ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 47100
November 2013

Proposed Loan
India: Madhya Pradesh Power Transmission and Distribution System Improvement Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 21 October 2013)

Currency unit	–	Indian rupees (Re/Rs)
Re1.00	=	$0.01634
$1.00	=	Rs61.199

ABBREVIATIONS

ADB	–	Asian Development Bank
DISCOM-C	–	Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company
DISCOM-E	–	Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company
DISCOM-W	–	Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company
GOMP	–	Government of Madhya Pradesh
LIBOR	–	London interbank offered rate
MPERC	–	Madhya Pradesh Electricity Regulatory Commission
MP Transco	–	Madhya Pradesh Power Transmission Company
T&D	–	transmission and distribution

WEIGHTS AND MEASURES

km	–	Kilometer
kV	–	Kilovolt
MVA	–	megavolt-ampere
MW	–	Megawatt

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies begins on 1 April and ends on 31 March. "FY" before a calendar year denotes the year in which the fiscal year starts, e.g., FY2013 begins on 1 April 2013 and ends on 31 March 2014.

(ii) In this report, "$" refers to US dollars.

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CONTENTS

PROJECT AT A GLANCE

1. Project Name: Madhya Pradesh Power Transmission and Distribution System Improvement Project **2. Project Number:** 47100-004

3. Country: India **4. Department/Division:** South Asia Department/Energy Division

5. Sector Classification:

Sectors	Primary	Subsectors
Energy	√	Electricity transmission and distribution

6. Thematic Classification:

Themes	Primary	Subthemes
Economic growth	√	Widening access to markets and economic opportunities
Environmental sustainability		Natural resources conservation
Capacity development		Organizational development

6a. Climate Change Impact

Adaptation	
Mitigation	Medium

6b. Gender Mainstreaming

Gender equity theme (GEN)	
Effective gender mainstreaming (EGM)	
Some gender elements (SGE)	
No gender elements (NGE)	√

7. Targeting Classification:

General Intervention	Targeted Intervention		
	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
√			

8. Location Impact:

National	Low
Rural	High
Urban	Medium

9. Project Risk Categorization: Complex

10. Safeguards Categorization:

Environment	B
Involuntary resettlement	B
Indigenous peoples	C

11. ADB Financing:

Sovereign/Nonsovereign	Modality	Source	Amount ($ Million)
Sovereign	Project loan	Ordinary capital resources	350.0
Total			350.0

12. Cofinancing:

None.

13. Counterpart Financing:

Source	Amount ($ Million)
Government of Madhya Pradesh	150.0
Total	150.0

14. Aid Effectiveness:

Parallel project implementation unit	No
Program-based approach	No

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to India for the Madhya Pradesh Power Transmission and Distribution System Improvement Project.[1]

2. The proposed project undertakes selective transmission and distribution (T&D) system improvements critical for meeting the growing demand for power in Madhya Pradesh. It also undertakes capacity building activities to ensure the institutional sustainability of the Madhya Pradesh power sector and improved service delivery to consumers. The project supports the installation of T&D assets necessary for capacity enhancement in the operational areas of the transmission company and the three distribution companies in Madhya Pradesh.[2]

II. THE PROJECT

A. Rationale

3. The peak availability in the Madhya Pradesh power sector was 9,692 megawatts (MW) while the estimated unrestricted peak demand was 10,308 MW, resulting in an unmet peak demand of 616 MW in FY2012. The state has 8.2 million electricity customers, of which 6.1 million are household customers. Expansion of the distribution system with new power connections to households, increased consumption from existing customers, and the fast economic growth of the state are expected to increase the demand for electricity rapidly.[3] Demand for electricity grew at about 13% per annum during FY2009–FY2012 and is predicted to grow by over 11% per annum during FY2012–FY2016. By FY2016, the T&D system should deliver about 7,000 MW of additional power to customers. An estimated 20% T&D capacity gap may result by 2017 if T&D capacity is not enhanced. The proposed investments in T&D aim at removing existing bottlenecks and expanding the T&D system capacity to meet growing demand.

