2026.

| · Hotelling (1931) · Resource Rent Economics

### The Hotelling Rent Trap: Pakistan as a Permanent Price-Taking Vassal

Hotelling's Rule holds that the price of an exhaustible resource must rise at the rate of interest in competitive equilibrium, with the scarcity rent accruing entirely to the resource owner. Pakistan, importing 80-plus percent of its oil needs, is the textbook price-taking counterparty in this rent extraction relationship. With Saudi Aramco's marginal extraction cost below \$3 per barrel and Brent above \$100, every barrel Pakistan imports carries a Hotelling rent of \$97-plus, a pure transfer from Pakistan's productive capital to Gulf sovereign wealth that generates zero domestic return. The US-Iran war has added a second layer to this rent calculus: the chokepoint rent, generated not by classical depletion dynamics but by geographic monopoly over transit infrastructure. With bypass capacity at only 3 mb/d against 20 mb/d of halted Gulf exports, 85 percent of volumes remain stranded, making the effective chokepoint rent infinite for countries like Pakistan with no bypass optionality.

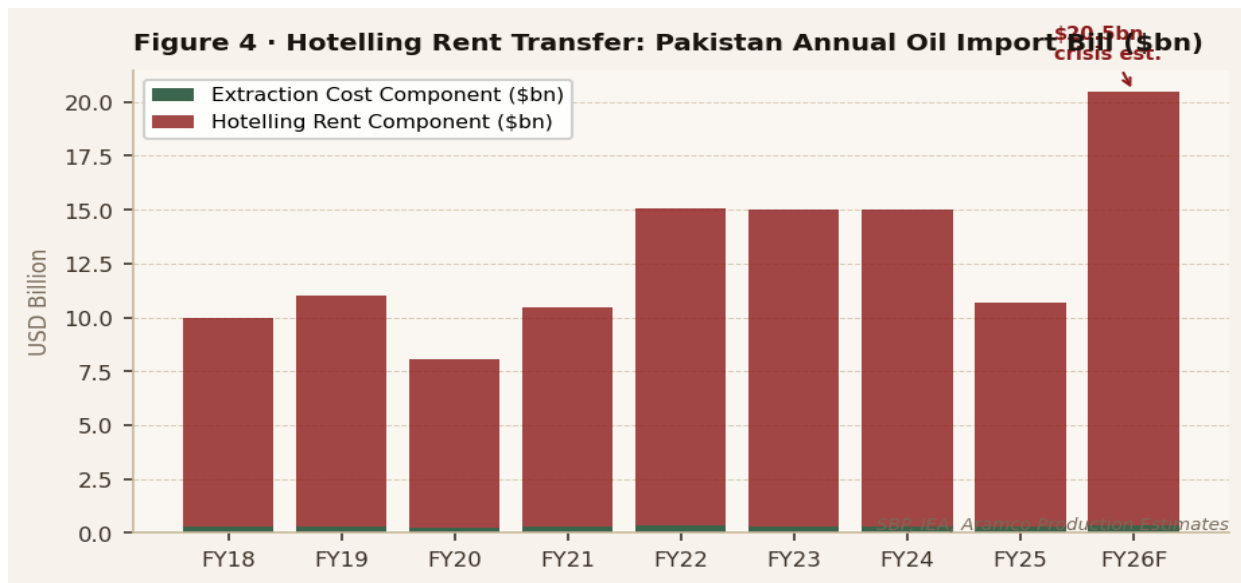


Figure 4 · Hotelling Rent Transfer: Pakistan Annual Oil Import Bill (\$bn) with extraction cost and pure rent components. FY26F projection assumes \$100 average Brent for H1 2026.

#### KEY DATA · NEPRA SOIR 2025 + IEA MARCH 2026

Oil imports July 2025–February 2026: \$10.71bn (pre-crisis). At \$100+ Brent, annualised Hotelling rent transfer expanded by an estimated \$5–7bn above baseline, equivalent to ~1.5–2% of GDP in pure value transfer.

Installed capacity fell to 41,121 MW (SoIR 2025) with Capacity Purchase Price averaging Rs 14.21/unit, accounting for 82% of the consumer electricity bill.

The Yanbu Red Sea bypass provides at most 3 mb/d of Saudi crude on Hormuz-independent routing, insufficient to replace the ~8–10 mb/d that Pakistan's supply chain requires from Gulf sources.

**POLICY PRESCRIPTION**

The only durable escape from the Hotelling rent trap is substituting exhaustible imported hydrocarbons, which carry rent, with domestic renewable resources, which carry none. Solar irradiance is not subject to Hotelling depletion dynamics. Every MWh of renewable electricity displacing imported LNG is, in Hotelling's framework, a permanent reduction in Pakistan's rent transfer obligation. The geopolitical shock of 2026 makes this the deepest economic case for renewables, not climate, but rent elimination. At \$100+/bbl Brent, the internal rate of return on any credible renewable substitution investment has crossed the threshold at which delay is more costly than action.

II · Prebisch (1950) · Singer (1950) · Terms of Trade Economics

**The Prebisch-Singer Double Squeeze: Export Competitiveness Eroded by the Same Shock**

The Prebisch-Singer hypothesis predicts secular terms-of-trade deterioration for primary commodity exporters. Pakistan experiences an inverted and more damaging variant: as a manufacturer-exporter and energy-importer, oil price spikes simultaneously inflate its import bill and degrade its export competitiveness through higher industrial production costs. Both sides of the trade account deteriorate together, a double squeeze the original hypothesis did not anticipate in this form. The transmission channel is direct: RLNG alone constituted 51 percent of the total energy purchase bill (PKR 568 billion) in FY25, flowing directly into electricity tariffs paid by Pakistan's textile and export manufacturing sectors which account for approximately 60 percent of total export earnings. The March 2026 crisis has intensified this squeeze by an order of magnitude: at crisis-period LNG prices of \$15 per MMBtu, the electricity cost embedded in every kilogram of exported textile now prices Pakistani industry further from its Bangladeshi and Vietnamese competitors than at any point in the post-2015 period.

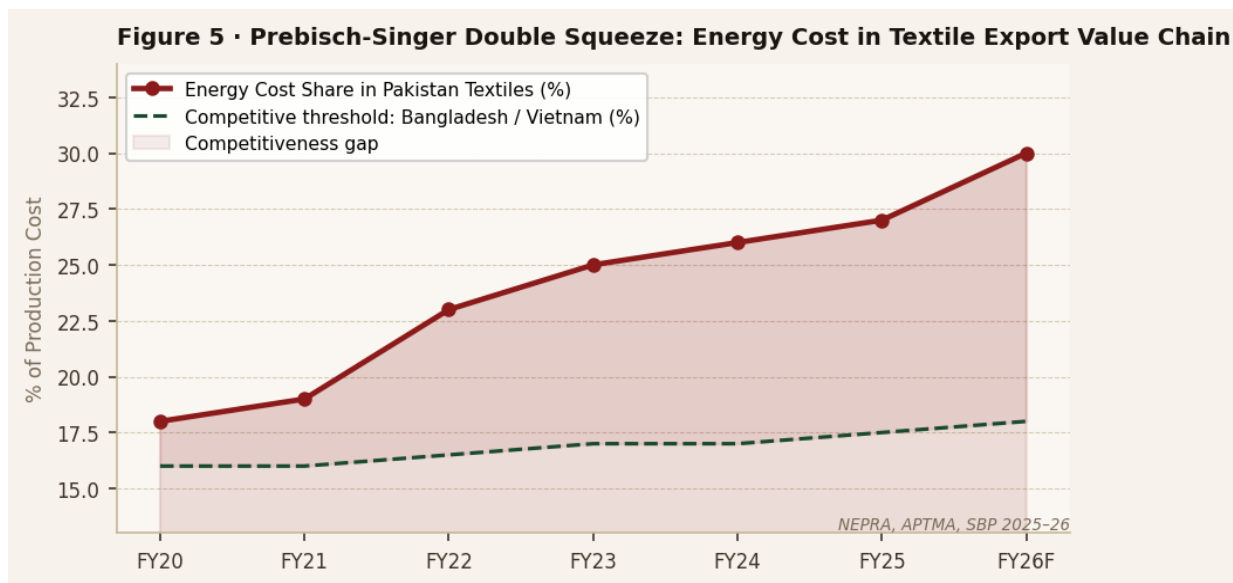


Figure 5 · Prebisch-Singer Double Squeeze: Energy cost share in textile export value chain (FY20–FY26F) versus competitive threshold of Bangladesh/Vietnam.

