

NAVA BHARAT: ENERGY SOLUTIONS FOR INDIA

Maram Srikanth and Palanisamy Saravanan wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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On June 30, 2009, Nava Bharat Energy India Limited (NBEIL) proposed the setup of two coal-fired power projects: one in Paloncha, Khammam District (150 megawatts), and another in Dharmavaram, East Godavari District (150 megawatts), Andhra Pradesh. The sites of these projects were located adjacent to the existing power plants of Nava Bharat Ventures Limited (NBVL), parent company of NBEIL, a renowned industrial group based in South India.

NBEIL approached Srinivasan Sridhar, president of Development Bank Limited, to arrange a term loan of ₹9.70 billion¹ through project financing under a syndication strategy.² The banker would have to evaluate whether project financing would be a suitable lending instrument for these projects, and if so, what would be the potential implications to both the lenders and project owners? Would it be wise to proceed to syndicate the term loan for the coal-fired power plants?

NAVA BHARAT VENTURES LIMITED: COMPANY BACKGROUND

NBVL was established by technocrats-turned-entrepreneurs Subba Rao Devineni, and Punnaiah Panda. NBVL was incorporated in November 1972 as Nava Bharat Ferro Alloys Limited to manufacture ferro alloys (a key raw material for manufacturing steel) at Paloncha, Khammam District, Andhra Pradesh. Subsequently, the two partners diversified their manufacturing facilities to also produce power and sugar (see Exhibit 1). In July 2006, the name of the company was changed from Nava Bharat Ferro Alloys Limited to Nava Bharat Ventures Limited to reflect its diversified business interests. NBVL was the flagship company of the Nava Bharat group, and it oversaw four subsidiary companies: Kinnera Power Company Limited, Brahmani Infratech Private Limited, Nava Bharat Realty Limited, and Nava Bharat (Singapore) Private Limited. Essentially, these companies were engaged in trading and investment activity, and they had limited operations as of June 30, 2009.

Initially, NBVL had established a captive power plant with a capacity of 50 megawatts (MW) at Paloncha, Andhra Pradesh, in 1997 and another power plant of 30 MW capacity in Orissa in 2004. Later, the aggregate

¹ ₹ = INR = Indian rupee; all currency amounts are in ₹ unless otherwise specified; US\$1.00 = ₹47.87 on June 30, 2009.

² "Syndication" referred to a group of businesses—in this case, banks—that formed a partnership to finance a given project.

capacities of these power plants were increased to 301 MW to meet NBVL's growing captive consumption of power. (Power accounted for 70 per cent of the total cost structure of ferro alloys.³) NBVL was a major Indian exporter of manganese alloys to the United States, Europe, and Japan.

NBVL had a banking relationship with Development Bank Limited, having secured financial assistance from the lender in the past when the company was in the process of establishing its manufacturing facilities, including power projects. Over a period of time, NBVL developed expertise for executing power projects of smaller capacities, all of which were operating successfully.

Management Team

Ashok Devineni was the chairman, and Trivikrama Prasad Pinnamaneni was the managing director of NBVL, and they were the legal heirs of the company's founders. Devineni held a master's degree in business administration from University of Wisconsin in the United States, and he had approximately three decades of professional experience with the Nava Bharat group of companies, having worked for the organization in various capacities. In the past, he had been involved in the group's expansion projects in ferro alloys and generation of power.

Pinnamaneni held a master's degree in business administration from University of Wisconsin in the United States, and he had been associated with the Nava Bharat group for more than 25 years. Besides monitoring the operations of the sugar and co-generation power plants, Pinnamaneni supervised NBVL's day-to-day affairs.

A third member of the management team, Rama Krishna Prasad, NBVL's executive director of finance and corporate affairs, was a chartered accountant and company secretary by profession; he had 27 years of experience in various industries.

Organizational Structure of Nava Bharat Energy India Limited

NBEIL was incorporated on April 8, 2008, as a special purpose vehicle (SPV) that would help NBVL to implement its power projects. Parent company NBVL had an alternate purpose in creating NBEIL, having established the SPV with a view to ring-fencing its balance sheet, thereby protecting itself from bankruptcy in the event of the failure of NBEIL. Also, since the size of NBVL's operations—total sales of ₹12.81 billion during financial year (FY) 2008–09—was relatively lower than the cost of the projects (₹13.86 billion), NBVL created NBEIL as a way to protect the parent company's assets.

While Devineni and Pinnamaneni were on the board of NBEIL, the SPV's day-to-day activities were managed by a team of experienced professionals. NBEIL constituted a project management committee for supervising implementation of the projects, and the projects were expected to launch 2.5 years from the date of financial closure (i.e., tentative date of financial closure was estimated as October 1, 2009).⁴

³ CH R S Sarma, "Hike in Power Tariff Hits AP Ferro Alloys Industry," *The Hindu Business Line*, October 5, 2015, accessed September 6, 2016, www.thehindubusinessline.com/news/national/hike-in-power-tariff-hits-ap-ferro-alloys-industry/article7726537.ece.

⁴ "Financial closure" referred to formal receipt of sanctions/commitments from a group of banks/financial institutions toward financing the project.

