



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

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Project Number: 41946  
March 2008

## Proposed Loan India: Mundra Ultra Mega Power Project

In accordance with ADB's public communications policy (PCP, 2005), this abbreviated version of the RRP excludes confidential information and ADB's assessment of project or transaction risk as well as other information referred to in paragraph 126 of the PCP.

Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 25 January 2008)

Currency Unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	\$0.025
\$1.00	=	Rs39.47

## ABBREVIATIONS

ADB	–	Asian Development Bank
ATC	–	aggregate technical and commercial
CGPL	–	Coastal Gujarat Power Limited
CSP	–	country strategy and program
Doosan	–	Doosan Heavy Industries & Construction Company Limited
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
KEXIM	–	The Export-Import Bank of Korea
MPSEZL	–	Mundra Port and Special Economic Zone Limited
NRRP	–	National Rehabilitation and Resettlement Policy
PFC	–	Power Finance Corporation Limited
PPA	–	power purchase agreement
PSEB	–	Punjab State Electricity Board
SEB	–	state electricity board
TCE	–	TCE Consulting Engineers Limited
Toshiba	–	Toshiba Corporation
TPC	–	The Tata Power Company Limited
UMPP	–	Ultra Mega Power Project

## WEIGHTS AND MEASURES

ha (hectare)	–	10,000 square meters
GWh (gigawatt-hour)	–	1,000,000 kWh
kWh (kilowatt-hour)	–	1,000 watt-hours
MW (megawatt)	–	1,000,000 watts

## NOTES

- (i) In this report, “\$” refers to US dollars.
- (ii) The fiscal year (FY) ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends.

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# INDIA MUNDRA ULTRA MEGA POWER PROJECT

- ★ National Capital
  - Provincial Capital
  - District Headquarters
  - Other Town
  - ▲ Mundra Ultra Mega Power Project
  - ⚓ Port
  - National Highway
  - Provincial Road
  - - - District Boundary
  - - - State Boundary
  - - - International Boundary
- Boundaries are not necessarily authoritative.



## **I. THE PROPOSAL**

1. I submit for your approval the following report and recommendation on a proposed loan of up to \$450,000,000 (denominated in Indian rupees and/or dollars), without government guarantee, to Coastal Gujarat Power Limited (CGPL) for the financing of the Mundra Ultra Mega Power Project. The proposed loan will have (i) a tranche of up to \$250,000,000 funded by the Asian Development Bank (ADB) and (ii) a tranche of up to \$200,000,000 funded by ADB and syndicated to the Export-Import Bank of Korea (KEXIM) through a risk participation agreement. The design and monitoring framework is presented in Appendix 1.

## **II. BACKGROUND**

### **A. Project Background**

2. The Project is one of the ultra mega power projects (UMPPs) planned by the Government to ease India's current and pending electric power deficits. The Government has a target of "Power for All" by 2012. To meet the capacity addition targets required to achieve this objective, the Ministry of Power launched an initiative facilitating the development of coal-based UMPPs. Development of large power projects can result in cheaper power through economies of scale. Recognizing this, the Government envisages a series of projects of at least 4,000 megawatts (MW) each. These projects will be awarded to developers identified and selected through international competitive tariff-based bidding processes. The projects will be developed on a build-own-operate basis. Based on supercritical technology, these projects are also expected to be more environment friendly than conventional subcritical generating units. India will be dependent upon coal as a fuel for a large portion of its power generation for the foreseeable future as it has no other practical alternatives. Thus the issue is how to generate power from coal as cleanly as possible. The Project will be one of the new generation of cleaner coal projects and thus merits ADB's active support. The Project will contribute significantly to reducing power shortages in the country.

3. To enhance investor confidence and reduce risk perception, the Government is undertaking some groundwork before the projects are handed over to the selected developers. Tasks for the Government include water linkage; environment and forest clearance; allocation of energy sales to offtakers; and substantial progress in land acquisition, rehabilitation, and resettlement-related work. These tasks are to be undertaken by a shell, or special purpose company, formed specifically for each UMPP. Power Finance Corporation Limited (PFC) set up CGPL to be the special purpose company for the Project.

4. The Ministry of Power, Central Electricity Authority, and PFC are working on the development of the UMPPs. PFC, as the nodal agency for project development, is responsible for setting up the special purpose companies and developing them to a stage when they can be transferred to the selected developers after the bid process. The Central Electricity Authority is to provide technical inputs on the various aspects of project conceptualization and development.

5. Bids for the selection of a developer for the Project opened on 18 December 2006. Six bids were received and the Tata Power Company Limited (TPC) was short-listed. On 28 December 2006, PFC issued a letter of intent in favor of TPC.

6. CGPL executed the power purchase agreement and other project-related agreements on 22 April 2007. Subsequently, TPC purchased the entire shareholding of CGPL; CGPL is now

a wholly owned subsidiary of TPC. CGPL will be responsible for the construction, operation, and maintenance of the Project and for arranging the required debt finance.

7. Given (i) India's need for generating capacity to be added quickly (ii) public sector limitations, (iii) the conventional memorandum-of-understanding route for private sector-led additions to add to capacity, the Government asked ADB for advice on new methods for adding large blocks of capacity quickly and transparently. ADB suggested the Government follow the ADB-developed Meghnaghat model successfully adopted by Bangladesh. This was accepted and the ultra mega power program was developed incorporating the Meghnaghat model, adapted to Indian conditions. At each stage in the process, ADB was informally consulted; the Government asked ADB to explore every possible financing option to assist the Project.

## B. Sector Background

### 1. Demand and Supply of Power

8. India continues to experience chronic electricity shortages, with peak demand exceeding supply by 13.8% and the energy deficit at 9.6% in FY2007.<sup>1</sup> Since FY1995, power demand has grown rapidly as the economy expanded at an annual average of 6.8% in real terms.<sup>2</sup> India is the third largest electricity consumer in Asia, behind the People's Republic of China and Japan. Power quality remains poor, marked by high voltage fluctuations and recurring load shedding. Industry buys approximately 35% of the electricity sold, followed by households at 25%, agriculture at 22%, and businesses and others at 17%.<sup>3</sup>

9. As of 31 December 2006, India's installed power generation capacity was 127,753 megawatts (MW) (Table 1). Capacity addition was targeted for 41,110 MW during the 10th Five-Year Plan (FY2003–FY2007); the actual capacity addition was 21,180 MW,<sup>4</sup> i.e., some 52% of the target. Energy shortfalls will persist over the short to medium term.

**Table 1: Summary of Installed Capacity as of 31 December 2006**  
(MW)

Sector	Hydro	Thermal					Nuclear	Renewable	Total
		Coal	Lignite	Gas	Oil	Total			
Central	6,672	24,020	2,490	5,899	0	32,409	3,900	0	42,981
State	25,664	37,386	465	3,500	1,239	42,589	0	2,568	70,821
Private	1,306	2,831	500	4,183	1,507	9,022	0	3,623	13,951
Total	33,642	64,237	3,455	13,582	2,746	84,020	3,900	6,191	127,753

MW = megawatt.

Source: Ministry of Power. 2007. *Report of the Working Group on Power for Eleventh Plan (2007–2012)*. New Delhi.

10. The northern and western regions are experiencing severe energy deficits with overall and peak power supply shortages well above the country average. Most of the states that will purchase power from the Project are dealing with significant power shortages. The energy and peak power supply positions for regions and for the states taking power from the Project are presented in Table 2.

<sup>1</sup> Ministry of Power. 2007. *Monthly Review of Power Sector*. New Delhi (April).

<sup>2</sup> International Monetary Fund. *International Financial Statistics*. Washington, DC (various issues).

<sup>3</sup> Central Electricity Authority. 2007. *Report on Seventeenth Electric Power Survey of India*. New Delhi.

<sup>4</sup> Central Electricity Authority and Confederation of Indian Industry. 2007. *White Paper on Strategy for 11<sup>th</sup> Plan*. New Delhi.

**Table 2: Energy Supply Position and Peak Power Supply Position in FY2007**

Region/State	Energy Supply Position			Peak Power Supply Position		
	Requirement (GWh)	Availability (GWh)	Shortage (%)	Demand (MW)	Met (MW)	Shortage (%)
Northern	202,125	179,987	11.0	31,516	26,644	15.5
Haryana	26,249	23,132	11.9	4,837	4,201	13.1
Punjab	38,641	34,839	9.8	8,971	6,558	26.9
Rajasthan	33,236	31,715	4.6	5,794	4,946	14.6
Western	232,391	196,117	15.6	36,453	27,463	24.7
Gujarat	62,464	54,083	13.4	11,619	8,110	30.2
Maharashtra	110,005	89,138	19.0	17,455	12,679	27.4
Southern	180,091	175,197	2.7	26,176	24,350	7.0
Eastern	68,198	66,183	3.0	10,491	10,058	4.1
Northeastern	7,782	7,012	9.9	1,477	1,166	21.1
All India	690,587	624,496	9.6	100,715	86,818	13.8

GWh = gigawatt-hour, MW = megawatt.

Source: Central Electricity Authority. 2007. *Monthly Review of Power Sector*. New Delhi (April).

11. The 11th Five-Year Plan (FY2008–FY2012) targets capacity addition at 78,577 MW,<sup>5</sup> with the goal of meeting a longer-term target. The target capacity was expanded to shadow India's 9% economic growth rate using an elasticity factor between economic growth and electricity consumption of 1.0 as projected by the Planning Commission. This is expected to allow India to achieve the national electricity policy of Power for All by 2012 and per capita availability of power to reach more than 1,000 kilowatt-hours (kWh) by FY2012.<sup>6</sup>

12. Over the longer term, significant growth of power demand is expected. Recent Government forecasts are summarized in Table 3.

**Table 3: Long-Term Forecast at Power Station Bus Bars**

Region/State	Energy Requirement (GWh)			Peak Electric Load (MW)		
	FY2012	FY2017	FY2022	FY2012	FY2017	FY2022
Northern	294,841	411,513	556,768	48,137	66,583	89,913
Haryana	38,417	54,305	73,838	6,839	9,375	12,557
Punjab	60,489	82,572	107,342	11,000	14,441	18,352
Rajasthan	48,916	67,767	92,377	8,482	11,404	15,101
Western	294,860	409,805	550,022	47,108	64,349	84,778
Gujarat	85,445	119,083	156,842	14,374	19,670	25,447
Maharashtra	125,661	167,227	219,910	21,954	28,348	35,944
Southern	253,443	380,068	511,659	40,367	60,433	80,485
Eastern	111,802	168,942	258,216	19,088	28,401	42,712
Northeastern	13,329	21,143	36,997	2,537	3,760	6,180
All India	968,659	1,392,066	1,914,508	152,746	218,209	298,253

GWh = gigawatt-hour, MW = megawatt.

Source: Central Electricity Authority. 2007. *Report on Seventeenth Electric Power Survey of India*. New Delhi.

<sup>5</sup> This excludes the target for renewable energy generation capacity. The target capacity addition proposed by the Ministry of New and Renewable Energy for the 11th Five-Year Plan is 15,000 MW including 14,000 MW of grid-interactive renewable power and 1,000 MW of off-grid renewable power.

<sup>6</sup> Electric power consumption per capita in India was 457 kWh in 2004. Source: World Bank. 2007. *World Development Indicators*. Washington, DC.



## 2. Power Sector Reform

13. State electricity boards (SEBs) have not performed well. Plagued by poor metering, low collections, high receivables, and high theft and losses, they have not been able to recover the losses through tariff increases. As in most of ADB's developing member countries, tariffs in India are politically sensitive and held artificially low for political and social reasons. Many states provide subsidized electricity to farmers and disadvantaged households; this results in tariffs that are significantly below the cost of supply. Consequently, the weaker SEBs have exposed power generators to the problem of large accounts receivable.