#### KEY DATA · NEPRA SOIR 2025

Domestic crude production has fallen 25% over the past decade; domestic gas output continues declining. In FY25, coal + gas + RLNG combined = ~46% of total generation at an average fuel cost of Rs 16.5/unit vs. system average Rs 8.6/unit.

Average consumer tariff reached Rs 35.5/kWh, a 200% increase since 2012, far outpacing GDP per capita growth of 51% over the same period.

APTMA estimates the energy cost share in textile export production has risen from ~18% in FY20 to ~27% in FY25, approaching the threshold at which production relocation to Vietnam or Bangladesh becomes economically rational.

#### POLICY PRESCRIPTION

Reduce the energy intensity of manufactured exports through industrial energy efficiency programmes, combined heat-and-power systems in the textile sector, and accelerated conversion of industrial thermal processes from gas to renewable electricity. This decouples export production costs from global fossil fuel price cycles, a competitiveness agenda, not a climate agenda. The US-Iran conflict has made the urgency of this decoupling existential rather than strategic: at current LNG prices, Pakistan's textile export competitiveness is being eroded at a rate that cannot be sustained through the duration of the conflict.

III · Samuelson (1954) · Olson (1965) · Public Goods & Collective Action

## The Samuelson-Olson Public Goods Failure: Why Pakistan Cannot Self-Insure

National energy security satisfies Samuelson's public goods criteria perfectly: its benefits are non-excludable and non-rival. The private market will therefore structurally underprovide it. Pakistan's failure to build strategic petroleum reserves is the most consequential expression of this failure, costing billions in crisis-period import price spikes that a 60-day reserve would have substantially cushioned. The March 2026 crisis has quantified this failure with precision: the IEA released a record 400 million barrels from member-country strategic reserves to counter the Hormuz disruption. Pakistan had no access to this collective mechanism, having failed to build either the reserves or the institutional membership that would have entitled it to participate. Olson's collective action dynamic explains the political persistence of this failure: the diffuse, long-term beneficiaries of energy security infrastructure have no organised political voice, while the concentrated, short-term beneficiaries of the resources that would otherwise fund it, electricity subsidies, IPP capacity payment commitments, circular debt financing, have very effective lobbying power. This dynamic has reproduced itself across five governments without interruption.

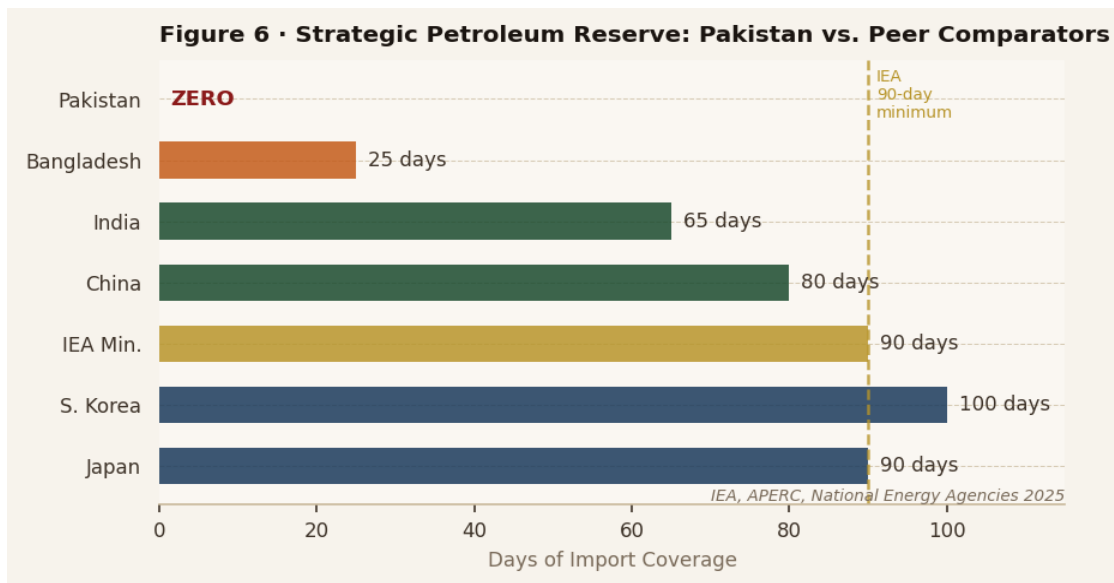


Figure 6 · Strategic Petroleum Reserve Comparison: Pakistan vs. peer Asian energy importers. Pakistan is the only major Asian importer with zero formalised reserve.

**KEY DATA · NEPRA SOIR 2025 + IEA**

Japan: 90 days · South Korea: 100 days · IEA average: 90 days · India: 67 days · Pakistan: ZERO.  
 IEA released a record 400 million barrels to counter the Hormuz disruption, Pakistan had no access to this collective mechanism.  
 Even after retiring 2,829 MW of inefficient capacity, installed capacity of 41,121 MW exceeded peak demand of ~33,000 MW by 8,121 MW, consumers paying for 24% surplus under take-or-pay while zero strategic reserve exists.  
 A 30-day petroleum reserve at pre-crisis prices would have cost approximately \$3.5bn, roughly half the additional current account stress generated in a single month of the Hormuz closure.

**POLICY PRESCRIPTION**

Establish a sovereign energy security fund capitalised through a small, ring-fenced levy on all petroleum and gas consumption, removing the reserve-building decision from the annual political budget process where Olsonian concentrated interests always prevail. Target: 30-day petroleum reserve (Phase 1, 2028), 60-day (Phase 2, 2032). Finance through AIIB and IsDB energy security windows. Simultaneously pursue accession to IEA Associate Member status, which would provide access to the collective reserve release mechanism that proved critical during the March 2026 crisis.

**IV · Arthur (1989) · Unruh (2000) · Path Dependency & Carbon Lock-In**

**The Arthur-Unruh Carbon Lock-In: The Institutional Ecosystem Reproducing Fossil Dependency**

Brian Arthur's increasing returns theory and Gregory Unruh's carbon lock-in thesis explain why Pakistan's energy sector has not reformed despite universal recognition that it must. The lock-in is not technological, Pakistan has added approximately 18 GW of rooftop solar on grid and off-grid, demonstrating that consumers and markets are ready for the transition. The lock-in is institutional: OGRA, NEPRA, PSO, SSGC, DISCOs, and the IPP contractual architecture have all co-evolved around fossil fuel procurement, creating a techno-institutional complex that actively resists renewable substitution. The IPP PPA structure is the concentrated

expression of this lock-in: dollar-indexed capacity payments, guaranteed off-take obligations, and fixed return-on-equity structures calibrated for fossil fuel plants actively discriminate against renewables. The US-Iran war has made the cost of this lock-in visible in a single quarter: per NEPRA SoIR 2025, thermal and nuclear plants in the CPPA-G system averaged a utilisation factor of just 38.82 percent, with consumers paying a Capacity Purchase Price of Rs 14.21 per unit, 82 percent of their electricity bill, for this idle capacity at precisely the moment when that capacity's fossil fuel supply chain was severed.