Financial Performance of Nava Bharat Ventures Limited

NBVL's FY ran from April 1 to March 31. NBVL registered total sales of ₹12.81 billion, with a profit after tax of ₹4.55 billion during FY 2008–09. NBVL had gross cash accruals⁵ of ₹4.93 billion during FY 2008–09. It had cash and cash equivalents of ₹3.33 billion as of March 31, 2009. Further, NBVL earned a net profit of ₹1.36 billion during the first quarter ended on June 30, 2009. Its net worth was ₹11.71 billion as of March 31, 2009. While its debt-equity ratio was 0.35, NBVL's current ratio was 4.06 and its weighted average cost of capital was 10.80 per cent as of March 31, 2009. NBEIL did not record any revenue in 2009 since it had not yet commenced commercial operations. NBVL's owners had spent ₹28 million on promoting NBEIL's projects as of June 30, 2009.

NBVL's shares were listed on the Bombay Stock Exchange as well as on the National Stock Exchange of India Limited. The shares traded at ₹296 per share (with a face value of ₹2 each) on June 30, 2009, with a 52-week high/low value of ₹373/₹91 per share on the National Stock Exchange. In a report dated June 30, 2009, the Credit Rating Information Services of India Limited (CRISIL) assigned a P1+ credit rating to NBVL⁶ (i.e., the highest credit rating and, hence, the lowest credit risk) owing to the company's sound financial health and supported by its low leverage and adequate liquidity. The names of all Nava Bharat companies and their directors were absent from the defaulters' list of the Reserve Bank of India and that of the Credit Information Bureau of India Limited.

OUTLOOK ON INDIA'S POWER INDUSTRY

India had experienced a deficit in electricity since demand had exceeded supply over the years. The peak power deficit stood at approximately 3.20 per cent⁷ and resulted in frequent power cuts in many parts of the country. CRISIL estimated an ongoing healthy demand for power in India until FY 2020–21. While industrial demand would increase on par with the growth rate in India's gross domestic product, demand from the household segment would witness exponential growth, driven by higher latent demand, rapid urbanization, and the government's thrust on rural electrification.⁸

According to India's 17th electric power survey, the nation's energy requirement in FY 2021–22 would be 1.91 million units, compared to 0.97 million units in FY 2011–12 (see Exhibit 2).⁹ CRISIL estimated that a total capacity of 54 gigawatts (with an aggregate capital outlay of ₹9 trillion) would be added, of which 82 per cent would be based on coal.¹⁰ Hence, the use of coal as an alternate power source would result in a lower or negligible level of deficit in the power industry as a whole from FY 2016–17 onwards.¹¹

⁵ "Gross cash accruals" meant profit after tax plus depreciation and amortization expenses in a financial year.

⁶ "Revision of Rating Symbols and Definitions," CRISIL Ratings, accessed September 6, 2016, www.crisil.com/pdf/ratings/standardisation-rating-symbols-definitions.pdf.

⁷ Sarita Singh, "For the First Time in History, India Will Not Have Power Deficit Situation in FY 2017," *Economic Times*, June 3, 2016, accessed September 6, 2016, <http://economictimes.indiatimes.com/industry/energy/power/for-the-first-time-in-history-india-will-not-have-power-deficit-situation-in-fy17/articleshow/52562666.cms>.

⁸ "Power Demand to Improve Led by Economic Revival, Higher Residential Demand," CRISIL Research, August 4, 2016, accessed September 5, 2016.

⁹ The 17th Electric Power Survey of India was conducted in March 2007 by India's Central Electricity Authority, with an objective of forecasting annual electricity demand for each state in India until the year 2022; Electric Power Information Society, Central Electricity Authority, Delhi, 17th Electric Power Survey of India, March, 2007.

¹⁰ "54 GW of Capacities to be Added over Next Five Years Led by Central and State Sector," CRISIL Research, August 4, 2016, accessed September 5, 2016.

¹¹ "Base Deficit Expected to be Negligible from FY 2017 Onwards," CRISIL Research, August 4, 2016, accessed September 5, 2016.

While capital expenditure in power generation would be moderate, investment in transmission and distribution infrastructure would escalate due to the implementation of various government schemes.¹² Power tariffs would decline by FY 2017–18 due to the commissioning of new plants that would not have power purchase agreements for the long term. However, prices would not come down drastically due to transmission constraints, mainly in South India.¹³

SPECIAL PROJECTS AT NAVA BHARAT ENERGY INDIA LIMITED

Cost

The total cost of the power projects was estimated at ₹13.86 billion (see Exhibit 3), so cost per MW would be ₹46.20 million, an amount that was comparable to the cost of other power projects established in South India. The NBEIL projects were to be financed with a debt-equity ratio of 2.33:1 (i.e., a term loan of ₹9.70 billion and equity component of ₹4.16 billion).

