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Connecting Regions: Pakistan as an Energy Transit Hub



Energy Research Paper

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Pakistan, one of the largest markets around the Arabian Sea periphery, has the potential to become an energy transit country linking the Middle East, Central Asia, and South Asia. However, numerous economic, infrastructure, political and security obstacles hinder reliability and security of supply through Pakistan. How can Pakistan leverage its geographic position to become a regional energy transit hub? What are the major cross-border energy infrastructure projects shaping Pakistan's connectivity? What domestic energy challenges must Pakistan address to maximise its transit hub potential? What are the security and geopolitical implications of Pakistan's energy transit role? How are international partnerships shaping Pakistan's energy sector development?

ENERGY RESEARCH PAPER

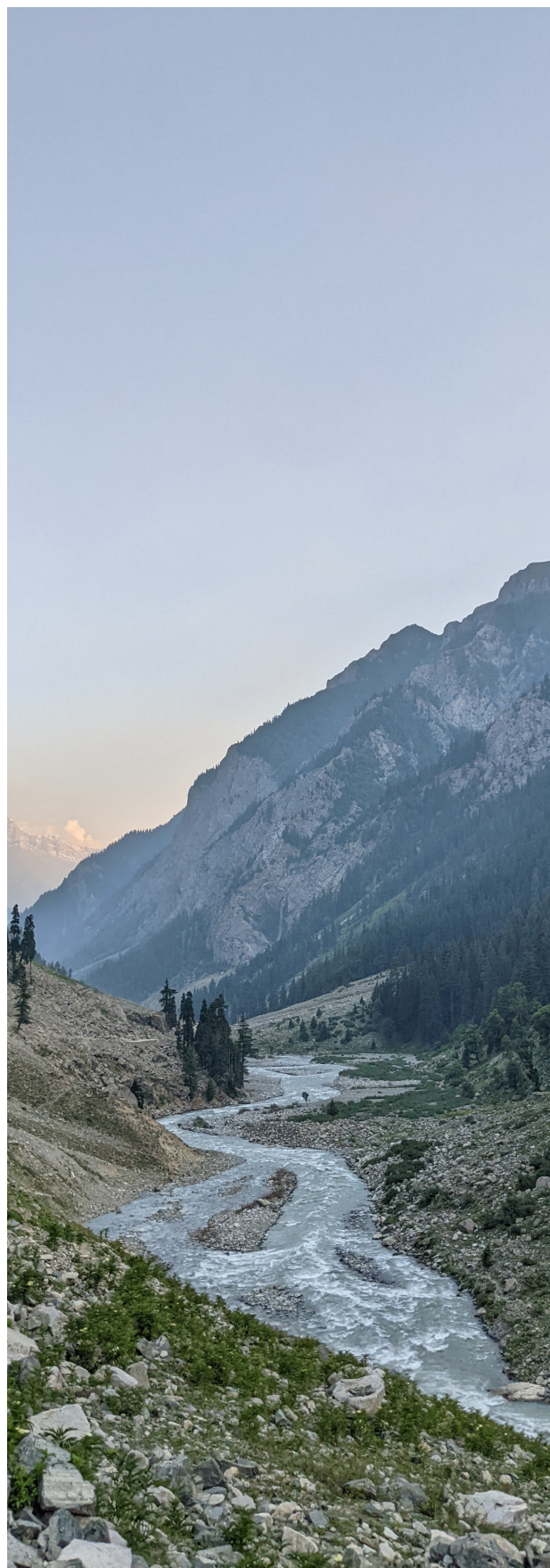
This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current energy topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.





- Pakistan's geographic position gives it the potential to become a key energy transit hub, connecting Gulf energy supplies to energy-deficient Afghanistan and western China, and Iranian and Central Asian energy supplies to India. To realise this, Pakistan is trying to expand cross-border pipelines and power grids and strengthening regional energy agreements, creating energy interdependencies with neighbours.
- Despite its transit potential, Pakistan faces significant domestic energy infrastructure shortcomings, due to localised shortages, unsustainable debt and financial commitments, market manipulation, infrastructure disruption, transmission losses, rising peak summer demand, and climate events, which must be addressed to establish credibility as a reliable energy conduit.
- Pakistan's role as a transit hub may introduce vulnerabilities with wide-ranging geopolitical implications. Eventually, Pakistan's domestic stability becomes internationally significant, potentially justifying foreign involvement in Pakistani affairs under the guise of protecting energy security.
- China – Pakistan Economic Corridor (CPEC) is the cornerstone of Pakistan's energy infrastructure modernisation, the most significant bilateral infrastructure investment in the country's history, and is a necessary step toward Eurasia's economic integration, encompassing US\$ 25 billion in Chinese investments in coal, hydropower, and renewable energy projects. Despite providing 13 GW of power capacity, the project has attracted concerns about Pakistan's debt sustainability and security challenges.

- The Turkmenistan – Afghanistan – Pakistan – India (TAPI) pipeline is another cross-border project, originally designed to deliver up to 33 billion cubic metres per year (BCM) / year (now 11 BCM / year) of piped natural gas deliveries from Turkmenistan to Pakistan and India.^{i ii} The US\$ 7.7 billion project would stretch ~1,600 kilometres from the Afghanistan – Turkmenistan border to the Pakistan – India border, with Pakistan and Afghanistan positioned as key transit states.ⁱⁱⁱ
- The Iran-Pakistan (IP) natural gas pipeline, originally the trilateral Iran-Pakistan-India (IPI) pipeline (“Peace Pipeline”) before India’s withdrawal, spans 2,775 kilometres, costing US\$ 7.5 billion. Iran has completed its US\$ 2 billion section, whereas Pakistan’s section remains incomplete due to sanctions on Iran, with Pakistan facing potential US\$ 18 billion penalties and ongoing legal disputes.^{iv}
- Central Asia–South Asia (CASA) 1000 is a US\$ 1.16 billion power transmission project, intended to supply 1.3 GW of surplus hydroelectricity from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan via a high-voltage direct current (HVDC) line.
- The Turkmenistan – Uzbekistan – Tajikistan – Afghanistan – Pakistan (TUTAP) 500 kV transmission line would complement CASA 1000, creating additional pathways for Central Asian power exports to South Asia.^v TUTAP’s development has achieved some success, with Phase 1 involving the Afghanistan – Uzbekistan 220 kV link completed in 2009 and Phase 2 involving the Afghanistan – Tajikistan 220 kV link commissioned in 2011.^{vi}



- Saudi Arabia leads the Gulf region's energy investments in Pakistan through multiple projects, demonstrating the Kingdom's commitment to long-term energy cooperation. The cornerstone of the Pakistan - Saudi energy partnership is the oil financing facility that provides critical support for Pakistan's energy import requirements.
- The United Arab Emirates already holds a 40% stake in the PARCO refinery, via strategic investor Mubadala. Now, it is positioning itself as a leading Gulf partner in Pakistan's energy transition through investment in renewable energy infrastructure, which aligns with both countries' climate change commitments and sustainable development programmes.
- Qatar's energy relationship with Pakistan centres on liquefied natural gas (LNG) supplies, which has positioned Qatar as a major supplier addressing Pakistan's natural gas shortage, while creating long-term commercial partnerships in the regional LNG market. Pakistan and Qatar signed the initial LNG agreement in 2016, valuing it at US\$ 15 billion for a 15-year supply arrangement.^{vii} However, Pakistan has struggled with payments, pricing and volume offtake.
- Security challenges affecting Pakistan's cross-border infrastructure projects are part of broader regional instability patterns, creating new vulnerabilities, with security concerns including military threats, terrorism, organised crime, and cybersecurity risks, which could disrupt critical energy flows and undermine regional energy cooperation.
- Political tensions among regional countries also complicate the development and operation of cross-border energy infrastructure projects, often leading to diplomatic challenges reflecting deeper geopolitical competition, which could result in new sources of interstate friction over energy cooperation terms.





Pakistan's geographic position gives it the potential to become a key energy transit hub, connecting Gulf energy supplies to energy-deficient Afghanistan and western China, and Iranian and Central Asian energy supplies to India. To realise this, Pakistan is expanding cross-border pipelines and power grids and strengthening regional energy agreements, creating regional energy interdependencies.

Pakistan shares land borders with energy-rich Iran, as well as with China, Afghanistan, and India, with a maritime boundary to the Gulf of Oman / Arabian Gulf. The country's geostrategic advantage has prompted Pakistani leadership to actively pursue a role as a key energy transit hub connecting the Gulf states with the Shanghai Cooperation Organisation (SCO) region.^{viii ix}

Pakistan is attempting to develop major cross-border energy infrastructure to realise its transit hub potential. Currently, the flagship connectivity project in the region is the China-

Pakistan Economic Corridor (CPEC), originally intended to link western China to the Gulf of Oman via the Gwadar Port, which has recently extended to include Afghanistan.

The trilateral partnership could transform regional energy dynamics,^x and provide Afghanistan's minerals extraction offtake in the Chinese industrial sector; in addition to transforming Gwadar into a gateway port linking western China and the landlocked Central Asian republics to the Gulf of Oman. While Pakistan gains from establishing itself as a vital transit state in regional trade, it also stands to gain from transit fees from these projects, as could Afghanistan.

The country's energy transit hub strategy also includes cross-border natural gas pipelines such as Turkmenistan-Afghanistan-Pakistan-India (TAPI) and Iran-Pakistan-India (IPI), and power transmission lines such as Central Asia-South Asia (CASA) 1000, Turkmenistan – Uzbekistan-Tajikistan – Afghanistan – Pakistan

(TUTAP) 500, and the Polan-Gabd line (which supplies power to the CPEC development in Gwadar).