14. During the early 1990s, the SEB-dominated power industry became a drain on the Indian economy and the Government recognized that changes were needed in the context of its economic reform program. Initially the Government focused on increasing investment in power generation by opening up participation to private power providers and offering to fast-track projects. However, it made little progress as only a handful of projects reached financial close, and the reforms did not address the SEBs' underlying fundamental weaknesses.

15. To address state and national difficulties, the Government initiated a reform program in the mid-1990s based on recommendations of a high-profile government commission on power sector reform. The program included (i) reform of state organizations, including commercialization and unbundling of generation, transmission, and distribution; (ii) regional and national reforms to strengthen the role of central public sector utilities; (iii) large-scale involvement of the private sector in generation and distribution, through transparent and competitive selection processes; (iv) creation of a central regulator to regulate bulk tariffs and state regulators for small generation and end-user tariffs, thus depoliticizing electricity tariff setting; and (v) a progressive phase-out of subsidies to agricultural consumers and increases in tariffs to more accurately reflect the cost of supply. While the suggested reforms emanated from the central Government, states were given flexibility to choose their own reform path; this produced very mixed results.<sup>7</sup> The lack of competitive standards in the power sector, an emphasis on privatization for its own sake rather than for effecting improvements in quality of supply and consumer satisfaction, the seeking of higher returns on investment without corresponding improvements in supply, and improper sequencing undermined the gains made in nonpolitical and transparent tariff setting and private sector participation in the sector. The well-publicized reform failures in certain states stalled any progress or political will in the others.

16. A much stronger central government role was required to accelerate the reform process. In 1998, the Government enacted the Electricity Regulatory Commission Act, which led to the establishment of the Central Electricity Regulatory Commission, an independent central regulator, and state equivalents (state electricity regulatory commissions). In 2003, the more comprehensive Electricity Act was promulgated, which consolidated existing legislation for the power sector under a single act and includes provisions to improve competition and efficient use of resources. It includes initiatives to (i) promote unbundling of the power sector; (ii) delicense thermal power generation; (iii) liberalize the captive power policy; (iv) open access to distribution networks allowing direct sale of power to bulk consumers; (v) open access to transmission lines to facilitate power trading and improve performance of the transmission system; (vi) require mandatory metering and stringent provisions against power theft to remove the causes of the SEB problems; (vii) upgrade the central and state regulatory infrastructure; and (viii) improve

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<sup>7</sup> The failures of the unbundling and privatization-driven efforts in Orissa were well publicized. However, the experience in Gujarat and Madhya Pradesh, which focused on restructuring through corporatization, was more positive. The reform efforts in the national capital region of Delhi provided some positive results by introducing private distribution licensees.

coordination between the central and state governments in planning and developing the power sector. The Government formulated a national tariff policy and national electricity policy in consultation with the Central Electricity Authority, Central Electricity Regulatory Commission, and the state governments. These recent legislative changes, new financial penalties to enforce grid discipline by the SEBs, and the settlement of past dues curtailed the financial problems of the SEBs, which had infected the sector as a whole.

## **C. Asian Development Bank Operations**

### **1. Country Strategy**

17. Mainstreaming poverty reduction is the central organizing theme of ADB's country strategy and program (CSP) for India.<sup>8</sup> The CSP draws on the three pillars of ADB's poverty reduction strategy: pro-poor growth, social development, and good governance. The strategy aims to support the Government's high-growth agenda by helping with fiscal consolidation, infrastructure development, and private sector development. Political and economic developments since finalizing the CSP indicate that the strategy remains valid, especially the core strategy of poverty reduction through infrastructure-led growth supported by social development and good governance. The 2006–2008 CSP<sup>9</sup> update suggests that the objective of accelerating India's annual gross domestic product growth to 8% depends on upgrading infrastructure facilities and improving the efficiency of such public services. ADB's proposed assistance program reflects this priority, with infrastructure accounting for nearly 77% of the 3-year pipeline (not including private sector and nonsovereign operations).

### **2. Sector Strategies**

18. The operating priorities of ADB's energy sector strategy<sup>10</sup> are (i) reduce poverty by, among others, creating energy infrastructure for sustainable economic growth; (ii) promote private sector involvement by restructuring the energy sector and creating an enabling environment for private investors; (iii) address regional and global environmental impacts; and (iv) promote regional cooperation. In particular, the strategy strongly encourages ADB interventions to increase private sector participation in the energy sector to take advantage of the higher operating efficiencies that private operators can achieve and to meet the large capital requirements. The strategy promotes a shift to cleaner fuels and processes.

19. ADB's assistance for the power sector, as outlined in the 2006–2008 CSP update, has six main priorities: (i) reform the sector; (ii) promote higher efficiency and low-carbon power sources that are locally available; (iii) expand and optimize transmission and distribution systems; (iv) support institutional strengthening to implement reforms required by the Electricity Act of 2003, including development of more flexible power delivery and trading systems; (v) promote private sector participation; and (vi) encourage energy conservation, and ensure environmental and social sustainability. To support the Government's Power for All by 2012 initiative, ADB's power sector strategy for create synergy with the 11th Five-Year Plan.

<sup>8</sup> ADB. 2003. *Country Strategy and Program (2003–2006): India*. Manila; and ADB. 2005. *Country Strategy and Program Update (2006–2008): India*. Manila.

<sup>9</sup> ADB. 2005. *Country Strategy and Program Update (2006–2008): India*. Manila.

<sup>10</sup> ADB. 2000. *Energy 2000: Review of the Energy Policy of the Asian Development Bank*. Manila.

### 3. Consistency with Asian Development Bank Operations

20. The proposed assistance will benefit from past ADB assistance to the Indian power sector. ADB successfully implemented a power sector reform program in the state of Gujarat; the Gujarat power sector is one of the few state power sectors that recently recorded a surplus. The Gujarat Power Sector Development Program<sup>11</sup> facilitated restructuring of the power sector, reduced the need for transfers from the state government budget, allowed expansion of power supplies using private generating capacity, and optimized the end use of electricity. The ADB assistance comprised a program loan of \$150 million, which emphasized the creation of structures for good governance and regulation of the sector, especially the independence of the regulator from the Government; and a project loan of \$200 million, which supported four subprojects for transmission lines, substations, and distribution systems to improve evacuation of power from independent power producers, strengthen the power distribution system to improve reliability and reduce systems losses, and conserve electricity and water through conversion of irrigation systems.

## III. THE PROPOSED PROJECT

### A. Project Description

21. The Project is to construct, operate, and maintain a 4,000 MW coal-fired power plant with five units of 800 MW each, incorporating supercritical technology near Tundawanda village, Mundra Taluka in Kutch district, in the state of Gujarat. In addition, CGPL is to make arrangements to bring imported coal to the project site. This includes development of a jetty, unloading and handling of imported coal, and transport to the site. Infrastructure for processing seawater to meet in-plant water requirements, including intake and discharge to the sea, water intake pipeline, and a desalination plant, will need to be built.

### B. Management and Ownership

22. CGPL, established under the Companies Act of 1956, is implementing the Project. CGPL's sponsor, TPC, owns 100% of CGPL shares.

23. CGPL's board of directors has four members: the TPC managing director, two TPC executive directors, and the managing director of the Tata Power Trading Company Limited. The CGPL project director, under the supervision and control of the board of directors, handles day-to-day management of CGPL, supported by a team of senior management with energy and private sector backgrounds.

24. TPC is a part of the Tata Group,<sup>12</sup> comprising 96 companies in seven business sectors: engineering, materials, energy, chemicals, services, consumer products, and information systems and communications. TPC is promoted by Tata Sons Limited, which was established as a trading enterprise by the founder of the Tata Group, Jamsetji Tata, in 1868. Tata Sons Limited is the promoter of all key companies of the Tata Group, and holds the bulk of the shares in these companies. The chair of Tata Sons Limited traditionally has been the chair of the Tata Group. Tata Sons Limited is the owner of the Tata brand name and the Tata trademark, which are registered in India and several other countries. Philanthropic trusts endowed by members of the Tata family hold about 66% of the equity capital of Tata Sons Limited.

<sup>11</sup> ADB. 2000. *Report and Recommendation of the President to the Board of Directors for Proposed Loans and Technical Assistance Grants to India for the Gujarat Power Sector Development Program*. Manila.

<sup>12</sup> Tata Group is an informal name for the group of companies.

25. TPC, the largest private power utility in India, has an installed capacity of more than 2,300 MW and the franchise for power distribution in Mumbai. Established in 1919, TPC took its current form in 2000 through a merger with two other group companies: Tata Hydro-Electric Power Supply Company (established in 1910) and Andhra Valley Power Supply Company (established in 1916). TPC has supplied power to the southern part of Mumbai, India's commercial hub and capital of Maharashtra state, for more than 80 years. TPC owns, operates, and maintains thermal power plants in several Indian states, including Maharashtra, Karnataka, and Jharkhand. It also owns 18% of the country's private sector generating capacity. TPC has a presence in all areas of the power sector: thermal, hydroelectric, wind, solar, transmission, distribution, and power trading. TPC has a track record in managing and executing power projects in India and other countries such as Algeria, Iran, Kuwait, Liberia, Malaysia, Saudi Arabia, and United Arab Emirates.

## **C. Implementation Arrangements**

### **1. Construction**

26. CGPL will construct the Project through various packages. A boiler package and a turbine generator package represent approximately 50% of the total project cost. The boiler package will be procured from Doosan Heavy Industries & Construction Company Limited (Doosan) of the Republic of Korea, and the turbine generator package from Toshiba Corporation (Toshiba) of Japan. Doosan Projects Limited, an Indian incorporated company wholly owned by Doosan, is expected to provide onshore supplies and services. TCE Consulting Engineers Limited (TCE) from India will assist in preparing detailed specifications and provide engineering and design support. Korea Power Engineering Company, Inc., a subsidiary of Korea Electric Power Company Limited, the largest power utility in the Republic of Korea, will review and reinforce TCE's work.

27. Doosan, established in 1962, has become one of the world's major engineering, procurement, and construction contractors; and is one of the few companies in the world with the capability to design and manufacture supercritical boilers. Doosan's business structure is organized by business groups for power generation, desalination plants, nuclear power plants, casting and forging, and construction. Its power generation business group is active in fields related to fossil fuel power generation, which includes boilers, heat recovery steam generators, turbine and generator equipment, and industrial support facilities such as material handling equipment and environmental systems. Doosan has built more than 300 nuclear, thermal, combined cycle, and hydropower plants. It is currently building more than 60 power plants in the People's Republic of China (PRC), India, Republic of Korea, United States, and others. Doosan recently provided 660 MW supercritical boilers to National Thermal Power Corporation of India, and manufactured 800 MW supercritical boilers for Younghung Thermal Power Plant in the Republic of Korea.

28. Toshiba started its business from a telegraph equipment factory in Tokyo in 1875, and is now a leading manufacturer of heavy electrical apparatus with a worldwide sales and service network. It has four major business areas: digital products, electric devices and components, social infrastructure systems, and home appliances and others. Toshiba has delivered approximately 1,700 steam turbine units, 240 hydraulic turbine units, 300 hydraulic generator units, and 32 nuclear reactor units to customers throughout the world. It provides a vast range of turbine products, from several megawatt back-pressure turbines to over 1,000 MW supercritical

turbines. In February 1997, Toshiba reached the rare milestone of having produced turbine products with aggregate generating capacity of more than 100 gigawatts.