4. Access to power remains a challenge in Madhya Pradesh, with only about 67% of households connected to the system. Quality of power and reliability of service are also below the standards expected of a modern public electricity network—power supply was limited to 6–8 hours per day for rural households in FY2010.[4] A substantial amount of investments are required for upgrades and reconfigurations of the medium- and low-voltage distribution networks to meet the growing demand and to improve the quality of services. The gap between supply and demand continues to be a concern, requiring load shedding throughout the year, which is likely to continue if necessary investments in T&D system are not made. Distribution losses had been very high, especially in rural areas where distribution lines are overloaded. Unmetered connections and theft caused distribution losses to be as high as 46% in FY2004. These losses have fallen to about 27% in FY2012 because of a series of government and Asian Development

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[1] The design and monitoring framework is in Appendix 1.

[2] The Asian Development Bank (ADB) provided project preparatory technical assistance. ADB. 2013. *Technical Assistance to India for Preparing Madhya Pradesh Transmission and Distribution System Improvement Project*. Manila.

[3] The Madhya Pradesh economy has been growing faster than the Indian economy since 2009, and is predicted to grow at 10% in 2013, which is the highest among Indian states.

[4] This situation is changing rapidly, with implementation of the feeder separation program for which ADB provided a $400 million multitranche financing facility; ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Technical Assistance Grant to India for the Madhya Pradesh Energy Efficiency Improvement Investment Program.* Manila (Loan 2764-IND and Loan 2830-IND). Some districts in Madhya Pradesh are already receiving 24-hour power supply.

Bank (ADB) interventions in the sector, and are predicted to be about 17% by FY2014.[5] Subsidized electricity served to agricultural water pumping also requires rationing to minimize financial losses to distribution companies.

5. The Government of Madhya Pradesh (GOMP) undertook a successful sector reform program, with ADB assistance, to solve power sector problems.[6] It unbundled the State Electricity Board and created six companies, segregating the generation and T&D functions. Madhya Pradesh has a reasonably well-functioning regulatory commission now—the Madhya Pradesh Electricity Regulatory Commission (MPERC), which oversees the quality of service delivery and issues tariff orders. The transmission business and the generation business have been revenue independent since FY2012.[7] The last milestone of the reforms—revenue independence of the three distribution companies—was achieved in March 2013. This was the main reform condition included in ADB's assistance to the Feeder Separation Program. Accordingly, each distribution company would be fully responsible for efficient management of its distribution business through independent decision making on new investments, hiring and firing, loss management, and monitoring such that the expected revenue allowed by the MPERC would be realized. Madhya Pradesh State Electricity Board, the predecessor of the new power companies, was dissolved on 26 April 2012. All employees have been assigned to each respective successor company. The proposed loan will enable the Madhya Pradesh power sector to reap the full benefits of already undertaken reforms.

6. GOMP also undertook a series of investments to solve power sector problems, with assistance from development partners. ADB has approved about $1.37 billion worth of support for power sector reforms and investment projects (mainly for T&D improvements) since 2001. GOMP's own programs include (i) Rajiv Gandhi Grameen Vidyutikaran Yojana, aimed at distribution improvements for new household connections in rural areas; (ii) the Restructured Accelerated Power Development Reforms Program, to improve electricity distribution infrastructure in urban areas; and (iii) the Feeder Separation Program, to provide agricultural consumers with 10 hours of supply and rural households with 24-hour power supply. The first two programs initially provided about $1,060 million and further allocated $545 million for FY2013–FY2016. The Feeder Separation Program costs about $1.1 billion and ADB provided a $400 million multitranche financing facility in two tranches. These programs are at various stages of implementation and the expected outcome—24-hour power supply to households—cannot be sustained without removing the remaining constraints in the T&D system.