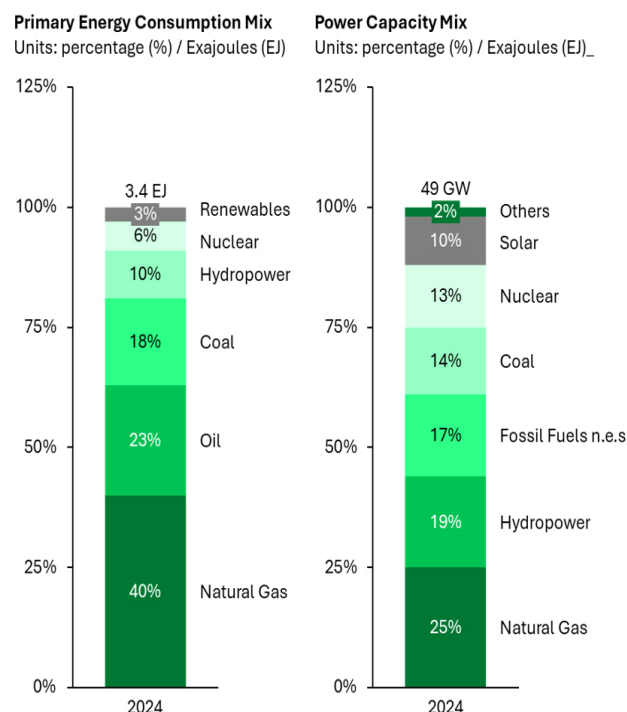
The TAPI project team will deploy a fibre optic network to provide advanced communication capabilities.^{xi} The 700-kilometre cable passes through five provinces in Afghanistan and is specifically funded through the TAPI project allocation. The TAPI project team uses the cable for two main purposes: to better manage and monitor gas pipeline operations, and to deliver internet connectivity to communities along the route.^{xii}

In 2023, the Pakistan Special Investment Facilitation Council (SIFC) was established, a federal government body and Investment Promotion Agency constituted by the incumbent government, reflecting Pakistan's commitment to attracting foreign investment in energy infrastructure and eliminating bureaucratic hurdles, focusing on upstream hydrocarbon exploration and production, renewable energy infrastructure development, and metals & minerals extraction mainly in Baluchistan and Khyber Pakhtunkhwa provinces.^{xiii}

Last year, the government introduced the National Economic Transformation Plan 2024–2029 ("Uraan Pakistan"), prioritising energy security and sustainability, and recognising energy and trade connectivity as key elements of national economic development.^{xiv}

To establish credibility as a reliable energy conduit, Pakistan must address significant shortcomings in its domestic energy infrastructure, including localised shortages, market manipulation, unsustainable debt, infrastructure disruptions, transmission losses, peak summer demand, and climate events.

Figure 1: Pakistan's Energy and Power Mix



Pakistan's current energy mix remains heavily dependent on imported fossil fuels, which account for >60% of energy demand, creating vulnerabilities in domestic energy security.

^{xv} The country's industrial and power sector faces challenges from dependency on imported seaborne liquefied natural gas (LNG) cargoes, mainly from Qatar, resulting in higher cost of industrial output and depreciating export cost competitiveness.

In order to counteract this, Pakistan is looking to enhance its domestic energy security and has committed to achieving a 60% clean energy mix by 2030, with plans to transition 30% of all road-based internal combustion engines (ICE) to electric vehicles (EV).^{xvi} The World Bank has identified tremendous potential for renewable generation, noting that utilising just 0.071% of Pakistan's area for solar photovoltaic power generation could meet the country's current power demand.^{xvii xviii} Wind resources are equally promising, with average wind speeds

of ~7.9 metres / second in 10% of its windiest areas, across several wind corridors.^{xxix xx}

However, current renewable energy capacities remain relatively underutilised, with solar and wind totalling 3.2 GW, accounting for 21% of total renewable capacity, and 10% of total power capacity.^{xxxi} Pakistan has fallen short on its interim target of 20% renewable generation by 2025; however, in order to meet its long-term target, the country will require an additional 22 GW of new utility-scale renewable capacity to be allocated through a competitive public-private mechanism.^{xxxi} Successfully meeting these targets could save it up to ~US\$ 5 billion in fuel and other costs.^{xxxi} Grid-connected solar reached 5.3 GW by the end of April 2025, while in 2024 it imported 22 GW of solar panels, suggesting a very large installation of off-grid use, underestimated or missed by official statistics.

Even with strong national and provincial support for coal development, Pakistan will likely delay its integration into the energy system until after the 2030s—or exclude it altogether—due to financing difficulties and falling renewable energy costs.^{xxiv xxv}

Avoiding the large-scale development of domestic coal, particularly for projects already in the pipeline, will present a strong opportunity to attract international climate finance in areas such as power grid modernisation to support intermittent renewable generation, deployment of advanced technologies such as concentrating solar power and battery storage, and measures to enhance the flexibility of large dams where hydropower is a secondary output. Improved utility-scale battery storage and flexibility solutions could also help avoid the need for large-scale deployment of open-cycle gas turbines (OCGT) or transition them to combined-

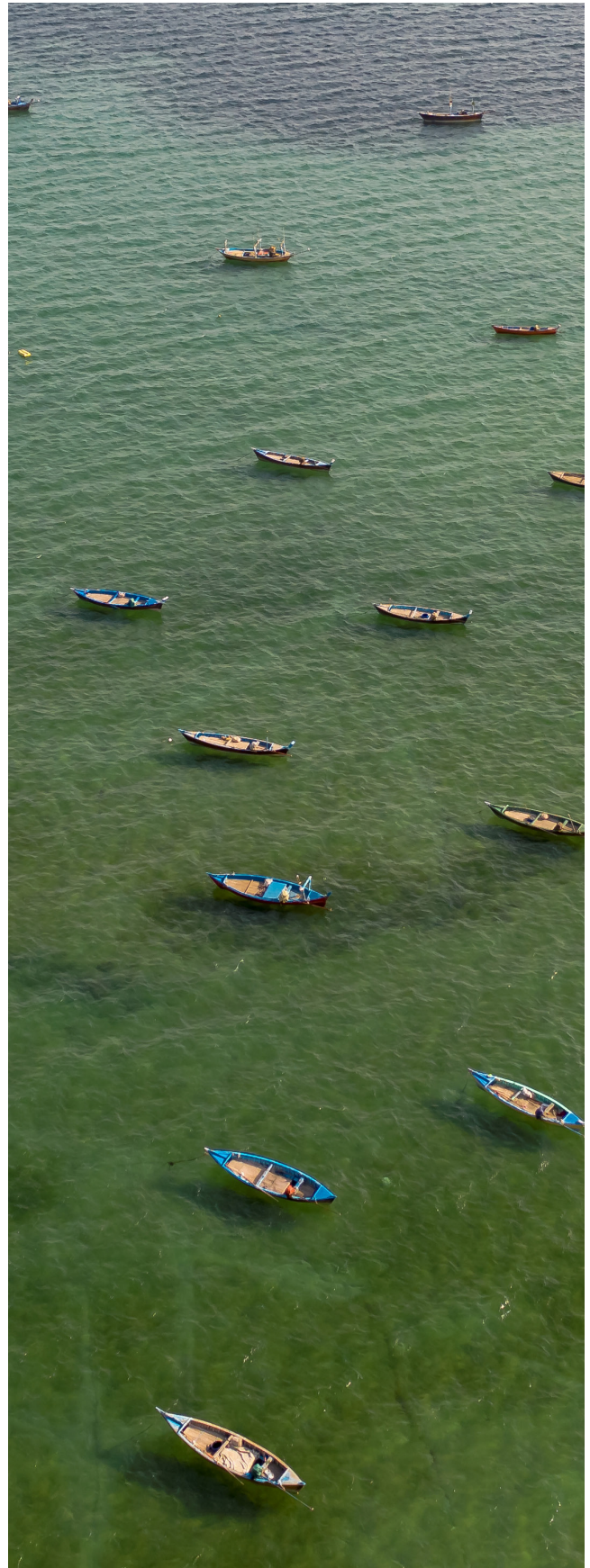
cycle gas turbines (CCGT), which might be necessary to maintain system reserves and capacity factors, regardless of additional variable capacity.

Pakistan's role as an energy transit hub could create new security vulnerabilities and requirements that have broader regional security and geopolitical consequences. Eventually, Pakistan's domestic stability becomes internationally significant, potentially justifying foreign involvement in Pakistani affairs under the guise of protecting energy security.



Political instability, at times poor administration, local ambiguity and geopolitical considerations, and security problems are likely to challenge the public interest in major energy projects.^{xxvi} These security challenges can draw regional diplomatic interventions, as protecting energy infrastructure becomes a shared interest among transit-dependent nations. These geopolitical risks could impact energy outcomes, with regional or global tensions exciting investor and corporate concern, resulting in unexpected market changes and, ultimately, a negative influence on energy outcomes as well as instability.

Managing energy transit routes provides Pakistan with substantial economic and diplomatic leverage, which may extend into multiple policy areas. Transit fees and infrastructure investments will create fiscal revenue streams, which will strengthen Pakistan's leverage in regional diplomacy. It may limit Pakistan's policy flexibility in other areas – the need to maintain investor confidence and energy partnerships could influence its domestic policies in tandem with regional security interests in ways that hyphenate regional-national energy interests, rather than purely national interests.





China – Pakistan Economic Corridor (CPEC) is the cornerstone of Pakistan's energy infrastructure modernisation, the most significant bilateral infrastructure investment in the country's history, and is a necessary step toward Eurasia's economic integration, encompassing US\$ 25 billion in Chinese investments in coal, hydropower, and renewable energy projects. Despite providing 13 GW of power capacity, the project has attracted concerns about Pakistan's debt sustainability and security challenges.^{xxviii}

Currently, fourteen power projects with a combined capacity of 9.5 GW and 4 GW of transmission projects have been completed through CPEC, with an additional 3.5 GW of power capacity in the pipeline.