29. Project construction will be managed with particular attention to coordination among the various contractors. An advisory council, to be formed by industry experts, will assist with CGPL management, with support of Korea Power Engineering Company, Inc. The entire scope will be handled by three project managers: (i) common facilities and unit 1, (ii) units 2 and 3, and (iii) units 4 and 5. Each project manager will cover engineering, procurement, and construction with support from, and coordination among, TCE, TPC's engineering and planning division, and the contractors.

30. The Project is expected to be completed unit by unit. Commissioning of the first unit is expected by March 2011 and of the remaining units at regular 4-month intervals. The Project is expected to achieve full commercial operation by July 2012.

## **2. Coal Supply**

31. Up to 11.7 million tons (t) of coal will be required per annum. The Government designed the Project with imported coal, and CGPL will source coal through long-term fuel supply agreements with exporters of coal in Indonesia, South Africa, Mozambique, and/or Australia, taking advantage of TPC's global coal procurement network. Despite the existing large domestic coal reserve, availability of domestic coal is not able to keep pace with the growing demand for coal for thermal generation. Under this circumstance, it is more economical to use imported coal for power plants on coastal locations, especially for those far away from the domestic coal mines. The main domestic coal reserves are in the eastern region of the country, and coal transport capacity is constrained. From the environmental perspective, the Government requires beneficiation before transporting high ash content coal over long distances.<sup>13</sup> Hence, the Project, being set up on a coastal location, has been designated to use imported coal. The design of boilers would be dependent on the type of coal, and once designed for imported coal it is difficult to switch to domestic coal which has high ash content and lower calorific value. In terms of the choice of imported coal, it is important to procure quality coal with higher calorific value, lower ash, and lower sulfur. Lower ash content improves the overall plant availability due to lower maintenance requirements. Also, with higher calorific value, the Project would require less quantity of coal to generate the same level of output. To achieve higher environmental standards, procurement of imported coal with lower ash and sulfur contents is essential.

## **3. Coal Transport**

32. CGPL will enter into a long-term time charter arrangement with bulk carriers for coal transport utilizing TPC's global fuel procurement network and capacity. TPC plans to set up a subsidiary to own vessels, and CGPL will enter into a time charter agreement with TPC's coal shipping subsidiary and/or directly with other shipping companies.

## **4. Port Services**

33. Coal will be unloaded at Mundra Port. The concessionaire for the port, Mundra Port and Special Economic Zone Limited (MPSEZL), will provide port facilities as per the port service agreement between CGPL and MPSEZL. MPSEZL will make the terminal available and operate it to enable the minimum guaranteed tonnage to be unloaded and handled at the terminal.

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<sup>13</sup>Power plants located beyond 1,000 km from pit head cannot use coal containing more than 34% ash.

MPSEZL will ensure storage of at least 0.6 million t in the coal stack yard if required by CGPL. It will give berthing priority to CGPL's coal transport vessels, and make all arrangements for berthing of coal transport vessels. CGPL can also use the facilities at Mundra Port for unloading plant and equipment required for project construction.

34. Transport of the coal from Mundra Port to the project site will be through a dedicated coal transport system. MPSEZL has agreed to provide the right-of-way for the corridor for the system, road access, and the seawater intake and discharge channel for the Project.

## 5. Power Offtake

35. Power generated by the Project will be sold to distribution licensees of the states of Gujarat (excluding Ahmedabad and Surat Electricity Company), Maharashtra, Punjab, Haryana, and Rajasthan (Table 4). The seven offtakers that have signed power purchase agreements are Gujarat Urja Vikas Nigam Limited, Maharashtra State Electricity Distribution Company Limited, Punjab State Electricity Board (PSEB), Haryana Power Generation Corporation Limited, and the three distribution companies from Rajasthan, Ajmer Vidyut Vitaran Nigam Limited, Jaipur Vidyut Vitaran Nigam Limited, and Jodhpur Vidyut Vitaran Nigam Limited.

**Table 4: Allocation of Contracted Capacity for the Project**

<b>State</b>	<b>Contracted Capacity (MW)</b>	<b>Percentage (%)</b>
Gujarat	1,805	47.5
Maharashtra	760	20.0
Punjab	475	12.5
Haryana	380	10.0
Rajasthan	380	10.0

MW = megawatt.

Source: Coastal Gujarat Power Limited.

36. The performance of the state power subsector is determined by a number of factors, including (i) share of agricultural consumers in total electricity sales (as they receive subsidized electricity), (ii) transmission and distribution losses, (iii) aggregate technical and commercial (ATC) losses in distribution, (iv) gap between average cost of supply and average revenue, and (v) collection efficiency. Table 5 provides a summary of recent changes in the composition of consumers and transmission and distribution losses for the five states. In most states, transmission and distribution losses have declined but the change in customer profile is insignificant. The gap in the average cost of supply and revenues is greatest for agriculture; therefore, the sales to this sector are an important determinant of required subsidy support.

**Table 5: Electricity Consumer Profile and Transmission and Distribution Losses**  
(%)

Consumer Category	Gujarat FY		Maharashtra FY		Punjab FY		Haryana FY		Rajasthan FY	
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
Domestic	13.2	15.5	24.0	23.2	22.9	22.5	20.2	20.5	21.3	21.7
Commercial	4.8	5.9	9.5	9.7	7.4	7.4	5.1	5.6	9.3	8.6
Agriculture	37.8	31.3	20.4	18.8	27.8	31.6	42.7	40.9	29.0	31.4
Industry	40.3	42.9	38.5	41.0	38.4	34.9	25.1	25.6	32.1	31.0
Others	3.9	4.4	7.5	7.2	3.5	3.6	7.0	7.3	8.4	7.3
Transmission and Distribution Losses	24.5	28.4	34.1	30.4	26.4	24.6	34.7	31.5	44.6	38.5

FY = fiscal year.

Source: Central Electricity Authority. 2007. *Report on Seventeenth Electric Power Survey of India*. New Delhi.

37. **Gujarat.** The Gujarat Electricity Industry (Reorganization and Regulation) Act of 2003 restructured the Gujarat Electricity Board into seven entities with functional responsibility for trading, generation, transmission, and distribution. Gujarat Urja Vikas Nigam Limited owns 100% of the shares of the other six companies; and is responsible for bulk purchase and sale of electricity, supervision, coordination, and facilitation among the six subsidiary companies. Distribution licensees in Gujarat have a positive cash flow (including subsidy), and the deficit between average revenue and average cost is declining. However, the cross-subsidies have not changed. The substantial improvement in financial performance is mainly due to near 100% collection efficiency, reduced cost of supply because of operating efficiencies, and savings in interest costs because of debt restructuring.

38. **Maharashtra.** The Maharashtra State Electricity Board has been unbundled into four companies. In FY2006, Maharashtra State Electricity Distribution Company Limited had a negative cash flow (including subsidy) despite substantial profit in FY2004 and FY2005. The cross-subsidy has been steadily declining, indicating that a higher proportion of the cost of supply is being recovered from consumers. Collection efficiency is good, with more than 100% collection efficiency in FY2005, indicating that distribution licensees are recovering current dues and a portion of past dues. Generally, financial performance has improved.

39. **Punjab.** Punjab state continues to follow an integrated model whereby all three functions of generation, transmission, and distribution are handled by PSEB. PSEB has reduced ATC losses considerably and achieved almost 100% cash collection. Its cash flow (including subsidy) has improved significantly with substantial profit in FY2004 and FY2005. During the same period, PSEB achieved a surplus between average revenue (including subsidy) and average cost. Thus PSEB performance is characterized by cash profit, dependence on subsidy from the state government because of the mid-level cross-subsidy, high collection efficiency, and relatively low ATC losses.

40. **Haryana.** The Haryana State Electricity Board was one of the first SEBs to be unbundled along functional lines into a generation company, a transmission company, and two distribution companies. Subsequently, the trading function was separated from the transmission function. The generation company, Haryana Power Generation Company Limited, has been handling the trading and bulk purchase functions in the state since June 2005. On 14 August

1998, the transmission and distribution businesses were transferred to Haryana Vidyut Prasaran Nigam Limited. The Haryana Electricity Regulatory Commission regulates transmission and distribution. Power is wheeled through the entire network by Haryana Vidyut Prasaran Nigam Limited on the payment of transmission charges approved by the Haryana Electricity Regulatory Commission. Financial performance of the distribution licensees in Haryana are characterized by (i) not very sound cash flow positions, (ii) high dependence on subsidies, (iii) low collection efficiencies, and (iv) high ATC losses. Dependence on the state government subsidy is primarily a result of Haryana having a largely agrarian economy with state-subsidized power provided to agricultural consumers. As a result, the negative gap between average revenue (without subsidy) and average cost of supply has steadily increased.

41. **Rajasthan.** The Rajasthan Power Sector Reforms Act of 1999 was enacted with effect from 1 June 2000, and accordingly the SEB was unbundled into five functional entities: one generation company, one transmission company, and three distribution companies: Jaipur Vidyut Vitran Nigam Limited, Ajmer Vidyut Vitran Nigam Limited, and Jodhpur Vidyut Vitran Nigam Limited. These distribution companies operate and maintain the electricity system below 66 kilovolts in their respective areas. As per the mandate of the 2003 Electricity Act, power purchase agreements (PPAs) and the procurement, bulk supply, and trading of power were transferred to the three distribution companies in February 2004. Financial performance of the distribution licensees in Rajasthan is characterized by negative cash flows, high dependence on subsidies, high collection efficiencies, high ATC losses, and a constant cross-subsidy. Dependence on the state government subsidy is primarily because the state government provides subsidies to various categories of consumers—mainly domestic and agricultural.

42. The financial profile of the Project's offtakers is thus diverse (Table 6). However, none have defaulted or delayed payment for power purchased, except for disputed amounts.

**Table 6: Characteristics of the Project's Offtakers**

Item	Gujarat	Maharashtra	Punjab	Haryana	Rajasthan
Offtake from the Project	47.5%	20.0%	12.5%	10.0%	10.0%
Cash flow (with subsidy)	Positive	Negative	Positive	Negative	Negative
Collection efficiency	Very High Near 100%	High 93%	High 98%	Low 85%	High 97%
Dependence on subsidy (Subsidy booked/Total income)	Medium 12%	Low 0%	Medium 17%	High 24%	High 20%
ATC losses	Medium 30%	Medium 36%	Low 26%	High 41%	High 46%

ATC = aggregate technical and commercial.

Sources: Coastal Gujarat Power Limited; Power Finance Corporation. 2007. *Report on the Performance of the State Power Utilities for the Years 2003-04 to 2005-06*. New Delhi.

43. CGPL has entered into a 25-year PPA with the offtakers. Tariffs will be payable on a take-or-pay basis, in accordance with the tariff bid submitted by TPC.

44. The tariff will comprise a capacity charge and an energy charge. The full capacity charge will be paid based on the contracted capacity at normative availability of 85%. An incentive will be provided for availability beyond 85%, but a penalty will be charged if availability is lower than 85%. The capacity charge and energy charge will have components subject to escalation factors. Application of the escalation factors are summarized in Table 7.



**Table 7: Applicability of Escalation Factor**

Item	Adjustment for	
	Inflation	FOREX
Capacity Charge		
Component with escalation factor	Yes	No
Component with no escalation factor	No	No
Energy Charge		
Component with escalation factor		
Fuel energy charge	Yes	Yes
Transportation energy charge	Yes	Yes
Fuel-handling energy charge	Yes	No
Component with no escalation factor		
Fuel energy charge	No	Yes
Transportation energy charge	No	Yes
Fuel-handling energy charge	No	No

FOREX = foreign exchange fluctuation (Rs/\$).