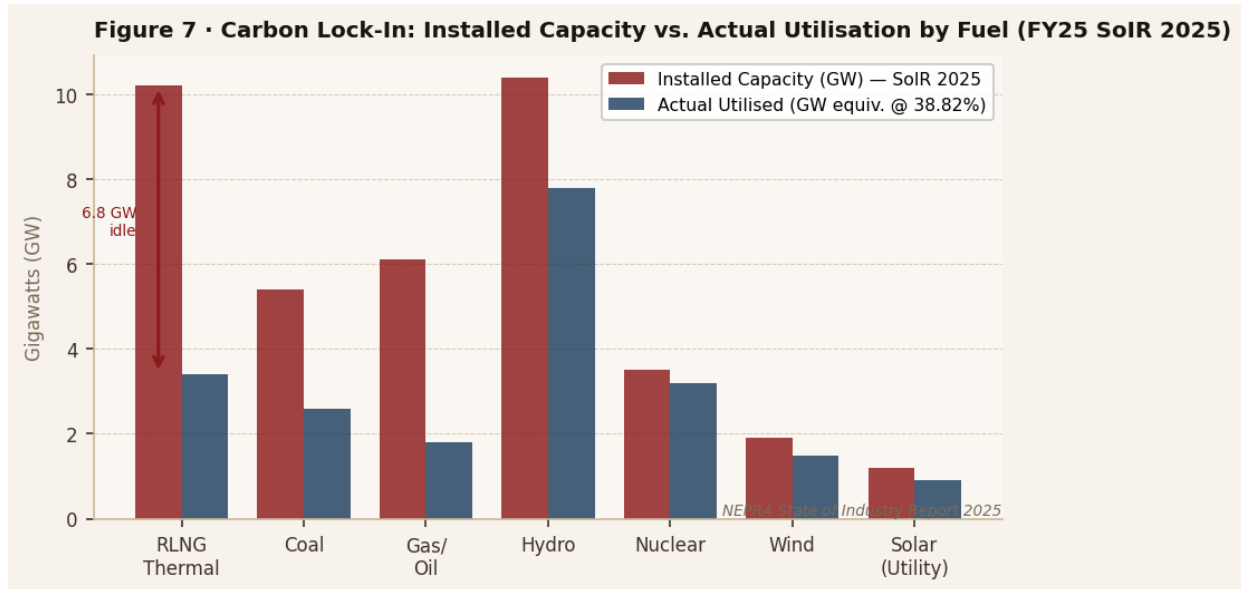


Figure 7 · Carbon Lock-In: Installed Capacity vs. Actual Utilisation by Fuel Type (FY25, NEPRA SoIR 2025). The gap between bars represents idle capacity that consumers still pay for through take-or-pay obligations.

**KEY DATA · NEPRA SOIR 2025**

Installed capacity: 41,121 MW (30 June 2025), down from 45,888 MW after retirement of 2,829 MW of take-or-pay contracts (saving ~Rs 900bn).

Thermal + nuclear utilisation: 38.82% in CPPA-G system. Peak demand: ~33,000 MW.

Capacity Purchase Price: Rs 14.21/unit = 82% of consumer electricity bill.

PLAC penalties: Rs 46.4bn. NPMV costs: Rs 13.3bn. Q1 FY26 capacity payments: ~Rs 500bn/quarter.

The 2,829 MW retirement template, saving Rs 900bn, must be extended across the remaining idle thermal fleet.

**POLICY PRESCRIPTION**

Escaping lock-in requires coordinated redesign of the entire techno-institutional complex: replace negotiated PPAs with competitive Contracts for Difference auction mechanisms (UK model); redesign merit-order dispatch to eliminate must-run obligations for fossil fuel plants; restructure NEPRA's regulatory framework around renewable energy cost characteristics. Near-term: cancel or renegotiate remaining take-or-pay contracts, SoIR 2025 confirms 2,829 MW already terminated, saving Rs 900bn. This template must be extended to the full idle thermal fleet. The crisis economics of March 2026, with 8,121 MW of surplus capacity sitting unused while LNG supply was severed, have made the political case for this reform self-evidently compelling.

V · Grubb (2014) · Pindyck (1991) · Option Value & Investment Under Irreversibility

**The Grubb-Pindyck Option Value Inversion: Why \$100+ Oil Should Trigger Irreversible Renewable Commitments**

Pindyck's real options theory holds that irreversible investment under uncertainty carries a positive option value to waiting. However, this argument inverts when the cost of remaining in the current technological trajectory is itself rising and becoming increasingly certain. At \$100-plus oil, the opportunity cost of remaining fossil-fuel-dependent compounds every year. Grubb's three-domain framework shows Pakistan's crisis response is almost entirely confined to the satisficing domain, demand compression, without action in the investment or systems domains where structural transformation originates. The LCOE differential has now crossed a threshold that makes this argument irreversible: utility-scale solar in Pakistan is deliverable at below \$40 per MWh, while RLNG generation at crisis-period spot prices of \$15 per MMBtu exceeds \$155 per MWh, a four-fold disadvantage that makes continued fossil fuel dependency not merely strategically risky but fiscally indefensible. The Grubb-Pindyck inversion in Pakistan's case is now total: waiting is demonstrably more costly than acting, by a margin that no future LNG price recovery can reverse, because the solar economics are driven by manufacturing learning curves, not commodity cycles.

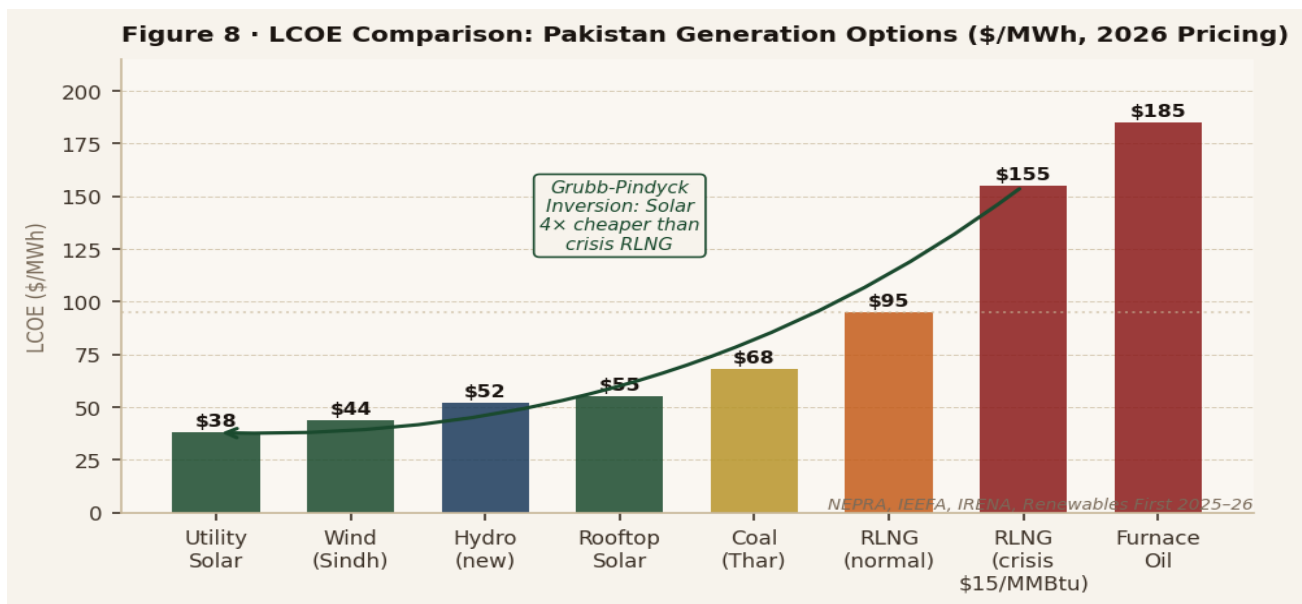


Figure 8 · LCOE Comparison: Pakistan Generation Options (\$/MWh, 2026 Pricing). The Grubb-Pindyck inversion made visible, utility solar at \$38/MWh vs. crisis RLNG at \$155/MWh.

**KEY DATA · NEPRA SOIR 2025 + IRENA 2026**

LCOE of utility-scale solar in Pakistan: below \$40/MWh. LCOE of RLNG generation at crisis LNG prices (\$15/MMBtu): above \$155/MWh, a 4x disadvantage.

Average generation cost FY25: Rs 8.6/kWh (down 2% YoY) but imported fuel sources averaged Rs 16.5/unit.

Chinese panel prices fell 73% from \$0.38/watt in 2017 to \$0.10/watt by 2025, the learning curve trajectory that makes the Grubb-Pindyck inversion permanent.

The investment economics have inverted decisively. The barrier is now entirely in Grubb's third domain: systems change, regulatory frameworks, grid architecture, contractual structures.