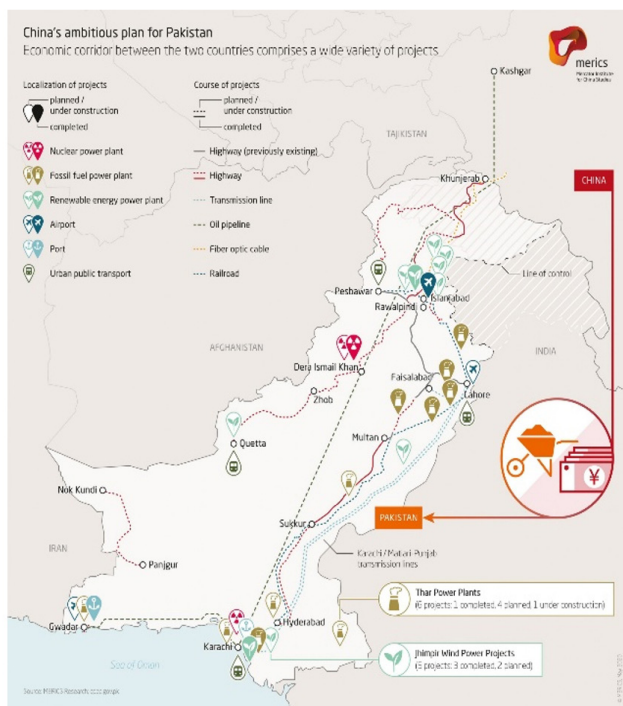
The completed portfolio includes major coal power plants such as the 1.3 GW Sahiwal, the 1.3 GW Port Qasim, and the 1.3 GW China Hub plant.^{xxix}

These coal plants account for 30% of the total power generation capacity developed through the CPEC platform.

The renewable energy infrastructure component of CPEC involves the 1 GW Quaid-e-Azam Solar Park and multiple wind power projects totalling > 300 MW across various locations in Sindh province.^{xxx} However, hydropower projects represent some of the most significant long-term investments, with the 720 MW Karot completed and the 884 MW Suki Kinari under construction. Pakistan's hydropower capacity rose from 7.4 GW in 2017 to 11.5 GW in 2024. The significant installed hydropower capacity can help in balancing the output of variable renewables.

CPEC's energy projects, at times, have also incurred challenges. The temporary suspension of economic activities, particularly during the COVID-19 pandemic, led to international supply chains disruptions, resulting in delays and cost overruns.^{xxxi}

Figure 2: China – Pakistan Economic Corridor^{xxvii}



Security concerns represent another major challenge for CPEC energy infrastructure projects, with militant attacks targeting Chinese workers between 2021 – 2024, leading to Chinese operators calling for tighter security measures.^{xxxii} These security threats have resulted in Pakistan's National Electricity Power Regulatory Authority introducing a security surcharge of $\leq 1\%$ of total project cost, which amounts to ~US\$ 216 million / year across the operational CPEC portfolio.^{xxxiii}

Multiple CPEC energy projects have also attracted financial sustainability concerns, with power plants accumulating substantial financial arrears. Outstanding receivables reached US\$ 1.4 billion in 2024 – before the Pakistani government expedited payments.^{xxxiv} The Central Power Purchasing Agency has at times struggled to recover payments from distribution utilities (DISCOs), creating liquidity issues.^{xxxv}

The rapidly growing share of off-grid solar PV, which is hard to estimate accurately, is positive for energy supply and the environment. However, it creates challenges for the utilities. As customers increasingly defect from the grid, using solar and batteries, the utility is forced to raise rates to cover its grid costs and contractual fixed payments to private power plant developers. These higher rates then create a further incentive for consumers to go off-grid, while unfairly penalising users who are unable to afford or to install solar power (for instance, lower-income consumers, or those living in high-rise buildings).

Some experts have argued that CPEC may exacerbate climate change vulnerabilities for Pakistan's struggling economy due to potential environmental hazards and consequences.^{xxxvi} However, the inclusion of future renewable capacity additions from newer sources like bioenergy and geothermal, alongside solar and wind, will result in energy-efficiency gains, resulting in a more balanced approach to energy infrastructure development than initially anticipated.^{xxxvii xxxviii}





The Turkmenistan – Afghanistan – Pakistan – India (TAPI) pipeline is another cross-border project, originally designed to deliver up to 33 BCM / year (now 11 BCM / year) of piped natural gas deliveries from Turkmenistan to Pakistan and India.^{xxxix xl} The US\$ 7.7 billion project would stretch ~1,600 kilometres from the Afghanistan – Turkmenistan border to the Pakistan – India border, with Pakistan and Afghanistan positioned as key transit states.^{xliviii}

TAPI's significance for Pakistan extends beyond simple energy imports, with the country receiving 13.8 BCM / year, while also benefiting from transit fees and associated infrastructure development. The Asian Development Bank has played a crucial role in TAPI's development, acting as the TAPI secretariat since 2003 and as the transaction advisor since 2013, establishing the TAPI Pipeline Company Limited.^{xlii}

However, project financing is the most important obstacle to TAPI's completion, far more than security.^{xliii} While initial cost estimates suggested a US\$ 10 billion price tag (for 33 BCM / year capacity), some experts consider US\$ 14 – 16 billion to be more realistic; and including upstream development costs, as a project costing ~US\$ 40 billion.^{xliv}

These financial scenarios have forced project developers to scale down TAPI's initial ambitions, reducing planned throughput from 33 BCM / year to 11 BCM / year, with the project cost at US\$ 7.7 billion. The revised "Phase 1" concept proposes using a free flow model with compression only upstream and no compressor stations along the Afghanistan-to-Pakistan route.

The pipeline has made notable progress on multiple fronts. Turkmenistan completed its 214 kilometre section in 2024.^{xlv}

Figure 3: Turkmenistan – Afghanistan – Pakistan – India Pipeline Route



In Afghanistan, construction resumed in September 2024 after the Taliban administration and Turkmenistan officially agreed to restart the project.

Currently, ~14 kilometres of pipeline have been completed within Afghan territory, with an additional 24 kilometres of route levelled and prepared for construction.^{xlvi} The pipeline's 153 kilometres route to Herat city is expected by the end of this year.^{xlvi}

Turkmenistan's state-owned energy company, Turkmenengaz holds an 85% stake in the project

Afghanistan, India, and Pakistan each hold 5% shares.^{xlvi} The current construction phase primarily involves Turkmenistan and Afghanistan, with limited participation from Pakistan and India.

The project has faced more than 30 years of delays since it was first proposed in the early 1990s. The primary obstacles have included security concerns, political instability, and regional conflicts in Afghanistan. The Taliban government has actively addressed security concerns by dedicating 30,000 troops to protect the pipeline traversing Afghan territory.^{xlvi}

TAPI represents one of the most significant infrastructure achievements under the current Taliban administration and is viewed as crucial for regional energy security and economic development.

India has raised concerns about TAPI on different grounds. In 2018, India objected to TAPI gas pricing, citing the 55% crude oil benchmark and over US\$ 10.5 / MMBTU total costs including transit fees, which significantly exceeded India's domestic average gas prices.^{li} India has expressed concerns about security challenges in volatile Afghanistan and fears dependence on arch-rival Pakistan for natural gas supply, worrying Pakistan could halt supplies during future bilateral conflicts.^{lii} The April 2025 crisis over Kashmir will have revived worries.

Still, India has not fully withdrawn from the project but has not firmly committed to joining it. India's uncertain participation could result in Pakistan losing interest, as the project becomes economically unsustainable without India.

The project would only be economical for Pakistan if India committed to a transit fee of US\$ 700 – 800 million / year to Pakistan.^{liii}

With India's participation, Pakistan could save US\$ 200 – 300 million / year in transit fees.^{liv}

If India withdraws from TAPI, Pakistan would lose the transit fee revenue from India and still be required to pay Afghanistan a transit fee of about US\$ 500 million / year for the pipeline segment crossing Afghan territory. In this situation, Pakistan would be importing, through TAPI, at ~US\$ 7.5 / MMBtu. This would still be cheaper than LNG at current prices, but it might become unattractive if LNG prices fall later in the 2020s.

However, India's withdrawal from the project and Pakistan's subsequent departure would mean an end to this pipeline, with Turkmenistan's 30 year-long plans to export its natural gas resources to South Asian energy-deficient markets failing.^{lv}

The Iran-Pakistan (IP) natural gas pipeline, originally the trilateral Iran-Pakistan-India (IPI) pipeline ("Peace Pipeline") before India's withdrawal, spans 2,775 kilometres, costing US\$ 7.5 billion. Iran has completed its US\$ 2 billion section, whereas Pakistan's section remains incomplete due to sanctions on Iran, with Pakistan facing potential US\$ 18 billion penalties and ongoing legal disputes.^{lvi}

Figure 4: Iran – Pakistan Pipeline Route



The IPI pipeline was proposed in 1994 as a trilateral project, delivering natural gas from Iran's South Pars field to Pakistan and India. The pipeline was intended to have 22 BCM/y of capacity, which would be equally split between India and Pakistan. However, India withdrew from the project in 2008 – 2009 due to sanctions on Iran and pressure from the United States. India's withdrawal also coincided with the United States – India civil nuclear deal, with India officially citing concerns over pricing and security as reasons for its departure.^{lvii lviii}

Similar to TAPI, India had fundamental security concerns about the pipeline's route through Pakistan, which became particularly acute after the 26/11 Mumbai attacks, with analysts arguing that the project would give Pakistan "a knife at India's energy throat".^{lix} At the time,



India's specific security-related demands included, 1) Iran should be responsible for ensuring safe passage of gas through the 1,035-kilometre pipeline section in Pakistan, 2) India would only pay for the supply once delivered at the Indian border, and 3) concerns about potential sabotage by insurgents.^{lx lxi lxii}

India also cited disagreements over pricing and insurance costs as reasons for withdrawal. In response, Iran proposed a trilateral mechanism requiring India to pay for its natural gas share even if supplies were disrupted in Pakistan, which India found unacceptable.