Source: Coastal Gujarat Power Limited.

45. The payment by each offtaker will be supported by an unconditional, irrevocable, and revolving letter of credit; and a default escrow account. If an offtaker defaults, CGPL has the option first to sell the power to the other offtakers and second to third parties. The liability of the defaulting offtaker to make capacity charge payments to CGPL will remain unaffected for up to 3 years of capacity charges (to the extent not paid by another offtaker). If the total offtake is less than the minimum guaranteed offtake of 65%, and CGPL has paid the penalty for not purchasing the minimum quantity of fuel, CGPL is entitled to receive compensation for such penalty from the offtakers that didn't meet the guaranteed minimum offtake.

46. The offtakers are responsible for procuring the transmission facilities beyond the Project's 400 kilovolt switchyard bus bar under the PPA. Power from the Project will be evacuated by a dedicated transmission line to connect the Project with the grid system operated by Power Grid Corporation of India Limited.

## **6. Operation and Maintenance**

47. CGPL's in-house engineers will be responsible for project operation and maintenance with support from TPC. The key personnel of the operation and maintenance team will be deputed from TPC and its affiliates, and have expertise in thermal power engineering. Other operations personnel, with strong expertise and experience, will be recruited from outside.

## **D. Environmental Aspects and Social Dimensions**

48. ADB classifies the Project as environment category A, involuntary resettlement category B, and indigenous peoples category C. The assessment of the Project's environmental and social impacts was conducted through the following six separate but related studies: (i) rapid environmental impact assessment (EIA) conducted by TCE from March to May 2006, (ii) comprehensive EIA conducted by TCE from March 2006 to August 2007, (iii) socioeconomic assessment report conducted by TCE from March to August 2006, (iv) rapid marine impact assessment conducted by the National Institute of Oceanography from January 2006 to April 2007 and supplementary information provided in October 2007, (v) supplementary investigation

of the cumulative impacts on ambient air quality of the Project and the neighboring 660 MW power plant prepared by TPC from late October to early November 2007 in consultation with Vishudda Envirotech of India, and (vi) baseline social impact assessment conducted by Saline Area Vitalization Enterprise Limited of India in November 2007.

49. During the environmental and social assessment, the Government initiated a number of meetings with the local community in 2005. A public hearing on the findings of the rapid EIA was held on 19 September 2006. The hearing was conducted by the district collector in the presence of officials from Gujarat Pollution Control Board and CGPL, and representatives of affected communities. After CGPL was transferred to TPC in April 2007, further consultations were conducted in Bhuj and project-affected villages. These meetings were attended by affected people and village *sarpanches* (village council heads), public representatives in district *panchayat* (village council), and local leaders. The Project received environmental clearance from the Ministry of Environment and Forests on 25 April 2007 based on the rapid EIA. All other clearances and permits required for various operations from the national and state authorities have been obtained, except one from the Ministry of Environment and Forests, which is expected soon to reclassify the forestland in the site.

50. ADB reviewed the six studies related to environmental and social impacts of the Project and an environmental and social safeguard due diligence mission was fielded during 29 October–1 November 2007. The summary EIA was circulated to the Board and posted on the ADB website on 4 December 2007. The summary poverty reduction and social strategy is presented in Appendix 2.

## 1. Environment

51. The EIA prepared for the Project meets the requirements of ADB's *Environmental Assessment Guidelines* (2003). It describes the environmental baseline conditions in the project area, and records the results of a comprehensive examination of the potential impacts of the Project on the surrounding natural and socioeconomic environment. The project area is located on marginal and barren land that is not ecologically or culturally sensitive. Important issues considered in the EIA include gaseous emissions and the discharge of a large volume of spent cooling water. The EIA confirms that (i) the emissions will meet national standards in India as well as the World Bank's emission guidelines for new power plants, and (ii) the ambient air quality will not exceed these standards even if emissions from all planned future power plants in the vicinity are considered. The EIA also confirms that the discharge of spent cooling water will not have significant impacts on the marine environment, or cause coastal erosion and deposition. Public stakeholder consultations were held and views expressed by the project-affected people are incorporated in the final EIA.

52. A core part of the EIA is an environmental management plan, including an environmental monitoring and evaluation program covering both emissions and ambient environmental quality parameters. The plan is to effectively address potential environmental issues during project construction and operation. Appropriate clauses will be included in construction contracts to require contractors to implement the environmental management plan to minimize transient environmental disturbances. The contractors will also be required to provide appropriate training to their workers in environment, safety, and health aspects of construction; and to provide protective measures for workers to minimize safety risks.

53. The Project will establish an organization to manage environmental, occupational health, and safety aspects during construction and commercial operation of the power plant. All

personnel will receive training in occupational health and safety practices. Safety drills will be carried out periodically. Safety manuals or handbooks will be prepared as required.

## 2. Social Safeguards

54. **Involuntary Resettlement.** The Project originally required acquisition of 1,254 hectares (ha) of land, including approximately 241 ha for ash disposal, 182 ha for the colony, and 100 ha for right-of-way for the coal transport system from Mundra Port. Project land is located within the village boundaries of Tunda and Mota Kandagara villages in Mundra Taluka (town) and Nana Bhadiya village in Mandavi Taluka. The location and impacts on land use were major considerations for selecting the site in Mundra Taluka. After careful review, the land for acquisition was reduced to 1,052 ha and only a 202 ha right-of-way is required for the coal transport system and inlet and discharge channels. Potential involuntary resettlement impacts were minimized by selecting a site that is uninhabited, of low and unreliable productivity, and requires minimal private land acquisition. The Project is categorized as B from the perspective of involuntary resettlement since the following impacts are expected: (i) loss of agricultural land owned by 76 families, (ii) loss of temporary structures (wells, cattle sheds), (iii) restricted access to produce such as fodder from forest and grazing land, (iv) loss of access to some of the public lands used for community activities (traditional mela [fair], cricket grounds) and (v) temporary loss of access to the coastline. CGPL has acquired the land and paid compensation at replacement rates that are well above recorded transactions. Measures to mitigate the socioeconomic impacts arising from land acquisition and restricted access to common property resources have been disclosed to the affected people. The summary resettlement plan is attached as Appendix 3.

55. Power Grid Corporation of India Limited will construct the transmission lines and MPSEZL will develop the coal-handling facilities in Mundra Port. Thus far, no land has been acquired for the transmission lines. When acquiring land Power Grid Corporation of India will follow its corporate policy on resettlement, which ADB has accepted as consistent with ADB's involuntary resettlement policy requirements. The coal shipment and unloading facilities will be constructed within Mundra Special Economic Zone; hence, no additional land acquisition is required. No issues with previous land acquisition for the economic zone are outstanding.

56. **Indigenous Peoples.** About 3% of the total population of 5,058 in two of three directly affected villages (Nana Bhadia and Kandagra Mota) belongs to scheduled tribes. No household or group belonging to scheduled tribes will lose housing, strip of land, or other fixed assets. The economic activities of villagers belonging to scheduled tribes may be affected by acquisition of Government-owned wasteland and grazing lands, but alternative *gauchar* (grazing) land will be provided. The scheduled tribes live together with the mainstream population, use the same common property resources, and engage in the same social activities; the Project will not affect their traditional practices. No impacts other than those identified in the short resettlement plan are expected; therefore, the Project is categorized as C from the perspective of ADB's *Policy on Indigenous Peoples* (1998).

## E. Development Impact

### 1. Impact, Outcome, and Output

57. The Project aims to promote sustainable economic development in India by increasing the supply of cleaner and low-cost electricity. The Project will build and operate the largest power plant based on state-of-the-art supercritical boiler technology. This will be one of the first

instances of the use of this technology in India. The Project will provide 4,000 MW of new electricity capacity that will improve productivity and the quality of life in the five offtaking states. The Project will help India increase the shift of its electricity supply to a cleaner generating technology thereby reducing emissions of greenhouse gases. The Project's design and monitoring framework is presented in Appendix 1.

## **2. Development Effectiveness**

58. The development effectiveness of the Project will be assessed in terms of private sector development, business success, and economic sustainability as per the guidelines for implementing the good practice standards for evaluating private sector investment operations, prepared by the Evaluation Cooperation Group of multilateral development banks. In terms of private sector development impact at the company level, the Project will expand the company's capacity to build, operate, and manage very large projects. For the CGPL and beyond, the positive impacts of the Project include development of workforce skills, and introduction of a new efficient technology, while demonstrating its viability for more widespread adoption. During the 4.5 years of construction, CGPL will generate employment for more than 5,000 workers, and during operations will employ 720 workers directly and create livelihoods for many others indirectly. The Project is expected to yield a private sector development impact well beyond CGPL. It is the first ultra mega power project and will help demonstrate the feasibility of joint public-private development of such projects. The Project generates efficient and low-cost power, setting a competitive benchmark for the industry. It also demonstrates the execution of international collaboration on commercial financing and technology transfer to the private sector. The Project is financially sustainable; it meets local environment requirements, and mitigates the emission of greenhouse gases thus yielding global environmental benefits. The Project's development effectiveness framework is provided in Appendix 1.

## **F. Economic Evaluation**

59. The economic analysis for the Project was carried out in accordance with ADB's *Guidelines for the Economic Analysis of Projects* (1997). The major economic benefit is the electricity generated. Given the shortages in meeting energy and peak demand in the five offtaking states of Gujarat, Maharashtra, Haryana, Punjab, and Rajasthan, all the electricity generated by the Project will meet unmet demand; it will not substitute power from any existing generation capacity. The entire project output is considered incremental. All offtaking states face peak and energy shortages that are projected to persist. A greater and more reliable supply of power is an important input for economic growth and development. Other project benefits include (i) adoption of more efficient power-generating technology that reduces coal burned and related emissions of greenhouse gases; (ii) generation of direct and indirect employment opportunities; and (iii) induction of supercritical technology to India, as this will be one of the first supercritical plants in the country. The incremental electricity produced is valued at the average cost paid by each state for power purchased. This is taken to reflect the willingness to pay for the incremental supply of electricity to that state. The Project will likely generate certified emission reductions; their value is incorporated as they represent the economic benefit of lower greenhouse gas emissions and positive external effects on the global environment.

60. The base case economic internal rate of return (EIRR) is estimated at 33.2%. The sensitivity of the EIRR was tested under five adverse scenarios. Under all scenarios the EIRR is well above the social discount rate of 12%. The EIRR is most sensitive to a decline in electricity sales but is still well above the social discount rate. The results of the economic analysis indicate that the Project is economically viable.

#### IV. THE PROPOSED ASSISTANCE

##### A. Loan

61. The proposed ADB loan of up to \$450,000,000 (denominated in Indian rupees and/or dollars) will be provided from ADB's ordinary capital resources without government guarantee, of which up to \$200,000,000 is syndicated to KEXIM through a risk participation agreement, thereby reducing ADB's net exposure to CGPL up to \$250,000,000.

62. ADB will enter into a risk participation agreement with KEXIM, under which KEXIM will agree to pay to ADB any unpaid amount due by CGPL on an event of default under the \$200 million tranche. ADB therefore has no credit exposure to CGPL for this tranche, but instead will have credit exposure to KEXIM with respect to its obligations under the risk participation agreement.

