ADB

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

Project Number: 44426 and 44917
September 2011

# Proposed Loans
# Power Grid Corporation of India
# India: National Grid Improvement Project

Asian Development Bank

## CURRENCY EQUIVALENTS
(as of 1 August 2011)

| | | |
|---|---|---|
| Currency Unit | – | Indian rupee/s (Re/Rs) |
| Re1.00 | = | $0.02263 |
| $1.00 | = | Rs44.195 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | – | Asian Development Bank |
| BPTA | – | bulk power transmission agreements |
| CERC | – | Central Electricity Regulatory Commission |
| CPSU | – | central public sector undertaking |
| ERM | – | enterprise risk management |
| HVDC | – | high voltage direct current |
| IPP | – | independent power producers |
| POWERGRID | – | Power Grid Corporation of India |

## WEIGHTS AND MEASURES

| | | |
|---|---|---|
| km | – | kilometer |
| kV | – | kilovolt |
| MW | – | megawatt |

## NOTES

(i) The fiscal year (FY) of the Government of India and the Power Grid Corporation of India begins on 1 April and ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2010 ends on 31 March 2010.

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

| | |
|---|---|
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# PROJECT AT A GLANCE

**1. Project Name:** National Grid Improvement Project **2. Project Number:** 44426/44917

**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 | ✓ | Promoting economic efficiency and enabling business environment |
| Environment sustainability | | Eco-efficiency |
| Private sector development | | Policy reforms |
| Capacity development | | Institutional development |

**6a. Climate Change Impact:**

| | |
|---|---|
| Mitigation | High |

**6b. Gender Mainstreaming:**

| | |
|---|---|
| Gender equity theme | |
| Effective gender mainstreaming | |
| Some gender benefits | ✓ |
| No gender benefits | |

**7. Targeting Classification**:

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

**8. Location Impact:**

| | |
|---|---|
| Rural | Medium |
| Urban | Medium |
| National | High |

**9. Sovereign Project Risk Categorization:** Complex
**Nonsovereign Operation Risk Rating :** Obligor risk rating: NSO5
Facility risk rating: NSO7

**10. Safeguard Categorization:**

| | |
|---|---|
| Environment | B |
| Involuntary resettlement | B |
| Indigenous peoples | C |

**11. ADB Financing:**

| Sovereign/Nonsovereign | Modality | Source | Amount ($million) |
|---|---|---|---|
| Sovereign | Project Loan | Ordinary capital resources | 500 |
| Nonsovereign | Project Loan | Ordinary capital resources | 250 |
| Total | | | 750 |

**12. Cofinancing:**

| Financier | Category | Amount ($million) |
|---|---|---|
| TBD-Commercial | Risk participation | TBD |
| Total | | |

**13. Counterpart Financing:**

| Source | Amount ($million) |
|---|---|
| POWERGRID (equity) | 675 |
| POWERGRID/Others (domestic bonds or other commercial banks or financial institutions) | 825 |
| Total | 1,500 |

**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 (i) a proposed loan of $500 million, with a sovereign guarantee; and (ii) a proposed loan of $250 million, without a sovereign guarantee, both to the Power Grid Corporation of India (POWERGRID) in India for the National Grid Improvement Project.[1]

2. The project will strengthen the interregional connections for bulk electric power transmission from 14 private independent power producers (IPPs) in the state of Chhattisgarh in the western grid region to demand centers in the northern grid region of the country including Delhi and the states of Haryana and Punjab.

# II. THE PROJECT

## A. Rationale

3. **Sector overview.** The Indian power sector has a history of growing demand for and chronic shortages of electricity.[2] During FY2010, the country's peak power deficit was at 12.7% and the average energy deficit at 10.1%. The country is in constant need of additional power supply and the power sector suffers the shortfalls in both generation and transmission capacity. Achieving efficient delivery of all the power that the growing economy needs is a national priority and critical to sustaining India's long-term development.

4. To alleviate the country's acute power shortage, the Government of India has traditionally focused on increasing power generation. The private sector has joined this effort and has added greatly to generation capacity over the last 4 years,[3] but transmission investment has lagged. India has an installed generation capacity of 173,626 megawatts (MW) at present but its interregional transmission capacity of about 23,800 MW is 13.7% of this total. Based on increasing generation capacity, commensurate improvements in the transmission system expansion are urgently needed.

5. To optimize the transfer and use of power throughout the country, the government aims to integrate its five regional power grids, which serve the northern, northeastern, eastern, western, and southern regions. Although individual regions try to connect and synchronize the state power systems within their grids, limited interregional transmission capacity has restricted the transfer of power between them. Interregional transmission superhighways are needed because India's natural energy resources and generation sites are unevenly distributed. Without these highways, regions with surplus power at a given time cannot effectively transfer electricity to regions facing power deficits. To use energy efficiently through the nation and overcome this regional disparity, the government's five-year plans seek to increase interregional transmission capacity from 23,800 MW to 27,950 MW by FY2012, 57,000 MW by FY2015, and 75,000 MW by FY2017. Strengthening the interregional transmission network will promote open access to power supply, increase investment in both generation and distribution, help integrate the electricity market, and encourage power trading and competitive electricity prices.