7. Generation capacity in Madhya Pradesh expanded rapidly parallel to the growth in demand. In FY2003, it had available capacity of 2,990 MW and by FY2012 its generation capacity increased to about 10,400 MW. Following the central government's policy directive of promoting private sector participation in generation, GOMP launched a program for independent power producers to produce electricity in Madhya Pradesh. GOMP has signed 49 memorandums of understanding with private generating companies, and about 10,000 MW capacity projects for independent power producers are in various stages of implementation. In 2013, the private sector is expected to commission 1,540 MW of projects. According to the generation plan of Madhya Pradesh, from FY2013 to FY2020 a total of 14,554 MW capacity will be added to the system and Madhya Pradesh is predicted to have a generation surplus from

[5] The tariff order of the Madhya Pradesh Energy Regulatory Commission (MPERC) for FY2013-FY2014 (March 2013) requires distribution companies to reduce losses to17%.
[6] Review of Power Sector Reforms (accessible from the list of linked documents in Appendix 2).
[7] After unbundling the power sector to six companies, revenues were collected and salaries and other dues were paid by the State Electricity Board. Revenue independence allows the companies to collect its own revenue and allocate the collected revenue to meet expenses and future investments.

FY2013 onward. The T&D systems require capacity expansion commensurate with generation expansion.

8. The transmission network of the state operates at 132-kilovolt (kV), 220 kV, and 400 kV capacities. Madhya Pradesh Power Transmission Company (MP Transco) reported a transmission loss of 7.9% in FY2003 (when the company was formed), which declined to 3.3% by FY2012. Transmission system availability increased from 98.4% in FY2005 to 99.4% in FY2012. Transmission substations also increased from 141 in 2003 to 248 in 2012. Transmission line length increased from 17,500 to 27,000 circuit-kilometers (km) over the same 10-year period. Over the current 12th five-year plan period, 2012–2017, MP Transco plans to build a further 10,500 circuit-km of transmission lines and 94 transmission substations to serve the growing demand, clear bottlenecks and congestions, maintain energy losses at about 3%, and improve system reliability.[8] The estimated investment requirement of MP Transco for the proposed expansion is $1,474 million. Of the total, MP Transco invested $574 million and Japan International Cooperation Agency provided a loan of $200 million. The company plans to finance the rest through borrowings from development partners, GOMP, and from the company's own resources. The proposed loan provides part of the remaining requirement. MP Transco is projected to be operating with a reasonable profit from FY2013 onward so that it is in a position to repay its debt obligations.

9. The distribution network of the state operates at 33 kV, 11 kV, and 400 kV capacities. It is owned and operated by three distribution companies—Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company (DISCOM-C); Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company (DISCOM-E); and Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company (DISCOM-W). The Madhya Pradesh Power Management Company (previously the Madhya Pradesh Power Trading Company) is the holding company for the three distribution companies. As mentioned above, several initiatives to reduce technical and commercial losses in electricity distribution have been taken. Along with the Feeder Separation Program, supply to rural households is being rearranged through high-voltage distribution systems, resulting in commercial loss reductions. To accelerate the distribution companies' efforts to curtail commercial losses through unmetered connections, MPERC issued a directive in March 2013 for all unmetered urban domestic connections to be provided with meters by June 2013, and all unmetered rural domestic connections to be provided with meters by March 2014. The ongoing Feeder Separation Program, includes provision of meters to rural customers, and the metering of distribution transformers serving agricultural water pumps.

10. ADB's investments in Madhya Pradesh—through the Madhya Pradesh Power Sector Development Program,[9] Madhya Pradesh Power Sector Investment Program,[10] and Madhya Pradesh Energy Efficiency Investment Program[11]—were directed at (i) expanding the T&D system, (ii) improving access to electricity, (iii) introducing high-voltage distribution systems to reduce commercial losses, and (iv) separating feeders between agriculture and households to ration subsidized power to agriculture and 24-hour power supply to households. Together with

[8] Government of India, Planning Commission. 2013. *Twelfth Five Year Plan, 2012-2017*. Delhi. http://planningcommission.gov.in/plans/planrel/12thplan/welcome.html

[9] ADB. 2001. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to India for the Madhya Pradesh Power Sector Development Program*. Manila (Loan 1868-IND and Loan 1869-IND).

