

SECTOR ASSESSMENT (SUMMARY): ENERGY

1. Sector Performance, Problems and Opportunities

1. A reliable and sustainable energy sector is essential to the economic growth and well-being of Pakistan. Load shedding has become common and severe, leading to civil strife and factory closures. A steady increase in international energy prices has resulted in a significant balance of payment deficit for the country. The import bill for energy products has nearly doubled during 2007–2012, corresponding to 32% of total imports in 2013. The demand–supply gap for indigenous natural gas has drastically increased since 2008, causing load shedding for retail and industrial customers. Given the increasing cost of imported fuels and decreasing allocation of domestic natural gas, electricity generation has relied increasingly on expensive and less efficient imported fuel oil, which has worsened the liquidity crisis of the sector.

2. Chronic power shortages are estimated to have reduced gross domestic product (GDP) growth by at least 2% in 2012 and 2013,¹ and are considered the major cause of the slowdown in large-scale manufacturing, which grew at only 1.2% in 2012 and 2.8% in 2013.² Despite a 160% increase in power tariffs from 2008 to 2013, the revenue from the sale of power could not keep pace with the rising cost of imported fuel or the sector's maintenance needs. Energy sector subsidies equaled \$3.8 billion or about 1.8% of GDP in 2013,³ and significantly reduced the funds available for social welfare and infrastructure.

3. The primary energy supplies from fiscal year (FY) 2007 to FY2012 remained at 48%–50% natural gas and 30%–32% oil. Use of coal decreased from 7.3% to 6.6% and of hydropower from 12.6% to 10.5% during the same period.⁴

4. Indigenous natural gas has been the preferred fuel for all consumers due to its low price, ease of use, and environment friendliness. In FY2012, the industrial sector consumed 38% of total energy, followed by the transport sector (31%), domestic sector (22%), commercial sector (4%), and agriculture and others (4%). While Pakistan has the largest pipeline network in South Asia, only 20% of its population has access to natural gas. In the absence of significant new discoveries and increased output through newer technologies, the supplies have leveled off and shortfalls have increased to crisis levels in the winter seasons. The gas allocation policies of the government have been based more on sociopolitical than economic considerations. During 2009–2012, the share of the residential sector has increased from 18.3% to 22.3%, while that of the transport sector—compressed natural gas (CNG)—has increased from 7.6% to 10%, mainly at the expense of electricity and industrial sectors. The share of electricity sector has fallen from 28.7% to 24.7%, that of the industrial sector from 28% to 25.3%. Long lines of cars can be seen on the 3 days a week that CNG is available.

5. In 2012, electricity distribution losses reached 23% and tariff collection amounted to 86% of total billing, against 16% and 100% allowed by the regulator. The receivables owed by private sector customers increased by 359% during the same period.⁵ Gas distribution

¹ Government of Pakistan Ministry of Finance. 2013. *Economic Survey 2012-13*. Islamabad. The amount is also used as one of the assumptions for the macroeconomic framework for 2013-14 in Government of Pakistan Planning Commission. 2013. *Annual Plan 2013-14*. Islamabad.

² ADB. 2013. *Asian Development Outlook 2013 Update: Governance and Public Service Delivery*. Manila.

³ International Monetary Fund. 2013. *Pakistan: 2013 Article IV Consultation and Request for an Extended Arrangement Under the Extended Fund Facility*. Washington, DC.

⁴ Hydrocarbon Development Institute of Pakistan. 2012. *Pakistan Energy Year Book*. Karachi.

⁵ Receivables owed by private sector customers totaled \$2.6 billion or 1.14% of GDP in 2013, compared with receivables owed by provincial and federal government customers, which increased by 7% from 2008 to 2013 and totaled \$1.5 billion or 0.66% of GDP in 2013. (Supplementary Document 13).

losses, or unaccounted for gas (UFG), totaled 11%—against 4.5% allowed by the Oil and Gas Regulatory Authority (OGRA). The poor performance of the public sector companies led to an accumulation of corporate losses. In 2013, the government injected \$3.8 billion in equity into the distribution companies (DISCOs) to clear these losses.