6. **Borrower.** As the country's central transmission utility, POWERGRID is responsible for planning, developing, and operating India's national transmission network, operating more than 95% of interregional and interstate power transmission.[4] POWERGRID was incorporated in

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[1] The design and monitoring framework is in Appendix 1.
[2] Sector Assessment (Summary): Energy (accessible from the list of linked documents in Appendix 2).
[3] After adding 1,931 MW in additional capacity during the Tenth Five Year Plan (FY2003–FY2007), private investment had already raised capacity by 11,040 MW as of 31 January 2011 under the current plan (FY2008–FY2012).
[4] Unlike interregional and interstate transmission, intrastate transmission is owned by state utilities.

1989 as a public limited company wholly owned by the central government. The company was initially listed in the domestic stock markets in October 2007 with an initial float of 11% of its shares. In 2010, the government reduced its shareholdings to 69%. By the end of the twelfth five-year plan up to FY2017, POWERGRID plans to invest about $22 billion to more than double the size of its network. This will be crucial to making effective use of the new power generation being developed by public and private utilities. To support its ambitious investment plan, the company proposes to diversify its sources of debt capital by tapping the commercial lending market. POWERGRID now relies predominantly on two sources of debt: domestic bond issues (67% of total debt outstanding) and sovereign guaranteed loans from multilateral banks (27%).[5] To help strengthen and diversify POWERGRID's ability to raise funding for future investment, the government asked the Asian Development Bank (ADB) to include a unique financing structure in the 2010 country program, combining a nonsovereign loan and a sovereign guaranteed loan in a single financing package. The government wants to demonstrate this novel financing package as a transitional arrangement for large publicly owned entities, including central public sector undertakings (CPSUs) that must increasingly become capable of raising market funds on their own account. Doing so will enable the CPSUs to meet their sizable investment requirements independently while gradually reducing dependence on government guarantees.

7. **Project design.** POWERGRID's immediate investment plans focus on the transmission projects required to deliver electricity from 55 new IPP power generation plants to primary load centers. Known collectively as the high capacity power transmission corridors program, these projects include nine major transmission schemes approved by the Central Electricity Regulatory Commission (CERC) with an estimated total cost of more than $12.9 billion. The project proposed for ADB financing is the biggest of these transmission schemes and involves 14 IPPs and a public power trading company in Chhattisgarh. It will strengthen interregional transmission between the western and the northern regional grids and supply additional bulk power to the north from generation of IPPs in Chhattisgarh, which will generate over 15,000 MW in total.[6] The project will create a high voltage direct current (HVDC) transmission system using smart grid technology to support stable, efficient, flexible, and economical long-distance power transfer among its interconnected systems. HVDC is a least-cost and low-carbon investment option.

8. **Alignment of ADB strategy and operations.** The project is consistent with ADB's Strategy 2020[7] and the 2009–2012 India country partnership strategy. The country partnership strategy includes continuous support for interstate and interregional transmission networks as part of the national level sector development strategy. It also directs ADB to leverage the financing capacity of CPSUs through its nonsovereign lending modality to help them meet substantial borrowing requirements under the government's five-year plans.[8]

9. The project is aligned with ADB's sector policy directive, which highlights the enhancement of energy efficiency in transmission systems. Since 1995, ADB has provided POWERGRID with five sovereign guaranteed loans to help strengthen the transmission system nationally. Three ongoing loans comprise a sector loan and two loan tranches from a

[5] The balance 6% of debt is mostly from legacy domestic bank facilities, suppliers' credit transactions, and sovereign-guaranteed facilities from bilateral agencies dating from the 1990s to the early 2000s.

[6] HVDC transmission technology will improve efficiency and reduce transmission loss when compared with existing interregional alternating current transmission system. The new system is to deliver 3,000 MW initially and will be increased to 6,000 MW by adding upgraded terminals later. The rest of power generated from IPPs will be supplied within the western region.

[7] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020.* Manila.

[8] The 2010 country program for India confirmed the government's aim to graduate strong CPSUs from use of sovereign facilities in a phased manner, in favor of funding other development programs.

multitranche financing facility (MFF).[9] These facilities have had satisfactory performance, warranting continued ADB engagement with POWERGRID.[10] The Independent Evaluation Department 2010 validation report for the second loan rated POWERGRID's performance *highly successful*.[11]

## B. Impact and Outcome

10. The project impact will be to accelerate the development of the interregional grid system to deliver increased power supply to sustain the country's economic growth. The project outcome, strengthened transmission capacity and more efficient operations, will increase reliable power supply from private IPPs and public utilities through the interconnected grid. The project will facilitate integration of electricity markets and create power trading opportunities through open access and competition among private and public utilities. It will expand the market for potential power sellers and buyers beyond their own regional grids. This will help promote private investment in generation and distribution.