[10] ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility for the Madhya Pradesh Power Sector Investment Program*. Manila (Loan 2323-IND; Loan 2324-IND; Loan 2346-IND; Loan 2347-IND; Loan 2520-IND; and Loan 2732-IND).

[11] ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Technical Assistance Grant to India for the Madhya Pradesh Energy Efficiency Improvement Investment Program.* Manila (Loan 2764-IND and Loan 2830-IND).

these investments, reforms were undertaken to ensure the financial sustainability and service orientation of power sector companies. These efforts are largely successful, as shown by the success of sector reforms, significant loss reductions, and improved environment for generation business. However, challenges remain for the Madhya Pradesh power sector. Distribution companies are yet to make profits. In particular, the growing demand cannot be met without expanding and strengthening the T&D systems. The proposed project will help meet the growing demand, make the sector companies financially sustainable, and achieve the long-term objective of GOMP to provide 24-hour power supply to households. The country operations business plan for India, 2013–2015 includes this project, and it helps in achieving the objectives of ADB's *Energy Policy* of access to energy for all and capacity building.[12]

B. Impact and Outcome

11. The impact of the project will be adequate and reliable power supply in Madhya Pradesh. The outcome will be increased capacity and operational efficiency in the electricity T&D system in Madhya Pradesh.

C. Outputs

12. The project will have three outputs: transmission system upgraded and expanded; distribution system upgraded and expanded; and capacity building for executing agency staff. Output 1 includes (i) about 1,800 circuit-km of transmission lines; (ii) two new and three upgraded 400 kV substations; (iii) four new and five upgraded 220 kV substations; and (iv) 26 new 132 kV substations. Output 2 includes (i) about 3,125 circuit-km of distribution lines installed; and (ii) 149 new and 328 upgraded 33/11 kV substations. Output 3 includes about 10 trained trainers and about 100 trained officials from executing agencies on project management, procurement, monitoring and evaluation, financial management, and safeguards, as well as training center hostel, laboratory, and associated facilities.

D. Investment and Financing Plans

13. The project is estimated to cost $500 million (Table 1).

Table 1: Project Investment Plan
($ million)

Item	Amount[a]
A. Base Cost[b]	
1. Transmission system improvement	271.64
2. Distribution system improvement	124.00
3. Capacity building	1.80
Subtotal (A)	**397.44**
B. Contingencies[c]	82.67
C. Financing Charges During Implementation[d]	19.89
Total (A+B+C)	**500.00**

[a] Includes taxes and duties of $12.87 million to be financed from Government of Madhya Pradesh resources.
[b] In second quarter 2013 prices.
[c] Physical contingencies computed at 6.3% for base costs; price contingencies computed at 1.95% on foreign exchange costs and 5.02% on local currency costs.
[d] Includes interest and commitment charges. Interest during construction for the Asian Development Bank (ADB) loan has been computed at the 5-year forward London interbank offered rate (LIBOR) plus a spread of 0.40%, and additional maturity premium of 0.10%. An onlending rate of 1% was also considered in estimating the financing charges. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

[12] ADB. 2013. *Country Operations Business Plan: India, 2013–2015.* Manila; ADB. 2009. *Energy Policy.* Manila.

14. The Government of India has requested a loan of $350 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,[13] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan agreement. The financing plan is in Table 2.

Table 2: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank		
Ordinary capital resources (loan)	350.00	70.0
Government of Madhya Pradesh	150.00	30.0
Total	**500.00**	**100.0**

Source: Asian Development Bank estimates.