**POLICY PRESCRIPTION**

Treat \$100+ oil as an irreversible investment trigger, not a transitory price shock. Accelerate and incentivise off-grid solarisation, grid-scale solar and wind procurement immediately. Establish legally binding renewable energy target trajectories (60% by 2035). Fund grid infrastructure through a dedicated surcharge. Critically: do not allow short-run crisis fiscal pressure to delay long-run capital

commitments, this is precisely the Pindyck inversion where waiting is more costly than acting. The US-Iran war has closed the window for ambiguity on this question. Every month of regulatory delay on renewable scale-up is a month in which Pakistan pays \$155/MWh for electricity that could be generated at \$38/MWh.

VI · Stiglitz & Weiss (1981) · Tullock (1967) · Information Asymmetry & Rent-Seeking

## The Stiglitz-Weiss Premium: How Regulatory Uncertainty Taxes Every Renewable Investment

Stiglitz-Weiss demonstrated that asymmetric information between borrowers and lenders generates credit rationing and a finance premium that taxes investment efficiency. In Pakistan's power sector, the relevant asymmetry is between investors and the government about regulatory stability and contract enforceability. A demonstrated willingness to impose retrospective tariff cuts, restructure IPP contracts under IMF duress, and create multi-billion-dollar payment arrears has created a Pakistan-specific political risk premium of 500 to 900 basis points above regional peers. The March 2026 crisis has added a further dimension to this asymmetry: international investors in renewable energy projects face acute uncertainty about whether the policy framework emerging from the crisis will honour existing commitments or use the emergency as cover for another round of contract renegotiation. Alongside this, Tullock's rent-seeking theory explains subsidy persistence: the resources devoted to capturing energy price subsidies constitute a social waste, double deadweight loss from both the allocative inefficiency of mispriced energy and the rent-seeking activity that sustains the mispricing. Per NEPRA SoIR 2025, DISCOs contributed Rs 397 billion to circular debt in FY25 through T&D excess losses (Rs 265bn) and revenue recovery shortfalls (Rs 132bn), a direct quantification of Tullock's deadweight.

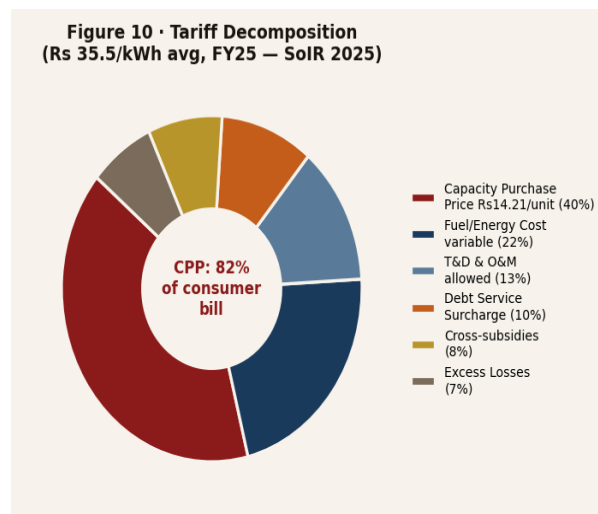
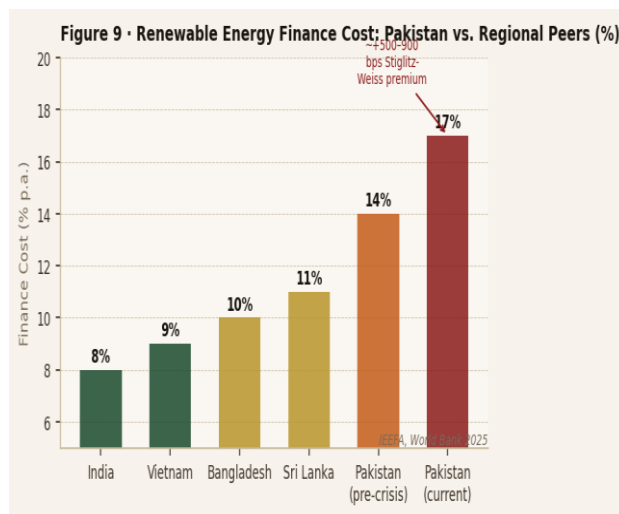


Figure 9 (left) · Renewable Energy Finance Cost: Pakistan vs. Regional Peers, 500–900 bps Stiglitz-Weiss premium | Figure 10 (right) · Tariff Decomposition: Capacity Purchase Price (Rs 14.21/unit) dominates at 40% of the bill. Source: NEPRA SoIR 2025.

### KEY DATA · NEPRA SOIR 2025

Average T&D losses FY25: 17.55% actual vs. 11.43% allowed → Rs 265bn unrecovered.

Revenue recovery: 93.5% of billed (96.62% vs. 100% allowed) → Rs 132.46bn shortfall. DISCO contribution to circular debt FY25: Rs 397bn total.

*Consumer tariff Rs 35.5/kWh, of which ~30–35% are non-energy financial adjustments (debt servicing, inefficiency charges).*

*Renewable finance cost in Pakistan: 14–17% p.a. vs. 7–9% in India, a premium that adds approximately \$15–20/MWh to every renewable project LCOE, negating half of solar's cost advantage.*

### POLICY PRESCRIPTION

Establish an independent energy regulatory authority with genuine statutory independence and binding dispute resolution powers, modelled on India's CERC. Develop a standardised, internationally arbitrable PPA template for renewable energy projects, one that cannot be retrospectively amended by ministerial decree. Incorporate ICSID arbitration clauses as standard. Signal contract sanctity immediately by ceasing retrospective tariff interventions. Publish transparent IPP renegotiation process and outcomes to reduce information asymmetry. A 1% reduction in renewable financing cost saves more over a 25-year project life than any equivalent capital subsidy, and the credibility dividend from institutional reform is achievable at zero fiscal cost.

VII · Thirlwall (1979) · Kaldor (1966) · Balance-of-Payments Constrained Growth

## The Thirlwall Growth Ceiling: Energy Import Intensity as Pakistan's Binding Constraint

Thirlwall's Law holds that a country's sustainable long-run growth rate is constrained by the ratio of its export growth rate to its income elasticity of demand for imports. Pakistan's income elasticity of energy imports is structurally high: every percentage point of GDP growth generates a more-than-proportionate increase in energy import demand, tightening the current account and triggering the familiar cycle of currency depreciation, IMF programme, growth compression, and incomplete structural reform. The current crisis, with energy imports projected at \$22 billion in 2026F at crisis-period prices, has tightened the Thirlwall constraint by an increment equivalent to two to three IMF programme tranches. The mechanism is directly observable in Pakistan's chronic boom-bust cycle: growth accelerates, energy imports surge, the current account deteriorates, the rupee depreciates, the IMF is called, growth is compressed, and the cycle repeats without the underlying fossil fuel dependency ever being addressed. The US-Iran war has made this cycle acute rather than chronic, compressing what would normally play out over 18 to 24 months into six weeks.