## C. Outputs

11. The project outputs will include (i) a strengthened interregional transmission network between the northern and western grid regions through physical investment; and (ii) improvements in POWERGRID's access to and management of financial credit by the promotion of diversification of its funding sources through combined nonsovereign loan and sovereign guaranteed loan of ADB. The physical output will comprise (i) 800 kilovolts (kV) HVDC transmission line between Champa in Chhattisgarh and Kurukshetra in Haryana (about 1,365 kilometers); and (ii) establishment of HVDC terminals at Champa and Kurukshetra.

## D. Investment and Financing Plans

12. The total investment cost is estimated at the equivalent of $2,250 million (Table 1).[12]

**Table 1: Project Investment Plan**
($ million)

| Item | | Amount |
|---|---|---|
| **A.** | **Base Cost**[a] | |
| | 1. Civil works | 297.2 |
| | 2. Equipment | 1,201.9 |
| | 3. Land acquisition and safeguard mitigation | 35.7 |
| | 4. Other overheads[b] | 168.8 |
| | **Subtotal (A)** | **1,703.6** |
| **B.** | **Contingencies** | **298.9** |
| **C.** | **Financing Charges During Implementation** | **247.6** |
| | **Total (A+B+C)** | **2,250.1** |

[a] In 2011 prices.
[b] Includes taxes and duties of the equivalent of $61.5 million to be financed from POWERGRID resources.
Sources: POWERGRID and Asian Development Bank estimates.

[9] ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to India for Power Grid Transmission (Sector) Project.* Manila; ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to India for the National Power Grid Development Program.* Manila.

[10] The sector loan has achieved 99% of the loan amount in contract award and 95% in disbursement as of 1 August 2011. The two loan projects under the MFF have also been progressing well in terms of contract awards and disbursements given the time elapsed since loan availability.

[11] ADB. 2010. *Validation Report for Power Transmission Improvement (Sector) Project.* Manila.

[12] The overall investment cost includes 400 kV transmission lines in Haryana and Punjab (about 318 kilometers) to be financed by POWERGRID as integrated facilities of the project.

13. To support the $2,250 million cost, POWERGRID will make an equity contribution equivalent to $675 million (30% of the project cost) from its own resources, as regulated by CERC tariff norms.[13] ADB will support project funding through a sovereign guaranteed loan of $500 million and a nonsovereign corporate loan of $250 million. The ADB loans will be used primarily to implement the HVDC terminals on a turnkey basis. To assure that funds are efficiently deployed and available for this portion of the project, the sovereign loan will only be made available upon the closure and availability of the nonsovereign loan. The remaining project cost will be financed from proceeds from POWERGRID's regular domestic bond issues and/or other financiers.[14] Table 2 summarizes the financing plan.

**Table 2: Financing Plan**

| Source | Amount ($ million) | Share of Total (%) |
|---|---|---|
| Asian Development Bank (sovereign guaranteed loan) | 500.0 | 22.2 |
| Asian Development Bank (nonsovereign corporate loan) | 250.0 | 11.1 |
| POWERGRID (internal resources) | 675.0 | 30.0 |
| POWERGRID (other sources)[a] | 825.1 | 36.7 |
| **Total** | **2,250.1** | **100.0** |

POWERGRID = Power Grid Corporation of India.
[a] Expected to be POWERGRID's domestic bond issuance and/or parallel financing from the commercial banking sector and/or other financial institutions.
Source: Asian Development Bank estimates.

14. **Sovereign guaranteed loan.** The government and POWERGRID have requested a sovereign guaranteed loan of $500 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 the ADB loan facility based on the London interbank offered rate (LIBOR), a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and guarantee agreements. The government and POWERGRID have provided ADB with (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility based on these terms and conditions, and (ii) an undertaking that these choices were its own independent decision and not made in reliance on any communication or advice from ADB.

15. **Nonsovereign loan.** A parallel loan to POWERGRID is proposed for up to $250 million without sovereign guarantee, with a maturity of 15 years, including a grace period 4 years. The loan will carry an interest rate, commitment and front-end fees to be determined by ADB's investment committee. The loan will be supported by the strength of POWERGRID's corporate credit.[15] The loan is proposed to be secured by a pari passu floating charge on the corporate assets of POWERGRID, details of which will be agreed during loan negotiations.

16. **Risk participation.** ADB is exploring a range of risk-sharing arrangements with eligible commercial cofinanciers to transfer a portion of the commercial and political risks in respect of the nonsovereign loan.

