

1. Explain the benefits of project financing and the rationale behind the creation of NBEIL as a special purpose vehicle (SPV) of the parent company, NBVL.

A: The benefits of project financing allow large scale, capital intensive projects to be financed off the balance sheet of the parent company. The parent company, NBVL, created an SPV called Nava Bharat Energy India Limited (NBEIL) to accomplish that. The benefits of this include separating the company's liabilities, and with that comes key advantages that help the parent company. These benefits include isolating risk, where the SPV keeps project risks separate from the parent company's existing businesses and protects the parent company's assets from project related liabilities. Risk is assumed by the appropriate parties, one company cannot be taken down for project oversights not in their control (gives parent company some protections). Secondly, large project financing relies on the future cash flow of the SPV, not the parent company, where lenders receive the first charge on project cash flow through a structured waterfall mechanism. Future money equals future cash flow and the banks do not rely on the parent companies assets/money to repay the loan, instead it relies on the money the project will make in the future. This in turn allows for greater leverage (can borrow more); for instance, the project has a high debt-to-equity ratio (2.33) that could not have been taken on by the parent company and is instead carried on the SPV's balance sheet. If NBVL wanted to borrow this much debt on its balance sheet it probably wouldn't have gotten approved because in doing so NBVL would look over leveraged and risky to lenders. NBVL keeps its financial health and the project gets completed using the SPV without weakening NBVL's credit or overloading it with debt. Without the SPV, NBVL would not be able to complete capital intensive, large scale projects. The SPV is important because it keeps debts separate, holds project contracts, enables lenders to control the project's cash flow, gives leverage to the project for a higher loan amount, and simplifies the web of obligations tied to the project.

2. Comment on the significance of NBEIL's cash flow waterfall mechanism.

A: The cash flow waterfall mechanism accounts for how the project will spend and distribute its money. It shows the order in which cash generated by the plant must be used, and this order is controlled by the lender. The waterfall protects the project, ensures the plant operates correctly, and guarantees that lenders get paid before anyone else. The mechanism is extremely important because NBEIL can only distribute its operating cash flows after meeting several strict requirements. (Page 10) These include paying all operating expenses, servicing debt, funding a debt service reserve account equal to two quarterly installments, and maintaining a Debt Service Coverage Ratio (DSCR) of 1.50x. DSCR is a fraction equal to the cash flow available for debt service divided by total debt service (interest + principal). A DSCR of 1.0 means the project has just enough cash to pay its debt, a DSCR greater than 1.0 means the project has more than enough cash to cover debt payments, and a DSCR less than 1.0 means the project does not generate enough cash to meet its debt obligations. Because NBEIL must maintain a DSCR of at least 1.50x, the structure ensures lenders are paid first, protects the

project from cash shortages, prevents NBVL from pulling money out prematurely, and maintains the financial stability needed for the project to operate and repay its loans.

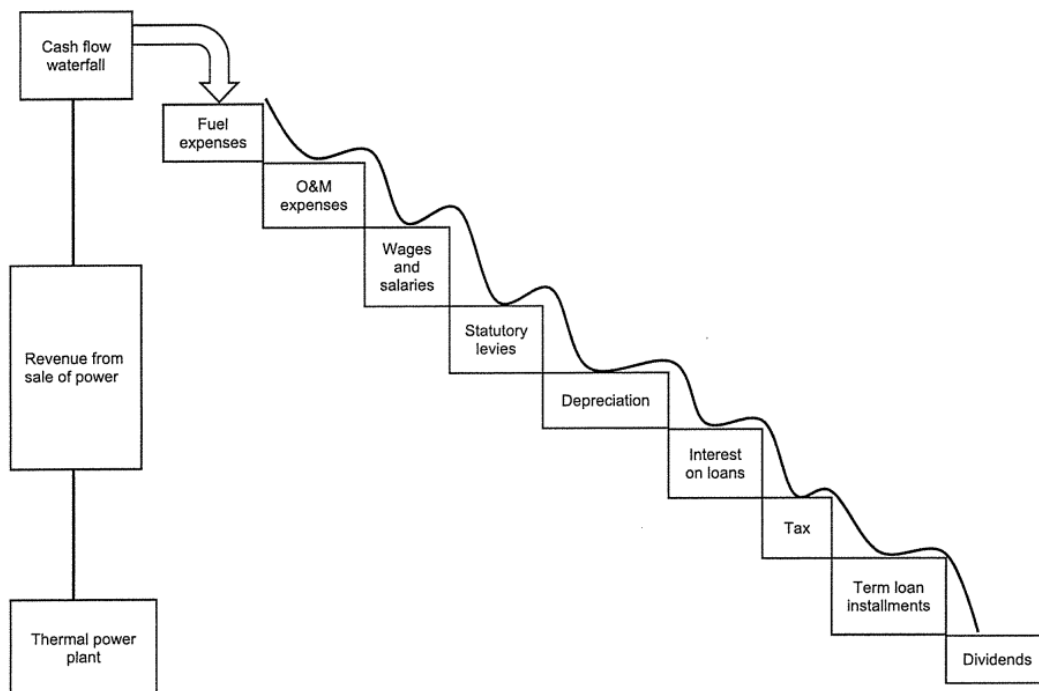
The borrower (NBEIL) is not allowed to take out or distribute any operating cash flows unless it first satisfies several strict requirements:

The SPV must first pay:

1. Operating expenses (O&M, fuel, salaries, environmental costs)
2. Debt service (interest + principal)
3. Debt Service Reserve Account (DSRA) funding equal to two quarters of loan payments
4. Interest for six months ahead
5. Maintain a minimum DSCR of 1.50x

Once these steps are fulfilled, NBEIL can distribute cash to NBVL or shareholders. Image of the waterfall is shown below.