E. Implementation Arrangements

15. MP Transco and the three distribution companies—DISCOM-C, DISCOM-E, and DISCOM-W—will serve as the executing and implementing agencies. All four executing agencies have established project management units for implementing previous ADB projects. These units will implement the proposed project. Madhya Pradesh Department of Energy will supervise and coordinate the project activities implemented by the four companies. Goods, equipment, and civil works financed under the project will be procured in accordance with ADB's Procurement Guidelines (2013, as amended from time to time). International competitive bidding will be used for civil works and turnkey contracts. Advance contracting and retroactive financing is proposed (Table 3). The consultants will be engaged in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

16. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.[14]

Table 3: Implementation Arrangements

Aspects	**Arrangements**
Implementation period	April 2014–December 2018
Estimated completion date	31 December 2018
Management	
(i) Oversight body	Project Oversight Committee Chair: Principal Secretary, Madhya Pradesh Energy Department Members: Officer on Special Duty, Madhya Pradesh Energy Department Deputy Secretary, Madhya Pradesh Energy Department Managing Director, Madhya Pradesh Power Transmission Company Limited (MP Transco) Managing Director, Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company (DISCOM-C) Managing Director, Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company (DISCOM-E) Managing Director, Madhya Pradesh Paschim Kshetra Vidyut Vitaran

[13] The interest includes a maturity premium of 10 basis points. This is based on the above loan terms and the government's choice of repayment option and dates.
[14] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Aspects	Arrangements		
	Company (DISCOM-W)		
(ii) Executing agencies	MP Transco, DISCOM-C, DISCOM-E, and DISCOM-W		
(iii) Key implementing agencies	MP Transco, DISCOM-C, DISCOM-E, and DISCOM-W		
(iv) Implementation unit	MP Transco, 11 staff; DISCOM-C, 11 staff; DISCOM-E, 11 staff; DISCOM-W, 11 staff		
Procurement	International competitive bidding	9 contract packages	$350.0 million
Consulting services	Quality- and cost-based selection	26 person-months (11 international 15 national)	$0.4 million
Retroactive financing and/or advance contracting	ADB may, subject to its policies and procedures, allow on request (i) advance contracting, and (ii) retroactive financing of up to 20% of the proposed individual loan for eligible expenditures incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related legal agreements.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank.
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

17. Madhya Pradesh transmission network is planned and operated based on the planning criteria and operation and monitoring procedures described in the grid code under the oversight of MPERC. MP Transco reviews the adequacy of the transmission network to provide generation connections and to meet the forecast demand at substations, over a period of 10 years. Load flow studies and short-circuit analyses are then conducted to establish the adequacy of the existing transmission network to meet future demand, and to examine the operation of proposed improvements to meet demand growth. These improvements and their investment requirements are documented in the 10-year rolling plan. Improvements consist of the construction of new transmission lines and substations, expansion of the capacity of existing substations, and installation of reactive compensation equipment to improve network performance. Subprojects to be financed under the project were selected from the 10-year plan, on the basis of the priority and urgency of such developments, as determined by load flow studies. The project preparatory team reviewed the load flow analyses conducted by MP Transco's planning and design division to examine the adequacy, impacts, and technical prudence of the project components; and found them to be technically sound.

18. According to the distribution code approved by MPERC, each distribution company is required to prepare a 5-year plan for distribution development. This is based on the 5-year demand forecast for the distribution companies' network and is prepared using the guidelines in the distribution code. The increase in number of households connected to the system and growing demand among already connected households, commercial, and industrial customers are considered in preparing the demand forecast. The target is to meet the service voltages stipulated in the distribution code at the lowest investment and operating costs, including the lowest possible losses. Subprojects selected to be financed under this project were proposed by the planning units of the three distribution companies, and were reviewed by the project preparatory team to verify that such improvements constitute the lowest cost improvements to ensure the adequacy and reliability of the distribution network over the next 5 years and beyond.

Based on this assessment, the lines and substations proposed were found to be part of the 5-year plan of each distribution company, prepared using prudent planning techniques.

B. Economic and Financial

19. The project aims to minimize the potential T&D capacity gap of 20% by 2017 to avoid possible load shedding. Hence, it contributes to achieving GOMP's goal of 24-hour power supply to all households. By minimizing the T&D capacity gap, it enables a large number of households to improve their economic, commercial, educational, and entertainment opportunities. The T&D system improvement of the project will result in energy savings of 878 million kilowatt-hours per annum. The project will enable an estimated 570,000 households to receive new power connections.[15] The project's technical loss reductions will also result in an estimated carbon emission reduction of 684,840 tons per annum.