17. **Investment limitations.** The proposed nonsovereign loan size lies within the country, industry, group, and single project exposure limits for ADB nonsovereign investments.

[13] CERC regulates a debt–equity ratio of 70:30 in setting transmission tariffs for each project.
[14] POWERGRID has initiated discussions with commercial banks and financial institutions to explore the possibility of funding on nonsovereign operations. POWERGRID also regularly issues domestic bonds.
[15] While drawdown against the two loans will be linked to underlying progress payments on the project, the credit obligation for nonsovereign loan rests with the corporate credit.

## E. Implementation Arrangements

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

**Table 3: Implementation Arrangements**

| Aspects | Arrangements | | |
|---|---|---|---|
| Implementation period | July 2011–December 2016 | | |
| Estimated closing date | 30 June 2017 | | |
| Management | | | |
| (i) Oversight body | Coordination committee, comprising CEA and POWERGRID | | |
| (ii) Executing agency | POWERGRID [a] | | |
| (iii) Key implementing agency | POWERGRID | | |
| (iv) Implementation unit | POWERGRID's western and northern regional offices, with about 100 staff | | |
| Procurement | ICB | 7 contracts | $750 million |
| Retroactive financing and/or advance contracting | All eligible contract packages and eligible expenditures agreed between ADB and the borrower have been approved for retroactive financing and advance contracting. | | |
| Disbursement | The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2007, as amended from time to time) and detailed arrangements agreed upon between POWERGRID and ADB. | | |

ADB = Asian Development Bank, CEA = Central Electricity Authority, ICB = International Competitive Bidding, POWERGRID = Power Grid Corporation of India.

[a] The company's board comprises 14 directors. Five are full-time directors, two are appointed by the government, and seven are independent.

Sources: Asian Development Bank and POWERGRID estimates.

19. **Procurement.** The project will be completed by 2016. POWERGRID's performance in procurement has been good during past and ongoing ADB-funded projects.[17] POWERGRID asked ADB for advance procurement action and retroactive financing for the project. All procurement under the project will follow International Competitive Bidding in accordance with ADB's Procurement Guidelines (2010, as amended from time to time).

20. **Disbursement.** The sovereign and nonsovereign loan proceeds will jointly finance the procurement of equipment. The financing and disbursements for each contract package will be on a pro rata basis.[18]

21. **Other arrangements.** The project was approved for implementation by the government under the Electricity Act, 2003. POWERGRID has already signed bulk power transmission agreements (BPTA) for the project with 14 IPPs and the Chhattisgarh State Power Trading Company to ensure offtake arrangements as defined by the CERC regulations.

## III. DUE DILIGENCE

22. **Value added by ADB assistance.** The project is innovative in the following respects:

(i) **Energy efficient technology.** The project will adopt advanced 800 kV HVDC transmission lines that have so far been used only elsewhere in India and in the

[16] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

[17] The procurement capacity assessment report has identified no substantial issues on project implementation.

[18] Debt funding for the project will be disbursed from the sovereign and nonsovereign loan proceeds simultaneously. Funds from the sovereign facility will only be disbursable upon the availability of funds from the nonsovereign facility. Disbursements from the two loans will be maintained, at minimum, on specific weighted percentages.

People's Republic of China. This technology will significantly reduce power loss and support low-carbon growth.[19] A large-scale HVDC supergrid network can also help stabilize power supply frequencies and voltages, which in turn will support development of smart grid operations.

(ii) **Promotion of private sector development.** Through public sector's support for the improvement of interregional transmission, the project will promote private sector development in power generation by facilitating the access of IPPs to markets. Public and private investment will be combined through the entire power sector value chain to leverage project benefits. Better interregional grid connectivity will greatly expand power trading opportunities and consequently boost IPP businesses. Because the government has opened investment in interregional transmission to competitive bidding, the project is also expected to attract private developers to similar transmission projects in other regions.[20]

(iii) **POWERGRID's self-financing capacity improvement.** This will be the first time ADB has combined sovereign and nonsovereign facilities for a single borrower. A foreign commercial term loan without credit support from governments will also be a first for POWERGRID. The government encouraged ADB to provide the nonsovereign loan to help POWERGRID transition to and gain experience with more commercial forms of funding. POWERGRID is now nearly completely reliant on the domestic bond markets and recognizes the need to diversify its sources of debt.[21] During the loan process and through ongoing capacity development technical assistance,[22] ADB will help POWERGRID strengthen its corporate credit capabilities to promote access to international capital markets and improve its fiscal planning and risk management. The nonsovereign loan will help POWERGRID (a) establish a much-needed benchmark for foreign commercial borrowing, and (b) enhance its capacity for dealing with foreign commercial lending institutions before launching any future commercial borrowing program, such as an offshore syndicated loan or an international bond début.[23] The nonsovereign loan facility will demonstrate to other financially viable CPSUs how to go about raising funds for the country's economic development in a more autonomous manner. It will thereby serve as a catalyst for sustainable economic growth while reducing strain on government finances and increasing fiscal space for other priority social programs.