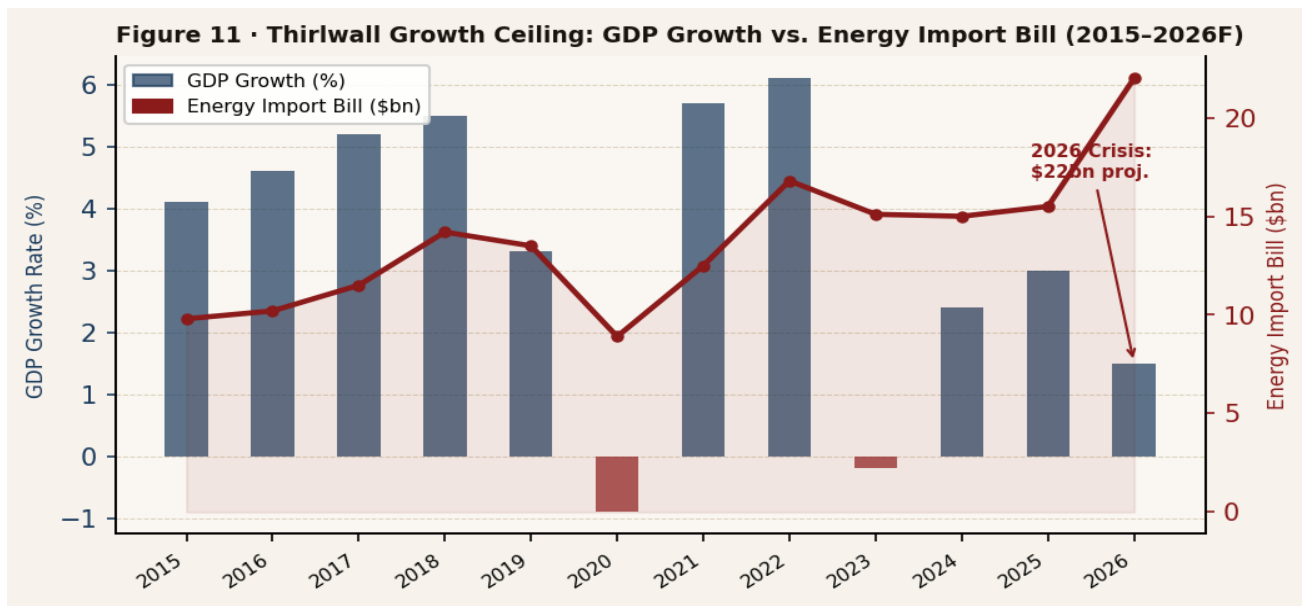


Figure 11 · Thirlwall Growth Ceiling: GDP Growth Rate vs. Energy Import Bill (2015–2026F). Every growth acceleration triggers an energy import surge that tightens the BoP constraint, the structural boom-bust mechanism quantified.

**KEY DATA · SBP, PBS, WORLD BANK, IEA**

For every \$10 rise in oil prices, the current account deficit expands by \$1.5–2bn annually.

At current \$100+ prices, the Thirlwall constraint has been tightened by \$5–7bn above baseline, equivalent to ~2% of GDP.

FY25 average generation cost: Rs 8.6/kWh (down 2%), but imported fuel sources averaged Rs 16.5/unit, feeding directly into inflation and BoP pressure.

Pakistan's tax-to-GDP ratio is ~10%; energy import exposure is ~5% of GDP, a crushing structural vulnerability when a supply shock doubles import prices in a single week.

A 30% reduction in income elasticity of energy imports through renewable substitution and efficiency would expand Pakistan's sustainable growth rate by an estimated 1.5–2 percentage points.

**POLICY PRESCRIPTION**

Frame Pakistan's energy transition explicitly as a balance-of-payments management strategy in communications with the IMF, World Bank, and bilateral development partners. The macroeconomic case for reducing energy import intensity is stronger than the climate case in Pakistan's specific institutional and fiscal context, and will attract different and broader political coalitions. A 30% reduction in income elasticity of energy imports would expand the sustainable growth rate by an estimated 1.5–2 percentage points without any deterioration in the external accounts, making the energy transition the most powerful macroeconomic policy available to Pakistan outside IMF conditionality itself.

# 04 THE COMPOUND FAILURE MATRIX

## How the Seven Theorems Interlock

The seven theoretical failures are not independent pathologies, they form an interlocking system of compound dysfunction. Each failure amplifies the others, producing a self-reinforcing institutional equilibrium that no single policy instrument can unwind.

**Table 2 · Compound Failure Interaction Matrix: Amplification Intensity Between Theorems**

→ Amplifies	I Hotelling	II P-Singer	III Sam-Olson	IV A-Unruh	V G-Pindyck	VI S-Weiss	VII Thirlwall
I · Hotelling	LOW	HIGH	HIGH	MED	MED	LOW	HIGH
II · Prebisch-S.	MED	LOW	HIGH	LOW	MED	LOW	HIGH
III · Sam-Olson	HIGH	MED	LOW	HIGH	MED	MED	HIGH
IV · Arthur-Unruh	HIGH	HIGH	MED	LOW	HIGH	HIGH	MED
V · Grubb-Pindyck	MED	LOW	LOW	HIGH	LOW	MED	LOW
VI · Stiglitz-W.	MED	MED	LOW	HIGH	HIGH	LOW	MED
VII · Thirlwall	HIGH	HIGH	HIGH	MED	LOW	MED	LOW

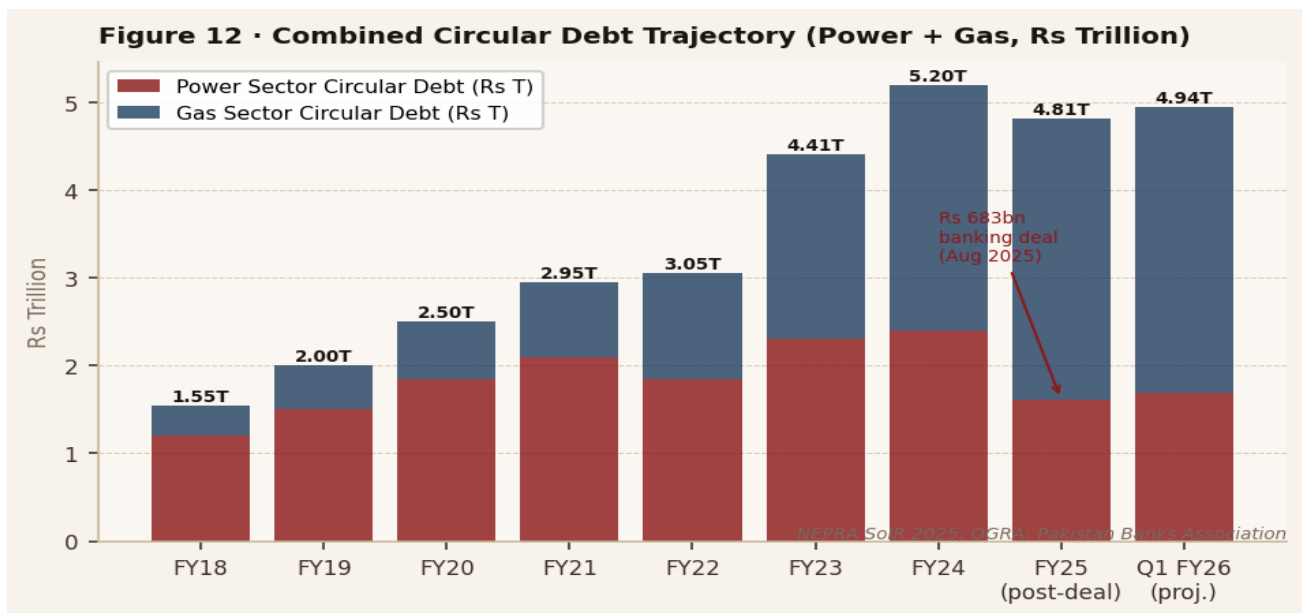


Figure 12 · Combined Circular Debt Trajectory: Power Sector + Gas Sector (Rs Trillion, FY18–Q1 FY26). Power sector debt reduced from Rs 2.40T to Rs 1.614T via Pakistan's largest-ever banking transaction. Gas sector debt reached Rs 3.2T by March 2025. Source: NEPRA SoIR 2025.

## 05 THE REFORM ARCHITECTURE

# Three-Horizon Strategic Roadmap

Each policy prescription is derived directly from its corresponding theorem, sequenced across three strategic time-horizons, and calibrated to the institutional realities of Pakistan's energy sector governance. The three horizons are parallel tracks, not sequential stages: leverage in each depends on simultaneous action in the others.