##### B. Justification

63. The Project merits ADB support for the following reasons:

- (i) The Project is consistent with the Government's power sector strategy, and will complement ADB's efforts in assisting physical infrastructure development for sustainable economic growth in India. The Government is trying to fully meet power demand by 2012 and plans to increase the installed capacity significantly during the 11th Five-Year Plan period. The Project will contribute significantly to the reducing power shortages in the northern and the western regions of India.
- (ii) The Project is consistent with ADB's CSP for India, which emphasizes infrastructure development and private sector participation. In particular, the Project is built upon ADB assistance to the power sector reform program in the state of Gujarat and dovetails with various efforts by the public sector operations for India's power sector reform including dialogue with the Government.
- (iii) The Project is consistent with ADB's energy sector strategy, with priorities including promotion of higher efficiency energy sources. Introduction of supercritical technology that improves thermal efficiency and reduces emissions is in line with the strategy.
- (iv) The Project would be the first UMPP to be implemented, and its success will be a showcase for large-scale power projects proposed for the country. In particular, UMPPs are being designed and implemented under public-private partnership structures, where the Government assumes key roles in developing the projects before they are transferred to private sector sponsors. The Project is expected to be another successful model case for public-private partnerships following on from ADB's work in Bangladesh.
- (v) The proposed ADB loan supports installation of supercritical technology and helps improve India's environmental standards by reducing greenhouse gas emissions. The use of supercritical technology helps achieve an overall higher conversion efficiency of 44% compared with prevailing efficiency of 34%–36%. This translates into annual coal savings of about 2.6 million t. The Project is

expected to reduce greenhouse gas emissions by approximately 28.3 million t of carbon dioxide over its 10-year crediting period under the Clean Development Mechanism of the United Nations Framework Convention on Climate Change. The Project could also benefit from ADB's carbon market initiative.

- (vi) Consistent with ADB's mandate to mobilize financing from other sources, the proposed loan will catalyze financing from KEXIM through a risk participation arrangement with ADB. The Project will be the first to be financed by KEXIM on a project finance basis in the Indian power sector. KEXIM's principle reason for entering into the proposed risk participation structure with ADB is the risk mitigation from ADB that this structure provides, and without the proposed risk participation arrangement with ADB, KEXIM may reconsider its participation in the Project. The proposed structure is critical to catalyze KEXIM's competitive financing for the Project.
- (vii) If relevant approvals for ADB's rupee financing can be obtained, ADB will provide the proposed loan in rupees with a fixed interest rate, thereby mitigating the risk of currency mismatch between borrowings and revenue, in addition to mitigating the risk of interest rate increases. This will improve the certainty of the Project's cash flow projections. Obtaining funding with these features from other sources would be difficult in the current market. In addition, a risk participation arrangement will catalyze the risk-taking capacity of another financier who otherwise would not have the capacity to provide rupee financing to the Project.

### **C. Anticorruption and Combating Money Laundering and the Financing of Terrorism**

64. ADB's *Anticorruption Policy* (1998, as amended to date) and *Combating Money Laundering and the Financing of Terrorism Policy* (2003) were explained to CGPL. Consistent with its commitment to good governance, accountability, and transparency, ADB will require CGPL to 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 CGPL will allow ADB to investigate any violation or potential violation of these undertakings.

## **V. ASSURANCES**

65. Consistent with the Agreement Establishing the Asian Development Bank, the Government of India will be requested to confirm that it has no objection to ADB's proposed loan to the Project. No funding will be disbursed until ADB receives such confirmation. ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed financing by ADB's Board of Directors.

## **VI. RECOMMENDATION**

66. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan of up to \$450,000,000 (to be denominated in Indian rupees and/or dollars) to Coastal Gujarat Power Limited for Mundra Ultra Mega Power Project, to be made available

through (i) a tranche of up to \$250,000,000 funded by ADB; and (ii) a tranche of up to \$200,000,000 funded by ADB and syndicated to the Export-Import Bank of Korea through a risk participation agreement, from ADB's ordinary capital resources on such other terms and conditions as are substantially in accordance with those set forth in this report, and as may be subsequently reported to the Board.

10 March 2008

Liqun Jin  
Vice President

**DESIGN AND MONITORING FRAMEWORK  
AND DEVELOPMENT EFFECTIVENESS FRAMEWORK**

**Table A1.1: Design and Monitoring Framework**

<b>Design Summary</b>	<b>Performance Targets/Indicator</b>	<b>Data Sources/Reporting Mechanisms</b>	<b>Assumptions and Risks</b>
<p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Promoting economic growth and development and contributing to India's Power for All by 2012 goal through the enhanced supply of efficient, reliable, and clean power</li> </ul>	<ul style="list-style-type: none"> <li>Peak shortages and energy outages reduced by 50% by 2012 and 75% by 2017</li> <li>At least 5 ultra mega power plants based on supercritical technology in operation by 2015</li> </ul>	<ul style="list-style-type: none"> <li>National electricity statistics</li> <li>National macroeconomic data</li> <li>Reports by the central and states' power subsector regulators</li> </ul>	<p><b>Assumption:</b></p> <ul style="list-style-type: none"> <li>Continued macroeconomic and political stability</li> <li>Continued implementation of power subsector reforms</li> </ul>
<p><b>Outcome</b></p> <ul style="list-style-type: none"> <li>Operating efficiency in coal-based generation increased</li> <li>Induction of clean coal technology in India</li> <li>Supply of competitively priced electricity leading to development of an efficient electricity market</li> <li>Mitigation of greenhouse gas emissions</li> </ul>	<ul style="list-style-type: none"> <li>Project achieves gross efficiency of 44% compared with baseline of 34%–36%</li> <li>Project demonstrates viability of supercritical technology operating at over 90% availability</li> <li>Peak and energy shortages reduced by 50% in five states by 2013</li> <li>Power requirements under the power purchase agreements met</li> <li>Project generates about 28 million tons of carbon dioxide savings over 10 years of operation</li> </ul>	<ul style="list-style-type: none"> <li>CGPL's operating reports</li> <li>Financial records of the procurers</li> <li>National and state electricity statistics</li> <li>Registration of the Project by the CDM executive board</li> </ul>	<p><b>Assumption:</b></p> <ul style="list-style-type: none"> <li>Timely completion of the transmission line</li> <li>Financial position of the offtakers remains stable and improves with implementation of reforms</li> <li>Revenue from CDM post-2012 depends on the agreement of a post-Kyoto protocol for climate change</li> </ul>
<p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Increased electricity generation capacity</li> <li>Use of more efficient coal technologies</li> </ul>	<ul style="list-style-type: none"> <li>Five units of 800 MW each commissioned and all units operating by July 2012</li> <li>First coal plant based on supercritical technology operating in India</li> </ul>	<ul style="list-style-type: none"> <li>Project company's operating reports</li> </ul>	<p><b>Assumption:</b></p> <ul style="list-style-type: none"> <li>No delay in the procurement and supply of boilers and turbines; engineering, procurement, and construction; and civil works</li> <li>Finances are raised</li> </ul>



Design Summary	Performance Targets/Indicator	Data Sources/Reporting Mechanisms	Assumptions and Risks
			<ul style="list-style-type: none"> <li>• Mitigation measures for adverse environmental impacts are in place</li> </ul> <p><b>Risk:</b></p> <ul style="list-style-type: none"> <li>• Project delay may result without adequate construction management given that the Project has multiple contracts</li> </ul>
<p><b>Activities with Milestones</b></p> <ol style="list-style-type: none"> <li>1. Notice to proceed issued on 1 September 2007</li> <li>2. Environmental and social requirements complied with prior to construction on site</li> <li>3. Completion of construction and COD for unit 1 (800 MW): 1 March 2011</li> <li>4. Completion of construction and COD for unit 2 (800 MW): 1 July 2011</li> <li>5. Completion of construction and COD for unit 3 (800 MW): 1 November 2011</li> <li>6. Completion of construction and COD for unit 4 (800 MW): 1 March 2012</li> <li>7. Completion of construction and COD for unit 5 (800 MW): 1 July 2012</li> </ol>			<p><b>Inputs</b></p> <p><b>Equity</b> TPC: \$1.057 billion</p> <p><b>Debt</b> Asian Development Bank:</p> <ul style="list-style-type: none"> <li>(i) Direct exposure: \$250 million</li> <li>(ii) KEXIM risk participation: \$200 million</li> </ul> <p>Other sources: \$2.720 billion</p>

ADB = Asian Development Bank, CDM = clean development mechanism, COD = commercial operation date, KEXIM = The Export-Import Bank of Korea, MW = megawatt, TPC = The Tata Power Company Limited.

Table A1.2: Development Effectiveness Framework

Objective	Impact	Performance Targets	Measurement
<b>Private Sector Development</b>	<p><b>Project Company Impact</b></p> <ul style="list-style-type: none"> <li>• Brings technical and operating skills</li> <li>• Implements state-of-the-art technology for power generation</li> <li>• Implements global standards for environment, health, and safety; and possible revenue generation from sale of GHG emissions reduction</li> </ul> <p><b>Beyond Company Impact</b></p> <ul style="list-style-type: none"> <li>• Prepares for more private sector participation and financing</li> <li>• Provides competitive pressure on other players to increase the industry's efficiency</li> <li>• Induces innovation and penetration of improved technologies</li> <li>• Promotes market-based power subsector, which induces private investment</li> <li>• Demonstrates effectiveness of regulatory environment and private sector participation in the economy</li> <li>• Generates employment</li> </ul>	<ul style="list-style-type: none"> <li>• Access to and successful operation of improved technology</li> <li>• Profitable business and better environmental management and mitigation of GHGs</li> </ul> <ul style="list-style-type: none"> <li>• Follow-on privatization of other power plants financed by long-term private sector finance</li> <li>• Competitive tariff</li> <li>• Increased electricity supply to fuel economic growth and raise standards of living</li> <li>• Creation of employment and livelihood opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• The project company's operating, financial, and environmental performance</li> </ul> <ul style="list-style-type: none"> <li>• Increase in percentage of power generating capacity in the private sector</li> <li>• Development and operation of other supercritical power plants in the country</li> <li>• GDP growth and household income growth</li> </ul>
<b>Business Success</b>	<ul style="list-style-type: none"> <li>• Financially profitable</li> <li>• Sustainable operations</li> </ul>	<ul style="list-style-type: none"> <li>• Financial internal rate of return greater than weighted average cost of capital</li> <li>• Timely and self-sustaining debt service</li> </ul>	<ul style="list-style-type: none"> <li>• Financial ratios</li> <li>• Operations reports</li> </ul>
<b>Economic Sustainability</b>	<ul style="list-style-type: none"> <li>• Contributes to economic growth, improvement to the environment, and improvement of living standards through the mitigation of power shortages</li> </ul>	<ul style="list-style-type: none"> <li>• Economic internal rate of return greater than 12%</li> <li>• Increase in per capita electricity consumption</li> <li>• Reduction in GHG emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Economic internal rate of return</li> <li>• Electricity sales</li> </ul>

GDP = gross domestic product, GHG = greenhouse gas.

## SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country/Project Title: India: Mundra Ultra Mega Power Project

Lending/Financing  
Modality:

Direct loan

Department/  
Division:

Private Sector Operations Department  
Infrastructure Finance Division 1

### I. POVERTY ANALYSIS AND STRATEGY

#### A. Linkages to the National Poverty Reduction Strategy and Country Partnership Strategy

1. Based on the country poverty assessment, the country partnership strategy, and the sector analysis, describe how the project would directly or indirectly contribute to poverty reduction and how it is linked to the poverty reduction strategy of the partner country.

Power generated by the Project will be connected to the local grid, which will contribute to the Government's goal of providing affordable, universal electric service by 2012. Increasing power supplies to local grids will bring the benefits of electricity to remote communities, including better health care, sanitation, and education; greater income-earning opportunities; and higher living standards.

