

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC54374

Project Name	National Transmission Modernization I Project (P154987)
Region	SOUTH ASIA
Country	Pakistan
Sector(s)	Transmission and Distribution of Electricity (100%)
Theme(s)	Infrastructure services for private sector development (90%), Other public sector governance (10%)
Lending Instrument	Investment Project Financing
Project ID	P154987
Borrower(s)	Islamic Republic of Pakistan
Implementing Agency	National Transmission and Despatch Company (NTDC)
Environmental Category	B-Partial Assessment
Date PID Prepared/ Updated	08-Mar-2016
Date PID Approved/ Disclosed	10-Mar-2016
Estimated Date of Appraisal Completion	30-Nov-2016
Estimated Date of Board Approval	15-Mar-2017
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

1. Pakistan's economy is projected to grow by 4.5 percent in 2016 after expanding by 4.2 percent in 2015. Pakistan is the world's sixth most populous country with 182 million people and a per capita income of US\$1,410 in 2015 placing it in the lower middle income country category. Since 2013, Pakistan has moved forward with macro-economic reforms, supported by an IMF Program and Development Policy Credits from the World Bank and others. Nevertheless, the country's rebound from the global financial crisis has been slow and fragile. Weak growth is partly due to macroeconomic, and security challenges, natural disasters and limited skills. Adding to these factors are weak public sector management, governance and capacity which hamper service delivery. Pakistan's performance on the Doing Business index has deteriorated in recent years (ranked 138 out of 189 countries in the 2016 report, down from 76 in 2008). Foreign direct investment and exports have stagnated.

2. The government is pushing ahead with bold structural reforms. After stabilizing the economy since it came to office in May 2013, the government is increasingly focusing its efforts on higher and more sustainable and inclusive economic growth. It aims to continue to widen the tax net to generate the necessary resources for higher infrastructure and social spending while strengthening public finances. Government is continuing to build foreign exchange reserves to bolster resilience in the face of external shocks, advancing the implementation of plans for creating suitable conditions for higher investment and exports by improving competitiveness and the business climate. An ambitious program of privatization and restructuring of public enterprises is focused on strategic sales of assets.

Sectoral and Institutional Context

3. The crisis conditions in the energy sector, and particularly electricity, of 2013 have now passed. Government has focused on better management of existing assets and resources throughout the fuel supply-generation-transmission-distribution chain which has yielded incremental improvements in sector performance. Government figures suggest that losses for 2015 were at their lowest for 10 years, at 17.9 percent, and recovery of amounts billed at their highest at 94.6 percent. Estimates suggest that GDP growth has been reduced by two percentage points for the past several years because of inadequate and poor quality electricity supply

4. Pakistan's power sector is unbundled, and has significant private participation in generation. In the early 1990s Pakistan was one of the first countries to initiate a comprehensive program of energy sector reform. The vision was to unbundle the Power Wing of the Water and Power Development Authority (WAPDA) into commercially oriented companies. Separate corporate entities were created from WAPDA with responsibilities for: thermal generation through four generation companies (Gencos); hydropower through WAPDA Hydel; transmission through the National Transmission and Despatch Company (NTDC); and distribution through eight Discos (now ten). Privately-financed generation by independent power producers (IPPs) was introduced in parallel, with some success; about one half of all electricity generated today is from IPPs. The Karachi Electricity Supply Company (KESC, now K-Electric) remained a separate utility which was privatized in 2005. An independent economic regulator, the National Electric Power Regulatory Authority (NEPRA), was established by law.

5. Incomplete reforms hamper sector investment and commercial discipline could improve. The intended structural reforms have not been completed, in particular neither the Gencos nor the Discos have been privatized as envisaged. A bureaucratic culture remains entrenched in the operating companies. Obstacles remain to further reforms and in particular privatization. Company accountabilities are not fully enforced or recognized due to the weak institutional setting. Past governments have been reluctant to stand behind pricing that ensures full cost recovery. As the owner of the Discos, government has not been able to find the right combination of incentives and management to ensure good performance across the board.

6. Pakistan's power sector has a significant shortage of supply. The Pakistan electricity system covers about 66 percent of all households. In the last ten years, demand has grown at an estimated rate of seven percent a year, whereas supply has grown at about 2.7 percent a year. In 2014, total installed capacity was 24,900 MW, but a maximum of only about 16,700 MW was available, and of that about 4,700MW is only available during the summer when hydropower generation is at its maximum. As a result, the country has been facing a peak shortfall between 5000-7000 MW since 2010. The shortage has been worsened by the high cost of generation, which because there is insufficient liquidity to buy fuel, has been capped at about 95 terawatt hours (TWh) per year for the past several years. In consequence, load shedding, started in 2006, has become the norm at 6-8

hours a day for households and 1-2 hours a day for industry, hurting all economic sectors and people's lives and livelihoods.

7. Aging and inadequate transmission and distribution systems exacerbate the problem. Recent efforts have concentrated on increasing generation capacity, but aging and increasingly unreliable transmission and distribution system also impose severe constraints. Anecdotal evidence suggests that the transmission system has capacity to dispatch about 15,000MW safely and there have been several instances of major system collapses which appear to be increasing in frequency and severity. In the distribution system two key measures of system reliability, the system average interruption duration index (SAIDI) and system average interruption frequency (SAIFI), present a mixed picture but suggest that in several distribution companies quality of supply is deteriorating. The regulator reports that most distribution systems do not meet their investment targets for repair and maintenance.

