



# Report and Recommendation of the President to the Board of Directors

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Project Number: 48078-002  
August 2016

## Proposed Multitranche Financing Facility Islamic Republic of Pakistan: Second Power Transmission Enhancement Investment Program

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Asian Development Bank

## **CURRENCY EQUIVALENTS**

(as of 25 July 2016)

Currency unit – Pakistan rupee/s (PRe/PRs)

PRe1.00 = \$0.009546

\$1.00 = PRs104.755

## **ABBREVIATIONS**

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
CPPA-G	–	Central Power Purchasing Agency (Guarantee) Limited
FAM	–	facility administration manual
FFA	–	framework financing agreement
IEE	–	initial environmental examination
IPPP	–	investment and power procurement program
LIBOR	–	London interbank offered rate
MFF	–	multitranche financing facility
NEPRA	–	National Electric Power Regulatory Authority
NPP	–	National Power Policy
NTDC	–	National Transmission and Despatch Company Limited
OCR	–	ordinary capital resources
PMU	–	project management unit
SDR	–	special drawing right
TA	–	technical assistance

## **WEIGHTS AND MEASURES**

GWh	–	gigawatt-hour
km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
MW	–	megawatt

## **NOTE**

In this report, "\$" refers to US dollars.

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INVESTMENT PROGRAM<sup>a</sup> AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number:</b> 48078-002			
<b>Project Name</b>	Second Power Transmission Enhancement Investment Program	<b>Department /Division</b>	CWRD/CWEN		
<b>Country</b>	Pakistan	<b>Executing Agency</b>	National Transmission & Despatch Company Limited		
<b>Borrower</b>	Islamic Republic of Pakistan				
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>			
✓ <b>Energy</b>	Electricity transmission and distribution		810.00		
		<b>Total</b>	<b>810.00</b>		
<b>3. Strategic Agenda</b>	<b>Subcomponents</b>	<b>Climate Change Information</b>			
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	100.00		
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	CO <sub>2</sub> reduction (tons per annum)	810,000		
		Climate Change impact on the Project	Medium		
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>			
Governance and capacity development (GCD)	Institutional development	Some gender elements (SGE)	✓		
<b>5. Poverty Targeting</b>		<b>Location Impact</b>			
Project directly targets poverty	No	Nation-wide	High		
<b>6. Risk Categorization:</b>	Complex				
<b>7. Safeguards Categorization [Tranche 1]</b>	Environment: B Involuntary Resettlement: B Indigenous Peoples: C				
<b>8. Financing</b>					
<b>Modality and Sources</b>	<b>Indicative Tranches (\$million)</b>				<b>Amount (\$million)</b>
	I	II	III	IV	
<b>ADB</b>					<b>810.00</b>
Sovereign MFF-Tranche (Loan): Asian Development Fund	10.00	0.00	0.00	0.00	10.00
Sovereign MFF-Tranche (Loan): Ordinary capital resources	115.00	300.00	270.00	115.00	800.00
<b>Cofinancing</b>					<b>0.00</b>
None					
<b>Counterpart</b>					<b>200.00</b>
Government	46.00	60.00	60.00	34.00	200.00
<b>Total</b>	<b>171.00</b>	<b>360.00</b>	<b>330.00</b>	<b>149.00</b>	<b>1,010.00</b>
<b>9. Effective Development Cooperation</b>					
Use of country procurement systems					No
Use of country public financial management systems					Yes

## INVESTMENT PROGRAM<sup>a</sup> AT A GLANCE

<b>10. Country Operations Business Plan</b>		
<b>CPS</b>	<a href="http://www.adb.org/documents/pakistan-country-partnership-strategy-2015-2019">http://www.adb.org/documents/pakistan-country-partnership-strategy-2015-2019</a>	
<b>COBP</b>	<a href="http://www.adb.org/documents/pakistan-country-operations-business-plan-2016-2018">http://www.adb.org/documents/pakistan-country-operations-business-plan-2016-2018</a>	
<b>11. Investment Program Summary</b>		
<p>The objective of the proposed multitranche financing facility (MFF) is to improve Pakistan's power transmission infrastructure and management. To achieve this objective, the investment program includes: (i) staged physical investments in the transmission system to increase transmission capacity, improve efficiency and energy security, and evacuate additional sources of power; and (ii) nonphysical investments to support institutional efficiency, cost recovery, competition, transparency and good governance within the sector.</p> <p><b>Impact:</b> Energy market transparency and efficiency improved</p> <p>Transmission infrastructure and management improved.</p> <p><b>Outcome:</b> Coverage reliability and quality of the power transmission service in Pakistan improved.</p> <p><b>Outputs:</b> (i) Rehabilitation, augmentation and expansion of the high voltage transmission network., and (ii) NTDC and CPPA-G operations and management strengthened</p> <p><b>Implementation Arrangements:</b> National Transmission &amp; Despatch Company Limited will be the executing agency.</p> <p><b>Project Readiness:</b> The necessary MFF constituents of a road map, an investment program, a strategic context and a policy framework are in place. Financing for the overall facility from ADB and the Government of Pakistan is identified. Lessons learned from MFF 0007 are incorporated.</p>		
<b>12. Milestones</b>		
<b>Modality</b>	<b>Estimated Approval</b>	<b>Estimated Completion<sup>b</sup></b>
Multitranche financing facility	23 August 2016	26 August 2026
Tranche I	30 August 2016	26 August 2026
Tranche II	4 August 2017	31 March 2022
Tranche III	31 March 2019	31 December 2023
Tranche IV	31 March 2021	31 December 2025
<b>13. Project Data Sheet (PDS)</b>		
<b>PDS<sup>c</sup></b>	<a href="http://www.adb.org/projects/48078-002/main">http://www.adb.org/projects/48078-002/main</a>	

<sup>a</sup> Multitranche Financing Facility (MFF).