Following India's exit, Iran and Pakistan agreed to proceed with a bilateral version in 2010, with an official agreement ratified by Pakistan in 2013, and construction work officially commencing in 2013.

Iran is committed to the project and has completed its section through a US\$ 2 billion investment, whereas Pakistan's section remains incomplete due to international sanctions constraints, which have created diplomatic tensions between both countries, with Iran filing a case against Pakistan in the International Court of Arbitration for failing to complete the pipeline construction.^{lxiv}

Pakistan's hindrance in proceeding with the project stems from the ongoing United States' sanctions on Iran. Despite Pakistan's attempts to secure waivers, which include unsuccessful appeals to the Biden administration in 2024, the United States has consistently denied relief that would allow the Pakistani section's completion.^{lxv}

Recently, Pakistan's Petroleum Minister Dr. Mussadik Malik announced plans to request a sanctions waiver from the Trump administration, another attempt to secure international approval

for project completion.^{lxvi} Currently, the United States' approvals are uncertain given the ongoing United States – Iran nuclear negotiations, which show limited progress. Iran and the United States recently completed a fifth round of discussions in Italy, aimed at establishing a revised agreement preventing Iran from curtailing its uranium enrichment programme in exchange for easing sanctions.

Until now, the project has experienced various delays. Pakistan also faces financial penalties for project delays, with possible liabilities of ~US\$ 18 billion for failing to complete construction on schedule.^{lxvii}

Last month, on a bilateral visit to Iran, Pakistani Prime Minister Shehbaz Sharif and Iranian President Dr. Masoud Pezeshkian re-committed to an early resolution of the dispute, with both countries dedicated to project completion.^{lxviii} But Iran's domestic gas shortages are also problematic, with repeated curtailments of its supplies to Iraq and to domestic customers. If the IP pipeline were completed, Iran would need a substantial amount of sanctions relief to be able to invest in more gas production at home, and boosting its alternative energy production and energy efficiency, to be able to meet export commitments to Pakistan.

Furthermore, Pakistan probably does not need both the 11 BCM from half of IPI (or, indeed, 22 BCM from the full project), plus 11 BCM from TAPI. Its total gas imports in 2023 were 10.1 BCM, in the form of LNG, a significant amount committed under long-term contracts. Although the country continues to suffer a gas deficit, and IPI or TAPI gas would likely be cheaper than LNG, the Indian market is still required for both projects to be viable simultaneously.



Central Asia–South Asia (CASA) 1000 is a US\$ 1.16 billion power transmission project, intended to send 1.3 GW of surplus hydroelectricity from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan via a HVDC line.

The transmission line's flexibility allows for seasonal power sharing, aligning with both Central Asian power generation patterns and the South Asian demand cycles.

CASA 1000's technical specifications include HVDC transmission systems spanning 1,387 kilometres across four countries. The project includes a 477 kilometre, 500 kV AC transmission line between Datka, Kyrgyzstan and Khujand, Tajikistan, and a 750 kilometre HVDC line from Sangtuda, Tajikistan to Nowshera, Pakistan via Afghanistan.^{lxxix}

The technical success of CASA 1000's converter stations, supplied by Hitachi Energy with capacity to transmit 1.3 GW over 800

kilometre with minimised losses, demonstrates the feasibility of long-distance HVDC power transmission lines across challenging environments.^{lxxx} The bipolar configuration and earth-return design also provide redundancy and reliability essential for cross-border power trading.

The project's economic viability appears strong under conservative assumptions, with feasibility studies indicating positive returns even under adverse scenarios.^{lxxxi} However, the project faces challenges related to coordination among multiple stakeholders – the need for comprehensive agreements covering operational and contractual issues including risk of non-payment that include energy transfers, dispatch services, tariff and transit fees.^{lxxxii}

Figure 5: Central Asia – South Asia 1000 Transmission Line



Financing structures for CASA 1000 present particular vulnerabilities. The World Bank, the Islamic Development Bank, and a number of smaller donations from friendly countries will fund the project.^{lxxiii}

The CASA 1000 project in Afghanistan was paused in 2021 after 18% of towers were completed, and 95% of materials had been supplied.^{lxxiv} Afghanistan's completion is critical for CASA 1000 transmission line. In May 2025, the Taliban government signed agreements with ministers from Kazakhstan, Tajikistan, and Pakistan aimed to accelerate the completion of the long-delayed power project.^{lxxv} Kyrgyzstan, Tajikistan, and Pakistan have nearly finished work and started loan repayments.

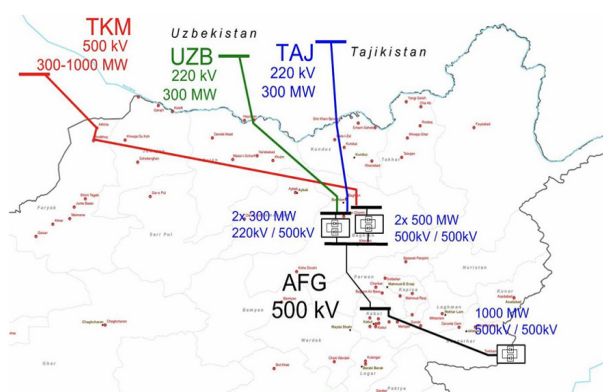
All CASA members have explored options to bring in private financing to cover the costs of completing project activities in Afghanistan. Since no investors or banks expressed interest, the members have asked the World Bank to resume the project in Afghanistan by continuing its original financing from the International Development Association to complete the project.

Afghanistan's role in CASA 1000 demonstrates the project's potential for regional development beyond simple power transfers. Similar to TAPI, Afghanistan would benefit from both transit fees and domestic power supply improvements, while also gaining access to fibre optic communication infrastructure developed alongside the transmission lines. However, Afghanistan's limited transmission and distribution capacity creates operational challenges, which will require substantial complementary investments. HVDC has to be converted to AC for transmission and use in standard grids; these converter stations are expensive. Therefore, the CASA 1000 line would ideally connect to Afghanistan's national grid at only one or two points, but this requires it to have the ability to receive the electricity and transmit it onwards to consumption centres.



Pakistan's membership in CASA 1000 aligns with its power security objectives, which includes further diversifying its energy mix with imported hydropower. The project offers opportunities for reverse power flows during Central Asian low-generation periods, creating mutually complementary power sharing and enhanced regional power infrastructure integration.

Figure 6: Turkmenistan – Uzbekistan – Tajikistan – Afghanistan – Pakistan Transmission Line



The Turkmenistan – Uzbekistan – Tajikistan – Afghanistan – Pakistan (TUTAP) 500 kV transmission line complements CASA 1000, creating additional pathways for Central Asian power exports to South Asia.^{lxxvi} TUTAP's development has achieved some success, with Phase 1 involving the Afghanistan – Uzbekistan 220 kV link completed in 2009 and Phase 2 involving the Afghanistan – Tajikistan 220 kV link commissioned in 2011.^{lxxvii}

TUTAP is designed as a multi-lane highway for power, connecting Central Asia with Afghanistan and Pakistan through a centralised hub system. It will supply surplus power to Pakistan, using Afghanistan as a crucial transit corridor.

At Pul-e-Khumri in Afghanistan, the main switching station and HVDC hub, engineers collect electricity from the three Central Asian countries and redistribute it onward. The location was strategically chosen as the central collection point for the entire regional power network.

Turkmenistan plans to export power via 500 kV lines with up to 1 GW capacity, representing the largest single contribution to the system. Uzbekistan connects through 220 kV lines providing 300 MW capacity, while Tajikistan links via both 220 kV and 500 kV lines with capacity ≤ 1.3 GW, depending on the development phase at the Pul-e-Khumri hub in Afghanistan. The power is distributed within Afghanistan's national grid to meet domestic needs, while surplus power continues south to Pakistan via 500 kV transmission lines with ≤ 1 GW export capacity.



Since each country operates a different power system, HVDC back-to-back converters at Pul-e-Khumri act like electrical translators, converting alternating current (AC) from one country into direct current (DC) before transforming it back into AC compatible with the receiving country's system, which enables controllable power injections where needed and ensures system stability.

However, TUTAP's technical route has been a source of political tension after the former administration of President Ashraf Ghani decided to route the transmission line over the Salang Pass, rather than through Bamiyan Province, triggering widespread protests among Afghanistan's Hazara population.^{lxxviii} The decision sparked the Jombesh-e-Roshnayi (Enlightening Movement) based on arguments that Bamiyan represented both a technically superior route and a matter of social justice for historically marginalised communities.^{lxxix}

Technical assessments of TUTAP routing options highlighted the complexity of infrastructure development in challenging terrain. In 2013, the German Fichtner Engineering Company concluded that the proposed line routing over the Salang Pass, if technically feasible, would face significant technical difficulties and constraints, necessitating an investigation into a more convenient and safer alternative.^{lxxx} The Bamiyan route became central to Afghanistan's opposition leaders' arguments.

The route controversy created significant political tensions within the government – entangled with ethnic politics and accusations of discrimination against the Hazara minority. Mohammad Mohaqiq, a coalition stakeholder in President Ashraf Ghani's government, threatened to end the alliance if the Salang Pass route was decided.^{lxxxi}

The uncertain ongoing political tensions in Afghanistan have impacted Pakistan's stake in TUTAP. Pakistan's role seems focused on the technical and commercial aspects of receiving power rather than mediating Afghanistan's internal political disputes over the project.

However, if commissioned, the integration of CASA 1000 and TUTAP will create synergistic benefits for all member states, while providing Afghanistan with transmission wheeling revenue opportunities. Experts indicate that combined implementation of CASA 1000 and TUTAP could achieve an internal rate of return of 13%, demonstrating their economic viability.^{lxxxii}





Saudi Arabia leads the Gulf region's energy investments in Pakistan through multiple projects, demonstrating the Kingdom's commitment to long-term energy cooperation. The cornerstone of the Pakistan - Saudi energy partnership is the oil financing facility that provides critical support for Pakistan's energy import requirements.