Sources of Finance

The entire equity capital of ₹4.16 billion for the project would be provided by NBVL from its internal sources. The proposed term loan of ₹9.70 billion for the projects would be arranged through a syndicate of banks under their project-financing mode. Development Bank Limited prepared a term sheet on the proposal for syndicating the term loan (see Exhibit 4). Out of the total required term loan of ₹9.70 billion, NBEIL had the flexibility to raise a loan equal to ₹4 billion denominated in foreign currency. In typical project-financing structure, the interests of a project's stakeholders (including lenders) would be protected through a cash flow waterfall mechanism (i.e., priority of each cash inflow and outflow in a project, thereby ensuring debt service). As such, lenders could derive confidence while financing the kind of large-scale, capital-intensive projects that were associated with systematic distribution of cash flows among the project's stakeholders (see Exhibit 4).

Technical Details

NBEIL proposed the use of coal-fired, subcritical technology,¹⁴ one of the proven technologies for power generation. The company proposed to implement the projects through package contracts supplied by boiler, turbine, and generator (BTG) and a variety of other plants.¹⁵ In order to execute the BTG contract, NBEIL would select contractors through an international competitive bidding process. The company proposed to acquire circulating fluidized bed combustion technology for the projects since this process had inherent advantages, such as efficient combustion (high thermal efficiency) and flexibility for usage of low-grade coal without affecting the performance of steam generator, as well as limited environmental pollution. The

¹² "Investments of Rs 9 Trillion Expected over 2015-16 to 2019-20; T&D Investments to Drive," CRISIL Research, February 6, 2016, accessed September 5, 2016.

¹³ "Short-Term Power Prices Expected to Decline over the Medium Term," CRISIL Research, January 7, 2016, accessed September 5, 2016.

¹⁴ Subcritical power technology enabled operational efficiency of thermal power plants at a lower level—say, 38 per cent—whereas supercritical technology enabled this process at a higher level of efficiency, that is, 42 per cent. Higher efficiency rates would result in a lower cost per unit of power generated and lower carbon emissions. Source: John Zactruba, "How Are Supercritical Boilers Different from Subcritical Boilers?" Bright Hub Engineering, March 5, 2010, accessed September 6, 2016, www.brighthubengineering.com/power-plants/32896-how-are-supercritical-boilers-different-from-subcritical-boilers/.

¹⁵ The balance of plants included coal handling plant, ash handling plant, condenser, cooling tower, boiler feed pumps, and civil works like preparation of project sites, construction of buildings, chimney, switchyard structure, ash pond, roads, railway sidings, culverts, drainage, etc.

equipment in the power plants would be designed and operated with a maximum noise level of 85 decibels acoustic, measured at a distance of 1.50 metres.

For its combined projects, NBEIL would require an aggregate land parcel of 100 hectares (33 hectares for the Dharmavaram project plus 67 hectares for the Paloncha project); this land would be sufficient for setting up both power plants, as well as for ash dumping and development of the green belt. Since the required land was registered in the name of NBVL, NBEIL would acquire the property from its parent company.

To run its special project initiatives, NBEIL estimated that it would require 1.3 million tonnes of coal per annum, assuming a plant load factor (PLF)¹⁶ of 85 per cent for both locations (see Exhibits 5 and 6). NBVL acquired the coal mining rights to 1,200 hectares of mines (for extraction of coal of 20,000 tonnes per annum from September 2009) in South Kalimantan, Indonesia, a parcel of land that possessed combined estimated reserves of 40 million tonnes of coal. While the entire amount of coal required for the Dharmavaram plant would be imported from Indonesia (through the sea port of Kakinada, which was 45 kilometres away from the site), the coal/washery rejects from the nearby government-owned Singareni Collieries Company Limited were proposed as the coal source for Paloncha plant. These coal mines, with proven geological reserves of 8.8 billion tonnes, were located approximately 40 kilometres away from the Paloncha plant. Since the sites of both projects were well connected through port, road, and rail transportation networks, the respective NBEIL power plants each possessed a reliable fuel supply.

The annual water requirement for each power plant was estimated at 5.26 cubic feet per second or “cusecs.” While the water for Dharmavaram plant would be sourced from the Yerravaram Canal, located 12 kilometres away from the plant, water for the Paloncha project would be sourced from Godavari River, which was 20 kilometres away from the plant. NBEIL expected that each project would provide direct employment to 300 people and indirect employment to 700 people in the surrounding areas.

Power Evacuation

Power would be evacuated through the 220 kilovolt switchyard of the Andhra Pradesh Power Transmission Corporation Limited, which was situated within a radius of 30 kilometres from the sites of both projects.

Power Tariff

The cost of power generation was estimated at ₹2.78 per unit (with an escalation clause of 1 per cent per annum) for 15 years from the date of commencement of commercial operations (i.e., April 1, 2012). The entire power generated from the projects would be sold to Reliance Energy Trading Limited (Reliance Energy), a category F ranked (i.e., the highest rank) power trading company in India that belonged to the highly regarded Anil Dhirubhai Ambani Group. Reliance Energy had issued an expression of interest to NBEIL regarding a purchase of power at a price of ₹4 per unit for an initial period of 10 years and, subsequently, at a mutually agreed-upon price. This long-term power purchase agreement contained certain embedded features to safeguard the interests of both parties (i.e., minimum take-or-pay clause,¹⁷ payment

¹⁶ “Plant load factor” (PLF) was a measure of the operating performance of a power plant, expressed in percentage terms. A PLF of 100 per cent implied that the plant was operating at its full installed capacity. Source: V.S. Motghare and R.K. Cham, “Plant Load Factor – Key Parameter for Evaluation of Performance of Thermal Power Plant,” *International Journal of Scientific Research and Management* 3, no. 1, accessed October 1, 2016, www.ijstrm.in/v3-i1/6%20ijstrm.pdf.