<sup>b</sup> For MFF, this refers to the end of the availability period; for tranches, this refers to the tranche closing date.

<sup>c</sup> Safeguard documents can be viewed by clicking the Document's hyperlink in the Project Data Sheet (PDS) page.

## I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed multitranche financing facility (MFF) to the Islamic Republic of Pakistan for the Second Power Transmission Enhancement Investment Program.<sup>1</sup>

2. The proposed investment program will expand and reinforce Pakistan's power transmission system, enabling it to provide a reliable and quality service capable of meeting increasing customer demand and supporting economic growth. The investment program consists of staged physical investments in the transmission system, including the rehabilitation, augmentation, and expansion of transmission lines, substations, and supporting infrastructure. The physical investments will support evacuation of new generation, including renewables; improve system reliability and quality of supply through reinforcement and improved monitoring and control; and meet increasing consumer demand. The capacity development component will further improve the financial management, regulatory relations, planning, project management, and procurement capacity of the transmission system owner and operator, the National Transmission and Despatch Company Limited (NTDC), and the sector's newly established commercial operator, the Central Power Purchasing Agency (Guarantee) Limited (CPPA-G). These investments will increase institutional efficiency, cost recovery, competition, transparency, and good governance within the power sector.<sup>2</sup>

## II. THE INVESTMENT PROGRAM

### A. Rationale

3. **Strategic context.** A reliable and sustainable energy sector is essential to the economic growth and well-being of Pakistan. A persistent gap between the end-user and cost-recovery tariffs has led to an enduring shortfall in funds within the sector. As a result there has been insufficient investment across the sector.<sup>3</sup> The average daily shortfall is 4,500–6,000 megawatts (MW), resulting in routine load shedding of 8–10 hours per day in urban areas and up to 18–20 hours per day in rural areas.<sup>4</sup> Chronic power shortages constrain gross domestic product and poverty reduction, and increases security issues and social unrest. The rural poor are disproportionately affected by the shortages because of their dependence on agriculture. The agriculture sector employs 44% of the labor force, of which 74% are women.<sup>5</sup> Insufficient investment in the transmission system, which links generation to large end users and distribution companies, has resulted in an overloaded system that is incapable of providing the reliable and quality supply required by the national grid code. The overloaded transmission system has contributed to major blackouts and supply constraints experienced by end users.<sup>6</sup>

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<sup>1</sup> The design and monitoring framework is in Appendix 1.

<sup>2</sup> ADB. 2014. *Technical Assistance to Pakistan for the Power Transmission Enhancement Investment Program II*. Manila.

<sup>3</sup> The government's targeted average cost of generation is \$0.10/kilowatt-hour (kWh), down from \$0.12/kWh in 2013. This compares with an average notified user tariff of \$0.11/kWh. The government has not passed on the cost of electricity to consumers for sociopolitical reasons. The gap between the end-user and cost-recovery tariffs is the difference between (i) cost recovery and National Electric Power Regulatory Authority (NEPRA)-determined tariffs, and (ii) NEPRA-determined and government-notified tariffs. Tariff structure is being addressed in concert with the International Monetary Fund and the World Bank through a combined systematic program approach.

<sup>4</sup> NEPRA. 2015. *State of Industry Report 2014*. Islamabad.

<sup>5</sup> M. Shahbaz. 2015. *Measuring Economic Cost of Electricity Shortage: Current Challenges and Future Prospects in Pakistan. Working Paper 2015-002*. Lahore.

<sup>6</sup> NEPRA. 2015. *Performance Evaluation Report*. Islamabad.

4. **Sector structure.** Pakistan's power sector consists of 10 regional distribution companies, four thermal and one hydro generation company, NTDC, and CPPA-G, which are government-owned. The private sector owns 48.5% of the 23,663 MW of installed generation capacity, and K-Electric, which is responsible for power generation and distribution in the Karachi area. The National Electric Power Regulatory Authority (NEPRA) determines tariffs, issues licenses, and regulates the energy sector to ensure its long-term sustainability. The Ministry of Water and Power sets policy, including the tariffs paid by consumers.

5. In 2015, the central power purchasing agency division of the NTDC was separated and established as the CPPA-G. The new entity provides a transparent settlement system for the power sector, which will evolve into a competitive electricity pricing platform as the regulatory framework develops.<sup>7</sup> In addition, the government has released policy frameworks to encourage private sector investment in transmission projects, and regulations to facilitate third party access to the existing transmission system. The proposed investment program will assist the NTDC and CPPA-G to operationalize the new market structure and comply with evolving regulations.