## A. Technical

23. The 800 kV HVDC transmission system is state-of-the-art, commercially proven technology. The first such system in India is being implemented by POWERGRID under the ADB-financed MFF (footnote 9). The project is expected to enhance energy efficiency by reducing transmission losses of approximately 3% below levels of typical conventional

[19] The project will support a reduction in carbon dioxide emissions quantified by the efficiency gained from transmitting a fixed amount of energy across an HVDC transmission system versus a conventional alternating current transmission system of equivalent length.

[20] To meet sizable investment requirements in interstate transmission, POWERGRID will also be required to consider expanding the transmission network strategically through structures such as public–private partnership in a competitive environment. POWERGRID has established nine joint ventures with private and public companies.

[21] This is to promote funding sustainability and mitigate risks from any adverse changes in the bond markets that could impair the investment plans. The domestic market has been constrained for large funding.

[22] ADB. 2010. *Technical Assistance for Innovative Financing Instruments for Power Grid*. Manila. With support from ADB, POWERGRID formulated the debt financing strategy.

[23] To diversify its funding sources, POWERGRID has explored other nonsovereign funding to finance a portion of the project. For the ongoing project financed by ADB, POWERGRID is also pursuing the equivalent of combined $720 million in buyer's export credits and nonsovereign commercial borrowing.

transmission systems. This in turn could result in the lowering of carbon dioxide emissions from power systems by an estimated 536,000 tons per year.[24]

## B. Economic and Financial

24. The project's financial internal rate of return is 9.54%,[25] higher than the weighted average cost of capital. Its economic internal rate of return is estimated to be 22.10%.[26] Thus, the project is financially viable and economically sustainable.

25. The government has accorded POWERGRID "Navratna" (jewel) status, which gives a CPSU managerial and financial autonomy despite majority government ownership. While POWERGRID does not currently have an international credit rating, it has top domestic credit ratings.[27] Based on the cost-plus nature of the tariff setting process and POWERGRID's superior operating efficiency, it has increased revenues and net profits consistently,[28] maintaining a robust financial position with stable cash flows to cover its cost of services, capital investment, and debt payments. Over the last 3 years, it achieved a post-tax return on equity of over 10% and a debt service coverage ratio of 1.5. In FY2011, return on equity rose to 12.6% and the debt service coverage ratio improved to 1.8. POWERGRID's debt–equity ratio has remained below 70:30. Based on its strong credit, POWERGRID has frequently raised large amounts by issuing domestic bonds and equity.[29] Although POWERGRID has an aggressive investment plan and a large need for additional borrowings, financial projections show that it will maintain a sound financial position even under stress scenarios.

## C. Governance

26. **Enterprise risk management.** Through public offerings for shares and bond issues, POWERGRID has established a sound corporate governance system. In February 2011, POWERGRID introduced an enterprise risk management (ERM) framework to strengthen its corporate governance. The framework has identified risks under four categories: (i) strategic, (ii) operational, (iii) financial, and (iv) others (e.g., human resources). The ERM also envisages appointment of a chief risk officer and a risk management committee. The ERM framework has been put in place and staff training began in June 2011.

27. **Anticorruption policy.** POWERGRID was advised of ADB's Anticorruption Policy (1998, as amended to date) and its Policy on Combating Money Laundering and the Financing of Terrorism (2003). Consistent with its commitment to good governance, accountability, and transparency, ADB will require POWERGRID to institute, maintain, and comply with internal procedures and controls following international best practice standards for the purpose of preventing corruption or money laundering activities or the financing of terrorism and covenant with ADB to refrain from engaging in such activities. The financing documentation between ADB and POWERGRID will allow ADB to review and examine any violation or potential violation of these undertakings. As a listed company, POWERGRID is subject to extensive disclosure requirements under the laws of India.

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[24] Clean Development Mechanism Assessment Report (accessible from the list of linked documents in Appendix 2).
[25] Financial Analysis (accessible from the list of linked documents in Appendix 2). The weighted average cost of capital is 3.92%.
[26] Economic Analysis (accessible from the list of linked documents in Appendix 2).
[27] Since 2001, POWERGRID's domestic bonds have been rated AAA by CRISIL and LAAA by ICRA. From 2008, the Credit Analysis & Research has also given these bonds a rating of AAA.
[28] In FY2011, POWERGRID generated Rs91 billion in revenue, resulting in Rs27 billion in net profit, up 32% over the previous financial year.
[29] Since FY2008, POWERGRID has issued new equity shares and the government has disposed of shares in equal amounts. In FY2011, POWERGRID raised equity of Rs74.4 billion. POWERGRID has regularly issued bonds in the domestic market since FY2001, raising more than Rs100 billion in FY2011 alone.

