I. Project Context

Country Context

1. The overarching socioeconomic objective of Pakistan is to raise the country's human development indicators in line with Vision 2025. Pakistan is the world's sixth most populous nation, with 207 million people. It is a lower-middle-income country, with per capita income of US$1,434, on a path to become an upper-middle-income country by 2025. Between FY2001 and FY2014, Pakistan's poverty headcount declined from 64.3 percent to 29.5 percent of the population. Nevertheless, Pakistan continues to rank low on the human development index, at 147th out of 188 countries. There are several reasons for this low ranking. For example, the primary school completion rate is among the lowest in the world, and expenditures on public health are also low at 0.8 percent of gross domestic product (GDP). Improving human development indicators will require sustained high economic growth combined with better macroeconomic management.

2. Pakistan’s economic growth, critical to improving human development indicators, was relatively high in 2016 but lower than planned. In FY2016, Pakistan's economy grew at an estimated 4.7 percent, the highest growth rate in eight years, significantly higher than the global average growth of 3.1 percent. However, it was well below the target growth of 5.5 percent envisaged in Pakistan's FY2016 economic plan and the average growth of 6.8 percent in South Asia. Factors that lower Pakistan’s economic growth compared with its neighbors include security challenges, infrastructure constraints, electricity shortages and load shedding, limited skills, and frequent natural disasters. Located at the crossroads of South Asia, Central Asia, China, and the Middle East, Pakistan is at the fulcrum of a
regional market with a vast population, large and diverse resources, and untapped potential for trade.

3. A relatively unfavorable business environment has constrained the growth of the private sector, hindering job creation and economic growth. About 90 percent of Pakistan's GDP originates in the private sector, and 70 percent of firms are classified as small businesses. Businesses resist expanding because of the costs associated with business formalization. Many tend to operate informally, resulting in low registration of firms in the tax system. Crowded out by large public sector borrowing, they have limited access to financing for expansion. In Doing Business 2017, Pakistan ranks 144th out of 190 countries in the ease of doing business. Though quite low, this ranking is slightly higher than Pakistan's 148th position in 2016. The improvement in 2017 resulted from a series of reforms to land records, credit availability, and customs clearance. In getting electricity, Pakistan's ranking for 2017 declined to 170 from 163 in 2016 while the country’s number and duration of power outages were too high to even qualify for a ranking of power reliability.

**Sectoral and Institutional Context**

4. Pakistan was one of the first countries to reform its power sector, in the early 1990s. The first stages of reform were aimed at attracting private investment into the generation segment and were initially highly successful. To avoid some of the more pressing conflicts of interest, the Government also unbundled the Power Wing of the Water and Power Development Authority (WAPDA), hitherto the publicly owned vertically integrated monopoly with responsibility for generation, transmission, and distribution. Four thermal generation companies (GENCOs) and eight distribution companies (DISCOs) were formed. The existing large hydropower assets remained with WAPDA, in a specialist unit, WAPDA Hydel. The National Transmission and Despatch Company (NTDC) was also established with a dual role: to act as the single buyer of electricity and to be the transmission network owner (TNO) and system operator (SO). An independent regulator, the National Electric Power Regulatory Authority (NEPRA), was also set up, responsible for licensing, determining tariffs, creating standards, and monitoring sector performance.

5. Despite the promising start, improvements in sector performance remain elusive. In the intervening two decades, there have been limited further reforms, including the privatization of some generation assets and the Karachi Electricity Supply Company (K-Electric), an integrated power utility serving Karachi and parts of Sindh province. More recently, the single buyer function has been separated from NTDC, and it is now the responsibility of the Central Power Purchasing Agency-Guarantee (CPPA-G). The original plan to privatize both GENCOs and DISCOs soon after the restructuring has not been followed through, and they remain largely in public hands. In addition, the competitive market for generation, originally planned to be started by 2012, has not yet been put in place.