6. **Sector strategy and road map.** The government's strategy to address the persistent energy crisis is set out in Vision 2025, Pakistan's comprehensive vision for economic growth.<sup>8</sup> Vision 2025 aims to (i) increase new power generation with a more balanced generation mix, (ii) provide uninterrupted electricity to all, (iii) increase electricity access to 90% of the population by 2025, and (iv) improve demand management. This is supported by the 2013 National Power Policy (NPP), a broad energy sector policy, which includes a detailed assessment of the issues and an action plan to address them (para. 8).<sup>9</sup> The NTDC has a detailed long-term investment plan to support the policy actions, which addresses the physical investments required (para. 9). The nonphysical investments, including policy reforms and broader sector issues, are addressed under the government's energy sector policy reforms. This provides a strong strategic, policy, and investment program to implement the sector reforms.<sup>10</sup>

7. The proposed MFF supports the reforms through the expansion and reinforcement of the transmission backbone, which is required to meet quality and reliability of supply standards and service the increasing customer demand. Investments in advanced control equipment and system strengthening are also required to facilitate the government's targeted increase in renewable energy generation. Policy reforms, including increased institutional efficiency, competition, transparency, and good governance are supported through the capacity development component. Operationalization of the CPPA-G, which is essential for the development of a transparent and efficient power sector, is also supported.

8. **Policy framework.** The NPP aims to apply the principles of efficiency, competition, and sustainability to establish an efficient, consumer-focused power sector that is capable of meeting the needs of Pakistan and boosting the economy in a sustainable and affordable manner. Key strategies include (i) expanding and strengthening the transmission grid to increase access and improve the quality and reliability of supply; (ii) reducing losses through improved planning, design, and implementation of improved monitoring equipment and software; and (iii) establishing transparency and controls for dispatch and payment. The need to improve governance, rationalize energy prices, ensure the efficient use of energy such as reducing technical losses in transmission and distribution systems, and rehabilitate the aging

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<sup>7</sup> ADB. 2014. *Technical Assistance to Pakistan for Strengthening the Central Power Purchasing Agency*. Manila.

<sup>8</sup> Government of Pakistan, Planning Commission. 2014. *Pakistan 2025: One Nation, One Vision*. Islamabad.

<sup>9</sup> Government of Pakistan. 2013. *National Power Policy, 2013*. Islamabad.

<sup>10</sup> Supported by ADB's program loan. ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Islamic Republic of Pakistan for the Power Transmission Enhancement Investment Program*. Manila.



power infrastructures are also reflected in the government's broader Vision 2025 policies and Poverty Reduction Strategy Paper II.<sup>11</sup> These policies are aligned with the strategic context.

9. **Investment program.** Prior to the start of each year, NTDC prepares an investment and power procurement program (IPPP), outlining the staged physical investments in the transmission system, for the approval of NEPRA.<sup>12</sup> Each IPPP will include the physical investments planned for the power transmission system for the next 5 to 10 years.<sup>13</sup> The MFF will support physical investments detailed in the IPPP approved by NEPRA from time to time. Specific projects will be selected based on their readiness (including in respect of required government approvals; procurement; and technical, economic, and financial feasibility); and compliance with Asian Development Bank (ADB) requirements. The NTDC's 2016–2026 IPPP includes physical investments in excess of \$11.0 billion.

10. The MFF's nonphysical investments support the NPP by assisting the NTDC and CPPA-G to achieve institutional efficiency, cost recovery, competition, transparency, and good governance. A capacity development plan will be prepared under tranche 1 to identify the training, resources, and capacity support required for the successful implementation of this MFF, including the (i) planning, construction, operation, maintenance, and management of the transmission system; and (ii) segregation and transfer of certain functions from the NTDC to the CPPA-G, and the ongoing operationalization of the CPPA-G. A facility management consultant will be engaged to assist the NTDC in preparing subsequent tranches, and in implementing and monitoring the MFF. Additional resources will be engaged to assist the NTDC and CPPA-G to update their internal procedures and policies to ensure compliance with regulatory requirements.

11. **ADB interventions.** The proposed investment program supports ADB's Sustainable Energy Sector Reform Program through targeted loss reduction, regulatory compliance, and improved tariff submission processes.<sup>14</sup> The expansion and reinforcement of the transmission system provides the critical connecting infrastructure required for the successful use of ADB support in generation, renewables, and distribution subsectors. The investment program is aligned with ADB's Energy Policy, country partnership strategy for Pakistan, and the Midterm Review of Strategy 2020.<sup>15</sup> It is included in the country operations business plan, 2016–2018 for Pakistan, and is consistent with the Development Coordination Framework.<sup>16</sup> It is also aligned with Sustainable Development Goal No. 7: Affordable and Clean Energy, and the country's intended nationally determined contribution through its contribution to Vision 2025.<sup>17</sup>

12. The proposed investment program will build on the Power Transmission Enhancement Investment Program approved in 2006.<sup>18</sup> Transmission system losses have reduced from 7.6%

<sup>11</sup> Government of Pakistan, Finance Division. 2008. *Poverty Reduction Strategy Paper II*. Islamabad.

<sup>12</sup> NEPRA. 2015. *Investment Standards and Procedures (Transmission and Distribution) Rules, 2015*. Islamabad.

<sup>13</sup> Projects required to address exceptional or emergency situations arising outside the regulatory cycle may be considered provided they have the required approvals from the government, including the planning commission. The Japan International Cooperation Agency is preparing a 25-year least-cost generation and transmission expansion plan to be approved by NEPRA by December 2016. This plan will provide longer term, macroeconomic guidance for the investment program, focused on the most economical solution for Pakistan.

<sup>14</sup> ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Islamic Republic of Pakistan for the Sustainable Energy Sector Reform Program*. Manila.