20. The economic viability was assessed by incorporating the benefits of technical loss reduction and the economic value of incremental sales attributed to the project. Using conservative benefit assumptions, the economic internal rate of return is estimated to be 21.02%. The sensitivity analysis shows that returns are robust against the main risk factors. The economic analysis clearly establishes that the proposed investments generate benefits in excess of costs and generate returns at an acceptable rate.

21. The financial viability assessment was undertaken, considering reduced electricity purchases arising from the reduction in network losses and additional sales resulting from the T&D system capacity enhancement. The weighted average cost of capital was calculated following ADB guidelines. The financial internal rates of return were estimated for MP Transco and the three distribution companies separately, and all exceed the weighted average cost of capital of 4.0%. The project provided a financial internal rate of return of 9.3%, which demonstrates the financial viability of the project. MP Transco is projected to make profits from FY2013 onward. However, the current financial position of the three distribution companies is not impressive. None of the distribution companies make profits and their debt situation is not healthy. The business plans of the companies forecast profits after FY2015. Anticipated loss reductions resulting from ongoing and proposed investments, and better financial management, are expected to result in improvements in the companies' financial positions.

C. Governance

22. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government, GOMP, MP Transco, and the distribution companies. The specific policy requirements and supplementary measures are described in the project administration manual. The financial management assessment shows that the executing agencies have adequate capacity to manage the financial aspects of the project implementation. The governance assessment shows that the procurement, financial management, institutional, and corporate governance measures introduced in Madhya Pradesh by previous ADB projects are in place and functioning.[16]

[15] Project investments increase the transmission and distribution capacity to provide estimated number of new connections. Resources for the new connections are provided by the distribution companies.
[16] Tariff and Governance Assessment (accessible from the list of linked documents in Appendix 2)

D. Poverty and Social

23. The power sector has significant potential to contribute to economic development and social well-being, and is both directly and indirectly linked to poverty reduction. Stable electricity supply promotes the agriculture sector and business expansion, and increases employment opportunities, which will have positive impacts on poverty reduction. A good quality electricity supply without load shedding is also crucial to meet the basic human needs of health and education. Poor and vulnerable consumers, as well as public utilities such as hospitals and schools, are often particularly disadvantaged by an inadequate power supply, load shedding, and poor power quality, and will therefore benefit directly from the project. The project is expected to generate considerable employment for skilled and unskilled labor during construction. The executing agencies will be responsible for contractors' compliance with labor standards, including equal pay for equal work (for men and women), and the provision of awareness training on HIV and sexually transmitted diseases and human trafficking, if relevant. A household survey conducted in Madhya Pradesh shows that beneficiaries believe that availability of a 24-hour supply of power will result in children spending more time studying (61%), women spending less time on household tasks (42%), the purchase of electrical appliances to make life easier (33%), people spending more time on leisure (29%), and people sleeping well under a fan (49%).[17]

E. Safeguards

24. **Environment (category B).** An initial environmental examination was prepared to address environment impacts. No subproject is located within or in the vicinity of Madhya Pradesh's declared forests, cultural and archaeological sites, nine national parks, and 25 wildlife sanctuaries. Some subprojects, however, may cause temporary environmental impacts during the construction phase. Adequate mitigation measures for such impacts are included in the environmental management plan of MP Transco and distribution companies, with adequate funds. These plans were incorporated in the project's bid documents. An environmental monitoring plan was also prepared. The project's capacity building component includes safeguard training for the executing and implementing agencies. The initial environmental examination was disclosed on the ADB website and a project brief in Hindi will be prepared by MP Transco, DISCOM-C, DISCOM-E, and DISCOM-W and will be made available to the public at their field offices.