**Table 3 · Reform Prescription Matrix: Theoretical Origin, Implementing Institution & Measurable Targets**

Theorem	Core Failure	Primary Reform	Lead Institution	Target Metric	Horizon
<b>I · Hotelling</b>	Rent transfer to Gulf	Renewable substitution for imported hydrocarbons	PPIB, NEPRA	50% reduction in oil import rent by 2035	<b>Long</b>
<b>II · P-Singer</b>	Export competitiveness erosion	Industrial energy efficiency; textile gas-to-electric via CTBCM	Ministry of Commerce, APTMA	Energy cost share in textiles ≤18% by 2030	<b>Medium</b>
<b>III · Sam-Olson</b>	Zero strategic reserves	Sovereign Energy Security Fund (dedicated levy)	Ministry of Finance, SBP	30-day SPR by 2028; 60-day by 2032	<b>Medium</b>
<b>IV · A-Unruh</b>	IPP lock-in; 61% idle capacity	Contracts for Difference auctions; merit-order reform	NEPRA, Power Division	Utilisation ≥55% by FY27; renewables ≥30% by 2030	<b>Medium</b>
<b>V · G-Pindyck</b>	Satisficing domain policy trap	Legally binding RE target; grid infrastructure surcharge	Cabinet, NEPRA, NTDC	60% renewable electricity by 2035	<b>Long</b>
<b>VI · S-Weiss</b>	14–17% RE finance cost	Independent regulator (CERC model); ICSID PPA template	Parliament, NEPRA	RE financing cost to 9–11% by 2030	<b>Med–Long</b>
<b>VII · Thirlwall</b>	Energy import income elasticity ceiling	30% reduction in energy import income elasticity	SBP, Planning Commission	Sustainable growth rate +1.5–2pp without BoP deterioration	<b>Long</b>

### ■ SHORT-TERM (0–6 MONTHS) · CRISIS TRIAGE AND DEMAND CONTAINMENT

Pakistan's energy sector does not suffer from a single correctable policy failure. It suffers from seven interlocking structural failures that have accumulated over three decades of institutional inertia, each reinforcing the others in a self-perpetuating cycle of imported dependency, fiscal haemorrhage, and suppressed growth. The US-Iran war and the Strait of Hormuz closure of February 2026 have not created this crisis, they have exposed it with a clarity that no previous shock has managed to produce. The reform architecture presented in this brief responds to that exposure not with crisis management platitudes but with a theoretically grounded, institutionally sequenced, and empirically calibrated programme of structural transformation.

The most important single short-term intervention is the restructuring of fuel allocation on a sector-priority basis, directing available petroleum supply first to agriculture, then to freight, then to industry, and finally to personal vehicle consumption. This sequencing reflects the economic multiplier structure of Pakistan's real

economy rather than political convenience: agriculture feeds the Kharif sowing season, whose fertilizer shutdowns from the Agritech crisis are already generating second-order shocks, freight moves the supply chains on which food prices depend, and industry sustains the export earnings on which IMF programme compliance rests. Blanket austerity measures treat all consumption categories identically; sector-prioritised allocation addresses the economic hierarchy of the problem.

Emergency LNG procurement from Atlantic Basin suppliers, specifically the US Gulf Coast (Sabine Pass, Corpus Christi) and West Africa, on Hormuz-independent Cape of Good Hope routing is the second critical short-term action. The geopolitical context is particularly relevant here: the US-Iran war creates a window of elevated American interest in demonstrating that allied nations can access US LNG supply chains as an alternative to Gulf dependence. Pakistan should activate this diplomatic channel actively, framing emergency LNG procurement as both a commercial transaction and a strategic partnership signal. Alongside this, the rooftop solar boom must be actively accelerated through the immediate removal of NEPRA net-metering caps and approval bottlenecks. Every megawatt of behind-the-meter solar installed during the crisis period is a permanent, irreversible reduction in LNG demand, a 25-year dividend compounding from a regulatory decision that costs nothing to implement.

The petroleum levy must be restructured to allow full cost pass-through to consumers above the bottom two income quintiles, with targeted cash transfers protecting vulnerable households. Suppressing price signals during a supply shock is precisely the mechanism by which Pakistan has historically generated circular debt, and repeating that mechanism in March 2026 would add another layer of financial liability on top of the Rs 4.8 trillion already accumulated. SBP bilateral swap lines with Saudi Arabia, the UAE, and China must be activated immediately to pre-empt the rupee pressure that oil import expansion at crisis prices will generate. Saudi Arabia's Yanbu Red Sea bypass routing for crude oil must be formalised with volume guarantees, absorbing higher freight costs as crisis insurance rather than treating them as a reason not to activate the route.

## ■ MEDIUM-TERM (6 MONTHS–3 YEARS) · STRUCTURAL DIVERSIFICATION AND INSTITUTIONAL REENGINEERING

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The medium-term reform agenda addresses the supply chain architecture that made the March 2026 shock possible. Its central objective is the elimination of single-point failure dependencies, whether in LNG procurement, electricity generation contracting, or petroleum routing. LNG procurement must be diversified across US Sabine Pass, Australian, and East African suppliers on Hormuz-independent routing, reducing Qatar's share from 99 percent to below 40 percent of total imports. This is not merely a supply security measure. It is a Stiglitz-Weiss intervention: a diversified, competitive procurement portfolio reduces the information asymmetry between Pakistan and its LNG suppliers, improving contract terms and reducing exposure to any single force majeure event. The US-Iran war's geopolitical realignment creates new opportunities in this diversification: American LNG exporters now have a strategic interest in Pakistani market access that diplomatic channels can be used to leverage for favourable long-term contract terms.

The sovereign energy security fund is the medium-term public goods intervention demanded by the Samuelson-Olson diagnosis. Capitalised through a ring-fenced petroleum levy and targeting a 30-day strategic petroleum reserve by 2028, expanding to 60 days by 2032, the fund addresses the most egregious gap in Pakistan's energy security architecture. A 30-day reserve at pre-crisis prices would have cost approximately \$3.5 billion to build, roughly half the additional current account stress generated in a single month of the Hormuz closure. The absence of any strategic reserve is not a resource constraint; it is an Olsonian collective action failure, and the March 2026 crisis has provided the political window to finally overcome it.

The replacement of negotiated IPP power purchase agreements with competitive Contracts for Difference auctions, modelled on the UK mechanism, is the medium-term intervention most directly targeting the Arthur-Unruh carbon lock-in. The current take-or-pay contractual architecture, under which consumers paid Rs 14.21 per unit in capacity charges representing 82 percent of the average electricity bill in FY25, is not a market outcome. It is an institutional legacy of the 1994 Power Policy that created incentive structures systematically hostile to renewable energy. CfD auctions replace this architecture with a mechanism calibrated to renewable energy's cost structure: competitive allocation, fixed strike prices, and no capacity payment obligations for idle plant. Industrial energy efficiency programmes for the textile export sector, EV import duty holidays, TAPI pipeline diplomacy, and CPEC battery manufacturing joint ventures complete the medium-term portfolio.

## ■ LONG-TERM (3–15 YEARS) · ENERGY SOVEREIGNTY AND STRUCTURAL TRANSFORMATION

The long-term reform architecture pursues a single overarching objective: the reduction of Pakistan's income elasticity of energy imports to a level at which Thirlwall's balance-of-payments growth constraint no longer binds at Pakistan's development ambition. A 30 percent reduction in income elasticity, achievable through the combined effect of 60 percent renewable electricity, electrified transport, and domestically manufactured energy storage, would expand Pakistan's sustainable growth rate by an estimated 1.5 to 2 percentage points without any deterioration in the external accounts. This is not a climate argument. It is a development economics argument about the binding constraint on Pakistan's growth trajectory, and it is the argument most likely to build durable political coalitions across the left and right of Pakistan's political spectrum.

The legally binding 60 percent renewable electricity target by 2035 must be institutionalised with enforcement mechanisms rather than aspirational policy statements. The establishment of an independent regulatory authority modelled on India's Central Electricity Regulatory Commission, with genuine statutory independence, eliminates the Stiglitz-Weiss premium that currently prices renewable project finance in Pakistan at 14 to 17 percent annually against 7 to 9 percent in India. A standardised, ICSID-arbitrable power purchase agreement template that cannot be retrospectively amended by ministerial decree institutionalises the contract sanctity that international renewable investors require before committing capital at scale.

Domestic manufacturing of solar panels, wind components, and ultimately Sodium-ion battery cells, using Pakistan's indigenous mineral resource base to eliminate lithium import dependency entirely, converts the energy transition from a source of import substitution into a source of industrial value creation. The Prebisch-Singer logic inverted: rather than transferring value chain rent abroad through imports, domestic manufacturing captures the rent domestically. Coal retirement governance under the VM0052 methodology, monetised through Article 6.2 ITMO carbon credit agreements, must be institutionalised through the ClimateWorks framework, an instrument whose economics are significantly stronger at \$100-plus Brent than at \$60, because the opportunity cost of coal retirement rises with the fossil fuel alternative it displaces. The electrification of BRT corridors, inter-city freight, and the railway network on domestically generated renewable electricity constitutes the transport-sector intervention that directly reduces the income elasticity of oil imports Thirlwall identifies as Pakistan's binding growth ceiling.