<sup>15</sup> ADB. 2009. *Energy Policy*. Manila; ADB. 2015. *Country Partnership Strategy: Pakistan, 2015–2019*. Manila; ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

<sup>16</sup> ADB. 2015. *Country Operations Business Plan: Pakistan, 2016–2018*. Manila. Development Coordination (accessible from the list of linked documents in Appendix 2).

<sup>17</sup> Tranche 1 subprojects will improve the quality and security of supply to the Faisalabad distribution system, which supplies 3.39 million customers, and Islamabad distribution system, which supplies 2.38 million customers.

<sup>18</sup> ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Islamic Republic of Pakistan for the Power Transmission Enhancement Investment Program*. Manila.

to less than 3.0%, with energy supplied increasing from 55,000 GWh to 98,000 GWh during the Power Transmission Enhancement Investment Program. The transformer capacity (11,000 megavolt-amperes) and transmission lines (500 kilometers [km]) added have reduced overloading, removed bottlenecks, and improved compliance with the grid code. Compliance with most undertakings in the framework financing agreement (FFA) and covenants in the loan agreements is ongoing. While substantial progress in procurement, project management, and outcomes has been made under the Power Transmission Enhancement Investment Program, further improvements could be achieved.<sup>19</sup> Lessons learned have been incorporated in the design of this MFF. The dedicated project management unit (PMU) has been strengthened, project readiness has been improved, and a facility management consultant and capacity development plan have been included to address the issues and associated delays experienced during the previous MFF.<sup>20</sup> The long-term engagement has enabled ADB to have consistent and constant policy dialogue as the leading partner in the sector.

**13. Justification for the multitranche financing facility.** The required MFF constituents—a road map, investment program, strategic context, and policy framework—are in place. The MFF modality provides critical mass, and continuity to the NTDC for long-term investment planning, and enables ADB to align financing with project readiness and sector reforms.<sup>21</sup>

## **B. Impact and Outcome**

14. The impact will be improved transmission infrastructure and management, and energy market transparency and efficiency. The outcome will be improved coverage, reliability, and quality of the power transmission service in Pakistan.

## **C. Outputs**

15. The outputs of the investment program will be (i) the rehabilitation, augmentation, and expansion of the high-voltage transmission network; and (ii) strengthening of the operations and management of the NTDC and CPPA-G. Tranche 1 will have the same physical output as the investment program. This will be achieved through the construction of transmission lines, extension and augmentation of substations, and replacement of protection equipment. The nonphysical output of tranche 1 will be the strengthening of the operations and management of NTDC. This will be achieved through the preparation of a safety manual, capacity development plan, and an action plan to meet the government-mandated quota of 10% employment of women, and implementation of a project management and information system, among others.

## **D. Investment and Financing Plans**

16. The overall financing need for the government's investment program is in excess of \$11.0 billion. The MFF will finance a portion of this investment program worth \$1.01 billion. Table 1 shows the portion of the investment program to be financed by the MFF.

<sup>19</sup> ADB. 2015. *Follow-up Review of the Implementation of Project Procurement-Related Review Recommendations, Loan 2289-PAK (Tranche-1) and Loan 2396-PAK (Tranche-2): Power Transmission Enhancement Investment Program*. Manila. Tranche 4 was effective within 3 months, with the first contract awarded within 9 months of effectiveness.

<sup>20</sup> The government's investment program places extreme pressure on the capacity of most NTDC departments, including planning, design, procurement, project management, and implementation. A capacity development plan will be prepared under tranche 1, focused on the requirements to meet the outputs and outcomes of this MFF.

<sup>21</sup> Comparison of Financing Modality (accessible from the list of linked documents in Appendix 2).

**Table 1: Investment Program (\$ million)**

Item	MFF	Tranche 1 <sup>a</sup>
	Amount	
<b>A. Base Cost<sup>b</sup></b>		
1. Transmission system development and system improvements	900.0	114.0
2. Facility management and capacity development	10.0	10.0
<b>Subtotal (A)</b>	<b>910.0</b>	<b>124.0</b>
<b>B. Contingencies<sup>c</sup></b>	<b>40.0</b>	<b>19.0</b>
<b>C. Financial Charges During Implementation<sup>d</sup></b>	<b>60.0</b>	<b>28.0</b>
<b>Total (A+B+C)</b>	<b>1,010.0</b>	<b>171.0</b>

ADB = Asian Development Bank, MFF = multitranche financing facility.

<sup>a</sup> Includes taxes and duties of \$19 million to be financed from the National Transmission and Despatch Company. Limited cash resources for tranche 1.

<sup>b</sup> In March 2016 prices.

<sup>c</sup> Physical contingencies are computed at 10.0% for equipment and civil works, 8.4% for turnkey contracts, 5.0% for project management, and 9.0% for taxes and duties. Price contingencies computed at 1.5% in 2016, 1.4% in 2017, 1.5% in 2018 and onward on foreign exchange costs; and 4.7% in 2016, 5.4% in 2017, 6.0% in 2018 and onward on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

<sup>d</sup> Includes interest and commitment charges. Interest during construction for the ADB loan has been computed at the 5-year fixed swap rate plus a contractual spread of 0.5% and 0.1% of maturity premium. The ADB loan will be onlent at 15.0% per annum and carry the same repayment and grace periods. Commitment charges are calculated at 0.15% per year on the undisbursed loan amount.

Source: Asian Development Bank estimates.