Earlier this year, Saudi Arabia offered Pakistan a US\$ 1.2 billion oil import financing facility, to defer oil payments by one year.^{lxxxiii} The facility began with disbursements of US\$ 100 million / month starting in March 2025, and will continue until February 2026, and is likely to ease Pakistan's foreign exchange burden.^{lxxxiv} The financing facility complements Saudi Arabia's financial assistance to Pakistan, placing US\$ 5 billion in deposits in the country's central bank.^{lxxxv}

Saudi Aramco has entered into a memorandum of understanding (MOU) with four Pakistani state-owned companies including Pakistan Oil & Gas Development Company Limited (OGDCL),

Pakistan State Oil (PSO), Pakistan Petroleum Limited (PPL), and Government Holdings Private Limited (GHPL) to establish an integrated refinery and petrochemicals facility, with a processing capacity of 300,000 barrels / day through a US\$ 10 billion greenfield oil refinery project at Gwadar Port.^{lxxxvi lxxxvii}

Through the MOU, Saudi Aramco will develop the supporting port infrastructure and oil storage facilities.^{lxxxviii} Pakistan supported the initiative by providing fiscal incentives, including a 20 year tax holiday and exemptions from customs duties, surcharges, withholding tax, and general sales tax, which underscores the importance placed on Saudi energy investments.

Last year, Saudi Aramco acquired a 40% stake in Gas & Oil Pakistan Limited (GOPL), allowing the company to set up a visible presence, with Aramco petrol pumps operating in Lahore and Islamabad.^{lxxxix} The acquisition allowed Aramco to capture downstream value chains in Pakistan, while building consumer recognition and market share in a growing retail fuels market.

Saudi Arabia has also made development financial commitments through the Saudi Fund for Development – particularly the US\$ 240 million financing facility signed in 2023 to support Pakistan's 800 MW Mohmand Multipurpose Dam Project.^{xc} The commitment includes US\$ 41 million for a Gravity Flow Water Supply Scheme in Mansehra district.^{xcii}

The Saudi Fund for Development is also considering investing > US\$ 100 million in Pakistan's mining sector. Saudi mining joint venture, Manara Minerals has also expressed an interest in Pakistan's Reko Diq mine – one of the world's largest undeveloped copper-gold resources.^{xcii}

Manara Minerals' investment in Pakistan also includes a potential acquisition of a 15% stake in the Reko Diq mine for US\$ 540 million, which is currently under discussion. The investment will complement Saudi Arabia's industrial strategy of securing critical mineral imports, while supporting Pakistan's mining sector modernisation and expansion.^{xciii}

The United Arab Emirates is positioning itself as a leading Gulf partner in Pakistan's energy transition through investment in renewable energy infrastructure, which aligns with both countries' climate change commitments and sustainable development programmes.

The UAE is already an investor in Pakistan's energy sector via the 40% stake of strategic sovereign wealth player Mubadala in the PARCO refinery.

Pakistan aims to achieve net-zero emissions by 2050, with a plan to reduce greenhouse gas emissions by 90% by that year.^{xciv}

In 2023, Pakistan and the United Arab Emirates signed a clean energy deal, which gave Masdar access to Pakistan's renewables resources through a diversified portfolio of planned renewable capacities across Pakistan, in return helping the country materialise its 60% clean energy mix by 2030 target.^{xcv}

The UAE renewable energy deal with Pakistan also includes broader climate change cooperation, with Minister of Industry and Advanced Technology, and UAE climate envoy, Dr. Sultan Ahmed Al Jaber, appreciating Pakistan's active role in climate change diplomacy and viewing Pakistan as an "important partner in climate change discourse".^{xcvi} Pakistan is responsible for < 1% of the global emissions, yet it is the eighth most vulnerable nation to the climate crisis.^{xcvii}





Earlier this year, the UAE and Pakistan signed five cooperation accords, during Abu Dhabi Crown Prince Sheikh Khaled bin Mohamed bin Zayed Al Nahyan's maiden official visit to Pakistan.^{xcviii}

Qatar's energy relationship with Pakistan centres on liquefied natural gas (LNG) supplies, which has positioned Qatar as a major supplier addressing Pakistan's natural gas shortage, while creating long-term commercial partnerships in the regional LNG market. The initial LNG terminal agreement signed in 2016 was valued at US\$ 15 billion for a 15-year supply arrangement.^{xcix}

The Qatar – Pakistan LNG partnership began in 2015, with the establishment of a 15 year contract between Pakistan State Oil and Qatar's Qatargas-2 for ≤ 3.75 MT / year of LNG supplies.^c The foundational agreement was priced at a slope of 13.37% of Brent crude price.^{ci} The contract includes provisions allowing either party to initiate renegotiation talks at the 10 year mark in 2026, with options

to either renegotiate pricing or terminate the agreement.^{cii ciii}

In 2021, Pakistan and Qatar signed an additional 10 year LNG supply contract for 200 MCF / day - secured at ~31% lower rates than the original 2015 contract, achieving what officials described as the "lowest-ever publicly disclosed price under a long-term contract in the world".^{civ}

Pakistan and Qatar finalised a third agreement in 2022, establishing another 10-year contract for 3 MT/year from 2022, priced at a 10.2% slope of Brent crude.^{cv} Qatar accommodated Pakistan's request by shipping supplies a year early in 2021, demonstrating the flexibility within their partnership.

Pakistan currently imports ~108 LNG cargoes / year from Qatar through various agreements. The monthly import structure includes nine cargoes (five under the 13.37% Brent slope and four at 10.2% slope) plus additional shipments from other suppliers such as Italy's Eni.^{cvi}

Qatar is Pakistan's dominant LNG supplier, providing ~85 – 100 of Pakistan's average 120 – 140 annual cargo imports.^{cvii}

In recent times, the Qatar – Pakistan LNG partnership has faced strain due to Pakistan's economic crisis and declining energy demand. Annual power consumption has dropped 8% – 10% y-o-y over the past three quarters, primarily due to higher power tariffs curbing household consumption, which has created an LNG surplus, forcing Pakistan to request deferrals of contracted shipments.

Last year, Pakistan successfully negotiated the deferral of five LNG cargoes from 2025 – 2026 without financial penalties. Prime Minister Shehbaz Sharif personally raised this issue during his visit to Qatar, highlighting Pakistan's need to manage an anticipated excess of 18 LNG cargoes.^{cviii} Pakistan is also negotiating deferrals of additional cargoes with other suppliers, including eight shipments from Eni between May and December 2025.^{cix}

Pakistan's Petroleum Dr. Minister Mussadik Malik has indicated plans to renegotiate the Qatar agreements, describing them as "costly" and expressing the government's intention to seek "better terms next year".^{cx} The original 2016 contract's 13.37% Brent slope represents the most expensive among Pakistan's term LNG contracts, creating financial pressure amid the country's economic difficulties.

The 2026 milestone could provide a formal opportunity for renegotiation, as the 15 year contract includes built-in review mechanisms at the 10 year mark. However, successful renegotiation requires justifiable changes in market conditions and mutual agreement between both parties.

Despite recent hurdles, Qatar and Pakistan remain committed to their energy cooperation. Qatar Energy has expressed interest in investing in LNG terminal infrastructure in Pakistan through partnerships with local companies. The relationship's evolution will likely depend on successful renegotiation of pricing terms and Pakistan's ability to stabilise its energy demand patterns as its economy recovers.





Security challenges affecting Pakistan's cross-border infrastructure projects are part of broader regional instability patterns, creating new vulnerabilities, with security concerns including military threats, terrorism, organised crime, and cybersecurity risks, which could disrupt critical energy flows and undermine regional energy cooperation.

CPEC energy infrastructure has become a key target for security threats, with militant attacks targeting Chinese workers in the country. The 2024 attack on Chinese staff from Port Qasim Power Plant exemplifies how energy infrastructure can become focal points for broader political and security tensions.^{cx}

The Natural Resources Monitoring Network has warned about growing security threats around the TAPI pipeline project, reflecting broader concerns about Afghanistan's security situation and its impact on regional energy cooperation.^{cxii}

Afghanistan's role as a transit state for TAPI, CASA 1000, and TUTAP creates particular security vulnerabilities that affect all participating countries. The Taliban administration's limited state capacity and ongoing insurgent activities create risks for pipeline infrastructure, transmission lines, and project personnel, which might require regional coordination and support.

Baluchistan province's security situation significantly affects the IP / IPI pipeline and the CPEC infrastructure. Separatist movements and insurgent activities in the province have specifically targeted overseas engineers and energy infrastructure, creating persistent security risks.

Cybersecurity threats to cross-border infrastructure projects are an emerging challenge that require enhanced international cooperation and technical safeguards.

As energy systems become more digitised and interconnected across borders, vulnerabilities to cyberattacks could potentially disrupt throughput or energy flows.

Pakistan along with its regional partners will need to strengthen regional security mechanisms, which includes sharing potential threats on cross-border energy infrastructure, through intelligence sharing, coordinated security planning, and joint response capabilities.

Political tensions among regional countries also complicate the development and operation of cross-border energy infrastructure projects, often leading to diplomatic challenges reflecting deeper geopolitical competition, which could result in new sources of interstate friction over energy cooperation terms.

Pakistan – India bilateral relations represent a particularly significant constraint on regional energy cooperation, affecting projects like TAPI and IP / IPI, which were originally designed to include Indian participation. The recent deterioration of bilateral relations has reduced prospects for large-scale energy cooperation.

China – India bilateral relations add another layer of complexity to regional energy projects, particularly those involving Chinese investment and participation. India's concerns about Chinese influence through infrastructure development may limit Indian participation in regional energy cooperation, while also affecting third-country calculations about project participation.