## D. Poverty and Social

28. The power sector plays a key role in improving economic development and social well-being.[30] The project has developed an implementation strategy to avoid or minimize negative impacts on affected people, with a focus on women and vulnerable groups.[31] Key social and gender-related design features include (i) gender-inclusive consultative processes, (ii) additional assistance for affected households headed by women in a resettlement framework, (iii) equal opportunities for women to access employment and equal pay under civil works contracts, and (iv) ensuring the incorporation of women's needs and concerns in all aspects related to project design and development (e.g., sanitation).

## E. Safeguards

29. The project is classified category B for environment,[32] category B for involuntary resettlement,[33] and category C for indigenous people. In accordance with ADB's Safeguard Policy Statement (2009), the potential environmental and social impacts and risks of the project have been identified. Effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts are incorporated in a resettlement plan and initial environmental examination, including the environmental monitoring and management plan.[34] The institutional capacity and commitment of POWERGRID to manage the project's social and environmental risks are deemed adequate.[35] Information disclosure and consultations with affected people are conducted in accordance with ADB requirements.

## F. Risks and Mitigating Measures[36]

30. **Counterparty risk.** POWERGRID is exposed to counterparty risk both in (i) completion of generation projects, and (ii) offtake of electricity from those projects upon commercial operations. However, POWERGRID is well protected by regulations. BPTAs are signed between generators and POWERGRID on terms defined by regulation. Each generator constructing a new power plant must post a performance bond with POWERGRID to cover liquidated damages in the event of delayed completion.[37] After power generation begins, transmission charge liability shifts from the generators to the designated offtakers, who are usually state distribution utilities. While the credit quality of the offtakers varies significantly, all offtakers must post a letter of credit covering 105% of 2 month's projected dues to

[30] Three of the five states crossed by the project have poverty levels above the national average of 26.1% (Chhattisgarh, 44%; Madhya Pradesh, 37.4%; and Uttar Pradesh, 31.2%). Transmission extension and efficiency gains will indirectly enhance electricity access through the distribution network to end users, including the poor.

[31] Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).

[32] The project avoided routing transmission lines through environmentally sensitive areas. While the government exempted transmission projects from environmental clearances, POWERGRID will secure all necessary forest clearances prior to construction and installation, in accordance with the Forest Conservation Act 1980.

[33] None of the affected people will be physically relocated from their homes. However, two substations for the terminals will acquire about 102 acres of private land and impact 190 persons, 170 persons of whom (34 families) will be significantly affected due to land loss. They will be duly compensated for their economic losses, in accordance with the specific entitlements, compensation rates, and livelihood restoration defined for the project.

[34] Initial Environmental Examination and Resettlement Plan (accessible from the list of linked documents in Appendix 2). POWERGRID ensures contractor's liabilities for safeguards in bid documents and will submit progress reports on safeguard implementation to ADB.

[35] POWERGRID has established its corporate environmental and social policy and procedures (ESPP), which is a comprehensive environmental and social management system. The ESPP was developed in 1998 and revised in 2009, integrating key guidance and best practices from the World Bank through a multi-stakeholder and participatory consultation process.

[36] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2) is based on the project-specific level instead of the POWERGRID corporate level.

[37] In the event of an incurable default by a given offtaker, the BPTAs require that remaining customers are liable pro rata for making POWERGRID whole on transmission charges on a joint basis.

POWERGRID. The large number of generators and offtakers to which POWERGRID is exposed provides a diversification benefit from supply and sales arrangements, thus mitigating payment risks. Since the above mechanisms were introduced, POWERGRID has not experienced a customer default.

31. **Completion risk.** There are two types of completion risks: (i) delay in completion by generators while the transmission line is ready, and (ii) a completion delay by POWERGRID while the generators are ready to connect. POWERGRID is protected from the first risk by performance bonds and transmission charge coverage under the BPTAs. Under the second risk, POWERGRID is liable to generators for payment of liquidated damages equivalent to the transmission charge only if POWERGRID cannot arrange an alternative route of evacuation. Typically, alternative transmission routes are available in the national grid network and very few transmission projects of POWERGRID have been delayed beyond 1 year. Sensitivity analysis indicates that a 1-year delay of all projects in POWERGRID's development program would result in limited impact on the company's financial position.[38] POWERGRID and the generators regularly hold coordination meetings to harmonize progress on their respective projects.