17. Eligible expenditures will include goods, works, and consulting services as detailed in the facility administration manual (FAM).<sup>22</sup> The MFF will have four tranches from 2016 to 2026.<sup>23</sup> Tranche 1 is expected to be executed in 2016. All tranches will finance similar physical investments as tranche 1 throughout Pakistan, and are expected to have similar safeguards categorizations.<sup>24</sup> All loans under all tranches will be relented by the government to the NTDC and/or CPPA-G in accordance with the implementation arrangements for the tranche.<sup>25</sup>

18. The government has requested an MFF in an amount up to \$810 million from ADB's ordinary capital resources (OCR) and Special Funds resources to help finance a part of the investment program. The MFF will consist of several tranches, subject to the government's submission of related periodic financing requests, execution of the related loan and project agreements for each tranche, and fulfillment of terms and conditions and undertakings set forth in the FFA.

19. The MFF will combine OCR and Special Funds resources, i.e., Asian Development Fund (ADF) resources, up to the aggregate MFF amount. The provision of any ADF resources will be balanced by a corresponding reduction in available OCR financing (and vice versa), with the total financing provided under the MFF not to exceed the aggregate MFF total of \$810 million. Any ADF allocation will be subject to (i) the availability of ADF resources, (ii) Pakistan's access to such resources pursuant to ADB's applicable Graduation Policy<sup>26</sup> and the requirements of ADF donors, and (iii) the availability of such resources to Pakistan given ADB's applicable policy on performance-based allocation of ADF resources.<sup>27</sup>

<sup>22</sup> Facility Administration Manual (accessible from the list of linked documents in Appendix 2).

<sup>23</sup> The tranches may be adjusted to meet the NTDC's financing requirements and project readiness requirements.

<sup>24</sup> Resettlement impacts could be increased in future tranches because of the nature of transmission system investments, e.g., transmission lines. Site selections will try to minimize such impacts.

<sup>25</sup> The loan under tranche 1 will be relented to the NTDC only.

<sup>26</sup> Currently: ADB. 2008. *Review of the 1998 Graduation Policy of the Asian Development Bank*. Manila.

<sup>27</sup> Currently: ADB. 2004. *Review of the Asian Development Bank's Policy on the Performance-Based Allocation of Asian Development Fund Resources*. Manila; and ADB. 2008. *Refining the Performance-Based Allocation of Asian Development Fund Resources*. Manila. The applicable policies will be those that are in force at the time that an ADF tranche is being proposed.

20. For the first tranche of the MFF, the government has requested the following loans to help finance the project.<sup>28</sup>

- (i) **A loan of \$115 million from ADB's ordinary capital resources.** The loan will have a 25-year term, including a grace period of 4 years, a custom-tailored repayment schedule, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,<sup>29</sup> a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions set forth in the draft loan and project agreements.
- (ii) **A loan in various currencies equivalent to SDR7,196,000 from ADB's Special Funds resources.** The loan will have a 25-year term, including a grace period of 5 years, an interest rate of 2.0% per annum during the grace period and thereafter, and such other terms and conditions as set forth in the draft loan and project agreements.

21. The financing plan is in Table 2. The NTDC will finance environmental mitigation measures and resettlement compensation; administration and audit; inland transportation; and insurance, taxes, and duties. A separate loan for the support component is included in the first tranche for the facility management consultant and capacity support requirements.

**Table 2: Financing Plan (\$ million)**

	Tranche 1	Tranche 2	Tranche 3	Tranche 4	MFF	Share of Total (%)
Source	Amount	Amount	Amount	Amount	Amount	
Asian Development Bank						
Ordinary capital resources (loan)	115.0	300.0	270.0	115.0	800.0	79.2
Special Funds resources (loan)	10.0				10.0	1.0
National Transmission and Despatch Company Limited	46.0	60.0	60.0	34.0	200.0	19.8
<b>Total</b>	<b>171.0</b>	<b>360.0</b>	<b>330.0</b>	<b>149.0</b>	<b>1,010.0</b>	<b>100.0</b>

MFF = multitranches financing facility.

Source: Asian Development Bank estimates.

22. Cofinancing possibilities for the investment program will be explored. If any cofinancing is confirmed, all necessary approvals for the incorporation of such cofinancing into the financing plan of the MFF, or the relevant project financed or to be financed by the MFF, as applicable, will be obtained.

## E. Implementation Arrangements

23. The implementation arrangements are summarized in Table 3 and described in detail in the FAM.<sup>30</sup>

<sup>28</sup> The government undertakings, outlined in the FFA, include a commitment to (i) the road map, policy framework and investment program; and (ii) regulatory, governance, and project implementation arrangements.

<sup>29</sup> The interest includes a maturity premium of 10 basis points. This is based on the loan terms and the government's choice of repayment option and dates.

<sup>30</sup> ADB will prepare and approve master bidding documents before loan signing.

