

FINANCING LONG TERM DEBT CAPITAL REQUIREMENTS OF SJVN LIMITED, A PUBLIC SECTOR POWER CORPORATION ON AN EXPANSION DRIVE: A STUDY OF PROJECT APPRAISAL PROCEDURES

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ABSTRACT

India, the world's second fastest growing major economy, desperately needs to expand its electricity infrastructure to reduce peak power shortage and provide electricity to millions of rural households, as well as to keep its resource-hungry industry on the move. Planning Commission of India and the Power Ministry have reached a consensus over fixing the capacity addition target of the country at 75,785 MW during the 12th plan. The global impetus and inclination towards renewable power sources such as hydro, wind and solar power etc. alongwith the Government of India's policies has created a window of opportunity in these Sectors. The SJVN Limited, a public sector power corporation promoted jointly by Government of India and Government of Himachal Pradesh, is well prepared to seize the opportunity available in the sector. To meet its ambitious capacity addition and diversification plans, the Corporation require to raise huge debt capital in line with general debt equity norm of 70:30. This paper aims to study the challenges that exist in financing of hydro power projects and the project appraisal process being used by domestic and foreign lenders. The study reveals that the major challenges being faced by the sector which are deterrent in the free flow of investment in hydro sector are basically the various risks associated with construction of projects. Furthermore, the study finds out that multilateral development banks like World Bank and Asian Development Bank gives considerable emphasis to environment and social appraisal in addition to techno-financial viability of the project.

KEYWORDS: Debt Capital, Internal Rate of Return, Multilateral Development Banks, Net Present Value, Project Appraisal

INTRODUCTION

SJVN Limited is a Public Sector Power Corporation engaged in operation of already executed 1500 MW underground Nathpa Jhakri Hydro Power Station and implementation of a large number of hydro power projects in India and neighboring countries like Bhutan and Nepal. The corporation has expanded its origins and envisions developing itself into a fully diversified

Transnational Power Sector company in all types of conventional and non conventional forms of energy. In this direction the corporation is exploring various opportunities in wind, solar, power transmission and even conventional forms of energy in addition to hydro power.

For its existing Nathpa Jhakri Hydro Power Station which is the largest underground hydropower project of the country, the debt capital was raised from the World Bank. The long term loan of US Dollar 400 Million has also been arranged from the World Bank for its 412MW Rampur Hydro Electric Project which is under advance stage of execution. The corporation, presently, is in the lookout for raising huge debt capital requirements for execution of its large number of upcoming projects.

2.0 OBJECTIVES OF THE STUDY

1. To study the specific challenges in financing of hydroelectric projects in India
2. To study and understand the actual project appraisal procedures being adopted by the domestic financial institutions of India like Power Finance Corporation (PFC) and various commercial banks as well as that of Multilateral Development Banks (MDBs) like Asian Development Bank (ADB) and World Bank (WB) and to present the same for easier understanding and comprehension.

3.0 CHALLENGES IN FINANCING OF HYDRO ELECTRIC POWER PROJECTS

The following risks, mainly associated while execution of the project, could delay the execution of the project leading to cost and time over run resulting negative impact on the viability of the project:

- Un-certainties like heavy rainfall, floods, landslides.
- Legal issues related to land acquisition, contractual negotiation, law & order.
- Construction related like accidents, design changes, geological surprises.
- Strikes, disputes with local residents etc.
- Delay in statutory approvals leading to delay in financial closure.
- Political interference, half hearted support from bureaucracy, general opposition for changes, environmentalist aggressive opposition.

Other major issues which negatively impact the hydro power sector are:

1. General dearth of resourceful contracting agencies, willing to invest in the appropriate technology especially to execute the job relating to underground works in a given time frame.
2. Clearances, specifically the forest and environmental takes a long time due to cumbersome procedures in place.

3. Rehabilitation, re-settlement and environmental issues are aggressively pursued by the NGOs inspite of the clearances provided by the Govt. Agencies which delays the project, add to the cost and brings bad publicity to the promoters.
4. A number of facilities like access road, bridges, widening of roads etc. has to be taken up by the promoters which constitutes 5-10% of the project cost and add to the capital cost of the project.

Because of above risks which make the borrowing costlier coupled with longer construction phase, high up-front cost of development etc., the banks and financial institutions hesitate to come forward to liberally fund the hydro power projects.

4.0 PROJECT APPRAISAL

Appraisal is the analysis of the proposed project to determine its merit and acceptability in accordance with established criteria. Appraisal involves a careful checking of the basic data, assumptions and methodology used in project preparation, an in-depth review of the work plan, cost estimates and proposed financing, an assessment of the project's organizational and management aspects, and finally the validity of the financial economic and social benefits expected from the project. On the basis of such an assessment, a judgment is reached as to whether the project is technically sound and financially viable from the point of view of the economy as a whole.