32. **Political and regulatory risk.** POWERGRID's transmission tariffs and revenues are defined under CERC regulations.[39] Because the framework is adjusted every 5 years, POWERGRID's revenues are subject to some uncertainty. Despite this, CERC has historically provided reasonable adjustments and incentives to promote the stable performance of the transmission sector to ensure a climate of sustainable investment and fiscal health in line with the National Tariff Policy. As the designated central transmission utility, POWERGRID plays a pivotal role in national transmission system planning, grid development, and stability in operations. As a corporate entity, it invests in and operates transmission systems according to commercial business principles. In POWERGRID's role as the country's central transmission utility, the government could in theory direct the public sector entity to undertake activities that may be commercially disadvantageous but are deemed by government to be in the national interest. This possibility is mitigated by the fact that, as a publicly traded company, POWERGRID must operate in compliance with requirements of the Securities Exchange Board of India under the listing rules of the national stock exchanges. In addition, since POWERGRID is a substantial source of dividends for the government, it is likely that the government will continue to support sound commercial operations for POWERGRID to maintain or increase the value of the government's shareholding.

33. **Competitive risk.** POWERGRID has participated as a minority joint venture party with private or other public utilities in nine projects. This reflects their partners' nascent skills in undertaking transmission activities and their consequent need to align with an experienced party. POWERGRID's participation in these joint ventures has helped build its experience in a competitive environment. Per CERC order, some transmission projects are now subject to competitive bidding, and 14 projects have been selected by a CERC sanctioned committee to date.[40] In the future, as competition from the private sector increases, there is a possibility that the company's role may be limited to pure transmission operations, which may affect its revenue growth and market share. Should this occur, however, POWERGRID's financial position would

[38] Financial Analysis (accessible from the list of linked documents in Appendix 2). One-year delay of all projects would be an extreme scenario.

[39] Tariff regulations permit POWERGRID to pass through to customers, without need for any further regulatory approval, any increase in debt servicing cost due to changes in interest rates or exchange rates on foreign currency borrowing and increases in operating costs due to inflation or real price changes. Tariffs are determined based on total final investment costs incurred to implement the project and are recovered via a fixed depreciation formula and a fixed return on equity. To date, the regulated tariff structures have adequately provided for recovery of all costs of investment and operations of transmission projects while providing a reasonable return on equity.

[40] To attract increased investment in interregional transmission from the private sector, the government issued tariff-based competitive bidding guidelines with effect from January 2011. They provide two forms of private participation through joint ventures or independent private transmission companies.

be maintained due to reduced capital expenditures in such a scenario. High barriers to entry in the transmission business would also give POWERGRID the first-mover advantage and its wide transmission network could mitigate competitive threats. While more competitively bid projects may be promoted, stress testing under the corporate financial projection indicates that this is unlikely to have a material impact on POWERGRID's long-term financial performance.[41]

34. The obligor risk rating for POWERGRID is NSO 5, equivalent to the sovereign. The nonsovereign facility risk rating is NSO 7, adjusted down two notches from the obligor risk rating due to the proposed tenor of the loan. Nonsovereign loan pricing will ensure recovery of ADB's cost of funds plus a reasonable margin to compensate for risk. Margin and fees will be benchmarked to market pricing.

## IV. ASSURANCES AND CONDITIONS

35. The government and POWERGRID 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. The government and POWERGRID have agreed with ADB on certain covenants for the project, which are set forth in the loan and guarantee agreements for the proposed sovereign loan.

36. Consistent with the Agreement Establishing the Asian Development Bank,[42] the Government of India has confirmed that it has no objection to the proposed nonsovereign loan to POWERGRID. ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed assistance by its Board of Directors.

37. The effectiveness of the sovereign loan will be subject to satisfaction of all requirements precedent for disbursement under the nonsovereign loan. Likewise, the nonsovereign loan will be disbursable upon satisfaction of all conditions for disbursements under the sovereign loan.

## V. RECOMMENDATION

38. I am satisfied that the proposed loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the loan of $500,000,000 to the Power Grid Corporation of India Limited, to be guaranteed by India, for the National Grid 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 guarantee agreements presented to the Board; and

(ii) the loan of $250,000,000 to the Power Grid Corporation of India Limited, without a sovereign guarantee, for the National Grid Improvement Project in India from ADB's ordinary capital resources, with such terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Haruhiko Kuroda
President

9 September 2011

[41] The scenario assumed that 50% of future POWERGRID projects would be lost due to competition.
[42] ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

## DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets and Indicators with Baselines | Data Sources and Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| **Impact**<br><br>Accelerated development of interregional grid system for increased power supply | Completion of the high capacity power transmission corridor program to supply additional 40,000 MW (from 2006) of power from 55 IPPs by 2018<br><br>Private sector participation in bidding of additional 14 interstate transmission projects by 2018<br><br>Interregional transmission capacity of 75,000 MW by 2018 from 23,800 MW (2011) to enhance power trading<br><br>Functional enterprise risk management system of POWERGRID | CERC's reports<br><br>CERC's reports and power sector statistics from the Ministry of Power<br><br>Power sector statistics from the Planning Commission<br><br>POWERGRID's risk management committee's reports | **Assumptions**<br><br>The government continues to put priority on power sector development.<br><br>Regulatory framework continues to enable interstate and interregional transmission projects for private sector participation.<br><br>POWERGRID diversifies its debt sources to include more commercial loans.<br><br>Government 5-year plans' transmission projects are completed on schedule.<br><br>**Risk**<br><br>ROW related costs increase. |
| **Outcome**<br><br>Increased reliable power supply from private IPPs and public utilities within the interconnected grid network | Additional reliable power supply and trading (3,000 MW) through interregional transmission from 14 IPPs in Chhattisgarh to the northern region by 2017<br><br>Maintained transmission system availability at no less than 98% at the 2010 level<br><br>Reduced interregional transmission loss by 3% of power supplied by 2017 [a]<br><br>POWERGRID created a benchmark for its funding source diversification from international capital and/or commercial bank markets. | CERC's annual reports and POWERGRID's annual reports<br><br>POWERGRID's annual reports<br><br>POWERGRID's and ADB's project completion report<br><br>POWERGRID's audited financial accounts | **Assumptions**<br><br>IPP generation projects are developed in the time envisaged.<br><br>Load growth and system expansion occur as forecast.<br><br>The government continues to facilitate external commercial borrowings for infrastructure projects.<br><br>**Risk**<br><br>Scheduled tariff adjustment may not be adequate for cost recovery. |

| Design Summary | Performance Targets and Indicators with Baselines | Data Sources and Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| | Financial covenants in the loan agreements complied with | POWERGRID's progress reports and audited financial accounts | International capital market may be volatile. |
| **Outputs**<br><br>1. Procurement, installation, and commissioning of strengthened interregional transmission network between the northern and western regions | Construction of about 1,365 km of 800 kV HVDC transmission systems including terminals at Kurukshetra and Champa by 2016<br><br>Safeguards implemented in compliance with ADB Safeguard Policy Statement (2009) and POWERGRID's environmental and social policy and procedures | POWERGRID's progress reports and project completion report<br><br>Safeguard monitoring reports | **Assumptions**<br><br>POWERGRID mobilizes counterpart funds on time.<br><br>POWERGRID has sufficient capacity to conduct procurement per ADB guidelines.<br><br>Ongoing capacity development TA from ADB is completed. |
| 2. Improvements to POWERGRID's corporate credit, access to nonsovereign borrowing, and risk management | Funding plan and strategy agreed for ADB nonsovereign loan<br><br>Financial risk management system designed and implemented by 2012 | POWERGRID's debt financing strategy and audited financial accounts<br><br>POWERGRID's enterprise risk management system and risk management committee's reports | **Risks**<br><br>Prices of commodities and raw materials increase more than expected.<br><br>ROW issues cause unexpected construction delays. |

| Activities with Milestones | Inputs |
|---|---|
| 1. Interregional transmission network strengthening between the northern and western regions<br>1.1 Disclosure of safeguard documents disclosure by July 2011<br>1.2 Preparation of bid document by August 2011<br>1.3 Commencement of land acquisition by August 2011<br>1.4 Bid floating by September 2011<br>1.5 Technical bid evaluation by March 2012<br>1.6 Start of contract award by July 2012<br>1.7 Contract award for the project by 2013<br>1.8 Midterm review by 2014<br>1.9 Physical completion of construction by 2016<br><br>2. Corporate credit, access to nonsovereign borrowing, and project management<br>2.1 Design of enterprise risk management system by February 2011<br>2.2 Preparation of debt financing strategy by May 2011 | **ADB:** $750 million<br><br>**Item** — **Amount** ($ million)<br>Sovereign loan: 500.0<br>Nonsovereign loan: 250.0<br><br>**POWERGRID:** $1,500 million<br><br>**Item** — **Amount** ($ million)<br>Equity: 675.0<br>Domestic bond and/or parallel financing: 825.1 |

| Activities with Milestones | Inputs |
|---|---|
| 2.3 Nonsovereign loan approval by September 2011<br>2.4 Operation of project management unit by October 2011<br>2.5 Completion of project construction management by 2017 | |

ADB = Asian Development Bank, CERC = Central Electricity Regulatory Commission, HDVC = high-voltage direct current, IPP = independent power producer, kV = kilovolt, km = kilometer, MW = megawatt, ROW = right of way.

[a] The loss saving results from the use of the advanced 800 kV HVDC technology rather than the less efficient alternative, a conventional system based on an alternating current transmission line. ADB estimated carbon dioxide emissions reductions of additional 536,000 tons per year based on the loss saving from the project.

Sources: Asian Development Bank and POWERGRID.

## LIST OF LINKED DOCUMENTS

(http://adb.org/Documents/RRPs/?id=44426-014-3)

1. Loan Agreement
2. Guarantee 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 Document**

14. Clean Development Mechanism Assessment Report