**Table 3: Implementation Arrangements**

Aspects	Arrangements		
Implementation period (physical completion plus 6 months for loan closing)	Investment program: August 2016–August 2026 Tranche 1 investment component: September 2016–December 2020 Tranche 1 support component September 2016–August 2026		
Estimated completion date	February 2026		
Management			
(i) Borrower	Islamic Republic of Pakistan		
(ii) Executing and implementing agencies	MFF and tranche 1: NTDC Subsequent tranches: NTDC and/or CPPA-G as applicable		
(iii) Implementation unit	MFF and tranche 1: NTDC project management unit Subsequent tranches: NTDC and/or CPPA-G project management unit		
Procurement	International competitive bidding	10 contracts	\$95,000,000 (Total)
	Shopping	One or more contracts	\$100,000
Consulting services	QCBS	620 person-months	\$8,500,000
	ICS	(TBD) person-months	\$500,000
Retroactive financing and/or advance contracting	Advance contracting will be undertaken for goods, works and consulting services. Retroactive financing will be available for expenditures on goods, works and consulting services, incurred prior to loan effectiveness but not more than 12 months prior to loan signing, up to 20% of the loan amount.		
Disbursement <sup>a</sup>	The loan proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2015, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, CPPA-G = Central Power Purchasing Agency (Guarantee) Limited, ICS = individual consultant selection, MFF = multitranche financing facility, NTDC = National Transmission and Despatch Company Limited, QCBS = quality- and cost-based selection, TBD = to be determined.

Source: Asian Development Bank estimates.

### III. DUE DILIGENCE

#### A. Technical

24. The investment component of tranche 1 comprises six subprojects grouped into four key components summarized below. Detailed due diligence confirmed the project justification and load flow analysis, technical viability, and suitability for application within the NTDC system.

- (i) Subproject 1 will upgrade and augment three substations (Sahiwal, Lahore South, and Rewat) to supply power to the distribution systems, complying with the security and reliability criteria indicated in the grid code.
- (ii) Subproject 2 will install event and fault recorders and fault locators at strategically important transmission substations in the southern area of the grid. Modern digital protection relays will replace the existing relays, which are no longer fit for purpose. To ensure the grid system stays intact, under-frequency relays are to be installed. The Dadu 500 kilovolt (kV) substation shunt reactor will be replaced to improve the voltage stability of the surrounding 500 kV system.
- (iii) Subproject 3 is the Faisalabad West substation phase II expansion, including the installation of 32 km of 500 kV transmission line, along with the associated 500 kV line bay equipment at Faisalabad West, and 84 km of 220 kV transmission line, along with the associated 220 kV line bay equipment at Faisalabad West and Lalian, to meet the growing demand in the Faisalabad distribution system.
- (iv) Subproject 4 will install 500 kV transmission lines to disperse power generated from the Guddu gas-fired power plant to the load centers.<sup>31</sup>

<sup>31</sup> The equipment for the Guddu transmission line was procured under the Power Transmission Enhancement Investment Program Tranche 4. <http://www.adb.org/projects/37192-044/main>

## B. Economic and Financial

25. Economic and financial analysis will be carried out separately for each tranche under the investment program. The main benefits derived from tranche 1 are (i) improved reliability and avoided unserved energy while ensuring compliance with the grid code, (ii) reduced technical losses from transformers, and (iii) increased flow of power from increased substation capacity. The analyses compare the incremental costs and benefits of with- and without-project scenarios.

26. A financial evaluation was carried out in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects.<sup>32</sup> Tranche 1 is financially viable, with a financial internal rate of return of 13.1%, which is greater than the weighted average cost of capital of 7.8%.<sup>33</sup> Sensitivity analysis found that the project's financial viability remained robust in the cases of (i) a 10% increase in capital costs, (ii) a 10% increase in operation and maintenance costs, (iii) a 10% decrease in revenues, and (iv) a 1-year delay in completion.

27. The economic evaluation was completed in accordance with ADB's Guidelines for the Economic Analysis of Projects.<sup>34</sup> The economic internal rate of return of 18.6% justifies the viability of tranche 1. Sensitivity analysis found that the project's economic viability remained robust in the cases of (i) a 10% increase in capital costs, (ii) a 10% decrease in benefits, and (iii) a 1-year delay in completion. The results compared favorably with the economic opportunity cost of capital of 12% in all cases.

28. The NTDC's financial performance was assessed for tranche 1. Its operating performance improved from PRs6 billion in profit before tax in 2012 to PRs9 billion in 2015. Its liquidity is also improving, since the central power purchasing agency division's activities, which held large outstanding receivable from distribution companies, were transferred to the CPPA-G in May 2015. As a regulated entity, with a regulated rate of return on equity of 13.11%, the NTDC's financial operation is expected to remain stable throughout the proposed MFF.

## C. Governance

29. The financial management assessment for tranche 1 was conducted in April 2016 and the pre-mitigation risks are substantial. An action plan was agreed to assist the NTDC to strengthen its financial management.<sup>35</sup> Although the NTDC has significant experience with ADB projects and the Procurement Guidelines (2015, as amended from time to time), capacity development and support are required to prevent the delays experienced in previous projects. This will be provided through a strengthened, dedicated PMU, facility management consultant, and capacity development support.

30. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and the NTDC. The specific policy requirements and supplementary measures are described in the FAM (footnote 22).

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<sup>32</sup> ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

<http://www.adb.org/sites/default/files/institutional-document/31339/financial-governance-management.pdf>

<sup>33</sup> The support component, primarily covering the facility management consultant, was not included in this analysis.

<sup>34</sup> ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila.

<http://www.adb.org/sites/default/files/institutional-document/32256/eco-analysis-projects.pdf>

<sup>35</sup> The World Bank is considering the implementation of an enterprise resources planning system for the NTDC.