#### B. Poverty Analysis

#### Targeting Classification: General Intervention

**Key Issues.** The Project will contribute to poverty reduction by supporting economic development of Gujarat and its neighboring states by providing critically needed power to support economic activities. The Project will generate employment and corporate income tax throughout the project life. Increased economical and efficient baseload generation capacity in the region will enable the Government to achieve its stated policy of Power for All by 2012. A positive, direct impact on local labor is expected during implementation and an indirect impact will be due to the increased income-earning opportunities generated by increased access to electricity.

**Design Features.** The Project is establishing a 4,000 MW Ultra Mega Supercritical Thermal Power Project in Tunda Village, Mundra Taluka, Kutch District, Gujarat State in western India. The project developer will implement livelihood and community development programs as part of their corporate social responsibility initiative.

**C. Poverty Impact Analysis for Policy-Based Lending:** Not applicable.

### II. SOCIAL ANALYSIS AND STRATEGY

#### Findings of Social Analysis

**Key Issues.** Acquisition of public and private land for the Project will affect livelihood patterns of people living in villages close to the project site. In addition to permanent private land losses, access to produce like fodder and fuelwood from common property resources for economic and domestic use will be affected. Activities during the 4–5 years of construction will result in movement of construction materials, equipment, and temporary in-migration of labor force, dust, and noise pollution; and may contribute to pressure on water resources, sanitation, and solid waste management systems. The Project is expected to generate livelihood and employment opportunities during plant construction and operation. The project developer has adopted measures to address community concerns about compensation packages for land acquisition, replacement of grazing land, and apprehension about environmental pollution due to the Project, including redress of grievances.

#### B. Consultation and Participation

1. Provide a summary of the consultation and participation process during the project preparation.

The Government initiated discussions with the local community in 2005; the project developer is continuing this process. The first formal consultation took place in September 2006 as a public hearing on the findings of the environmental impact assessment of the Project. The meeting discussed the Project, its potential environmental and social impacts, land acquisition, mitigation measures, and monitoring programs. All other concerns raised at the meeting were clarified and recorded in minutes. Further public consultations were conducted in villages as part of preparation of the comprehensive environmental impact assessment, land acquisition process, and social impact assessment that form the basis for the livelihood restoration program.

2. What level of consultation and participation (C&P) is envisaged during the project implementation and monitoring?

Information sharing     Consultation     Collaborative decision making     Empowerment

3. Was a C&P plan prepared?  Yes     No

**C. Gender and Development**

1. **Key Issues.** Women landowners will be affected by land acquisition but their rights as legal titleholders are recognized under the law.

2. **Key Actions.** Measures included in the design to promote gender equality and women's empowerment—access to and use of relevant services, resources, assets, or opportunities and participation in decision-making process:

Gender plan     Other actions/measures     No action/measure

Compensation will be paid at rates equivalent to replacement value. Consultation processes will ensure representation of women villagers. If desired by women landowners, assistance in finding suitable replacement land will be provided.

**III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS**

<b>Issue</b>	<b>Significant/Limited/ No Impact</b>	<b>Strategy to Address Issue</b>	<b>Plan or Other Measures Included in Design</b>
<b>Involuntary Resettlement</b>	Private and public land will be used. Loss of land and restricted access to grazing land will have limited economic impacts.	Compensation for land at replacement rates that are well above recorded transaction rates; access to common property resources restored; and income restoration measures elaborated in the short resettlement plan	<input type="checkbox"/> Full Plan <input checked="" type="checkbox"/> Short Plan <input type="checkbox"/> Resettlement Framework <input type="checkbox"/> No Action
<b>Indigenous Peoples</b>	About 3% of the total population in affected villages belongs to scheduled tribes, who live together with the mainstream population, use the same common property resources, and engage in the same social activities; their traditional practices remain unaffected by the Project.	None	<input type="checkbox"/> Plan <input type="checkbox"/> Other Action <input type="checkbox"/> Indigenous Peoples Framework <input checked="" type="checkbox"/> No Action
<b>Labor</b> <input checked="" type="checkbox"/> Employment opportunities <input type="checkbox"/> Labor retrenchment <input type="checkbox"/> Core labor standards	Plant construction and operation will provide employment opportunities to qualified local residents. Employment arrangements will comply with employment and labor standards as provided in the applicable laws and regulations.	None	<input type="checkbox"/> Plan <input type="checkbox"/> Other Action <input checked="" type="checkbox"/> No Action
<b>Affordability</b>	No impact. Power will be made available through the grid.	None	<input type="checkbox"/> Action <input checked="" type="checkbox"/> No Action
<b>Other Risks and/or Vulnerabilities</b> <input type="checkbox"/> HIV/AIDS <input type="checkbox"/> Human trafficking <input type="checkbox"/> Others	None	None	<input type="checkbox"/> Plan <input type="checkbox"/> Other Action <input checked="" type="checkbox"/> No Action

**IV. MONITORING AND EVALUATION**

Are social indicators included in the design and monitoring framework to facilitate monitoring of social development activities and/or social impacts during project implementation?  Yes     No

## SUMMARY RESETTLEMENT PLAN

1. In December 2006, the Tata Power Company Limited (TPC), India's largest private power utility, won the bid to establish a 4,000 megawatt (MW) ultra mega power project (the Project). Coastal Gujarat Power Limited (CGPL) will set up the plant in Tunda Village, Mundra Taluka,<sup>1</sup> Kutch District, Gujarat State in western India. The power generated will be allocated to the states of Gujarat, Maharashtra, Punjab, Haryana, and Rajasthan. Power Grid Corporation of India Limited will develop, operate, and maintain the electrical power flow transmission system, which will augment the existing transmission network in Gujarat and other states. The site is well connected with state highways no. 50 (Anjar) and 6 (Gandhidham), the proposed national highway 8A (Delhi–Kandla), the railway station in Adipur, and Mundra Port.

2. This resettlement plan to mitigate adverse social and economic impacts from land acquisition and/or restrictions on affected persons<sup>2</sup> use of land, and to establish and maintain an ongoing relationship with those affected throughout the life of the Project.

### A. Scope of Land Acquisition and Involuntary Resettlement Impacts

#### 1. Land Requirements for the Project

3. The Project originally planned to acquire 1,254 hectares (ha), including land for ash disposal, residential complex, and the coal transport system. At present, the land acquisition requirements are 1,052 ha (Table A5.1). Project lands are located within the village boundaries of Tunda and Mota Kandagara villages in Mundra Taluka, and Nana Bhadiya in Mandavi Taluka. Except for 181 ha of private land in Tunda, the Project will utilize Government land in Tunda, Mota Kandagara, and Nana Bhadiya.

#### 2. Land Requirements for Associated Facilities

4. **Transmission Lines.** The net power produced by the power plant will be transmitted from the power plant's switchyard to Limbdi (300 kilometers [km]), Ranchodpur (390 km), and Jetpur (330 km) substations. Power Grid Corporation of India will be responsible for acquiring ownership rights; rights-of-way, easements; and continued access rights necessary for the construction, operation, maintenance, and upgrading of the new transmission facilities. Power Grid Corporation of India's environmental and social policy and procedures are consistent with the *Involuntary Resettlement Policy* (1995) of the Asian Development Bank (ADB).

5. **Coal Shipment and Unloading Facilities.** Existing facilities at Mundra Port can handle only about 4 million tons per annum of coal. Therefore, Mundra Port and Special Economic Zone Limited, the port owner, will construct a new berth and install mechanized coal-unloading facilities and a mechanized coal-stacking and reclaiming system within the port's special economic zone to meet the coal import requirements of the Project and others. No additional land acquisition is required for these facilities.

<sup>1</sup> *Taluka* or *tehsil* is a unit of local government that covers several villages.

<sup>2</sup> Affected person includes any people, households, firms, or private institutions who, on account of changes that result from the Project will have their (i) standard of living adversely affected; (ii) right, title, or interest in any house, land (including residential, commercial, agricultural, forest, and/or grazing land), water resources, or any other moveable or fixed assets acquired, possessed, restricted, or otherwise adversely affected, in full or in part, permanently, or temporarily; and/or (iii) business, occupation, place of work or residence, or habitat adversely affected, with or without displacement.

**Table A5.1: Land Required and Ownership Status**

Plant Facility	Location	Area (ha)	Ownership/Type of Land
A. Main plant area	Tunda and Kandagara	88	Government wasteland
		12	Government grazing land
		218	MSEZ land to be notified and allocated to the Project.
		181	Private land (owned by 76 families)
		130	Government forestland
<b>Subtotal (A)</b>		<b>629</b>	
B. Ash disposal	Kandagara	241	Government wasteland
C. Residential complex	Nana Bhadiya	182	Government wasteland
<b>Subtotal (B+C)</b>		<b>423</b>	
<b>Subtotal (A+B+C)</b>		<b>1,052</b>	
D. Coal transport system	From Mundra Port to the power plant site	100	Government forestland and private land (right-of-way)
E. Inlet and discharge channels		102	MSEZ (right-of-way)
<b>Total (A to E)</b>		<b>1,254</b>	

ha = hectare, MSEZ = Mundra Special Economic Zone.

Source: Power Finance Corporation.

### 3. Status of Land Acquisition

6. **Private Land.** CGPL and Power Finance Corporation initiated land acquisition in June 2006 after finalization of the project site. Following their application, the district collector issued notifications under section 4<sup>3</sup> of the Land Acquisition Act of 1894 (amended in 1984) on 20 September 2007 and for section 6<sup>4</sup> on 13 April 2007. Notices were placed in the *mamlatdar's*<sup>5</sup> office at Bhuj, and village *panchayat*<sup>6</sup> offices. After section 6 notification, CGPL, now owned by TPC, began the process of acquiring land through consent negotiation by offering compensation at rates higher than prevailing market rates and other incentives or benefits to those affected. CGPL organized small and large public meetings at Bhuj (five meetings) and project-affected villages (three meetings). The meetings were attended by *sarpanches* (village council heads), those affected, public representatives in district panchayats and local leaders. As a result of these meetings, compensation was fixed at Rs1.5 million per ha for private landowners. This rate is higher than land acquisition rate fixed by the Government Rs250,000 per ha.<sup>7</sup> Compensation payments to all 76 private landowners are expected to be completed by the end of March 2008.

7. **Government Wasteland and Gauchar Land.** The project site requires acquisition of Government wasteland and *gauchar* (grazing) land. Land transfer orders for wasteland and grazing land were issued by the Kutch district collector in April and May 2007, respectively. Prior to the Project, part of Tunda village wasteland was allocated to the Mundra Special Economic

<sup>3</sup> Under section 4 of Land Acquisition Act, notification was issued on 20 September 2006 (Ref. No. AM/2006/190/M/LKU/162006/ 1551/GH) and public notices were issued in local vernacular daily *Chanchal* and English daily *Indian Express* on 2 October 2006.

<sup>4</sup> The public notices for section 6 of the Land Acquisition Act were issued in *Chanchal* and *Indian Express* on 13 April 2007.

<sup>5</sup> A *mamlatdar*, who has delegated powers of a magistrate, is responsible for maintaining land records and issuing such certifications as domicile, caste, and income.

<sup>6</sup> Local village government bodies.

<sup>7</sup> Calculated based on data from the last 5 years of land transactions in the area.

Zone. Following CGPL's application, the Government decided to transfer the allotment for zone to CGPL in November 2007.

8. **Forestland.** The Project requires reserve forestland at Mota Kandagra, Mundra Taluka. The Ministry of Environment and Forests approved the request on 29 March 2007 with the condition that CGPL establish 130 ha of compensatory forest at Bamnka, Bhachau Taluka, Kutch district.

#### 4. Involuntary Resettlement Impacts

9. The Project will entail loss of private land, temporary structures, and other assets; and affect common property resources and access of the fishing community to fish-drying areas on the coastline.