The United States – China strategic competition also affects regional infrastructure development, with American concerns about Chinese influence potentially complicating financing and technical cooperation for energy projects.

These great power dynamics create additional political risks for Pakistan seeking to participate in Chinese-led infrastructure initiatives, while maintaining relationships with the United States.

Iran's international isolation due to sanctions creates diplomatic complications for energy cooperation projects involving Iranian participation or territory, potentially overriding regional energy cooperation logic.

Gulf – Iran relations represent a critical variable affecting Pakistan's cross-border energy connectivity projects, creating complex diplomatic triangulations.





Any tensions, directly affect the IP / IPI, where Pakistan faces a challenging task of balancing energy security needs against potential diplomatic complications with Gulf partners who provide substantial financial support and investment opportunities. In 2023, the Saudi – Iran rapprochement was initiated through Chinese mediation, created new possibilities – it concurrently introduced an additional complexity to Pakistan's strategic calculations.

Afghanistan's political instability and international recognition is another issue affecting CASA 1000, TUTPA, and TAPI. The Taliban administration's limited international recognition creates legal and diplomatic challenges for project implementation.

Israel – Iran tensions create another complex layer of regional dynamics, introducing additional geopolitical variables that complicate regional energy cooperation and affect Pakistan's positioning as a neutral transit hub. A full-scale Iran – Israel military confrontation is the worst possible scenario for the Gulf states and Pakistan – such a conflict could have devastating consequences for the region's energy infrastructure.^{cxiii}

Pakistan has been marginalised from emerging energy corridors, particularly the proposed India-Arabian-Mediterranean Corridor to Europe, which links ports in India, United Arab Emirates, Saudi Arabia, Jordan, Israel, and Greece, creating alternative transit routes, which could reduce demand for Pakistani energy infrastructure.



Pakistan is at a critical juncture in its energy evolution, as it leverages its geographic advantage and strategic partnerships to transform into a pivotal regional energy hub. The convergence of > US\$ 35 billion in committed energy investments from China, Saudi Arabia, the United Arab Emirates, and Qatar, in addition to development of major cross-border energy connectivity projects, positions the country to fundamentally reshape regional energy dynamics over the next decade.

Pakistan's energy hub aspirations will be realised through three critical actions: completing major cross-border infrastructure projects within the next five years, achieving domestic energy reliability through rapid renewable expansion,

and maintaining regional security cooperation that protects energy investments.

Success requires Pakistan to simultaneously serve as energy bridge-builder, reliable domestic energy provider, and neutral facilitator among competing regional powers. The next decade will determine whether Pakistan capitalises on its strategic geographic position to become an indispensable regional energy hub or remains trapped in energy deficit and political instability.

The foundation is in place — execution will define Pakistan's energy destiny and regional influence for generations to come.

- i. TAPI Pipeline to Help Address Energy Shortages in Pakistan, ADB, 2016, <https://www.adb.org/news/tapi-pipeline-help-address-energy-shortages-pakistan>
- ii. Will a Taliban victory advance TAPI, Atlantic Council, 2021, <https://www.atlanticcouncil.org/blogs/energy-source/will-a-taliban-victory-advance-tapi/>
- iii. TAPI Pipeline to Help Address Energy Shortages in Pakistan, ADB, 2016, <https://www.adb.org/news/tapi-pipeline-help-address-energy-shortages-pakistan>
- iv. Will the Trump Administration Grant the Iran-Pakistan Pipeline Project a Sanctions Waiver, The Diplomat, 2025, <https://thediplomat.com/2025/01/will-the-trump-administration-grant-the-iran-pakistan-pipeline-project-a-sanctions-waiver/>
- v. Afghanistan's Power Sector Update: Outlook remains uncertain, REGLOBAL, 2022, <https://reglobal.org/afghanistans-power-sector-update-outlook-remains-uncertain/>
- vi. Afghanistan's Power Sector Update: Outlook remains uncertain, REGLOBAL, 2022, <https://reglobal.org/afghanistans-power-sector-update-outlook-remains-uncertain/>
- vii. Hurdles in materialization of GCC's economic ventures in Pakistan, The Express Tribune, 2024, <https://tribune.com.pk/story/2517229/hurdles-in-materialization-of-gccs-economic-ventures-in-pakistan>
- viii. Pakistan says eyeing transit hub role to connect South, Central Asian economies, Arab News, 2025, <https://www.arabnews.com/node/2601173/pakistan>
- ix. Ideal trade, transit hub: Dar highlights significance of Pakistan's geo-strategic location, Business Recorder, 2024, <https://www.brecorder.com/news/40304642/ideal-trade-transit-hub-dar-highlights-significance-of-pakistans-geo-strategic-location>
- x. Pakistan, China agree to extend CPEC into Afghanistan, The Express Tribune, 2025, <https://tribune.com.pk/story/2547072/pakistan-china-agree-to-extend-cpec-into-afghanistan>
- xi. Fiber-Optic Line Will Run Alongside TAPI: MCIT, TOLO News, 2018, <https://tolonews.com/business/fiber-optic-line-will-run-alongside-tapi-mcit>
- xii. Fiber-Optic Line Will Run Alongside TAPI: MCIT, TOLO News, 2018, <https://tolonews.com/business/fiber-optic-line-will-run-alongside-tapi-mcit>
- xiii. Pakistan Establishes the Special Investment Facilitation Council (SIFC), UNCTAD, 2023 <https://investmentpolicy.unctad.org/investment-policy-monitor/measures/4366/pakistan-establishes-the-special-investment-facilitation-council-sifc>
- xiv. National Economic Transformation Plan 2024-29, Ministry of Planning and
- xv. 2024 Statistical Review of Energy, Energy Institute, <https://www.energyinst.org/statistical-review>
- xvi. Pakistan urges global support for its \$100 billion energy transition at World Governments Summit in UAE, Arab News, 2025, <https://www.arabnews.com/node/2589817/pakistan>
- xvii. Solar Resource Maps, Solargis, <https://solargis.com/resources/free-maps-and-gis-data?locality=pakistan>
- xviii. Expanding Renewable Energy in Pakistan's Electricity Mix, The World Bank, 2020, <https://www.worldbank.org/en/news/feature/2020/11/09/a-renewable-energy-future-for-pakistans-power-system>
- xix. Global Wind Atlas, <https://globalwindatlas.info/en/>
- xx. Expanding Renewable Energy in Pakistan's Electricity Mix, The World Bank, 2020, <https://www.worldbank.org/en/news/feature/2020/11/09/a-renewable-energy-future-for-pakistans-power-system>
- xxi. IRENASTAT Power Capacity and Generation, <https://www.irena.org/Data/Downloads/IRENASTAT>
- xxii. Pakistan plans to quadruple renewables by 2025, Smart Energy International, 2019, <https://www.smart-energy.com/renewable-energy/pakistan-plans-to-quadruple-renewables-by-2025/>
- xxiii. Expanding Renewable Energy in Pakistan's Electricity Mix, The World Bank, 2020, <https://www.worldbank.org/en/news/feature/2020/11/09/a-renewable-energy-future-for-pakistans-power-system>
- xxiv. Expanding Renewable Energy in Pakistan's Electricity Mix, The World Bank, 2020, <https://www.worldbank.org/en/news/feature/2020/11/09/a-renewable-energy-future-for-pakistans-power-system>
- xxv. Renewable Power Generation Costs in 2023, IRENA, 2023, <https://www.irena.org/Publications/2024/Sep/Renewable-Power-Generation-Costs-in-2023>
- xxvi. China-Pakistani economic corridor project bring the international trade, healthcare, self-efficacy, and social performance facility to Gilgit city, Pakistan, ScienceDirect, 2022, <https://www.sciencedirect.com/science/article/pii/S2405844022018114>
- xxvii. The BRI in Pakistan: China's flagship economic corridor, MERICS, 2020, <https://merics.org/en/analysis/bri-pakistan-chinas-flagship-economic-corridor>