6. Although regulations are in place, third-party access to the transmission system has not taken place except for mine-mouth fertilizer and power generation plants. Third-party access would allow producers to directly contract with buyers for electricity and gas at market prices. The producers would be able to take on the credit risk of the buyer rather than of the entire system. Clarifying the rules and streamlining the procedures would enhance interest from private sector investors. Outsourcing of tariff collection and economic dispatch of electricity has been pioneered by K-Power with some success. Two power distribution and generation companies and both gas distribution companies are included in the 2011 list for privatization. Without a strong regulator and careful monitoring of the contracts, privatization of these companies may not result in a more efficient and reliable sector.

7. In June 2012, total installed generation capacity reached 23,538 megawatts (MW), with a de-rated capacity of 18,704 MW (15,731 MW during winter). The shortage of funds to pay for fuel oil and the lack of natural gas allocation has constrained power generation to 14,000 MW.

8. **Sector structure and reforms.** Reforms have been ongoing in Pakistan since 1992. But the pace has been slow and the expected efficiencies have yet to fully materialize. The reforms include the unbundling and corporatization of the Water and Power Development Authority (WAPDA) into nine regional DISCOs, four government-owned thermal power generation companies (GENCOs), a transmission company licensed also as a single buyer and seller of electricity—the National Transmission and Despatch Company (NTDC)—and the hydropower plants were retained by WAPDA. All are fully owned by the government. K-Electric Limited (formally known as Karachi Electric Supply Company), which is responsible for power generation and distribution in the Karachi area, is listed on the stock exchanges and is privately owned. Privately owned independent power producers (IPPs) generate 56% of the country's power.⁶ The National Electric Power Regulatory Authority (NEPRA) was established to determine tariffs, issue licenses, and regulate and ensure the long-term sustainability of the sector. The Ministry of Water and Power sets sector policies, including the tariffs paid by electricity customers.

9. The fuel sector is still dominated by the public sector companies—two gas transmission and distribution companies, a gas import company, two exploration companies, and one oil marketing company. The Ministry of Petroleum and Natural Resources (MPNR) provides the policy framework and administrative oversight for the upstream oil and gas operations, including oil refining, and for the midstream and downstream functions carried out by gas transmission and distribution companies, oil marketing companies, and liquefied petroleum gas storage and marketing companies. Technical functions of the MPNR are managed by the director generals responsible for petroleum concession, gas refineries, oil, and liquefied natural gas. OGRA was set up under the OGRA Ordinance in 2002 to foster competition, increase private investment and ownership in the midstream and downstream petroleum industry, protect the public interest while respecting individual rights, and provide effective and efficient regulations. OGRA has a primary role in issuing operating licenses to utilities and companies in the energy sector.

10. **Tariffs, pricing, and subsidies.** The government has not passed on the total cost to the electricity customers and provides subsidies for the difference between the customer

⁶ Government of Pakistan, National Electric Power Regulatory Authority. 2012. *State of Industry Report, 2012*. Islamabad.

tariff and the cost-recovery tariff determined by NEPRA. The government has paid over PRs1 trillion in tariff differential subsidies since 2008. The difference between the customer tariff and the cost-recovery tariff, and the delay in determining and applying the cost-recovery tariff and the ensuing delay in payment of subsidies have caused (i) substantial and costly payment arrears to fuel suppliers and IPPs; (ii) loss of efficiency due to insufficient funds for maintenance and augmentation of equipment; (iii) reduction of working capital reserves of public and private power companies to critically low levels, resulting in payment arrears, and (iv) concerns by private investors and their financiers over the creditworthiness of the power sector.

11. Similarly, gas prices for fertilizer producers, and for small- and medium-volume retail customers, are subsidized by industrial (including electricity sector) and large-volume retail customers. This cross-subsidization leads to uneconomic allocation and wastage of scarce resources. The government fixes gas prices and maintains them at a uniform level within the same category of customers throughout the country. Gas tariffs for consumers are set on the basis of the average cost of gas production in the country, regulated transmission and distribution expenditure, and return on assets for the two state-owned gas distribution companies. The government earns a gas development surcharge of PRs30 billion⁷ from power and fertilizer producers that draw gas from medium British thermal units (Btu) gas fields. In the upstream gas sector, the price of gas for producers is determined by OGRA on the basis of their respective pricing formulas. Drilling for gas declined from an average of 30 a year to 20 a year during 2009–2012.