For the FIs, the prime objective of the project appraisal is to satisfy itself that the proposed project is technically feasible and financially viable and is likely to be implemented within the projected time frame so that the loan provided is expected to be repaid alongwith the interest as planned.

5.0 GENERAL PRINCIPLES OF LENDING BEING ADOPTED BY FINANCIAL INSTITUTIONS

Almost all the Financial Institutions (FIs) follows the following principles while lending for a project:

Safety:

It essentially means ensuring that the borrowed capital is repaid. This factor has assumed great importance due to stringent NPA norms. To go in for third party guarantee for repayment of loan and collateral security is also common with FIs.

Purpose:

Funds are provided for an approved purpose only and the FIs have formulated lending policy in respect of purpose.

End Use:

Bankers invariably ascertain that money lent has been used for the purpose for which the same was granted and has not been diverted elsewhere.

Need Based Finance:

Funds are provided after ascertaining the credit needs of the borrower. The FIs ensure that the funds provided are neither more nor less than the actually required by the borrower i.e. the project is neither over nor under financed.

Own Stake:

A significant financial stake is ensured by the promoters in the project so that the promoters do not lose interest in the project in between. This is taken care through the debt equity norms of the FIs.

6.0 PROJECT APPRAISAL PROCESS

A typical project appraisal process, presently in place, in term lending financial institutions includes:

- 1. Entity and Managerial Appraisal**
- 2. Market or Commercial Appraisal**
- 3. Technical Appraisal**
- 4. Financial Appraisal**
- 5. Economic or Social Appraisal**
- 6. Risk or Sensitivity Analysis**

1. Entity and Managerial Appraisal

This involves analysis of three Cs, the Character, Capacity and Capital of the borrower. Character implies honesty, integrity, and reputation in the market; Capacity means the knowledge of the borrower about his business and ability to conduct the affairs successfully; Capital refers to the funds to be employed by the borrower in the project.

Managerial competence and integrity is an extremely important pre-requisite to translate a project viable on paper into a real life success. The followings are looked at by FIs to form a judgment regarding the managerial competence and resourcefulness:

- Track record in earlier projects.
- Resourcefulness of the promoters.
- Understanding of the business.
- Commitment to the project.

The sources of information available to assess the borrower comprises of working results of the existing units, market reports, report from the earlier bankers regarding operation of the account and loan repayment track, assets and liabilities statement of promoters, income tax returns etc.

In case of large scale projects the FIs also evaluates the key personnel and managerial team finalized for the execution of project so as to get the answer of the questions; (a) is technical competence available? (b) are the authority and responsibility properly linked? (c) does the

organizational setup encourage delegation of authority? (d) are the specialist required for the project arranged? (e) what are training and development arrangements? etc. In case of partnership / proprietary concerns FIs also takes into account the problem of succession and sharing of work amongst them. In case of a limited company the study of the Directors is also made through discussions.

2. Market or Commercial Appraisal

The commercial aspects of a project include the arrangements for marketing the output produced by the project and the arrangement for the supply of inputs needed to build and operate the project. On the output side, careful analysis of the proposed market for the project's production is essential to ensure that there will be an effective demand at a remunerative price.

The reasonableness of the demand projections supplied by the promoters are verified by utilizing the findings of available reports/ surveys, industry association/ planning commission projections, and independent market survey (sometimes commissioned with the expense borne by the promoters). Assessment of the adequacy of the marketing infrastructure planned in terms of promotional effort, distribution network, transport facilities stock levels etc. is also made. The knowledge, experience and competence of the marketing department are judged.

3. Technical Appraisal:

This refers to analysis of the project for determining the technical viability. Technical appraisal provides a comprehensive review of all aspects of the project and focuses mainly on the following:

- Suitability of the technology selected,
- Engineering know how and technical collaborations
- Product mix
- Installed capacity and utilization of capacity in initial years
- Manufacturing Process
- Suitability of the location / site in terms of accessibility
- Administrative as well as office buildings
- Plant and equipments
- Raw materials and consumables
- Manpower requirements
- Break-even point
- Implementation schedule and consequences, in case, project implementation is delayed

Besides above, one of the important aspect of technical appraisal of the project is evaluation of supplier of the machinery in terms of reasonableness of prices of the equipments, delivery schedule, reputation of supplier, financial position of the supplier, performance guarantees etc. A feedback is generally obtained by the FIs from the existing customers and banker of the supplier.

4. Financial Appraisal

The main objective of financial appraisal is to determine the requirements of funds/timing and the expected returns of investment from the points of view of the various parties involved in the financing of the project. The financial appraisal is considered to be most important part of the project appraisal as it is conducted to decide whether the project is worth financing or not considering its capability of servicing debt.