THEOREM	SHORT-TERM 0–6 Months <i>Triage &amp; crisis containment</i>	MEDIUM-TERM 6 Months–3 Years <i>Structural diversification</i>	LONG-TERM 3–15 Years <i>Energy sovereignty &amp; transition</i>
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*Each policy prescription is derived directly from its corresponding theorem, sequenced across three strategic time-horizons, and calibrated to the institutional realities of Pakistan's energy sector governance. Source: NEPRA SoIR 2025; SDPI Energy Economics Analysis; US–Iran War (Op. Epic Fury, Feb. 28, 2026).*

THEOREM	SHORT-TERM 0–6 Months <i>Triage &amp; crisis containment</i>	MEDIUM-TERM 6 Months–3 Years <i>Structural diversification</i>	LONG-TERM 3–15 Years <i>Energy sovereignty &amp; transition</i>
<b>I</b>	HOTELLING (1931) · RESOURCE RENT ECONOMICS <b>Escape the Hotelling Rent Trap through Renewable Substitution</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Rooftop solar and battery storage acceleration fast-track NEPRA approvals, remove net metering caps; immediate deployment reduces grid LNG demand and household fuel exposure</li> <li>• Negotiate China solar panel supply surge + technology transfer for battery manufacturing leverage CPEC framework for emergency PV shipments and localised battery assembly.</li> <li>• Activate Yanbu Red Sea bypass for Saudi crude (Hormuz-independent routing)</li> </ul>	<ul style="list-style-type: none"> <li>• Diversify LNG portfolio: US Sabine Pass, Australian, East African suppliers</li> <li>• Accelerate grid-scale renewable procurement to displace RLNG generation</li> </ul>	<ul style="list-style-type: none"> <li>• 60% renewable electricity by 2035: eliminate Hotelling rent on 60% of power sector</li> <li>• Domestic solar panel &amp; wind component manufacturing exit the rent trap permanently</li> </ul>
<b>II</b>	PREBISCH (1950) · SINGER (1950) · TERMS OF TRADE ECONOMICS <b>Break the Prebisch-Singer Double Squeeze on Export Competitiveness</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Petroleum levy adjustment + targeted cash transfers to bottom two income quintiles</li> <li>• Sector-prioritised fuel allocation: agriculture → freight → industry → personal vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial energy efficiency programme for textile export sector</li> <li>• Scale rooftop solar + grid-scale battery storage target 5 GW additional behind-the-meter solar by FY27; battery storage reduces RLNG peaking dependency</li> <li>• China technology transfer: establish joint-venture battery manufacturing plants under CPEC produce Li-ion storage locally; reduce import dependence for grid storage systems</li> <li>• Accelerate gas-to-electric conversion of industrial thermal processes</li> </ul>	<ul style="list-style-type: none"> <li>• Domestic solar panel and wind component manufacturing (industrial policy)</li> <li>• Reduce energy cost share in textiles to ≤18% by 2030</li> </ul>

THEOREM	SHORT-TERM 0–6 Months <i>Triage &amp; crisis containment</i>	MEDIUM-TERM 6 Months–3 Years <i>Structural diversification</i>	LONG-TERM 3–15 Years <i>Energy sovereignty &amp; transition</i>
<b>III</b>	SAMUELSON (1954) · OLSON (1965) · PUBLIC GOODS & COLLECTIVE ACTION <b>Build the Public Goods Pakistan Has Systematically Underprovided</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Activate SBP bilateral swap lines (Saudi Arabia, UAE, China) to pre-empt rupee pressure</li> <li>• Emergency LNG spot procurement from Atlantic Basin (US Gulf Coast, West Africa)</li> </ul>	<ul style="list-style-type: none"> <li>• Establish sovereign energy security fund (ring-fenced petroleum levy)</li> <li>• Build 30-day strategic petroleum reserve Phase 1 (target: 60-day by 2032)</li> </ul>	<ul style="list-style-type: none"> <li>• AIIB + IsDB financing for strategic reserve storage infrastructure</li> <li>• Pakistan accession to IEA Associate Member status for collective reserve mechanism</li> </ul>
<b>IV</b>	ARTHUR (1989) · UNRUH (2000) · PATH DEPENDENCY & CARBON LOCK-IN <b>Dismantle the IPP Take-or-Pay Lock-In Architecture</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Formalise Saudi Arabia's Yanbu Red Sea bypass crude routing</li> <li>• Emergency generation dispatch prioritisation: hydro and renewables over thermal</li> </ul>	<ul style="list-style-type: none"> <li>• Replace negotiated IPP PPAs with competitive Contracts for Difference auctions (UK model)</li> <li>• Redesign merit-order dispatch eliminate must-run obligations for fossil fuel plants</li> </ul>	<ul style="list-style-type: none"> <li>• NEPRA regulatory framework restructured around renewable energy cost characteristics</li> <li>• Retrain energy bureaucracy in variable renewable integration economics</li> </ul>
<b>V</b>	GRUBB (2014) · PINDYCK (1991) · OPTION VALUE & INVESTMENT UNDER IRREVERSIBILITY <b>Treat \$100+ Oil as an Irreversible Renewable Investment Trigger</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Accelerate NEPRA approvals for grid-scale solar and wind projects</li> <li>• Fast-track net metering cap removal let behind-the-meter solar scale freely</li> </ul>	<ul style="list-style-type: none"> <li>• EV import duty holiday + concessionary credit for 2/3-wheeler electrification</li> <li>• Grid infrastructure investment surcharge: fund transmission for renewable integration</li> </ul>	<ul style="list-style-type: none"> <li>• Legally binding 60% renewable electricity target trajectory by 2035</li> <li>• Electrify BRT, inter-city freight, and railway network on domestic renewable generation</li> </ul>
<b>VI</b>	STIGLITZ & WEISS (1981) · TULLOCK (1967) · INFORMATION ASYMMETRY & RENT-SEEKING <b>Eliminate the Regulatory Uncertainty Premium Taxing Every Investment</b>		
SHORT MEDIUM LONG	<ul style="list-style-type: none"> <li>• Cease retrospective tariff interventions signal contract sanctity to investors</li> <li>• Publish transparent IPP renegotiation process and outcomes (reduce information asymmetry)</li> </ul>	<ul style="list-style-type: none"> <li>• TAPI pipeline diplomacy; push Article 6.2 ITMO bilateral agreements (UK, Japan, Switzerland)</li> <li>• Establish CERC-modelled independent regulatory authority with statutory independence</li> </ul>	<ul style="list-style-type: none"> <li>• Standardised, ICSID-arbitrable PPA template cannot be amended by ministerial decree</li> <li>• Reduce RE financing cost from 14–17% to 9–11% p.a. by 2030</li> </ul>
<b>VII</b>	THIRLWALL (1979) · KALDOR (1966) · BALANCE-OF-PAYMENTS CONSTRAINED GROWTH		

THEOREM	SHORT-TERM 0–6 Months <i>Triage &amp; crisis containment</i>	MEDIUM-TERM 6 Months–3 Years <i>Structural diversification</i>	LONG-TERM 3–15 Years <i>Energy sovereignty &amp; transition</i>
<b>Reduce Energy Import Income Elasticity to Raise Pakistan's Growth Ceiling</b>			
<b>SHORT</b> <b>MEDIUM</b> <b>LONG</b>	<ul style="list-style-type: none"> <li>• Frame energy crisis response explicitly as BoP management in IMF programme discussions</li> <li>• SBP directive to prioritise foreign exchange for essential energy imports over discretionary</li> </ul>	<ul style="list-style-type: none"> <li>• Frame energy transition as BoP strategy not climate strategy for IMF/World Bank</li> <li>• Coal retirement governance with VM0052-based carbon credit monetisation (ClimateWorks)</li> <li>• Indigenisation of Sodium-ion battery manufacturing establish domestic Na-ion cell production using Pakistan's indigenous salt and mineral resources; eliminates lithium import dependency</li> </ul>	<ul style="list-style-type: none"> <li>• 30% reduction in income elasticity of energy imports through RE + efficiency</li> <li>• Sustainable growth rate expansion of +1.5–2 pp without BoP deterioration by 2035</li> </ul>