12. Petroleum product prices in Pakistan are market based and linked to fluctuations in petroleum product prices in the international market. However, except for fuel oil and high speed diesel, petroleum product prices are determined by OGRA based on a fixed formula agreed between the government and marketing companies. Refineries are allowed to fix their ex-factory prices on the basis of import parity prices under a revenue protection regime. OGRA was mandated by a federal cabinet decision in March 2006 to fix the prices in accordance with the government's prescribed formula. In 2011, the government deregulated the prices of motor fuels and jet fuels. As a result, refineries and oil marketing companies (OMCs) fix the prices of these products. The OMCs are allowed to charge a distribution margin of 3.5% and a dealer's commission of 4% to protect their returns. The government, at times, controls the prices of these products for consumers through adjustment in the petroleum development levy charged in the final prices to consumers.

2. Government Strategy

13. In July 2013, the government approved the National Power Policy to support current and future energy needs. The policy seeks to eliminate load shedding by 2017, by (i) reducing the average system-wide generation cost from \$0.12 per kilowatt-hour (kWh) to \$0.10 per kWh by 2018; (ii) decreasing transmission and distribution losses from the current 25%–28% to 16% by 2018; and (iii) increasing revenue collection from 85% to 95% of total billing. The government also aims to reduce processing times for all sector operations.

14. The policy, in the short term, intends to establish efficiency through promotion of a system-wide merit order (e.g., in fuel allocation, dispatch, payments, and the energy mix), transparency through providing seamless access to information via public websites, and accountability through hiring of professionals on the basis of competency, the signing of performance contracts, and a zero-tolerance approach to corruption and poor performance. Competition will be based on infrastructure development, upfront tariffs, competitive bidding, and key client management. NEPRA will be strengthened and a one-window operation will be

⁷ Government of Pakistan. Ministry of Finance. 2013. *Explanatory Memorandum on Federal Receipts, 2013-14*. Islamabad. (http://www.finance.gov.pk/budget/exp_memorandum_2013_14.pdf)

established to encourage and assist private sector investors. Sustainability will be achieved through the use of low-cost energy, fair treatment of stakeholders, rationalization of consumer tariffs, and demand management through pricing and regulatory instruments.

15. In the medium term, low-cost gas pipeline, coal, and hydropower projects will be implemented. In the long term, large infrastructure hydropower projects will be completed, and existing high-cost energy projects and contracts will be retired, to ensure more affordable electricity generation. The National Power Policy encourages IPPs to invest in new power plants or to convert existing ones for use of less expensive fuels.