- xxviii. Energy Projects under CPEC: A Game Changer, Pakistan Institute of Development Economics, 2025, <https://file.pide.org.pk/pdfpideresearch/discourse-2025-01-12-energy-projects-under-cpec-a-game-changer.pdf>
- xxix. Energy Projects Under CPEC, Ministry of Planning, Development, and Special Initiatives, <https://cpec.gov.pk/energy>
- xxx. Energy Projects Under CPEC, Ministry of Planning, Development, and Special Initiatives, <https://cpec.gov.pk/energy>
- xxxi. Exploring the China-Pakistan economic corridor project performance during Covid-19 pandemic, ScienceDirect, 2023, <https://www.sciencedirect.com/science/article/pii/S2405844023100430>
- xxxii. Pakistan expresses 'surprise' over Chinese envoy's statement on security issues, AA, 2024, (<https://www.aa.com.tr/en/asia-pacific/pakistan-expresses-surprise-over-chinese-envoys-statement-on-security-issues/3380432>)
- xxxiii. Pakistan must rebuild Chinese investor confidence in its energy transition, IEEFA, 2025, <https://ieefa.org/resources/pakistan-must-rebuild-chinese-investor-confidence-its-energy-transition>
- xxxiv. Govt expedites payments to China, Tribune Pakistan, 2024, <https://tribune.com.pk/story/2505343/govt-expedites-payments-to-china>
- xxxv. AGP points out Rs5.273tr irregularities in power sector entities, The Nation, 2024, <https://www.nation.com.pk/05-Aug-2024/agp-points-out-rs5-273tr-irregularities-in-power-sector-entities>
- xxxvi. Does political risk undermine environment and economic development in Pakistan? Empirical evidence from China-Pakistan economic corridor, Springer, 2022, <https://link.springer.com/article/10.1007/s10644-022-09434-z>
- xxxvii. Assessing the impact of renewable energy integration on energy efficiency within the China-Pakistan economic corridor (CPEC), Nature, 2024, <https://www.nature.com/articles/s41598-024-81173-9>
- xxxviii. Does political risk undermine environment and economic development in Pakistan? Empirical evidence from China-Pakistan economic corridor, Springer, 2022, <https://link.springer.com/article/10.1007/s10644-022-09434-z>
- xxxix. TAPI Pipeline to Help Address Energy Shortages in Pakistan, ADB, 2016 <https://www.adb.org/news/tapi-pipeline-help-address-energy-shortages-pakistan>
- xl. Will a Taliban victory advance TAPI, Atlantic Council, 2021, <https://www.atlanticcouncil.org/blogs/energysource/will-a-taliban-victory-advance-tapi/>
- xli. TAPI Pipeline to Help Address Energy Shortages in Pakistan, ADB, 2016, <https://www.adb.org/news/tapi-pipeline-help-address-energy-shortages-pakistan>
- xlii. TAPI Pipeline to Help Address Energy Shortages in Pakistan, ADB, 2016, <https://www.adb.org/news/tapi-pipeline-help-address-energy-shortages-pakistan>
- xliii. Will a Taliban victory advance TAPI, Atlantic Council, 2021, <https://www.atlanticcouncil.org/blogs/energysource/will-a-taliban-victory-advance-tapi/>
- xliv. Will a Taliban victory advance TAPI, Atlantic Council, 2021, <https://www.atlanticcouncil.org/blogs/energysource/will-a-taliban-victory-advance-tapi/>
- xlv. TAPI Pipeline to Remain Failure Without India and Pakistan's Participation, The Jamestown Foundation, 2025, <https://jamestown.org/program/tapi-pipeline-to-remain-failure-without-india-and-pakistan-participation/>
- xlvi. TAPI pipeline to reach Herat by end of 2025: Ministry, ATN News, 2025, <https://www.ariananews.af/tapi-pipeline-to-reach-herat-by-end-of-2025-ministry/>
- xlvii. 14 Kilometres Of TAPI Pipeline Completed Inside Afghanistan, Says Project Head, Afghanistan International, 2025, <https://www.afintl.com/en/202504248323>
- xlviii. TAPI Pipeline to Remain Failure Without India and Pakistan's Participation, The Jamestown Foundation, 2025, <https://jamestown.org/program/tapi-pipeline-to-remain-failure-without-india-and-pakistan-participation/>
- xlix. TAPI pipeline prospects finally get a shot in the arm, Pakistan Today, 2022, <https://www.pakistantoday.com.pk/2022/01/18/tapi-pipeline-prospects-finally-get-a-shot-in-the-arm/>
- l. India seeks re-negotiation in gas price from TAPI pipeline, The Economic Times, 2018, <https://economictimes.indiatimes.com/industry/energy/oil-gas/india-seeks-revision-in-gas-price-from-tapi-pipeline/articleshow/65497724.cms?from=mdr>
- li. India Should Take a Proactive Interest in the TAPI Pipeline South Asian Voice, 2024, <https://southasianvoices.org/geo-f-in-n-india-and-tapi-pipeline-11-06-2024/>
- lii. New Delhi lukewarm over extension of TAPI to India given current state of ties with Pakistan, The Economic Times, 2024, <https://economictimes.com>

[indiatimes.com/news/india/new-delhi-lukewarm-over-extension-of-tapi-to-india-given-current-state-of-ties-with-pakistan/articleshow/113407692.cms?from=mdr](https://economictimes.indiatimes.com/news/india/new-delhi-lukewarm-over-extension-of-tapi-to-india-given-current-state-of-ties-with-pakistan/articleshow/113407692.cms?from=mdr)

liii. New Delhi lukewarm over extension of TAPI to India given current state of ties with Pakistan, The Economic Times, 2024, <https://economictimes.indiatimes.com/news/india/new-delhi-lukewarm-over-extension-of-tapi-to-india-given-current-state-of-ties-with-pakistan/articleshow/113407692.cms?from=mdr>

liv. TAPI Pipeline to Remain Failure Without India and Pakistan's Participation, The Jamestown Foundation, 2025, <https://jamestown.org/program/tapi-pipeline-to-remain-failure-without-india-and-pakistan-participation/>

lv. TAPI Pipeline to Remain Failure Without India and Pakistan's Participation, The Jamestown Foundation, 2025, <https://jamestown.org/program/tapi-pipeline-to-remain-failure-without-india-and-pakistan-participation/>

lvi. Will the Trump Administration Grant the Iran-Pakistan Pipeline Project a Sanctions Waiver, The Diplomat, 2025, <https://thediplomat.com/2025/01/will-the-trump-administration-grant-the-iran-pakistan-pipeline-project-a-sanctions-waiver/>

lvii. Issue Brief on "Fuelling Progress: The Iran-Pakistan (IP) Gas Pipeline, Institute of Strategic Studies Islamabad, 2024, <https://issi.org.pk/issue-brief-on-fuelling-progress-the-iran-pakistan-ip-gas-pipeline/>

lviii. Issue Brief on "Fuelling Progress: The Iran-Pakistan (IP) Gas Pipeline, Institute of Strategic Studies Islamabad, 2024, <https://issi.org.pk/issue-brief-on-fuelling-progress-the-iran-pakistan-ip-gas-pipeline/>

lix. IPI Gas Pipeline, RIP, Times of India, 2008, <https://timesofindia.indiatimes.com/sa-aiyar/swaminomics/ipi-gas-pipeline-rip/articleshow/3902150.cms>

lx. Pak hints India 'pulled out' of IPI because of US pressure, the Economic Times, 2010, <https://economictimes.indiatimes.com/industry/energy/oil-gas/pak-hints-india-pulled-out-of-ipi-because-of-us-pressure/articleshow/6115164.cms>

lxi. Pak hints India "pulled out" of IPI because of US pressure, Business Standard, 2013, https://www.business-standard.com/article/economy-policy/pak-hints-india-pulled-out-of-ipi-because-of-us-pressure-110070100160_1.html

lxii. IPI Gas Pipeline, RIP, Times of India, 2008, <https://timesofindia.indiatimes.com/sa-aiyar/swaminomics/ipi-gas-pipeline-rip/articleshow/3902150.cms>

lxiii. India should reopen the IPI pipeline project, ORF, 2015, [https://www.orfonline.org/research/india-](https://www.orfonline.org/research/india-should-reopen-the-ipi-pipeline-project)

[should-reopen-the-ipi-pipeline-project](https://www.orfonline.org/research/india-should-reopen-the-ipi-pipeline-project)

lxiv. Will the Trump Administration Grant the Iran-Pakistan Pipeline Project a Sanctions Waiver, The Diplomat, 2025, <https://thediplomat.com/2025/01/will-the-trump-administration-grant-the-iran-pakistan-pipeline-project-a-sanctions-waiver/>

lxv. No Need for US Waiver to Build Gas Pipeline With Iran, Pakistan Says, VOA, 2024, <https://www.voanews.com/a/no-need-for-us-waiver-to-build-gas-pipeline-with-iran-pakistan-says-/7537570.html>

lxvi. Govt may raise matter for waiver of sanctions on Iran-Pak gas pipeline with Trump admin, The Nation, 2024, <https://www.nation.com.pk/05-Dec-2024/govt-may-raise-matter-for-waiver-of-sanctions-on-iran-pak-gas-pipeline-with-trump-admin>

lxvii. Will the Trump Administration Grant the Iran-Pakistan Pipeline Project a Sanctions Waiver, The Diplomat, 2025, <https://thediplomat.com/2025/01/will-the-trump-administration-grant-the-iran-pakistan-pipeline-project-a-sanctions-waiver/>

lxviii. Pakistan, Iran commit to early resolution of Gas Pipeline Project, ISGS, 2025, <https://www.isgs.com.pk/index.php/2025/05/26/pakistan-iran-commit-to-early-resolution-of-gas-pipeline-project/>

lxix. Afghanistan's Power Sector Update: Outlook remains uncertain, REGLOBAL, 2022. <https://reglobal.org/afghanistans-power-sector-update-outlook-remains-uncertain/>

lxx. CASA-1000, Hitachi Energy, <https://www.hitachienergy.com/me/en/news-and-events/customer-success-stories/casa-1000>

lxxi. Central Asia - South Asia Electricity Transmission and Trade (Casa-1000) Project Feasibility Study Update, SNC Lavalin, 2011, [https://www.casa-1000.org/Docs/1\)Techno-EconomicFeasibilityStudy_Main-Rep_English.pdf](https://www.casa-1000.org/Docs/1)Techno-EconomicFeasibilityStudy_Main-Rep_English.pdf)

lxxii. Central Asia - South Asia Electricity Transmission and Trade (Casa-1000) Project Feasibility Study Update, SNC Lavalin, 2011, [https://www.casa-1000.org/Docs/1\)Techno-EconomicFeasibilityStudy_Main-Rep_English.pdf](https://www.casa-1000.org/Docs/1)Techno-EconomicFeasibilityStudy_Main-Rep_English.pdf)

lxxiii. CASA-1000: Opportunities and Challenges, CSCR Pakistan, 2016, <https://cscr.pk/explore/themes/trade-economics/casa-1000-opportunities-challenges/Taliban-sign-agreements-in-Tajikistan-to-accelerate-CASA-1000-energy-project>, AMU, 2025, <https://amu.tv/174371/#:~:text=Prior%20to%20the%20suspension%20of,required%20equipment%20had%20been%20procured>

lxxiv. Taliban sign agreements in Tajikistan to accelerate CASA-1000 energy project, AMU, 2025, <https://amu.tv/174371/#:~:text=Prior%20to%20the%20suspension%20of,required%20equipment%20had%20been%20procured>

lxxv. Taliban sign agreements in Tajikistan to accelerate CASA-1000 energy project, AMU, 2025, <https://amu.tv/174371/#:~:text=Prior%20to%20the%20suspension%20of,required%20equipment%20had%20been%20procured>