## D. Poverty and Social

31. The investment program will deliver substantial economic and social benefits through improved and more reliable electricity supply. Poor and vulnerable consumers, who make up about half of the population, will particularly benefit as they are often the most affected by inadequate power supply, load shedding, and poor power quality. The rural poor, especially the women who comprise 74% of agricultural workers, will benefit from reduced power outages as it will improve crop water distribution. Hospitals and schools will improve their services with reduced power outages. Increases in the Human Development Index are strongly correlated with access to reliable electricity supplies.<sup>36</sup>

32. Women will benefit from the use of time-saving electrical appliances, which will cut the time they spend on household chores. Specific benefits will include an action plan for the NTDC to meet the government's 10% quota of employed women. Women will also be targeted in the energy conservation and safety awareness-raising activities, which will coincide with the community awareness campaign on the project.

## E. Safeguards

33. According to ADB's Safeguard Policy Statement (2009), tranche 1 has been categorized B for environment. Civil works in tranche 1 will be limited to the substations and the final alignment of the transmission lines. Environmental impacts will be limited to the construction phase of these projects. The proposed alignments do not traverse any environmentally sensitive areas. Separate initial environmental examination studies have been performed for the components and disclosed on the ADB website.<sup>37</sup> The project has been rated a medium risk to climate change. A climate change assessment will be undertaken for each tranche to ensure that appropriate risk mitigating measures are incorporated into the project design.

34. No physical displacement of persons from housing or loss of more than 10% of income-generating resources will occur. Project areas have no indigenous peoples. Environment, land acquisition, and resettlement impacts are assessed as insignificant. Tranche 1 is classified B for environment, B for involuntary resettlement, and C for indigenous peoples.<sup>38</sup> An environment and social impacts cell staffed with environment, social, and resettlement officials has been established in the PMU. Capacity will be strengthened through the facility management consultant until the environment and social impacts cell has sufficient resources.

## F. Risks and Mitigating Measures

35. The investment program's benefits and impacts are expected to outweigh the costs. Major risks and mitigating measures are summarized in Table 4, and described in detail in the risk assessment and risk management plan.<sup>39</sup>

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<sup>36</sup> United States Agency for International Development. 2007. *Energy Sector Assessment for USAID/Pakistan*. Washington, DC.

<sup>37</sup> The approved environmental assessment and review framework was disclosed on 30 May 2016. The required initial environmental examinations were disclosed on 30 May and 21 June 2016 (accessible from the list of linked documents in Appendix 2). Public consultations were undertaken in the preparation of these documents.

<sup>38</sup> The approved land acquisition and resettlement framework was disclosed on 30 May 2016. The required land acquisition and resettlement plans were disclosed on 30 May 2016 (accessible from the list of linked documents in Appendix 2). Public consultations were undertaken in the preparation of these documents.

<sup>39</sup> Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

**Table 4: Summary of Risks and Mitigating Measures**

<b>Risks</b>	<b>Mitigating Measures</b>
Procurement: Delays caused by capacity constraints and bureaucratic internal procedures	Augment PMU staff, simplify internal processes, and use master bidding documents. Supplement with external resources as required. Provide capacity building support from the resident mission.
Financial reporting and monitoring: Incomplete and delayed reports, and manual accounting processes	Implementation of an enterprise resource management system, to be expanded by the World Bank or other support. Continue to engage reputable audit firms to audit financial statements.
Regulatory environment: Delayed reforms, unstable environment, and incomplete tariff submissions	Capacity building covering regulatory logic, principles, and process compliance. Better coordination between concerned departments. ADB's ongoing support for sector reforms.
Sector investments: Insufficient supply, unexpected demand growth, and counterpart funds not mobilized	Investment plan reviewed annually to reflect market conditions. Approval of required counterpart funds before commencement of projects, and government's ongoing commitment to sector.

ADB = Asian Development Bank, PMU = project management unit.

<sup>a</sup> World Bank. 2016. *National Transmission Modernization I Project (P154987)*. Washington, DC.

Source: Asian Development Bank.

#### **IV. ASSURANCES AND CONDITIONS**

36. The government and NTDC have assured ADB that project implementation shall conform to all applicable ADB policies including those concerning anticorruption, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the FAM and loan documents. The government and NTDC have given ADB certain undertakings for the MFF, as set forth in the FFA. Covenants agreed by the government and NTDC with respect to individual tranches under the MFF are set forth in the loan agreement and project agreement for the respective tranches. No withdrawal shall be made under any loan agreement for goods, works, and consulting services until ADB has received a subsidiary loan agreement executed between Pakistan and the NTDC and/or the CPPA-G in form and substance satisfactory to ADB.

#### **V. RECOMMENDATION**

37. I am satisfied that the proposed multitranche financing facility would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the multitranche financing facility to the Islamic Republic of Pakistan for the Second Power Transmission Enhancement Investment Program in an aggregate principal amount not exceeding the equivalent of \$810,000,000, which comprises

- (i) the provision of loans from ADB's Special Funds resources, with interest and other terms to be determined in accordance with ADB's applicable policies relating to Special Funds resources; and
- (ii) the provision of loans from ADB's ordinary capital resources, with interest and other terms to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,

and is subject to such other terms and conditions as are substantially in accordance with those set forth in the framework financing agreement presented to the Board.