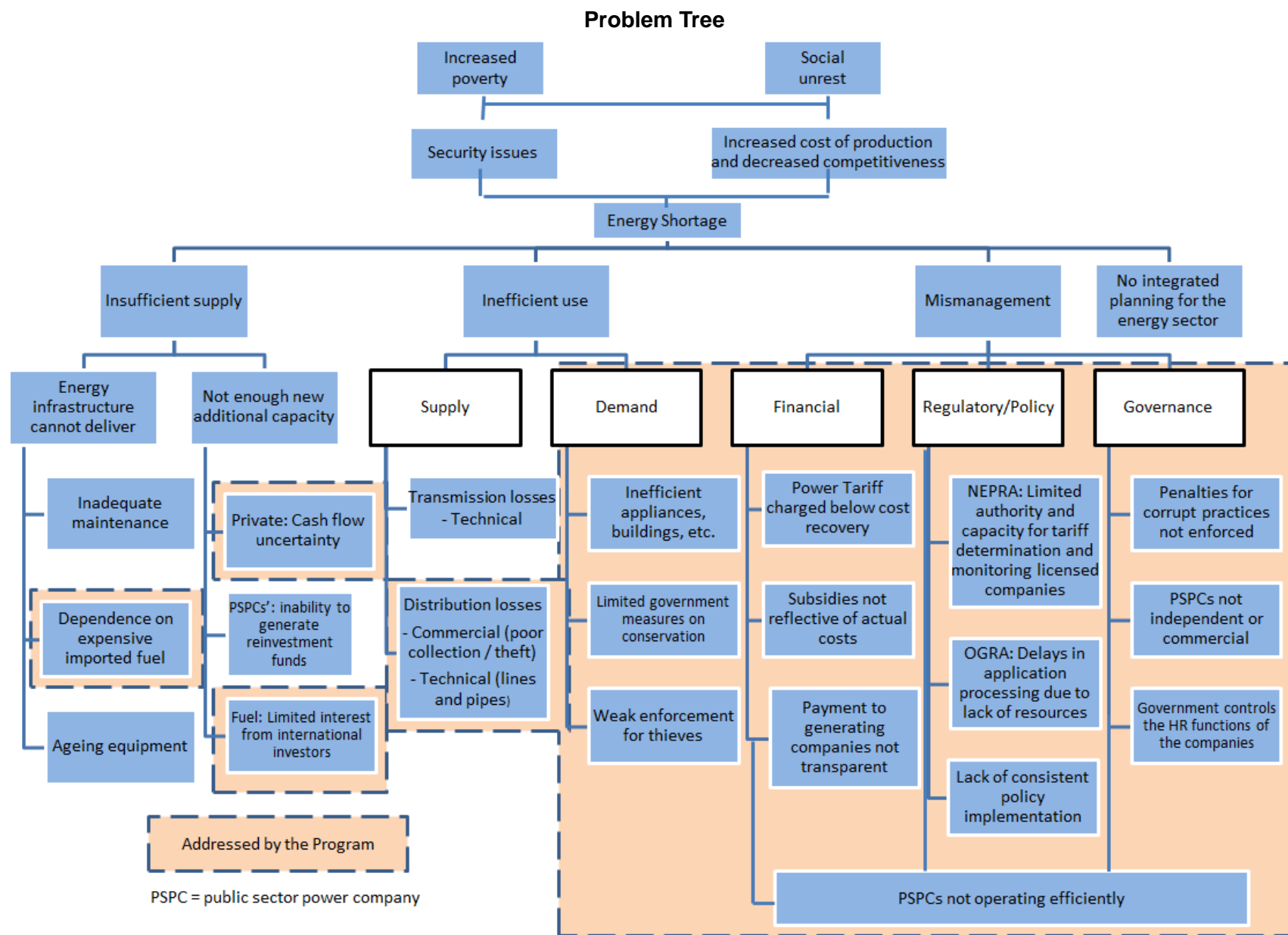
16. Under the Petroleum Exploration and Production Policy 2012, the government enhanced the well-head pricing terms for natural gas producers. The government has had a positive response in that 50 offers were received in recent bidding for 58 blocks with exploration and production rights. However, the response from foreign companies remained subdued, even after the increase in gas price from \$4 to \$6 per million British thermal units (MMBtu) for some zones. A Tight Gas Policy for exploration and production was announced in May 2011. The policy gives 40% premium over the respective price for each zone under 2009 Policy. To fast-track development and production of tight gas, an additional 10% premium was offered for volumes that are brought into production by 2013 to squeeze gas from existing fields. The maximum producer price for pipeline-quality specification gas from tight gas reserves in zone III works out to \$6.57/MMBtu for fields coming on line within 2 years, and to \$6.13/MMBtu for later developments. So far, three gas fields have taken advantage of this policy. The MPNR is developing a shale gas policy. Under the 18th Constitutional Amendment, provinces have been awarded greater authority in the approval process for oil and gas sector affairs, which has delayed exploration in some cases. Consequent to the amendment, the Petroleum Rules 2013 have been modified to disburse the royalty share directly to the provinces instead of channelizing them through the federal government, a major step in removing a long-standing provincial grievance.

3. Asian Development Bank Sector Experience and Assistance Program

17. The multitranche financing facilities (MFFs) of the Asian Development Bank (ADB) have been approved to finance energy efficiency, transmission, distribution, and renewable energy projects. Each MFF includes an Asian Development Fund loan that supports capacity development and performance improvement. In addition to the four MFFs, ADB approved the Jamshoro Power Generation Project (JPGP) to finance a 660-MW coal-fired supercritical power plant. As the sector's largest donor, ADB holds regular policy dialogue and provides periodic sector assessments to the International Monetary Fund country reviews on request.