lxxvi. Afghanistan's Power Sector Update: Outlook remains uncertain, REGLOBAL, 2022, <https://reglobal.org/afghanistans-power-sector-update-outlook-remains-uncertain/>

lxxvii. Afghanistan's Power Sector Update: Outlook remains uncertain, REGLOBAL, 2022, <https://reglobal.org/afghanistans-power-sector-update-outlook-remains-uncertain/>

lxxviii. The "TUTAP" transmission line could fracture Afghanistan yet further, Prospect, 2016, <https://www.prospectmagazine.co.uk/world/48857/the-tutap-transmission-line-could-fracture-afghanistan-yet-further>

lxxvix. The "TUTAP" transmission line could fracture Afghanistan yet further, Prospect, 2016, <https://www.prospectmagazine.co.uk/world/48857/the-tutap-transmission-line-could-fracture-afghanistan-yet-further>

lxxx. The "TUTAP" transmission line could fracture Afghanistan yet further, Prospect, 2016, <https://www.prospectmagazine.co.uk/world/48857/the-tutap-transmission-line-could-fracture-afghanistan-yet-further>

lxxxi. The "TUTAP" transmission line could fracture Afghanistan yet further, Prospect, 2016, <https://www.prospectmagazine.co.uk/world/48857/the-tutap-transmission-line-could-fracture-afghanistan-yet-further>

lxxxii. Developing the Central Asia - South Asia Energy Corridor, ADB, <https://www.carecprogram.org/uploads/2015-19th-ESCC-Session-1.Developing-the-Central-Asia.pdf>

lxxxiii. Pakistan secures \$1.2B deferral on Saudi oil payments, Energy Terminal, 2025, <https://www.aa.com.tr/en/energy/oil/pakistan-secures-12b-deferral-on-saudi-oil-payments/47291>

lxxxiv. Pakistan to receive \$1.2bn Saudi oil facility, disbursement begins this month, Profit Pakistan, 2025, (Pakistan to receive \$1.2bn Saudi oil facility, disbursement begins this month - Profit by Pakistan Today)

lxxxv. Pakistan to receive \$1.2bn Saudi oil facility, disbursement begins this month, Profit Pakistan, 2025, <https://profit.pakistantoday.com.pk/2025/03/20/pakistan-to-receive-1-2bn-saudi-oil-facility-disbursement-begins-this-month/>

lxxxvi. Pakistan, Saudi Arabia sign pact for \$10bln greenfield refinery – report, ZAWYA, 2023, <https://www.zawya.com/en/business/energy/pakistan-saudi-arabia-sign-pact-for-10bln-greenfield-refinery-report-eurdutqh>

lxxxvii. Saudi Arabia invests USD 10 billion to build Pakistan's largest oil refinery, Gulf International Forum, <https://gulffif.org/timeline/saudi-arabia-invests-usd-10-billion-to-build-pakistans-largest-oil-refinery/>

lxxxviii. Pakistan, Saudi Arabia sign pact for \$10bln greenfield refinery – report, ZAWYA, 2023, <https://www.zawya.com/en/business/energy/pakistan-saudi-arabia-sign-pact-for-10bln-greenfield-refinery-report-eurdutqh>

lxxxix. Aramco completes acquisition of 40% stake in Gas & Oil Pakistan, Aramco, 2024, <https://www.aramco.com/en/news-media/news/2024/aramco-completes-acquisition-of-stake-in-gas-and-oil-pakistan>

xc. Saudi Fund for Development contributes \$240 million to support Pakistan's energy transition via Mohmand Multipurpose Dam project, Saudi Fund for Development, 2023, <https://www.sfd.gov.sa/en/n486>

xc. Pakistan secures \$1.2B deferral on Saudi oil payments, Energy Terminal, 2025, <https://www.aa.com.tr/en/energy/oil/pakistan-secures-12b-deferral-on-saudi-oil-payments/47291>

xcii. Saudi firm Manara may invest in Pakistan's Reko Diq mine, minister says, Reuters, 2025, <https://www.reuters.com/markets/commodities/saudi-firm-manara-may-invest-pakistans-reko-diq-mine-minister-says-2025-01-14/>

xciii. Saudi Arabia chases 15% stake in Pakistan's Reko Diq mine, AGBI, 2025, <https://www.agbi.com/mining/2025/01/saudi-arabia-chases-15-stake-in-pa>

[kistans-reko-di-q-mine/](#)

xciv. Pakistan Net-Zero 2050, UNESCAP, 2023, https://www.unescap.org/sites/default/d8files/event-documents/1-1.4.Sofia%20Net%20Zero%20Strategy%20in%20Pakistan_0.pdf

xcv. Pakistan, UAE sign renewable energy deal, AA, 2023, <https://www.aa.com.tr/en/middle-east/pakistan-uae-sign-renewable-energy-deal/2938922>

xcvi. Pakistan, UAE sign renewable energy deal, AA, 2023, <https://www.aa.com.tr/en/middle-east/pakistan-uae-sign-renewable-energy-deal/2938922>

xcvii. Pakistan emits less than 1% of the world's planet-warming gases. It's now drowning, CNN, 2022, <https://edition.cnn.com/2022/08/30/asia/pakistan-climate-crisis-floods-justice-intl>

xcviii. Pakistan, UAE sign 5 accords of cooperation on Abu Dhabi crown prince's first official visit, DAWN News, 2025, <https://www.dawn.com/news/1894667>

xcix. Hurdles in materialization of GCC's economic ventures in Pakistan, The Express Tribune, 2024, <https://tribune.com.pk/story/2517229/hurdles-in-materialization-of-gccs-economic-ventures-in-pakistan>

c. Pakistan's LNG deal with Qatar open to renegotiation next year, Arab News, 2025, <https://www.arabnews.com/node/2589371/pakistan>

ci. Pakistan plans to renegotiate LNG prices under 15-year contract with QatarEnergy, S&P Global, 2025, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/lng/021825-pakistan-plans-to-renegotiate-lng-prices-under-15-year-contract-with-qatarenergy>

cii. Pakistan's LNG deal with Qatar open to renegotiation next year, Arab News, 2025, <https://www.arabnews.com/node/2589371/pakistan>

ciii. Pakistan plans to renegotiate LNG prices under 15-year contract with QatarEnergy, S&P Global, 2025. (Pakistan plans to renegotiate LNG prices under 15-year contract with QatarEnergy | S&P Global)

civ. Pakistan, Qatar sign 10-year LNG supply contract, Dawn, 2021, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/lng/021825-pakistan-plans-to-renegotiate-lng-prices-under-15-year-contract-with-qatarenergy>

cv. Pakistan plans to renegotiate LNG prices under 15-year contract with QatarEnergy, S&P Global, 2025, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/lng/021825-pakistan-plans-to-renegotiate-lng-prices-under-15-year-contract-with-qatarenergy>

cvi. Qatar defers five LNG cargoes to 2026 amid Pakistan's reduced demand, Profit Pakistan, 2024, (<https://profit.pakistantoday.com.pk/2024/11/08/qatar-defers-five-lng-cargoes-to-2026-amid-pakistans-reduced-demand/>)

cvii. Pakistan to defer eight LNG cargoes from Eni for May-Dec amid weak demand, S&P Global, 2025, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/lng/032025-pakistan-to-defer-eight-lng-cargoes-from-eni-for-may-dec-amid-weak-demand>

cviii. Qatar defers five LNG cargoes to 2026 amid Pakistan's reduced demand, Profit Pakistan, 2024, <https://profit.pakistantoday.com.pk/2024/11/08/qatar-defers-five-lng-cargoes-to-2026-amid-pakistans-reduced-demand/>

cix. Pakistan to defer eight LNG cargoes from Eni for May-Dec amid weak demand, S&P Global, 2025, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/lng/032025-pakistan-to-defer-eight-lng-cargoes-from-eni-for-may-dec-amid-weak-demand>

cx. Pakistan to renegotiate Qatar LNG deal amid high costs — report, Arab News, 2025.

<https://www.arabnews.com/node/2589351/Pakistan>

cxii. Pakistan must rebuild Chinese investor confidence in its energy transition, IEEFA, 2025, <https://ieefa.org/resources/pakistan-must-rebuild-chinese-investor-confidence-its-energy-transition>

cxiii. Watchdog Warns Against Rising Security Threats Around TAPI, TOLO News, 2018, <https://tolonews.com/business/watchdog-warns-against-rising-security-threats-around-tapi>

cxiiii. Walking a Tightrope: How Gulf States are Navigating the Iran-Israel Conflict, Stimson, 2024, <https://www.stimson.org/2024/walking-a-tightrope-how-gulf-states-are-navigating-the-iran-israel-conflict/>

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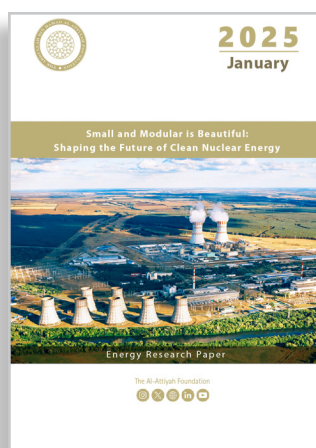
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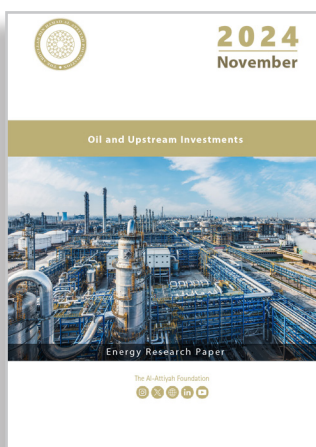
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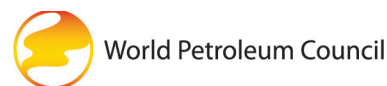
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