10. **Loss of Private Land.** Private land (181 ha) to be acquired comprises 95 land plots owned by 76 families. Although listed in the village panchayat records as agricultural, this land is predominantly saline and of low and unreliable productivity with some grazing potential.

11. Among the private landowners are 30 households classified as belonging to vulnerable groups.<sup>8</sup> Nine households are identified as scheduled castes, while 21 are women landowners. No one losing land or livelihoods from privately owned land belongs to any scheduled tribes.

12. **Loss of Structures and Other Assets.** A few temporary structures (cattle sheds and thatched sheds) and other assets (wells) will require compensation.

13. **Loss of Common Property Resources.** The acquisition of public land will have partial economic impacts on Tunda, Mota Kandagra, and Nana Bhadiya villages. Approximately 4% of total available grazing land, 50% of total available wasteland, and 40% of total available private agricultural land in village Tunda and subvillage Tunda Wandh are required. In Motakandagra, 45% of the total available wasteland and all forestland (open scrub vegetation) are required, while in Nana Bhadia, 33% of the total available wasteland in the village is required. Cattle rearing and milking is an important source of livelihood in the affected villages in which 330 households have 4,340 livestock. In Tunda Wandh, about 150 *rabaris* (shepherds) will be affected by acquisition of grazing land. Approximately 80 charcoal makers utilize wood from the thorn scrub plant species in the area.

14. **Impact on Fishing Communities.** Although the fishing potential of the Gulf of Kutch is significant, no local fishing activities occur in the coastal waters directly fronting the project area, which has vast intertidal mudflats. The nearest small fishing community is at the Kotdi creek bank located outside the project area about 2.8 km from the Mudhwa creek. The discharge of spent cooling water will not affect the fishing activities in the gulf. The provision of a culvert over the intake channel will ensure continued access of the fishing community to fish-drying areas on the coastline.

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<sup>8</sup> Affected persons considered socially "vulnerable" comprise households headed by women, those who are physically challenged, and those who belong to scheduled castes and scheduled tribes.

## **B. Policy and Legal Framework**

### **1. Compensation and Resettlement and Rehabilitation Principles**

15. The policy framework and entitlements for the Project are based on the Land Acquisition Act of 1894 (amended in 1984), National Rehabilitation and Resettlement Policy (NRRP, 2007); and ADB's *Involuntary Resettlement Policy* (1995). Based on those, the following involuntary resettlement principles are applicable:

- (i) Avoid negative impacts of land acquisition and involuntary resettlement on people affected by the Project to the extent possible.
- (ii) Where negative impacts cannot be avoided, assist those affected, particularly vulnerable groups, in improving or at least regaining their standard of living and income.
- (iii) Disclose all information related to, and ensure affected peoples participation in, rehabilitation planning and implementation.
- (iv) Provide compensation for acquired assets at replacement value in accordance with the rehabilitation policy and entitlement framework.
- (v) Provide rehabilitation assistance and income restoration to those affected including nontitled residents.
- (vi) For those persons without land titles such as squatters and encroachers, CGPL has declared the date of the census as the cutoff date for eligibility and entitlement.
- (vii) Provide for affected people not present during enumeration. Anyone moving into the project area after the cutoff date will not be entitled to assistance.
- (viii) Provide compensation for land prior to taking possession of the acquired lands and property.
- (ix) Establish village and district grievance redress mechanisms to ensure speedy resolution of disputes.
- (x) Ensure involvement of women and vulnerable groups in all activities related to rehabilitation planning, implementation, and monitoring.
- (xi) Ensure adequate budgetary support to cover implementation costs for resettlement plans.
- (xii) Conduct internal and external monitoring of implementation of resettlement plans.

### **2. Entitlement Matrix**

16. In accordance with these principles, those affected will be entitled to a combination of compensation packages and resettlement assistance depending on (i) the nature of ownership rights on lost assets; (ii) scope of the impacts including socioeconomic vulnerability of those affected; and (iii) the measures to support livelihood restoration, if livelihood impacts are envisaged. Social mitigation arrangements will be set up to support livelihood restoration measures. Project-affected people will be entitled to the following five types of compensation and assistance packages: (i) compensation for the loss of land, crops and/or trees at replacement cost; (ii) compensation for structures and other immovable assets at replacement cost; (iii) assistance in lieu of loss of income; (iv) rebuilding and/or restoration of community resources and facilities; and (v) assistance to restore and improve sources of income and livelihoods. The entitlement matrix is shown in Table A5.2.



Table A5.2: Entitlement Matrix

Type of Loss	Identification of Affected Households	Entitlement	Details
<b>Loss of Land</b>			
Loss of agricultural land and assets	Owner, titleholder, traditional land rights <sup>a</sup> of the affected plot	Compensation at replacement value through consent mechanism	<ol style="list-style-type: none"> <li>1. Cash compensation at replacement value,<sup>b</sup> based on consent mechanism as per market value agreed between CGPL and the affected titleholder or landowner. Affected persons with traditional title or occupancy rights will also be eligible for full compensation based on consent mechanism.</li> <li>2. If the residual plot(s) is (are) not viable, i.e., the affected person becomes a marginal farmer, either of the following two options are to be given, subject to his/her acceptance: <ol style="list-style-type: none"> <li>a. The affected person remains on the plot, and the compensation and assistance paid given the amount of land to be acquired.</li> <li>b. Compensation and assistance are to be provided for the entire plot including residual part, if the owner of such land wishes that his/her residual plot should also be acquired by CGPL. CGPL will acquire the residual plot and pay the compensation for it.</li> </ol> </li> <li>3. CGPL will cover all fees, taxes, and other charges as applicable under the relevant laws.</li> </ol>
Loss of nonagricultural land and assets	Owner, titleholder, traditional land rights <sup>a</sup> of the affected plot	Compensation at replacement value through consent mechanism	<ol style="list-style-type: none"> <li>1. Cash compensation at replacement value. based on consent mechanism as per market value agreed between CGPL and the affected titleholder or landowner. Affected persons with traditional title or occupancy rights will also be eligible for full compensation based on consent mechanism.</li> <li>2. If the residual plot(s) is (are) not viable, either of two options are to be given to the affected person, subject to his/her acceptance: <ol style="list-style-type: none"> <li>a. The affected person remains on the plot, and the compensation and assistance paid given the amount of land to be acquired.</li> <li>b. Compensation and assistance are to be provided for the entire plot including residual part, if the owner of such land wishes that his/her residual plot should also be acquired by CGPL. CGPL will acquire the residual plot and pay the compensation for it.</li> </ol> </li> </ol>

Type of Loss	Identification of Affected Households	Entitlement	Details
			3. CGPL will cover all fees, taxes, and other charges as applicable under the relevant laws.
<b>Loss of Crops and Trees</b>			
Loss of crops and trees	Owner of crops and trees including sharecroppers, tenant farmers if any	Compensation at market value	<ol style="list-style-type: none"> <li>1. Advance notice to those affected to harvest their crops.</li> <li>2. In case of standing crops, cash compensation for loss of agricultural crops will be at current market value of mature crops based on average production.</li> <li>3. Compensation for loss of timber trees will be at current market value of wood, timber or firewood depending on the kind of tree.</li> <li>4. In case of fruit trees, compensation will be for average fruit production for next 15 years to be computed at current market value.</li> </ol>
<b>Loss of Source of Livelihood</b>			
Loss of primary source of income	Titleholders losing income through agriculture	Training assistance for income restoration	<ol style="list-style-type: none"> <li>1. Direct and indirect project employment opportunity during construction and operations on a priority basis guided by skill sets of the eligible person.</li> <li>2. Training for eligible people based on educational qualifications and skill sets for nontechnical and technical trades in the Project and township.</li> <li>3. Rehabilitation allowance as per the NRRP 2007 equivalent to 750 days of minimum agricultural wage.</li> </ol>
<b>Losses of Nontitleholders</b>			
Encroachers	Land and structures in affected area	No compensation for land but assistance for assets to all (not only to vulnerable among the nontitleholders but all nontitleholders)	<ol style="list-style-type: none"> <li>1. Encroachers will be notified and given sufficient time to remove their affected assets.</li> <li>2. They will have the right to salvage material from demolished structure at no cost.</li> <li>3. Compensation for affected structures will be at replacement value.</li> <li>4. Suitable measures will be devised for resettlement and rehabilitation of encroachers as per the applicable entitlement and cutoff date.</li> </ol>
Loss of structure by squatters and informal settlers	Land and structures in affected area	No compensation for land but compensation for structures at replacement cost and other assistance	<ol style="list-style-type: none"> <li>1. Encroachers will be notified and given sufficient time to remove their affected assets.</li> <li>2. They will have the right to salvage material from demolished structure at no cost.</li> <li>3. Compensation for loss of structure will be at replacement cost to be paid by the Project.</li> <li>4. A lump sum shifting grant of Rs5000 will be provided for shifting household assets and other belongings.</li> <li>5. Suitable measures will be devised for</li> </ol>

Type of Loss	Identification of Affected Households	Entitlement	Details
			resettlement and rehabilitation of encroachers as per the applicable entitlement and cutoff date.
<b>Loss of Access to Common Property Resources</b>			
Loss of common property resources	Affected community, institution responsible	Cash compensation, reconstruction, alternate income generation activities	<ol style="list-style-type: none"> <li>1. Cash compensation will be at replacement value or the community structure will be reconstructed in consultation with the community.</li> <li>2. Suitable land for grazing and fodder growth will be identified and developed.</li> <li>3. Self-help groups will be formed for community-led initiatives for income restoration and generation.</li> </ol>
<b>Rehabilitation Measures</b>			
Additional assistance to vulnerable groups	Households categorized as vulnerable (below poverty line households, female-headed households, scheduled castes, scheduled tribes, disabled, elderly)	Monetary and nonmonetary assistance	<ol style="list-style-type: none"> <li>1. Provide a lifetime pension of Rs500 per month to vulnerable individuals or groups such as households headed by women, physically challenged people, widows, households with the differently abled or physically challenged, households below poverty line, scheduled tribe and scheduled caste households, etc. affected by the Project.</li> <li>2. Provide priority to vulnerable groups for employment as construction workers during project construction.</li> <li>3. Train residents in nontechnical trades for employment in the plant and township.</li> </ol>
Any unanticipated adverse impact due to project intervention	Any unanticipated consequence of the Project will be documented and mitigated based on the spirit of the principles agreed upon the policy framework.		

CGPL = Coastal Gujarat Power Limited, NRRP = National Rehabilitation and Resettlement Policy.

- a Traditional land rights refer to households with customary rights to land and need to be treated equivalent to titleholders.
- b CGPL has opted for direct purchase of land from the affected landowners on the basis of consent mechanism (negotiated price) after issue of notification requiring acquisition of land under the Land Acquisition Act of 1894 (amended in 1984). If acquisition of land through the consent mechanism fails, other provisions of the relevant act may be invoked, i.e., it would follow the conventional process of land acquisition adopted by the district administration as per the Land Acquisition Act.

Source: Coastal Gujarat Power Limited.

## **C. Public Consultation, Disclosure, and Grievance Redress Mechanisms**

### **1. Public Consultations and Disclosure**

17. The Government initiated discussions with the local community in 2005 before CGPL was transferred to the successful bidder, the Tata Power Company Limited, in April 2007. The first formal consultation took place in September 2006 as a public hearing on the findings of the environmental impact assessment of the Project. The public hearing was conducted by the district collector in the presence of officials from Gujarat Pollution Control Board, CGPL, and representatives of affected communities. The major concerns related to the location, compensation package land, availability of gauchar land, and apprehension on environmental pollution due to the Project.