18. The government and donors developed a framework for resolving the energy crisis through the Energy Sector Task Force of Friends of Democratic Pakistan in 2010. ADB coordinates a quarterly meeting with major energy donors to discuss the sector's status and projects' progress. This forum enables donors to coordinate closely and engage in policy. ADB has partnered with Agence Française de Développement in the MFF for Energy Efficiency Investment Program⁸ and with the Islamic Development Bank in the JPGP. ADB has also sought cofinancing opportunities with other donors.

⁸ ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Cofinancing to the Islamic Republic of Pakistan for the Energy Efficiency Investment Program*. Manila.



Sector Results Framework (Pakistan Energy Sector, 2009–2013)

| Country Sector Outcomes | | Country Sector Outputs | | ADB Sector Operations | |
|--|--|--|---|--|--|
| Outcomes with ADB Contribution | Indicators with Targets and Baselines | Outputs with ADB Contribution | Indicators with Incremental Targets | Planned and Ongoing ADB Interventions | Main Outputs Expected from ADB Interventions |
| Reliable and affordable energy services through the development of indigenous energy resources (hydropower, renewable energy, coal, and gas) and strengthening transmission and distribution networks. | <p>Private investment as a share of total investments in the power sector increased from 19% in 2012 to 23% by June 2018.</p> <p>Average power distribution and transmission system losses reduced from 21.86% in 2013 to 17.86% by June 2017 for all DISCOs and NTDC.</p> <p>Unaccounted for gas reduced from 11% in 2013 to 8% by June 2018.</p> | <p>Increased efficiency, both technical and financial, of the power and natural gas systems.</p> | <p>CPPA becomes fully operational as an independent agency.</p> <p>Efficient regulation of DISCO tariff determination.</p> <p>Improvement in collection rate and performance target of DISCOs.</p> <p>Institutionalization of energy efficiency standards.</p> <p>Issuance of a long-term least-cost generation and transmission expansion plan (LCP).</p> <p>Updated policy framework, procedures, and documentation for competitive and/or unsolicited bids for new independent power producers in accordance with the LCP.</p> <p>Approved Gas Theft (Control & Recovery) Act/Ordinance.</p> | <p>Planned key activity areas Subsector development and other renewables (2% of approved funds). Small hydro (20 MW) and below (5% of approved funds). Electric power transmission (45% of approved funds). Distribution loss reduction (9% of approved funds). Energy efficiency (21% of approved funds). Emission trading and CDM (0.19% of approved funds). Cleaner production (industry) (0.58% of approved funds). Thermal power (16% of approved funds). Tariffs and pricing (0.06% of approved funds). Pipeline projects with estimated amounts Sustainable Energy Sector Reforms Program (\$400 million). MFF Power Transmission Enhancement Investment Tranche 4 (\$250 million). Renewable Energy Development Sector Investment Program Tranche 3 (\$109 million). Ongoing projects with approved amounts MFF Renewable Energy Development Sector Investment Program (\$510 million), Tranche 1 (\$115 million). MFF Power Transmission Enhancement Investment Program (\$800 million), Tranche 1 (\$236 million), Tranche 2 (\$220 million), Tranche 3 (\$243 million). MFF Power Distribution Enhancement Investment Program (\$810 million), Tranche 1 (\$252 million), Tranche 2 (\$242 million), Tranche 3 (\$245 million), Tranche 4 (\$167 million). MFF Energy Efficiency Investment Program (\$780 million), Tranche 1 (\$60 million). Jamshoro Power Generation Project (\$900 million).</p> | <p>Pipeline projects Two small to medium-sized hydropower plants constructed.</p> <p>Ongoing projects Small to medium-sized hydropower stations are operational, and feasibility studies and other due diligence work on new renewable energy schemes completed. Transmission lines and substations constructed and rehabilitated. Compact fluorescent lamps are introduced in the local market, lamp waste collection and recycling demonstration facility established, and energy efficiency and climate change mainstreamed in national development strategy. Supercritical coal-fired power generation units constructed.</p> |

ADB = Asian Development Bank, CDM = Clean Development Mechanism, CPPA = Central Power Purchasing Agency, DISCO = distribution company, kWh = kilowatt-hour, LCP = long-term, least-cost generation and transmission expansion plan, MFF = multitrance financing facility, MW = megawatt.

Source: Asian Development Bank.