**THE REFORM ARCHITECTURE: THREE-HORIZON STRATEGIC ROADMAP**  
*Policy actions grouped by time-horizon cross-referenced against the Seven-Theorem diagnosis*

	<p><b>Sector-prioritised fuel allocation</b></p> <p>Agriculture → freight → industry → personal vehicles transport dominates 80% of petroleum consumption; austerity measures must target consumption, not optics</p>	<p><b>LNG portfolio diversification</b></p> <p>US Sabine Pass and Corpus Christi (Cape of Good Hope routing), Australian, East African emerging producers reduce Qatar monopoly from 78% to &lt;40%</p>	<p><b>60% renewable electricity by 2035</b></p> <p>Legally binding target trajectory with enforcement mechanism eliminates Hotelling rent on majority of power sector; relaxes Thirlwall growth ceiling by ~1.5–2 pp</p>
	<p><b>Emergency LNG spot procurement</b></p> <p>Atlantic Basin suppliers: US Gulf Coast (Sabine Pass), West Africa Hormuz-independent routing critical given QatarEnergy force majeure</p>	<p><b>Sovereign Energy Security Fund</b></p> <p>Ring-fenced petroleum levy → 30-day strategic petroleum reserve Phase 1 by 2028; 60-day Phase 2 by 2032 funded via AIIB and IsDB energy security windows</p>	<p><b>Independent regulatory authority</b></p> <p>CERC-modelled statutory independence with binding dispute resolution eliminates Stiglitz-Weiss premium; reduces RE financing cost from 14–17% to 9–11%</p>
	<p><b>Petroleum levy adjustment</b></p>	<p><b>Contracts for Difference (CfD) auctions</b></p>	<p><b>ICSID-arbitrable PPA template</b></p>

THEOREM	SHORT-TERM 0–6 Months <i>Triage &amp; crisis containment</i>	MEDIUM-TERM 6 Months–3 Years <i>Structural diversification</i>	LONG-TERM 3–15 Years <i>Energy sovereignty &amp; transition</i>
	Targeted cash transfers to bottom two income quintiles; levy applied to higher-income consumption avoid blanket price suppression that created circular debt	Replace negotiated IPP PPAs with UK-model competitive auctions addresses Arthur-Unruh lock-in; ends dollar-indexed take-or-pay capacity payment architecture	Standardised, internationally arbitrable cannot be retrospectively amended by ministerial decree; institutionalises contract sanctity for renewable investors
	<b>SBP bilateral swap lines</b> Activate emergency lines with Saudi Arabia, UAE, and China pre-empt rupee pressure before depreciation amplifies the import bill stagflationary spiral	<b>EV import duty holiday</b> Concessionary credit for 2/3-wheeler electrification targets the 80% transport share of petroleum; reduces Thirlwall income elasticity of oil imports	<b>Domestic RE manufacturing</b> Solar panel and wind component manufacturing (Prebisch-Singer industrial policy) exit the rent-transfer relationship; capture value chain domestically
	<b>Yanbu Red Sea bypass formalisation</b> <ul style="list-style-type: none"> <li>• Rooftop solar &amp; battery storage deployment</li> <li>• China solar panel supply + battery technology transfer</li> </ul> Saudi Arabia rerouting crude via Yanbu formalise arrangement, negotiate volume guarantees, absorb higher freight cost as crisis insurance premium	<b>TAPI pipeline diplomacy</b> Push Article 6.2 ITMO bilateral agreements (UK, Japan, Switzerland) geopolitical window may have improved; TAPI gas is Hormuz-independent	<b>Electrify transport network</b> BRT, inter-city freight, and railway on domestic renewable generation addresses 80% petroleum transport dependency; reduces income elasticity of oil imports
	<b>Full fuel cost pass-through</b> Allow electricity and gas tariff adjustments to reflect actual costs suppressing pass-through repeats the institutional error that generated Rs 4.8T circular debt	<b>Industrial energy efficiency</b> <ul style="list-style-type: none"> <li>• Scale rooftop solar + grid-scale battery storage</li> <li>• China CPEC battery manufacturing JV</li> </ul> Textile sector gas-to-electric conversion; combined heat-and-power systems reduce energy cost share from 27% to ≤18% to restore export competitiveness	<b>Coal retirement governance</b> <ul style="list-style-type: none"> <li>• Indigenisation of Sodium-ion battery manufacturing</li> </ul> VM0052-based carbon credit monetisation (ClimateWorks framework) Article 6.2 ITMO agreements; stronger economics at \$100+/bbl than at \$60/bbl

## 06 THE COMPOUND VERDICT

# Critical Juncture or Wasted Crisis?

*Pakistan's crisis of March 2026 is, in the language of institutional economics, a critical juncture: a moment when the political costs of maintaining the existing institutional equilibrium may finally exceed the political costs of changing it. The two conditions institutional economists identify as necessary for a critical juncture to produce genuine structural change, a system under acute stress and a credible alternative trajectory, are both present with a clarity that Pakistan's policymakers have never before confronted simultaneously.*

The renewable economics are no longer debatable. Utility-scale solar in Pakistan is deliverable at below \$40 per MWh. Wind in Sindh and Balochistan comes in at approximately \$44 per MWh. Against these benchmarks, RLNG generation at crisis-period spot prices exceeds \$155 per MWh, a four-fold disadvantage that makes continued fossil fuel dependency not merely strategically risky but fiscally indefensible. Yet the more politically significant story is not what utility-scale procurement can deliver in project tenders. It is what Pakistani households, businesses, and small manufacturers have already delivered entirely on their own initiative, without waiting for regulatory frameworks, without policy design, and in many cases in direct defiance of a tariff and net-metering architecture that was never designed to accommodate them.

Pakistan's distributed solar boom is one of the most remarkable consumer-led energy transitions in the developing world. An estimated 18-plus GW of net-metered rooftop and behind-the-meter solar has been added, driven by a combination of collapsing Chinese panel prices, which fell 73 percent from \$0.38 per watt in 2017 to \$0.10 per watt by 2025, and electricity tariffs that more than doubled between 2022 and 2025. Pakistani consumers, priced out of the grid by the compound failures this brief diagnoses, made a rational economic decision at scale: they exited. Residential rooftops, commercial buildings, industrial facilities, agricultural tube-wells, and small workshops across Punjab and Sindh installed panels at a pace that no utility-scale procurement programme has ever matched. The 18-plus GW of rooftop solar already installed represents more generating capacity than all of Pakistan's RLNG-based generation combined.

The geopolitical context of the US-Iran war adds a further dimension to this verdict. The conflict has altered the strategic landscape for energy transition in ways that extend beyond Pakistan's immediate supply crisis. The demonstrated vulnerability of Hormuz-dependent energy supply chains, affecting not only Pakistan but India, Japan, South Korea, and the Gulf economies themselves, has created international political will for accelerated investment in alternative energy infrastructure. Pakistan's positioning as a recipient of climate finance, technology transfer under CPEC, and concessional renewable energy investment from the UK, EU, and multilateral development banks has improved markedly in this environment. The reform architecture laid out in this brief is thus not merely a domestic policy programme, it is also an international investment opportunity that the geopolitical moment has made more commercially attractive than at any previous point in Pakistan's energy reform history.

The historical pattern of wasted crises is discouraging but not deterministic. Every previous energy shock, in 2008, in 2011, and in 2022, was absorbed through demand suppression, IMF conditionality, and the passage of time until commodity prices moderated, leaving the underlying fossil fuel dependencies intact. But the current crisis differs from each of those predecessors in one structurally decisive respect: Pakistani consumers have already voted with their wallets for the renewable alternative, at a scale of 18-plus GW in a single year,

and the economics of solar have crossed the threshold at which no future commodity price movement can reverse that verdict. Even if LNG returns to pre-crisis prices, rooftop solar at \$0.10 per watt is cheaper. Even if the Hormuz reopens tomorrow, the 18-plus GW already installed will keep generating for 25 years. The solar boom is real, it is large, and it is irreversible. The only question is whether Pakistan's policy framework will catch up with its own people or continue to obstruct a revolution that has already arrived.

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