¹⁷ A minimum take-or-pay clause would ensure that Reliance Energy had to buy a certain quantum of power, as per the contract; otherwise, it had to pay specified compensation to NBEIL for the shortfall in off-take. Source: Company documents.

security mechanisms¹⁸). On a conservative basis, NBEIL assumed a tariff of ₹3.30 per unit, with an escalation clause of 1 per cent per annum.

Environmental Impact

Power would be generated from the plants, using coal as the fuel source. While the plants' operations were expected to generate carbon emissions, this issue could be controlled to some extent by improved technology. The project sites were situated mainly on non-agricultural wasteland without any human habitation. There were no major towns or cities located within a radius of 20 kilometres from the plant sites and no historic sites, sanctuaries, forests, or national parks in the area.

The major potential environmental impact of the projects would involve deterioration of air quality, emission of greenhouse gases, liquid waste effluents, thermal pollution from the discharge of spent cooling water, and ash disposal. The total quantity of ash generated by the projects (300 MW at a rate of 85 per cent PLF) would be about 15.80 tonnes per hour (fly ash of 85 per cent and bottom ash of 15 per cent), with an estimated maximum ash content of 8.3 per cent. Fly ash, one of the solid wastes of thermal power plants, had some commercial value since it was used in the making of bricks, cement, and roads, so NBEIL wanted to capitalize on that opportunity. Also, the company would have to take suitable environmental protection and waste management measures to comply with the government's regulatory requirements. NBEIL had applied for environmental clearance from the Ministry of Environment, Forest and Climate Change and was waiting for approval to come through.

Risk Profile

Risk of Obtaining Approvals: NBEIL had to receive requisite clearances from various statutory authorities before it could proceed with its execution of the power projects. Although the company had proposed suitable measures to protect the environment, obtaining two sets of approvals (one for each site) from the state pollution control board and environmental clearance from the ministry might be a challenge for both projects.

Financial Closure Risk: Given the nation's subdued market conditions, combined with the high leverage of the projects and the lenders' preference for renewable energy sources and environmentally clean energy generation projects, NBEIL might not be able to obtain commitments for the full amount of the required term loans.

Equity Risk: The entire equity contribution of ₹4.16 billion for the two power projects would be brought in by NBEIL's parent company, NBVL. Although it did have the requisite financial strength, NBVL might be unable to provide the necessary level of equity due to its commitments to other companies within the group. Additionally, the sponsors might not hold a majority stake in the projects (i.e., more than 51 per cent) during the life of the term loan, thus adversely affecting the lenders' interest.

Execution Risk: NBEIL planned to execute the projects by appointing a project management consultant to oversee smooth integration of the balance of plants, BTG, etc. The company might not be able to accomplish this goal if the consultant were to fail in their duties due to lack of adequate expertise or unforeseen circumstances.

¹⁸ A payment security mechanism would ensure that Reliance Energy would provide an irrevocable letter of credit in favour of NBEIL equivalent to 100 per cent of 18 days' peak billing of contracted power off-take. Source: Company documents.

Risk of Time Overrun: NBEIL proposed the start of commercial operations at 2.5 years from the date of final financial approval. However, implementation of the projects might not take place as scheduled, resulting in a time overrun.

Risk of Cost Overrun: The project would be implemented through a number of package contracts. Since the company had not yet finalized the agreements in this regard, cost overruns might occur, thereby affecting the projects' viability parameters. As well, the estimated capital cost of the Dharmavaram plant was higher than that of the Paloncha plant, even though the size of the projects was the same (see Exhibit 3).

Technology Risk: The BTG contract would have performance warranties on key operational parameters, such as steam generator efficiency, station heat rate,¹⁹ and auxiliary power consumption.²⁰ However, the power plants might not perform up to standard, and the consequent operational inefficiency might result in lower power generation, in turn adversely affecting the company's financial performance.

Fuel Risk: Although NBVL had secured coal mining rights from Indonesia, the extracted coal would be insufficient for the need of the power plant in Dharmavaram. As such, NBEIL would have to partially rely on imported coal for its operations. The estimated landed cost of fuel in the case of the Dharmavaram project was far higher than that of the Paloncha project, even after considering the relative gross calorific value of the coal (see Exhibit 5). Additionally, the price of imported coal might escalate in future due to regulations from the government and political risk from Indonesia. Another issue might involve transportation of coal over a long distance (i.e., Indonesia to Dharmavaram). Thus, lack of a sufficient and timely fuel supply for the power plants might result in their subdued performance, leading to lower PLF. Since financials were projected based on an estimated PLF of 85 per cent, a lower PLF might lead to impaired capacity utilization and lower revenues, which would ultimately hamper the projects' debt-servicing capability.