25. **Involuntary resettlement (category B).** The construction of transmission lines will not require the acquisition of private property. However, temporary impacts will affect crops cultivated and people's livelihood sources. Effective measures to avoid, minimize, mitigate, and compensate adverse impacts are incorporated in the approved resettlement plan. The institutional capacity and commitment of the executing and implementing agencies to manage the project's social and environmental risks are deemed adequate. During project implementation, if any additional involuntary resettlement impacts are identified, the executing agencies will design and integrate sound mitigation measures into the resettlement plan and submit to ADB for review and approval. The resettlement plan was disclosed on the ADB website.

26. **Indigenous peoples (category C).** Social assessments conducted during project preparation found no indigenous peoples who would be impacted by project activities. If any

[17] H. Gunatilake, et al. 2012. Willingness to Pay for Good Quality, Uninterrupted Power Supply in Madhya Pradesh, India. *South Asia Working Paper Series.* No. 13. Manila: ADB. http://www.adb.org/sites/default/files/pub/2012/willingness-to-pay-good-quality-power.pdf

project impact on indigenous peoples is found during implementation, project authorities will either formulate an indigenous peoples plan or revise the approved resettlement plan, incorporating additional entitlements to address them. The revised resettlement plan or the new indigenous peoples plan will be submitted to ADB for review and approval.

F. Risks and Mitigating Measures

27. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[18] The risks have been identified and mitigation measures are incorporated in the project design. The integrated benefits and impacts are expected to outweigh the costs.

Table 4: Summary of Risks and Mitigating Measures

Risks	Management Plan or Measures
In order to provide 24 hour power supply and to avoid excess capacity in T&D system, power generation should be expanded as planned. Delay in implementation of the government's generation plan is a risk to the project.	GOMP provided assurance that there will be adequate power supply to meet the incremental demand resulting from the project.
The proposed project finances only selected distribution improvements and the targeted loss reduction depends on timely completion of government-funded projects. Delay in implementation of government-funded distribution projects is a risk to the project.	GOMP provided assurance that it will ensure timely implementation of its distribution projects.
Affordability of the improved service is an important factor that determines community support for the project. Low affordability and lack of public support for tariff increase are risks to the project.	GOMP will continue to provide subsidized power to households below the poverty line.
In the past, MPERC used to set ambitious distribution loss targets. This resulted in financial losses to the distribution companies, because tariff is estimated using the allowed distribution loses. Unrealistic expectations on loss reduction in tariff setting is a risk to the project.	MPERC has changed its practice of setting unachievable loss reduction targets and the three distribution companies met the loss reduction targets in FY2012.
Delay in providing counterpart funds is a risk to the project.	GOMP provided assurances to ensure timely provision of counterpart funding.
In adequate staff in project management units result in poor supervision. Poor construction quality resulting from poor supervision is a risk to the project.	MP Transco, distribution companies, and GOMP agreed to maintain 11 staff members in each project management unit.
Distribution loss reduction is instrumental for achieving financial profitability of distribution companies. Inadequate distribution loss reduction is a risk to the project.	Distribution companies agreed to reduce distribution losses and continuously monitor loss levels using the computerized metering system.
Exchange rate fluctuations and use of over-shoot exchange rate for estimating project costs may result in cost overruns.	A conservative exchange rate was used in estimating the costs.
The project provides selected limited support for capacity building. GOMP and DISCO-C should provide continuous support to ensure sustainability of the training activities. Lack of support for capacity building activities after project completion is a risk to the project.	GOMP and DISCOM-C assured continuous provision of resources to sustain training programs.

DISCOM C = Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company, GOMP = Government of Madhya Pradesh, MPERC = Madhya Pradesh Electricity Regulatory Commission, MP Transco = Madhya Pradesh Power Transmission Company, T&D = transmission and distribution.
Source: Asian Development Bank.

[18] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

IV. ASSURANCES

28. The Government of India, the Government of Madhya Pradesh and the executing agencies (MP Transco, DISCOM-C, DISCOM-E, and DISCOM-W) have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents.

29. The Government of India, the Government of Madhya Pradesh, and MP Transco, DISCOM-C DISCOM-E and DISCOM-W have agreed with ADB on certain covenants for the project, which are set forth in the loan agreement and project agreement.