6. The sector lacks commercial discipline, operational effectiveness, and sufficient investment. Although performance across the DISCOs varies, in aggregate, technical and nontechnical losses remain relatively high at around 18 percent, and collections are low at around 94 percent. Combined with continuing high levels of subsidy to households and to some classes of bulk and commercial consumers, the result is a chronic liquidity crisis. The accumulated arrears of payments from DISCOs to their suppliers, commonly called the circular debt, reached an estimated PKR 420 billion (US$4 billion) by the end of FY2016, or rather more than one percent of GDP. Furthermore, company accountabilities are not fully enforced or recognized due to the weak institutional setting, and they continue to operate under the centralized control. They are not at arm’s length from the Power Division of the Ministry of Energy (MoE) and remain entrenched in a bureaucratic culture. The Government recognizes these shortcomings and that electricity shortages constrain economic activity and diminish livelihoods. Estimates indicate that inadequate power supply and poor quality of electricity service have reduced GDP growth by two percentage points for the past several years.
7. Power shortages have resulted from inadequate power system investment, which had declined substantially by the beginning of the power crisis in 2013, after peaking in the mid-1990s. From the mid-1990s to FY2009/10, investment in power infrastructure declined from 26 percent of total investment and 51 percent of public investment to 4 percent and 26 percent, respectively. Also, during this period, private sector investment in power essentially came to a halt except for expenditures necessary to complete power plant construction initiated in the 1990s. Investment declined due to water use concerns constraining hydropower development and emerging power surplus in 2002 resulting from over capacity installed by IPPs. Consequently, the Government paid insufficient attention to investment and the long lead times required for new capacity to come on stream.

8. Generation capacity shortages persist due to limited capacity availability and continued liquidity constraints. The country's electricity system has expanded over the past decade and now covers about 66 percent of all households. This increased coverage and the normal increases in demand that accompany economic growth have resulted in a rise in peak demand at an estimated 7 percent a year to about 27,000 MW against a total installed capacity of 25,000 MW of which about 5,000 MW is available only during the summer when hydropower generation is at its maximum. The actual shortfall remains stubbornly high at an estimated 5,000–7,000 MW, partly because a large proportion of the existing generating fleet is aging and unable to generate at its nameplate capacity. In addition, the shortage of liquidity obliges the Government to constrain generation at typically around 100 TWh per year. This allows the Government to avoid paying for the most expensive and inefficient peaking power plants but results in load shedding at periods of peak demand. Consequently, households experience load shedding of 6–8 hours a day and industry experiences 1–2 hours. Since assuming office, the Government has focused strongly on adding new generation capacity.

9. The plan to expand power generation during 2017–2022 is beginning to bear fruit. To address the gap between electricity demand and supply, the Government has plans to increase generation capacity by 30,000 MW by 2022. There has been progress in securing the US$36 billion required for this expansion, including funds for power system investments planned under the China-Pakistan Economic Corridor. New private investment and expanded investments by existing IPPs will fund an estimated two-thirds of the investment requirements. The least-cost generation plan focuses on the development of hydropower projects in the north and efficient thermal plants in the center and south of the country. The Government has taken steps to import liquefied natural gas (LNG) that will support investment in new gas-fired power generation. The first new generation plant was commissioned in mid-2017, and further additions are expected in the coming years, including the World Bank-financed Tarbela IV hydropower extension and the Dasu hydropower project.

10. With a substantial volume of new generation now coming online, strengthening of transmission and distribution become critical. In the distribution system, in FY2015, over 40 percent of distribution transformers were overloaded; two key measures of system reliability—SAIDI and SAIFI—suggest that in DISCOs, the quality of supply is deteriorating. The need for expansion and rehabilitation is pressing but less so in the transmission system, where anecdotal evidence suggests that the system has the capacity to dispatch about 15,000–17,000 MW safely, which is substantially below the generation constrained peak load of over 20,000 MW. System reliability has deteriorated substantially, resulting in several instances of major system collapse in recent years, which appear to be increasing in frequency and severity. Years of neglect and underinvestment are at the root of the problem, which is worsened by poor system expansion planning and weak project execution. As the system experiences increasing loading, weaker parts will fail with increasing frequency, throwing additional load on the remaining parts and thus creating a vicious circle.
II. Proposed Development Objective(s)

The Project Development Objective (PDO) of NTMP-I is to increase the capacity and reliability of selected segments of the national transmission system in Pakistan and modernize key business processes of the National Transmission and Dispatch Company.