Operation Risk: The operation and maintenance, as well as the engineering procurement and construction activities of the projects, would be carried out by NBVL. The company might not have adequate experienced staff for operating its key equipment, in turn resulting in the sub-optimal performance of the projects.

Off-Take Risk: NBEIL might be unable to sell the power as expected, leading to off-take risk. Further, the power tariff might decline in the future due to commissioning of new projects, and that situation could lead to a renegotiation of the original power purchase agreements. Hence, NBEIL might be unable to repay its debt as envisioned.

Risk of Substitutable Sources of Energy: The proposed thermal power projects might face competition from other clean sources of energy (e.g., hydro, solar, wind-based power plants). As such, power generated from the thermal projects might not draw sufficient demand, and the projected economic benefits might not be realized.

Payment Risk: Even after selling the generated power, NBEIL might not receive payments from its counter parties due to the poor financial health of the many state electricity boards that made up NBEIL's potential clientele. Hence, the financial viability of the project might be doubtful.

Exchange Rate Risk: As NBEIL was planning to procure its plants and machinery through international competitive bidding (i.e., possibly through imports), the projects might face exchange rate risk due to the

¹⁹ "Station heat rate" meant energy conversion efficiency of the power station (i.e., required number of British thermal units/hour of energy to generate one kilowatt of power in order to supply to the grid). Una Nowling, "Understanding Coal Power Plant Heat Rate and Efficiency," *Power*, January 2, 2015, accessed October 1, 2016, www.powermag.com/understanding-coal-power-plant-heat-rate-and-efficiency/.

²⁰ "Auxiliary power consumption described the energy required to run the power plant in order to generate the power."

appreciation of the U.S. dollar against the Indian rupee, a situation that would adversely affect the project's profitability.

Interest Rate Risk: NBEIL might face interest rate risk since a floating interest rate had been proposed for the term loan of ₹9.70 billion (with a long term of 12 years).

Regulatory Risk: Since the power sector was regulated by the Government of India, in the future, NBVL's power projects might face certain restrictions (e.g., trading of power, pricing, coal mining).

Force Majeure Risk: The project might face a risk of *force majeure* (i.e., a chance occurrence or unavoidable accident) in terms of the earthquake, floods, and other natural disasters, apart from terrorist attacks. Hence, the owners and lenders of the projects might be at risk in the event of such occurrences.

DECISION

The financing for NBVL's thermal power project would involve certain costs from the borrowers' point of view. Unlike corporate financing, project financing could be relatively complex in structure (sponsors, SPV, lenders, fuel suppliers, power purchasers, government), costly (fee to be paid to arrangers, engineers, legal consultants), and time-consuming (structuring the project finance, signing the contractual agreements, syndicating the term loan). Further, the proposal would have to be evaluated not only from the standpoint of the above-stated factors for risk potential but also in terms of the banks' general sanction norms (see Exhibit 7) with regard to syndication of the project's financing.

Given all these considerations, did the coal-fired thermal power plants offer a good investment vehicle for the lenders?

EXHIBIT 1: NAVA BHARAT VENTURES LIMITED'S MANUFACTURING FACILITIES

Manufacturing Facility	Installed Capacity	Location
Ferro alloys	200,000 tonnes per annum	Orissa and Andhra Pradesh
Sugar	4,000 tonnes of sugar cane crushing per day	Andhra Pradesh
Power	301 MW	Orissa and Andhra Pradesh

Source: Company documents.

EXHIBIT 2: ENERGY STATUS IN INDIA

Region	Peak Load (MW)			Energy Requirement (million units)		
	2011-12	2016-17	2021-22	2011-12	2016-17	2021-22
Northern	48,137	66,583	89,913	294,841	411,513	556,768
Western	47,108	64,349	84,778	294,860	409,805	550,022
Southern	40,367	60,433	80,485	253,443	380,068	511,659
Eastern	19,088	28,401	42,712	111,802	168,942	258,216
North Eastern	2,537	3,760	6,180	13,329	21,143	36,997
All India	152,746	218,209	298,253	968,659	1,392,066	1,914,508

Source: Electric Power Information Society, *17th Electric Power Survey of India* (Delhi: Central Electricity Authority, March, 2007); The 17th Electric Power Survey of India was conducted in March 2007 by Central Electricity Authority with an objective of forecasting annual electricity demand for each state in India until the year 2022.

**EXHIBIT 3: COST BREAKDOWN FOR NAVA BHARAT ENERGY INDIA LIMITED'S PROJECTS
(in ₹ millions)**

Cost Component / Projects	Paloncha	Dharmavaram	Total
Hard Costs			
Land and civil works	750	950	**1,700
Plant and machinery*	4,820	5,070	***9,890
Soft Costs			
Preliminary and pre-operative expenses	70	70	140
Contingent expenses	110	120	230
Interest during construction	760	830	****1,590
Margin money for working capital	150	160	*****310
Total Cost of Projects	6,660	7,200	13,860

*Including boiler, turbine, and generator. Generally, the boiler, turbine, and generator was the vital component of the thermal power plant and comprised around 50 per cent of its total project cost.