The financial appraisal involves checking up of cost of the project; financing plan; preparation of financial forecasts which includes projected income statement, cash flow statements and balance sheet; calculation of various financial ratios etc., followed by ascertaining of financial viability i.e. the return on capital of the project to take a decision regarding financing of the project by using standard techniques.

Financial Appraisal Techniques / Methods

There are various techniques for estimating the worth or viability of the project but there is no one best technique as some are better than others and some are deficient. The traditional non-discounting techniques like Pay Back Period, Profitability Index, Rate of Return method, which are now limited to academic interest only and are not being used by the FIs for project appraisals, are not discussed here.

In day to day practice the FIs have their own independent criteria and credit rating methodology for arriving at the credit rating of each project. However, the following discounted methods are used by almost all the FIs including MDBs:

- (i) Net Present Value (NPV) or Net Present Worth (NPW)
- (ii) Internal Rate of Return (IRR)

Net Present Value (NPV)

The net present value (NVP) is the sum of the present values of the expected incremental positive and negative net cash flows over a project's anticipated lifetime. In simple words NPV of a project is the present value of future cash inflows minus the initial investment or cash out flow. In NPV analysis selection of discount rate is important. The discount or cut-off rate is usually the marginal cost of money to the firm for which the analysis is being done. This often will be the rate at which the enterprise is able to borrow money. Sometimes the discount rate chosen is the borrowing rate the nation needs to pay to finance the project. In most developing countries, it is assumed to be somewhere between 8 and 15 percent in real terms. In India, the discount rate is generally taken at 12% by the FIs.

The NPV formula for the annual net cash flow can be written out in its component present values as follows:

$$NPV = C_0 + C_1/(1+r) + C_2/(1+r)^2 + \dots + C_n/(1+r)^n$$

Where, 'C₀' is the initial investment or cash out flow, 'C₁' is cash in flow during first year and 'r' is the discount rate.

During the analysis, if the NPV is equal to zero, then investor can expect to recover their incremental investment and earn a rate of return on the capital equal to the discount rate used to compute the present values. A NPV greater than zero means that investors can expect not only to recover their capital investment and earn a rate of return equal to the discount rate, but also to receive an addition to its real net worth equal to the positive amount of the NPV. In other words, a positive NPV project outperforms the capital market and makes investors better off. If the NPV is less than zero, then investors cannot expect to earn a rate of return equal to the discount rate, nor possibly to recover their invested capital, and hence, their real net worth is expected to decrease. **Only projects with positive NPVs are considered beneficial and are financed by the FIs.**

Sample Calculation of NPV is given hereunder:

(Rs. in Crores)					
Year	Initial Investment	Future Cash inflows or Return	Present Value of future cash in flows		Net Flow
1	2	3	4	5	6=5-2
0(2012-13)	1300	0	0	0	(-)1300.00
1(2013-14)	0	400	$400/(1+0.12)^1$	357.14	357.14
2(2014-15)	0	450	$450/(1+0.12)^2$	358.74	358.74
3(2015-16)	0	450	$450/(1+0.12)^3$	320.30	320.30
4(2016-17)	0	500	$500/(1+0.12)^4$	317.70	317.70
				NPV	53.00
At discount rate of 12%					

Internal Rate of Return (IRR)

Internal Rate of Return refers to the rate of return that the project is expected to generate in real terms based on its project cash flows accruing over its expected lifespan. From computation point of view IRR is that rate of return (from a project) at which present value of the future cash inflows shall be equal to initial investment resulting in Net Present Value of zero. In other words, it is that discount rate which makes the NPV of the incremental net benefit stream or incremental cash flow equal to zero.

The project is considered to be financially viable only if the IRR of the project exceeds the Weighted Average Cost of Capital (WACC). The higher the IRR, the better it is.

The WACC represents the cost incurred by the entity to raise the capital necessary to implement the project. As most projects raise capital from several sources and each of these sources may have different cost/return, it is necessary to use a weighted average of the different cost/return paid to these sources. The Appraisal Report also includes a calculation of the project’s WACC expressed in real terms.

Sample Calculation of IRR is given hereunder:

In the NPV sample calculation, discussed above, the NPV at 12% discount rate works out to Rs. 53.00 Crores. The IRR calculations are other way round where we have to calculate the discount rate at which NPV of the above sample project works out to zero instead of Rs. 53.00 Crores. There is no formula for finding the internal rate of return straightaway. We are forced to resort to a systematic procedure of trial and error to find that discount rate which will make the net present worth of incremental net benefit-stream equal to zero. The formula of interpolation is used and is given below:

$$IRR = R_1 + (R_2 - R_1) \times \frac{(PV \text{ of Cash flows at } R_1)}{(\text{absolute sum of PVs at } R_1 \text{ and } R_2)}$$

where, R1 is lower discount rate which gives positive NPV and R2 is higher discount rate which gives negative NPV.