Takehiko Nakao  
President

1 August 2016



## DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

<b>Impacts the Program is Aligned with:</b>			
Transmission infrastructure and management improved (National Power Policy, 2013) <sup>a</sup>			
Energy market transparency and efficiency improved (Pakistan 2025: One Nation, One Vision) <sup>b</sup>			
<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting</b>	<b>Risks</b>
<b>Outcome</b> Coverage, reliability, and quality of the power transmission service in Pakistan improved	a. 5.0 GW of additional peak power supplied (metered) through the grid by 2026 (2015 baseline: 22.9 GW)  b. Transmission losses reduced to less than 2.5% in 2026 (2013 baseline: 2.9%)  c. Full compliance with NEPRA Performance Standards Transmission Rules, 2005 by 2026  d. Full compliance with the Transmission License and Grid Code by 2026	a–b. NEPRA’s annual state of the industry report   c. NTDC’s annual performance evaluation report  d. NEPRA’s annual state of the industry report	Delayed progress on policy, regulatory, and institutional reforms  Power demand does not continue to grow by at least 4.5% annually or grows by more than 7.0% annually.  Power supplies and imports are not increased to meet demand.
<b>Outputs</b> 1. Rehabilitation, augmentation, and expansion of the high-voltage transmission network	1a. At least 1,000 km of new transmission lines operational by 2026  1b. At least 2,500 MW new substation capacity added to the network by 2026  1c. Capacity of existing substations increased by at least 3,500 MW through extension and augmentation of transformers by 2026  1d. Entire transmission system covered by SCADA system by 2026 (2015 baseline: less than 10% of total system covered)	1a–c. NEPRA’s annual state of the industry report          1d. NTDC’s annual report	The regulatory environment does not remain stable.  Counterpart funds are not mobilized on time.  High turnover among NTDC staff  Modernization of NTDC’s manual accounting system is not completed by 2023.
2. Strengthening of the operations and management of NTDC and CPPA-G	2a. NEPRA tariff determination completed before year of application by 2025 (2015 baseline: FY2015 tariff determined in April 2015)	2a. NEPRA website (tariff determination)	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	2b. Annual financial statements approved within 6 months of year-end by 2020 (2015 baseline: FY2014 +18 months after year-end)  2c. Market settlement system, based on grid code compliant data, operationalized by 2024 (2015 baseline: Nil)	2b. NTDC board resolution  2c. NEPRA's annual state of the industry report	
<b>Key Activities with Milestones</b>			
<p><b>1. Rehabilitation, augmentation, and expansion of the high-voltage transmission network</b></p> <p>1.1 Complete bidding process for tranche 1 by June 2017            1.2 Start installation works by December 2017            1.3 Complete tranche 1 implementation by June 2020            1.4 Complete tranche 2 implementation by September 2021            1.5 Complete tranche 3 implementation by June 2023            1.6 Complete tranche 4 implementation by June 2025</p> <p><b>2. Strengthening of the operations and management of NTDC and CPPA-G</b></p> <p>2.1 Hire facility management consultant by April 2017            2.2 Commence work on strengthening operations and management by June 2017            2.3 Complete support component by December 2025</p>			
<p><b>Inputs</b></p> <p>ADB: \$800.0 million (OCR loan)            ADB: \$10.0 million (ADF loan)            NTDC: \$200.0 million</p> <p>Tranche 1            ADB: \$115.0 million (OCR loan)            ADB: \$10.0 million (ADF loan)            NTDC: \$46.0 million</p>			
<p><b>Assumptions for Partner Financing</b></p> <p>Not applicable.</p>			

ADB = Asian Development Bank, ADF = Asian Development Fund, CPPA-G = Central Power Purchasing Agency (Guarantee) Limited, GW = gigawatt, km = kilometer, MW = megawatt, NEPRA = National Electric Power Regulatory Authority, NTDC = National Transmission and Despatch Company Limited, OCR = ordinary capital resources, SCADA = Supervisory Control and Data Acquisition.

<sup>a</sup> Government of Pakistan. 2013. *National Power Policy, 2013*. Islamabad.

<sup>b</sup> Government of Pakistan, Planning Commission. 2014. *Pakistan 2025: One Nation, One Vision*. Islamabad.

Source: Asian Development Bank.

**LIST OF LINKED DOCUMENTS**

<http://www.adb.org/Documents/RRPs/?id=48078-002-3>

1. Framework Financing Agreement
2. Periodic Financing Request for Project 1
3. Sector Assessment (Summary): Energy
4. Facility Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis: Tranche 1 of the Investment Program
8. Economic Analysis: Tranche 1 of the Investment Program
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Initial Environmental Examination: Rehabilitation of National Transmission and Despatch Company Limited System in South Area
12. Initial Environmental Examination: Subprojects in Sahiwal, Lahore South, and Rewat
13. Initial Environmental Examination: Transmission Line from Faisalabad West to Lalian
14. Initial Environmental Examination: Transmission Line from Faisalabad West to Multan-Gatti
15. Initial Environmental Examination: Guddu to Muzaffargarh
16. Environmental Assessment and Review Framework
17. Land Acquisition and Resettlement Plan: Transmission Line from Faisalabad to Lalian
18. Land Acquisition and Resettlement Plan: Transmission Line from Faisalabad to Gatti
19. Land Acquisition and Resettlement Plan: Transmission Line of Muzaffargarh, Multan Guddu, and D. G. Khan
20. Land Acquisition and Resettlement Framework
21. Risk Assessment and Risk Management Plan

**Supplementary Documents**

22. Procurement Capacity Assessment
23. Financial Management Assessment
24. Comparison of Financing Modality