8. Massive, well targeted and efficiently executed investment is needed throughout the electricity value chain. To address the supply-demand gap, the Government has focused on improving the electricity supply through development of low cost generation, in particular hydro power projects in the north and efficient thermal plants based on gas and coal in the center and south of the country. It is committed to promote private investment for power generation by attracting new players as well as capacity expansion of existing IPPs. The government is also working to address the gas supply shortage, including expediting LNG import and devising a gas price rationalization plan that will support investment in new gas-fired power generation. The power development plan envisages adding 8,300 of MW generation capacity over the period 2017 to 2021.

9. Investment in generation will not have intended benefits without adequate and timely upgrading of transmission and distribution systems. The government strategy for the transmission segment is to create a cutting-edge national transmission network. This involves (a) expansion and upgrading of the national grid to accommodate new large and small scale hydropower generation and to reduce losses; (b) optimizing management of the transmission system through a performance contract with NTDC and using IT for optimizing economic dispatch, management and operation of the system; and (c) mobilizing private investment in transmission infrastructure through provision of incentives and an innovative regulatory regime. The government also encourages development of regional interconnection to promote power trade. Notwithstanding the significant private investment potential, the government intends to maintain most of the transmission system in public ownership. Financing is needed to restore the capacity deficit and enable evacuation of new generation and imports that are due to come on line in the near future.

Relationship to CAS

10. The Country Partnership Strategy (CPS) for FY15-19 includes a pillar exclusively for energy. It seeks a structural and a cost transformation in the energy sector and includes reductions in load shedding, cost of electricity production, and improved financial sustainability of the sector among the expected outcomes. The proposed project aims to remove bottlenecks of the national transmission system and to increase its capacity to evacuate the upcoming new generation capacity under construction or planned by public and private sector and thus contribute directly to the first two CPS outcomes.

11. As part of the CPS implementation, the World Bank Group has embarked upon a "Transformational Power Initiative". The initiative aims to support significant new investments and

reforms in the power sector and to mobilize over \$10 billion over the next five years, to support system expansion through public and private projects that address current supply gaps and future needs. The Bank supports sector reform and public investment, including the Tarbela hydropower fourth and fifth extension and the Dasu hydropower project. International Finance Corporation (IFC) has made investments in mid to large hydropower and wind generation and in LNG import. The Bank and IFC continue to work together on the Central Asia-South Asia Regional Electricity Transmission and Trade Project (CASA-1000) to bring Central Asian power to Pakistan.

12. The proposed project will complement the Dasu HPP, Tarbela 4 & 5 HPP and CASA-1000. Although the proposed project is not in the CPS, additional transmission infrastructure is needed to evacuate the electricity produced from current or planned Bank-financed investment operations.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The proposed Project Development Objective (PDO) is to increase the availability, reliability and efficiency of selected segments of the national transmission system in Pakistan.

Key Results (From PCN)

14. Key expected results from the Projects are:
- (i) Increased transfer capacity of the transmission system and
 - (ii) Increased reliability indicators in selected transmission segments.

Detailed indicators will be developed during preparation.

III. Preliminary Description

Concept Description

15. The proposed project would invest in high-priority transmission infrastructure, information communication technology (ICT) and technical assistance (TA). Infrastructure investments would be either transmission lines, transmission substations or a combination of the two. The project will create new assets or rehabilitate existing parts of the system. The subprojects would be selected based on system planning conducted by NTDC that identifies the highest priority improvements. The ICT investment would support better corporate and operations management, while the TA would enable NTDC to implement the project. The project is envisaged to consist of three components as described below.

- Component A: Upgrading and Expanding of the Transmission Network (estimated cost \$448 million, of which \$380 million IBRD loan and \$68 million NTDC counterpart funds). The component would include (a) upgrading, expanding and rehabilitating of selected existing 500 and 220 kV power substations and associated lines; and (b) constructing of new 500 and 220 kV substations and transmission lines. If NTDC decides to start operating at 765kV, currently under consideration, subprojects at that voltage will also be eligible.
- Component B: Deployment of Enterprise Resource Planning (ERP) for NTDC (estimated cost \$25 million, all IBRD loan). The component includes implementation of the information and communication (ICT) infrastructure modernization phase for NTDC, followed by development and deployment of an ERP system aimed at strengthening the company's management capabilities through the use of an integrated ICT system to facilitate its financial, human resources management, inventory and asset management, and metering data management. The component includes the procurement of software licenses, hardware and consulting services for implementation support,

change management and ICT capacity building and strategic sourcing to ensure the sustainability of the ERP system.

- Component C: Project Management, Technical Assistance, and Capacity Building (estimated cost \$20 million, all IBRD loan). The component includes (a) a project implementation support consultant; and (b) capacity building program for NTDC to plan, invest and operate the upgraded national transmission grid.

16. Detailed cost estimates for each component and financing arrangement will be finalized during project preparation.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04			x
Forests OP/BP 4.36			x
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12	x		
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

V. Financing (in USD Million)

Total Project Cost:	493.00	Total Bank Financing:	425.00
Financing Gap:	0.00		
Financing Source			Amount
Borrower			68.00
International Bank for Reconstruction and Development			425.00
Total			493.00

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