III. Project Description

Component Name
Expanding, Augmenting and Upgrading of the Transmission Network

Comments (optional)
This component consists of (a) expanding, augmenting, and upgrading of selected existing 500 kV and 220 kV power substations and associated lines; and (b) constructing new 765 kV, 500 kV, and 220 kV substations and transmission lines. The component will have groups of subprojects. Group 1 subprojects will consist of those that the NTDC has designated as having the highest priority. These subprojects have completed feasibility studies and required safeguards documentation. Group 2 subprojects will consist of potential subprojects that the NTDC’s Power Sector Development Plan (PSDP) for 2016–2021 has identified, but the details are not yet known. For inclusion in NTMP-I, these subprojects have to meet a set of technical, economic, and safeguards criteria.

Component Name
Deployment of the Enterprise Resource Planning

Comments (optional)
This component will finance the first stage of an ERP program for the NTDC. The component includes implementation of the ICT infrastructure modernization and the development and deployment of an ERP system aimed at strengthening the company’s selected management capabilities through using an integrated ICT system. The component includes the procurement of civil infrastructure such as data centers, provision of local area network outlets, software licenses, hardware for office automation, consulting services for implementation support and change management, and ICT capacity building and strategic sourcing to ensure the sustainability of the ERP system.

Component Name
Project Management, TA, Capacity Building

Comments (optional)
This component will finance (a) project management and implementation support services; (b) strengthening of NTDC’s planning, operations, and maintenance capability to accommodate new thermal and renewable energy generation; (c) modernization of NTDC’s key business processes; (d) preparation of new investments; and (e) other priority TA and capacity building to be agreed between the NTDC and the World Bank.

IV. Financing (in USD Million)

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<th>Amount</th>
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V. Implementation

11. The NTDC, the proposed project’s implementing agency, has experience managing projects funded by the donor community. The company currently is implementing three World Bank-financed projects in addition to projects of other development partners. In July 2017, the NTDC’s board of directors launched a company-wide restructuring for strengthening investment capability that was informed by international experience of transmission companies faced with implementing substantial investment programs. The restructuring created the positions of Deputy Managing Director (DMD) for Asset Development and Management (ADM) and Chief Information Officer (CIO). The DMD for ADM now is responsible for project preparation, procurement, and construction management until commissioning. The CIO will lead implementation of the ERP component.

12. The NTDC will implement the proposed project through its departments in the headquarters as well as the regional project offices. The procurement process will be managed jointly by the Multi-Function Program Management Unit (MFPMU) and the Chief Engineer for Procurement and Material Management (PMM). They both report directly to the new DMD. Land acquisition and construction management will be managed through the two project management offices, one in the north of the country, Project Delivery North (PD-N), and another in the south, Project Delivery South (PD-S). In each of these offices, a General Manager (GM), also reporting to the DMD for ADM, will manage the entire investment project cycle through the commissioning of assets acquired.

13. The NTMP-I Project Director (PD) in the MFPMU will oversee and drive results across multiple World Bank-funded projects in coordination with the GMs in the regional offices to ensure the integration of the projects into the NTDC’s organization. This PD will have a technical team and receive support from the procurement, financial management (FM), and safeguards units within the MFPMU.

14. Given the in-house capacity constraints at the NTDC, the project will finance two implementation support consultants for Component A. The Project Design and Procurement Consultant (PDPC) will prepare the design and bidding documents for all subprojects and assist the NTDC with the procurement of goods, works, and services and preparation of Group 2 subprojects. The Project Supervision Consultant (PSC) will assist the NTDC on construction supervision until commissioning. To streamline decision making, a Procurement Review Committee, consisting of members of key NTDC units, will review the bidding documents and evaluation recommendations of the PDPC. In addition, the NTDC’s Chief Financial Officer (CFO) will assign a focal manager for the FM of the project supported by staff hired specifically for the project.

15. The NTDC will manage the ERP component through a separate ERP Project Management Unit (PMU), reporting to the CIO. The core team of the PMU has been established and includes external specialist consultants. A special management-level ERP Coordinating Committee will coordinate the work across the NTDC functional departments. The NTDC’s Managing Director (MD) will chair a high-level ERP Steering Committee to oversee overall implementation of the component. The Project Management and Quality Assurance (PMQA) consultant will support the PMU in the procurement of the ERP module and ICT infrastructure as well as their implementation.

16. The NTDC has a data system that is adequate to monitor project outcomes such as system reliability indicators. The PD, supported by the PDPC and PSC and the regional GMs for the PD will monitor NTMP-I’s physical progress and overall implementation performance according to the designated intermediate results indicators, in coordination with other NTDC entities.
VI. Safeguard Policies (including public consultation)

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VII. Contact point

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The World Bank