**This figure was based on the estimates given by the architect.

***This figure included the cost of transmission line of ₹950 million from the sites of the projects to the power grid/station.

**** Interest during construction was computed based on proposed disbursements of term loan as per the implementation schedule of projects. Promoters of NBEIL proposed bringing in equity of 25 per cent upfront for the projects.

***** The total current assets of the company during FY 2012-13 (i.e., the first year of commercial operation of the projects) were estimated at ₹1.24 billion, which included two months' stock of raw material, receivables for one month, and 1 per cent of the gross block for maintenance spares. The working capital borrowing was considered to be 75 per cent of the current assets, which worked out to ₹930 million, and a provision of ₹310 million was made toward margin money for working capital.

Source: Company documents.

EXHIBIT 4: PROPOSED TERM SHEET FOR SYNDICATION OF NAVA BHARAT ENERGY INDIA LIMITED'S TERM LOAN OF ₹9.70 BILLION

Borrower	SPV: NBEIL, wholly owned by NBVL
Purpose of term loan	Construction and operation of 2 x 150-MW coal-fired power plants located in Dharmavaram and Paloancha, Andhra Pradesh, India
Cost of the projects	₹13.86 billion (Paloancha plant: ₹6.66 billion; Dharmavaram plant: ₹7.20 billion)
Equity contribution	₹4.16 billion from NBVL's internal sources; constituting 30 per cent of total cost of the projects
Credit facilities	Term loan of ₹9.70 billion; constituting 70 per cent of total cost of the projects
Security	The term loan would be secured by first charge on all immovable and movable assets of the project (present and future) as well as NBEIL's entire cash flows
Date of financial closure	October 1, 2009
Maturity and repayment of term loan	The total life of term loan would be 12 years (projects' execution period of 2.5 years + moratorium* of half a year + repayment period of nine years). As such, the term loan would be repaid in 36 quarterly instalments, taking effect on October 1, 2012.
Arranger	Development Bank Limited, a leading project-finance bank in India
Underwriting	The arranger would underwrite 100 per cent of the term loan, with the expectation that the funds would be provided by the lenders in a syndication arrangement.
Underwriting fee	0.25 per cent of the term loan
Interest rate	The interest rate on the term loan was proposed as a variable rate (i.e., 12 per cent per annum) at the time of syndication and would be reset every two years from the date of commencement of commercial operations on April 1, 2012.
Commitment fee	The borrower would pay 0.25 per cent on undrawn amount of term loan.
Drawdowns	Drawdowns would be made in accordance with the implementation schedule of the projects and subject to approval by the lenders' independent engineer.
Distribution of operating cash flows of the projects (cash flow waterfall mechanism as shown in Exhibit 8)	The borrower would distribute its operating cash flows during the life of the term loan only after meeting certain requirements. Typically, these requirements were payment of operating expenses, debt service, and debt service reserve account equivalent to two quarterly instalments of term loan repayment, and interest on the term loan for a period of six months, subject to maintaining a debt service coverage ratio of 1.50 x.
Covenants of term loan	The borrower should not obtain additional debt during term of the loan without specific approval of the lenders; the borrower should obtain approval of the lenders before declaration of dividends during tenor of the loan; the borrower should maintain equity stake of its promoter not less than 51 per cent during the term of the loan.
Events of default	Non-payment of interest or principal of the term loan; interest coverage ratio of less than 2x during term of the term loan; deficit in achieving projected revenues of the projects by more than 20 per cent in a financial year; bankruptcy
Other conditions	The arranger should receive satisfactory technical evaluation report from the lenders' independent engineer; the arranger should approve implementation schedule, total cost, and financial projections of the projects.

*Moratorium was the time period during the life of a term (project) loan when the borrower was not required to make any repayment since the underlying project was under implementation. It was the gestation (waiting) period before the repayment of a term loan began. Normally, the repayment began after the loan was disbursed in full and after commencement of commercial operations of the project.

Source: Company documents.

EXHIBIT 5: ASSUMPTIONS OF NAVA BHARAT ENERGY INDIA LIMITED'S PROJECTS

The assumptions underlying the financial projections of the power projects are given below.

Operational Parameters

Parameter	Assumed
Plant Load Factor (PLF)	
• Actual	85%
• Normative	85%
Auxiliary consumption	9%
Gross station heat rate (kcal/kWh)	2,400

Energy Parameters

Parameters	Paloncha	Dharmavaram
Fuel	Indigenous coal	*Imported coal
Gross calorific value	3,450 kcal/kg	5,500 kcal/kg
Landed price of coal (as of March 31, 2012)	₹1,011/tonne	₹3,614/tonne
Exchange rate	US\$1 = ₹49	
Cost escalation for coal	3% per annum	
Coal transit loss	0.80%	

* Compared to coal from India, coal from Indonesia had a higher gross calorific value with more sulphur content (i.e., up to 3 per cent higher) and moisture; hence, Indonesian coal was more expensive than Indian coal.

Operation and Maintenance Expenses (as per the guidelines of Central Electricity Regulatory Commission)

Operation and maintenance expenses during base year (based on the prices as of March 31, 2012)	₹1.55 million per MW
Cost escalation	4% per annum

Source: Company documents.