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



Source: Authors' creation.

3. Calculate the debt service coverage ratio (DSCR) and internal rate of return (IRR) on the power plant project and perform a sensitivity analysis on the key financial parameters (fuel expenses, plant load factor [PLF], interest rate)

A: The plant begins full operation in 2013 thus 2013 is the first operating year, this is how I will calculate the DSCR and IRR. CFADS (Cash flow available for debt services). Equations done in word.

$$\text{PBDIT} = 3,189$$

$$\text{Interest on Term Loan} = 1,132$$

$$\text{Principal Repayment} = 9,160 - 8,060 = 1,100$$

$$\text{Current Tax} = 200$$

$$\text{Depreciation} = 680$$

$$\text{CFADS} = \text{PBDIT} - \text{Taxes} = 3,189 - 200 = 2,989$$

$$\text{Debt Service} = \text{Interest} + \text{Principal} = 1,132 + 1,100 = 2,232$$

$$\text{DSCR} = \frac{\text{CFADS}}{\text{Debt Service}} = \frac{2,989}{2,232} = 1.34x$$

Above the minimum of 1.20x but below the target of 1.50x

IRR is calculated using the formula in which the total project cost (the initial negative cash flow) is added to the summation of the discounted Free Cash Flow to the Firm (FCFF) over the 15 projected operating years. In this case, FCFF is computed as PBDIT - Tax. IRR needs to equal to a net present value (NPV) of 0.

$$0 = -13860 + \sum_{t=1}^{15} (\text{FCFF}_t / (1 + r)^t)$$

This was done in excel:

Year	PBDIT	Tax	FCFF
Year 0 (Construction)			-13860
2013	3189	200	2989
2014	3146	210	2936
2015	3099	220	2879
2016	3050	240	2810
2017	2998	250	2748
2018	2943	260	2683
2019	2884	270	2614
2020	2822	280	2542
2021	2757	290	2467
2022	2687	300	2387
2023	2614	290	2324
2024	2537	280	2257
2025	2456	260	2196
2026	2371	250	2121
2027	2282	230	2052
		Project IRR	18%

The power plant project will generate an IRR of 18%. This is very good, the standard is roughly around 15% - 25%.

Sensitivity analysis: Adjust key parameters like fuel cost ($\pm 10\%$), PLF ($\pm 10\%$), and interest rates ($+1\%$) to see how those changes affect DSCR and IRR. Basically a “what-if” exercise. We want to analyze the over-performance, under-performance, and base-case. Performed in Excel and linked below.

[Nava_Bharat_Completed excel.xlsx](#)

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																		
Equity	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	1,260	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	8,860	10,040	11,440	13,100	15,040	17,280
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.

4. Evaluate NBEIL's project by commenting on its managerial, technical, market, environmental, and financial aspects. Is it wise to proceed to syndicate a term loan for the coal-fired power project?

A: Managerial:

- NBVL has good leadership and a strong company structure, as shown in the document. The parent company is well managed, and both the chairman and the managing director are experienced in their respective professions. NBVL has also executed properly on previous large-scale, capital-intensive projects. The creation of NBEIL as an SPV demonstrates the competence of higher management in mitigating risk, and the waterfall mechanism ensures proper cash-flow management so that lenders are paid and the project remains profitable.

Technical:

- NBEIL proposed several key items that demonstrate the company's competence. First, the power plant uses coal-fired subcritical technology, which enables higher operating efficiency, drives down the cost per unit of power generated, and reduces carbon emissions. They hired a subcontractor to implement this technology using circulating fluidized bed combustion, chosen for its inherent advantages such as efficient combustion and the flexibility to use low-grade coal without affecting the plant's performance or output.
- Secondly, the power plant is designed with a low maximum decibel level of 85, measured at a distance of 1.5 meters. The plant is designed in accordance with regulations, relies on trusted suppliers, and uses proven technology to achieve its goals. The plant design is strategically planned to operate at a plant load factor of 85%, and its location is well connected to both a water source and a mine.

Market:

- Need in the market for power, consistent demand for power because of persistent shortages with constant power deficits. Government estimates stated that power consumption would exceed supply in 2022. There is an increase in tariffs for outsourcing power, and it is consistently on the rise. The biggest risk in the market is the exposure to merchant pricing. The market needs this power plant.

Environmental:

- The plant is located in the proper area, away from residential zones, on non-agricultural land, with no displacement of residents, and not on government-protected lands. It is implementing technology to mitigate environmental impact in the inherent design of the

plant while also adhering to government regulations by using pollution control systems to reduce carbon footprint, water pollution, and other environmental degradations. The company was in the process of acquiring clearances from the Ministry of Environment and the Forest Ministry. With a properly designed plant (which they are doing) and compliance with the law, the power plant is within its jurisdiction to operate.

Financial aspects:

- Total project cost is 13.86 billion, leveraged through an SPV and financed at a high debt-to-equity ratio. This is typical with large infrastructure projects in India. The waterfall mechanism will mitigate financial risk if the company adheres to its own policies. The projected balance sheet displays strong cash flow, good revenue, and increasing amounts of cash accruals. The IRR is 18%, which is excellent, and the DSCR is 1.34x, which meets lender requirements. Financially, the project is strong, and there is a well-planned system to manage the financial aspects of the plant.

Yes, the company is structured and managed correctly according to the books. Therefore, I would approve a term loan for the power plant. Everything they are showing me as the “lender” is positive.

5. Create a "Spider Diagram" of the Nava Bharat Project by email to the Professor as a .pdf before class.

A: Shown below