V. RECOMMENDATION

30. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $350,000,000 to India for the Madhya Pradesh Power Transmission and Distribution System Improvement Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

5 November 2013

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Adequate and reliable power supply in Madhya Pradesh	Potential transmission and distribution capacity gap of 20% in 2017 is reduced to about 3% by 2022. Households will receive 24-hour power supply from 2020 onward.	Annual reports of MPERC Annual reports of MPERC	**Assumptions** Generation expansion plan for India is implemented as planned. Feeder separation program is implemented as planned. Demand for electricity will grow by 11% per annum during 2013–2017.
Outcome Increased capacity and operational efficiency in the electricity transmission and distribution system in Madhya Pradesh	Distribution loss reduction from 27% in 2013 to 16% by 2018 Transmission loss reduction from 3.3% in 2013 to 3% by 2018 and maintained thereafter Increased transmission substation capacity from 37,000 MVA in 2013 to 41,000 MVA by 2018	Annual reports of MPERC Annual reports of MPERC Annual reports of MPERC	**Assumption** Ongoing transmission and distribution projects are implemented as planned.
Outputs 1. Transmission system upgraded and expanded	About 1,800 circuit-km of transmission lines installed by 2018 Two new 400 kV substations constructed and three 400 kV substations upgraded by 2018 Four new 220 kV substations constructed and five 220 kV substations upgraded by 2018 26 new 132 kV substations constructed by 2018	Annual reports of MP Transco Annual reports of MP Transco Annual reports of MP Transco Annual reports of MP Transco	**Risk** Exchange rate fluctuation results in inadequate financial resources to deliver the outputs.
2. Distribution system upgraded and	About 3,125 circuit-km of distribution lines	Annual reports of distribution companies	

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
expanded	installed by 2018		
	149 new 33/11 kV substations constructed by 2018	Annual reports of distribution companies	
	328 33/11 kV substations upgraded by 2018	Annual reports of distribution companies	
3. Built capacity of executing agency staff	About 10 trainers (male and female) trained by 2015	Annual reports of DISCOM-C	
	About 100 staff (male and female) trained on procurement, project management, monitoring and evaluation, safeguards, and financial management by 2018	Annual reports of DISCOM-C	
	Laboratory, training center hostel, and support facilities constructed by 2018	Annual reports of DISCOM-C	
4. Project management system in place	Project implemented on time and within allocated budget	Semiannual review reports of executing agencies	

Activities with Milestones	Inputs
1. Transmission system upgraded and expanded 1.1 Construction of transmission lines and transmission substation, and upgrading of existing substation commence by June 2014 2. Distribution system upgraded and expanded 2.1 Construction of distribution lines and distribution substation, and upgrading of existing distribution substations commence by June 2014 3. Built capacity of executing agency staff 3.1 Needs assessment completed by September 2014 3.2 Curricula and training materials developed by December 2014 4. Project management system in place 4.1 Advertisement of bids by August 2013 4.2 Contract awards by January 2014 4.3 Recruitment of consultants for capacity building by June 2014	Loan ADB: $350 million Government: GOMP: $150 million

ADB = Asian Development Bank, DISCOM-C = Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company, GOMP = Government of Madhya Pradesh, km = kilometer, kV = kilovolt, MPERC = Madhya Pradesh Electricity Regulatory Commission, MP Transco = Madhya Pradesh Power Transmission Company, MVA = megavolt-ampere.
Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://adb.org/Documents/RRPs/?id=47100-004-3

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Power
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Initial Environmental Examination
12. Resettlement Plan
13. Risk Assessment and Risk Management Plan

Supplementary Documents

14. Climate Change Impacts
15. Technical Justification of the Project
16. Review of Power Sector Reforms in Madhya Pradesh
17. Financial Management Assessment and Projections
18. Detailed Economic Analysis
19. Tariff and Governance Assessment
20. Capacity Building for Executing Agencies
21. Exchange Rate Fluctuations