EXHIBIT 6: SUMMARY OF FINANCIAL PROJECTIONS OF NAVA BHARAT ENERGY INDIA LIMITED

Projected Profitability Statement—Nava Bharat Energy India Limited (in ₹ millions)															
Details as of March 31 per year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Capacity (MW)	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Plant load factor	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Actual generation (million units)	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234	2,234
Auxiliary consumption (million units)	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201
Units available for sale (million units)	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033	2,033
Average merchant tariff (₹ per unit)	3.30	3.33	3.37	3.40	3.43	3.47	3.50	3.54	3.57	3.61	3.65	3.68	3.72	3.76	3.79
Revenue	6,708	6,775	6,843	6,912	6,981	7,050	7,121	7,192	7,264	7,337	7,410	7,484	7,559	7,635	7,711
Expenditure															
Cost of fuel	3,036	3,127	3,221	3,317	3,417	3,519	3,625	3,734	3,846	3,961	4,080	4,202	4,328	4,458	4,592
Operation & maintenance expenses	484	503	523	544	566	588	612	636	662	688	716	744	774	805	837
Total Expenditure	3,519	3,630	3,744	3,861	3,983	4,108	4,237	4,370	4,507	4,649	4,796	4,947	5,103	5,263	5,429
Profit Before Depreciation, interest, and Tax (PBDIT)	3,189	3,146	3,099	3,050	2,998	2,943	2,884	2,822	2,757	2,687	2,614	2,537	2,456	2,371	2,282
Interest on term loan	1,132	1,033	903	774	645	516	387	258	129	32	0	0	0	0	0
Interest on working capital	112	112	114	116	118	120	122	125	127	130	132	134	137	140	143
Depreciation	680	680	680	680	680	680	680	680	680	680	680	680	680	680	680
Profit Before Tax	1,266	1,320	1,402	1,480	1,555	1,627	1,695	1,759	1,820	1,845	1,802	1,723	1,639	1,551	1,459
Current tax	200	210	220	240	250	260	270	280	290	300	290	280	260	250	230
Deferred tax	0	0	0	0	0	0	0	-10	-40	-70	-90	-110	-130	-140	-150
Profit After Tax	1,066	1,110	1,182	1,240	1,305	1,367	1,425	1,489	1,570	1,615	1,602	1,553	1,509	1,441	1,379
Gross Cash Accruals	1,746	1,790	1,862	1,920	1,985	2,047	2,105	2,159	2,210	2,225	2,192	2,123	2,059	1,981	1,909

EXHIBIT 6 (CONTINUED)

As on March 31	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Liabilities																		
Shareholders' Funds																		
<i>Equity</i>	1,040	2,690	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160	4,160
Reserves & Surplus	0	0	0	970	1,990	3,080	4,230	5,440	6,710	8,040	9,430	10,900	12,430	13,930	15,390	16,790	18,130	19,410
Net Worth	1,040	2,690	4,160	5,130	6,150	7,240	8,390	9,600	10,870	12,200	13,590	15,060	16,590	18,090	19,550	20,950	22,290	23,570
Borrowed Funds																		
Long-Term Debt	2,420	6,290	9,700	9,160	8,060	6,990	5,910	4,840	3,760	2,690	1,610	540	0	0	0	0	0	0
Working Capital Borrowings	0	0	0	930	940	960	980	990	1,010	1,030	1,050	1,070	1,090	1,110	1,130	1,160	1,180	1,200
Total Borrowed Funds	2,420	6,290	9,700	10,090	9,000	7,950	6,890	5,830	4,770	3,720	2,660	1,610	1,090	1,110	1,130	1,160	1,180	1,200
Total Liabilities	3,460	8,980	13,860	15,220	15,150	15,190	15,280	15,430	15,640	15,920	16,250	16,670	17,680	19,200	20,680	22,110	23,470	24,770
Assets																		
Gross Fixed Assets (including capital work-in-progress)	3,460	8,980	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550	13,550
Less: Accumulated Depreciation	0	0	0	680	1,360	2,040	2,720	3,400	4,080	4,760	5,440	6,120	6,800	7,480	8,160	8,840	9,520	10,200
Net Fixed Assets	3,460	8,980	13,550	12,870	12,190	11,510	10,830	10,150	9,470	8,790	8,110	7,430	6,750	6,070	5,390	4,710	4,030	3,350
Current Assets	0	0	0	1,240	1,250	1,280	1,300	1,320	1,350	1,370	1,400	1,430	1,450	1,480	1,510	1,540	1,570	1,600
Cash Balance	0	0	310	1,110	1,710	2,400	3,150	3,960	4,820	5,760	6,730	7,760	9,360	11,440	13,460	15,410	17,280	19,080
Deferred Tax Assets	0	0	0	0	0	0	0	0	0	0	10	50	120	210	320	450	590	740
Total Assets	3,460	8,980	13,860	15,220	15,150	15,190	15,280	15,430	15,640	15,920	16,250	16,670	17,680	19,200	20,680	22,110	23,470	24,770