18. After transfer of CGPL to TPC in April 2007 about eight (small group and large public) meetings were organized both at Bhuj (five meetings) and in project-affected villages (three meetings). These meetings were attended by affected people and village sarpanches, public representatives in district panchayat, and local leaders. At that stage, key issues raised related to the compensation package for land and alternative land for cattle grazing.

19. Information on affected assets, compensation rate and payments, and mitigation measures have been disclosed through notices and public communications to affected persons from April to November 2007, which has given them sufficient time to raise objections and for CGPL to propose alternative mitigation measures. The short resettlement plan has been disclosed on the ADB website and a summary made available to affected persons in the local language at the *tehsil* and the district magistrates' offices. CGPL has dedicated resources to ensure that the consultative process will continue during construction and operation of the power plant. CGPL is committed to ensuring that affected households and the local community benefit substantively from opportunities offered by the Project.

### **2. Grievance Redress Mechanisms**

20. An effective district grievance redress mechanism will be set up to deal with grievances of the project-affected people relating to land acquisition and rehabilitation. Effective participation of the affected communities will be ensured in the process. The grievance redress mechanism will be a two-tier system comprising a field cell, and a senior cell. The field cell will address grievances pertaining to eligibility and entitlement filed by affected individuals or families. It will comprise the community relations officer, assisted by the village coordinator and the village workers of the concerned village. The senior cell will be chaired by the district administration's representative, normally the block development officer and other cell members, and include two representatives of the affected community and the head of community relation team of CGPL. It will review cases escalated by the field cell for consideration. The claimants whose cases were rejected by the field cell can apply to the senior cell for review.

21. Issues requiring legal advice will be handled by the panchayat and district administration or, if required, in a court of law that will be distinct from CGPL's responsibilities.

## **D. Income Restoration and Rehabilitation**

22. The involuntary resettlement impacts of the Project can be mitigated and opportunities generated maximized by taking up appropriate mitigation measures in consultation with local

residents. CGPL will implement the following mitigation measures to mitigate the impacts on account of private and public land acquisition.

23. **Restoration of Income for Loss of Agriculture Land.** Aside from payment of full compensation for acquired land at negotiated rates, vulnerable affected people who have lost all their land or are left with unviable parcels of land will be assisted in utilizing their cash compensation to buy alternate land in a nearby area, given land availability. Compensation for the standing crop for the land acquired by the Project, will be paid at market value.

24. **Provision of Alternative Grazing Land.** CGPL is working with the Gujarat government and affected communities to develop and implement solutions to ensure that livelihoods of cattle-grazing communities in the project-affected villages are not adversely affected. Compensation paid for gauchar land includes an 30% to ensure the gauchar land can be purchased to restore the area required to support the animal population in the village. Villagers can continue grazing on the project land until construction activities begin. Alternate grazing land and forestland will be made available to the villagers by the Gujarat government.

25. **Provision of Employment and Livelihood Opportunities.** The Project will employ 5,000–6,000 people during construction and 720 during operations. During construction, CGPL will provide suitable employment opportunities to appropriately skilled affected people. During project operation, the suitable local community will be employed to the extent possible. Special efforts will be made to train local residents to achieve skills for better employability and entrepreneurship development in the area. CGPL will also encourage entrepreneurship among the community by awarding service contracts to qualified local candidates for such activities as canteens, vehicle hiring, maintenance of gardens, office services and cleanliness, courier services, and material supplies.

26. **Restoration of Other Common Property Resources.** The traditional *mela* (fair) in the area occurs annually. An approach road will be built that will ensure continued access to the mela in addition to the current approach road. The approach road is expected to be completed within 6 months. CGPL is coordinating with local officials to provide open space for village youth who use public land as a cricket playground and identify alternate sites for the crematorium to be used by scheduled castes.

27. Access to the coastline will be ensured by providing a culvert over the intake channel connecting to Kotdi creek. The culvert will be completed before any interruption by the construction of the intake channel.

#### **E. Rehabilitation Budget**

28. Based on the detailed measurement survey and census, the resettlement and rehabilitation budget will be worked out. Besides the cost for land, other allowances for different categories will be ascertained. In addition, affected people will be entitled to a resettlement and rehabilitation assistance according to the NRRP 2007. Contingency provisions will be made to take into account variations from this estimate. The budget will be indicative of outlays for the different expenditure categories. These costs will be updated and adjusted to the inflation rate as the Project continues and given more specific information such as increased number of affected people during implementation; unit costs will be updated as necessary.

29. **Costs for Budget Components.** The budgetary allocation for the rehabilitation component of the Project was based on the anticipated impacts, entitlement options as defined

in the entitlement matrix, and requirements to be fulfilled as per the directives under the NRRP 2007 and guidelines prescribed by the International Finance Corporation and ADB. The budget covering resettlement and rehabilitation activities is approximately Rs100 million.

30. The resettlement and rehabilitation budget, excluding land compensation cost, is for Rs1.5 million per ha of private land for 181 ha. Monetary assistance for structures and other assets; expenditures for livelihood restoration program and training; budgetary allocation for facilitating market linkages and entrepreneurial development; and land development for fodder production, water conservation, and silvipastoral practices are part of the allocation.

31. To ensure functioning of the resettlement and rehabilitation cell through the project life cycle and facilitate project preparation and implementation, the Project will cover administrative costs of the resettlement and rehabilitation cell, payments for necessary consultancy services, project implementation support services, and postimplementation evaluation by independent agency. This is part of the budgetary allocation.

32. In line with its corporate social responsibility initiative, requirements under NRRP 2007, and guidelines prescribed by the International Finance Corporation and ADB, peripheral area development in the district is part of the budgetary allocation.

33. **Compensation for Acquisition of Private Properties.** The compensation for the permanent acquisition of private agricultural land has been agreed at Rs1.5 million per ha. The agreement is based on negotiations between affected persons and CGPL.

34. **Compensation for Structures and Other Nonland Assets.** A consolidated allocation will be made for temporary structures (sheds) and other assets (wells).

35. **Livelihood Restoration Budget.** A detailed livelihood restoration component will be estimated for the Project. The livelihood restoration component will include funding for employment opportunities, and monetary and nonmonetary allowances. The components will include (i) training for agricultural laborers on non-land-based activities, (ii) training and material procurement support and market linkages for artisans, (iii) alternate livelihood options and training for charcoal manufacturers, (iv) vocational training for employable persons in Industrial Training Institute and other technical institutions, (v) implementation of women-led self-help group activities and cooperative activities (cottage industries, handicrafts, microcredit activities, pickle and *papad* [lentil chips] making, etc.) and (vi) development of grazing and pasture lands.

36. **Allowance to Vulnerable Affected Persons.** A pension plan for affected people and families identified under the vulnerable category will be allocated. It will include (i) pension to the vulnerable category; (ii) facilitation of income restoration activity in the project villages; (iii) community development programs in the project area; (iv) infrastructure augmentation in the project villages (water supply, sewerage, sanitation, roads and solid waste management); (v) development of common property resources and community assets in the villages.

37. **Approach Road Construction.** Allocation will be made for construction of a new approach road to the mela ground.

38. **Supporting Cost for Implementation of the Resettlement Plan.** Allocation will be made for administrative cost for the institutional setup within CGPL for finalizing the resettlement plan, implementing resettlement and rehabilitation, logistics, preparation of other compliance documents for submission to funding institutions and implementation support agencies.

39. **Contingency.** Fifteen percent of the budget will be kept as contingency to absorb any variation in the budget during implementation.

#### **F. Institutional Arrangements and Implementation Schedule**

40. Since April 2007, CGPL has set up a project office at Bhuj, which acts as a link between people from the project-affected villages and the company. At present, two senior staff and other support staff are engaged in addressing issues related to land acquisition. The officials interact on a regular basis with the villagers and attempt to address their concerns. In order to strengthen the process, CGPL will establish a formal project management office with expertise in engineering planning and design, financial management, procurement and contracts management, and environmental and social impacts management. The project management office will have a full-time corporate social responsibility and resettlement and rehabilitation officer who will be responsible for ongoing community engagement, and finalization and implementation of the resettlement plan.

41. The implementation schedule is presented in Table A5.3.

#### **G. Monitoring and Evaluation**

42. Project monitoring and evaluation will be carried out by CGPL covering the implementation progress as well as any updates on the resettlement plan. Monitoring will include: (i) administrative monitoring—daily planning, implementation, feedback and troubleshooting, individual affected persons database maintenance, and progress reports; (ii) socioeconomic monitoring—baseline information for comparing affected persons socioeconomic conditions, consultative processes and general socioeconomic activities; and (iii) impact evaluation monitoring and reporting—income standards restored or improved, and socioeconomic conditions of the affected persons.

43. Monitoring and evaluation reports documenting progress on resettlement implementation and completion reports will be submitted by the project office staff at the site to the CGPL management. CGPL will make monitoring reports available to affected persons in a form and language they can understand, and submit those to ADB on a quarterly basis. Monitoring reports will be disclosed on the ADB website.

Table A5.3: Implementation Schedule

Activity	Target/Completion Date
<b>A. Impact Assessment and Resettlement Planning</b>	
1. Rapid socioeconomic assessment	August 2006
2. Baseline social impact assessment	November 2007
3. Submission of draft resettlement plan to ADB	January 2008
4. ADB approval of short resettlement plan	February 2008
5. ADB approval of detailed social mitigation plan	April 2008
<b>B. Consultation and Disclosure Activities</b>	
1. Public hearing	19 September 2006
2. Land Acquisition Act section 4 notification	20 September 2006
3. Section 4 public notification through local newspapers	2 October 2006
4. Land Acquisition Act section 6 notification	13 April 2007
5. Section 6 public notification through local newspaper and village <i>panchayat</i> offices	13 April 2007
6. Local disclosure of impact assessment and mitigation measures	April 2007
7. Web posting of short resettlement plan	February 2008
8. Disclosure of detailed social mitigation plan	May 2008
<b>C. Land Acquisition</b>	
1. Application for land acquisition	March 2006
2. Private land acquisition	
Compensation rate negotiation	10 September 2007
Payment of compensation to district collector	23 October 2007
Payment of compensation to private landowners	31 March 2008
3. Forestland acquisition	
Application for transfer of forestland	22 February 2007
Gujarat government approval of transfer of land to CGPL	29 March 2007
4. Government wasteland and <i>gauchar</i> land	
Gujarat government allocation of wasteland and grazing land	17 October 2006
Gujarat government approval of transfer of land to CGPL	April 2007 (Tunda); May 2007 (M. Kandagara); November 2007 (MSEZ)
<b>C. Acquisition of Structures and Other Nonland Assets</b>	
1. Detailed measurement survey	March 2008
2. Payment of compensation for temporary structures	April 2008
3. Evaluation and enlistment of loss of trees	March 2008
4. Payment of compensation for loss of trees	April 2008
<b>D. Common Property Resources</b>	
1. Availability of grazing lands in affected villages	March 2008
2. Construction of additional approach roads to mela	April 2008
3. Construction of culvert across inlet channel	Q4 2008
<b>E. Establishment of CGPL Corporate Social Responsibility Office</b>	
	December 2007
<b>F. Implementation of Social Mitigation Plan</b>	
	Q3 2008
<b>G. Civil Works</b>	
Site preparation/preconstruction works	
Commencement of main civil works (main plant, building, roads, and drains)	Q2 2008

ADB = Asian Development Bank, CGPL = Coastal Gujarat Power Limited, MSEZ = Mundra Special Economic Zone, Q = quarter.

Source: Coastal Gujarat Power Limited.