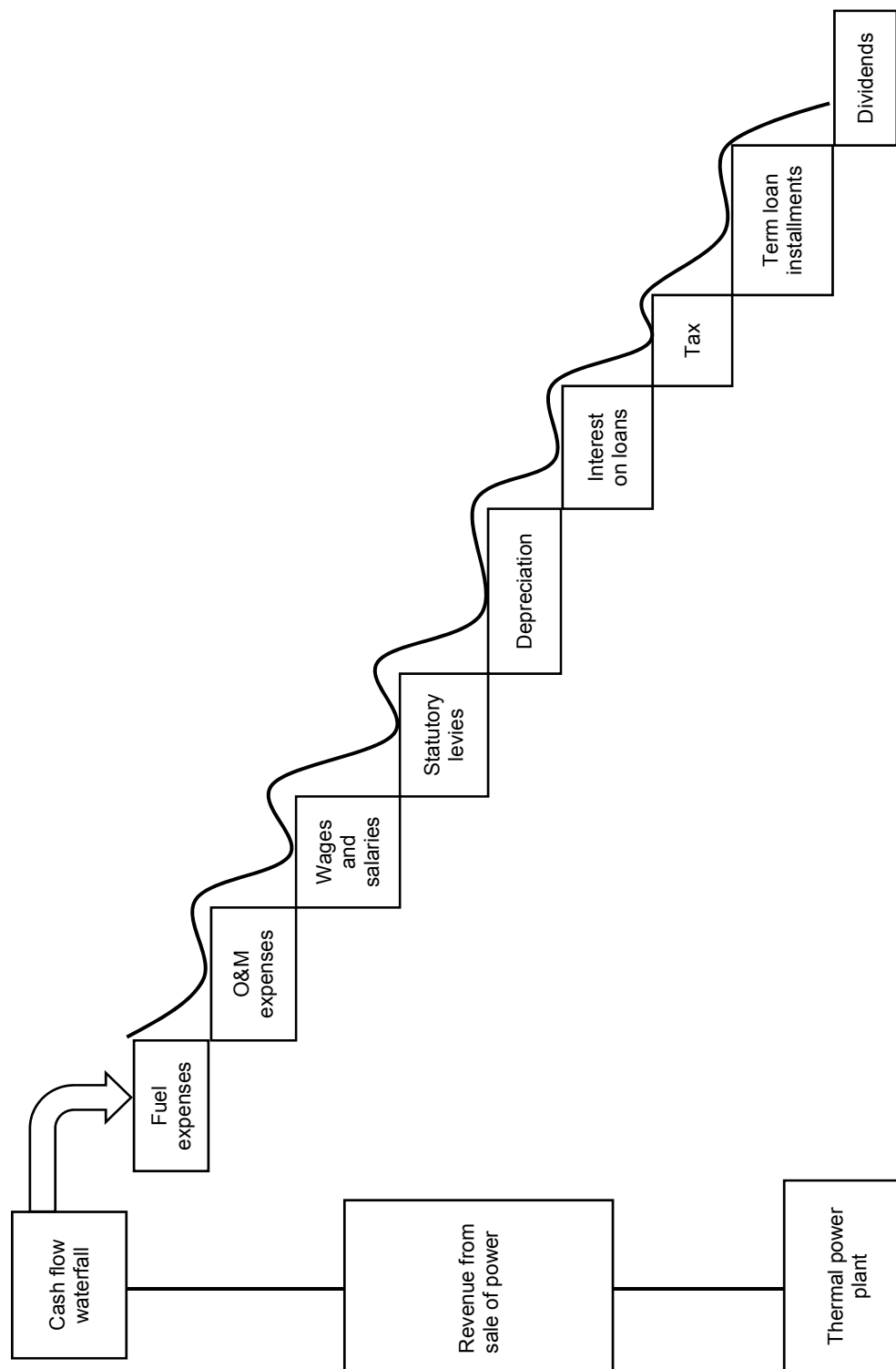
Source: Company documents.

EXHIBIT 7: GENERAL SANCTION NORMS FOR PROJECT FINANCE IN INDIA

Criteria	Lending Norms
Profitability	Promoters should have an impeccable track record and demonstrate the ability to withstand shocks.
Credit history	No known default by company or group
Promoters' contribution	Minimum of 25 to 30 per cent of total cost of the projects
Interest coverage ratio	Minimum of 2x
Debt service coverage ratio	Average of 1.50x and a minimum of 1.20x in each year
Fixed assets coverage ratio	Minimum of 1.25x
Leverage	Project's debt-to-equity ratio should be a maximum of 2.33x; in the case of infrastructure projects, the ratio can be up to 3x.
Internal rate of return	Around 15 per cent and should be above the project's cost of capital.

Source: Chandra Prasanna, Chapter 18 in *Projects: Planning, Analysis, Selection, Financing, Implementation, and Review*, 8th ed. (New Delhi: McGraw Hill Education [India] Private Limited, 2014), 18.01–18.49.

EXHIBIT 8: CASH FLOW WATERFALL MECHANISM FOR NAVA BHARAT ENERGY INDIA LIMITED



Source: Authors' creation.