IRR for the above sample project has been calculated based on the above described formula and the same works out to 13.88% (calculations not presented here). The illustration below shows that the NPV of the sample project shall be ZERO at discount rate of 13.88% equivalent to calculated IRR.

Illustration

(Rs. in Crores)						
Year	Outflow	Future Cash inflows or Return	Net Cash in Flow	Present Value of future cash in flows		Net Flow
1	2	3	4=3-2	5	6	7=6-2
0(2012-13)	1300	0	(-)1300	0	0	(-)1300.00
1(2013-14)	0	400	400	$400/(1+0.1388)^1$	357.14	357.14
2(2014-15)	0	450	450	$450/(1+0.1388)^2$	358.74	358.74
3(2015-16)	0	450	450	$450/(1+0.1388)^3$	320.30	320.30
4(2016-17)	0	500	500	$500/(1+0.1388)^4$	317.70	317.70
NPV						0.00

Government of India, also considers IRR as a criteria for taking investment decision in case of Public Sector Projects. As per guidelines issued by Planning Commission, GOI, the project having IRR equal or more than 12% can only be considered by the Public Investment Board (PIB).

In determining the return or cash inflow streams for calculating discounted measures of the project like NPV and IRR, interest as well as depreciation is not considered as a cost both in financial and economic analysis. Expressing it in another way interest and depreciation is not deducted from the benefit-stream while doing above analysis. To understand the logic, while computing NPV we determine what would be left over after allowing for some specific Rate of Return to the entity's own capital which is nothing but the 'interest'. When we compute IRR, this is return to the entity's own capital and in a sense it is the interest which that capital earns. In simple words the analysis is carried out for total cost of the project without considering the financing pattern to know the exact return so as to take a decision whether to take a particular loan on a specified interest rate.

Depreciation is an accounting concept, the provision of which is necessarily while preparation of account for a period. Actually a part of the project's revenue is set aside in an account labeled as 'depreciation' to ensure that some revenue are retained to replace capital when it wears out. Thus, in real sense it is neither a cost nor a cash out flow and is a provision only. Accordingly, depreciation is not deducted from the benefits stream i.e. cash inflows being the part of the return of capital. Its deduction from the cash inflows will result into distorted picture of the return on capital obtained through discounted techniques.

Further, the project analysis is undertaken at constant prices. It is assumed that the current price level will continue to apply and that inflation will affect cost and benefits to the same extent so that they retain their same general relations.

In addition all FIs also calculate the Debt Service Coverage Ratio (DSCR) from the projected financial statement of the project under consideration for providing term loan. The DSCR tells about the capacity of the project to repay its debt / loan obligations and as a general norm this ratio should be between 1.5:1 to 2.0:1. In case it works out to more than 2:1, the repayment period is reduced to bring it below 2:1. A DSCR of 2:1 means that the project shall be having Rs. 2/- available for repayment of Rs. 1/- on account of interest as well as installment of term loan. If DSCR works out to less than 1.5:1, the repayment period of the loan is required to be increased so as to bring DSCR more than 1.5:1.

5. Economic or Social Appraisal

Economic appraisal refers to analysis from the economic aspect which assesses the desirability of an investment proposal in terms of its effect on the economy. The question to be addressed here is whether the investment proposal contributes to the developmental objective of the country and whether this contribution is likely to be large enough to justify the use of scarce resources such as capital, skilled labour, managerial talents etc., that would be needed to implement and operate the project. This type of appraisal is principally relevant to public sector investments only and is commonly called as Social Cost Benefit Analysis (SCBA).

The process involved consist of (i) identifying the social costs and benefits of the project to the society such as costs like human displacements, inconvenience, increase in dust and pollution level during construction etc. and benefits like increased level of income, direct and indirect employment, increase level of literacy etc. and (ii) quantifying and valuing social costs and benefits. It is often possible to express social costs and benefits in physical units but placing meaningful monetary values on them is a biggest challenge. However, unless they have a monetary value, it is not possible to include them in the cost benefits analysis alongwith financial cost and benefits. An important techniques which is followed for correct quantification of costs and benefits is “with and without project” comparison of costs and benefits. Project analysts try to identify and value costs and benefits that arise with the proposed project and to compare them with the situation as it would be without the project. The difference is the incremental net benefits arising from the project investment. This approach is not the same as comparing the situation “before” and “after” the project. The “before” and “after” comparison fails to account for the situation changes in production over the life of the project that would occur without the project and thus leads to an erroneous statement of benefits attributable to the project investment.

Once social costs and benefits have been identified and valued, the methodology for conducting Social Cost Benefit Analysis follows a similar procedure to financial appraisal like calculation of Net Present Values, the Internal Rate of Returns and Benefit Cost Ratio etc. with the minor difference that IRR here is called as Economic Internal Rate of Return (EIRR). The taxes and duties are treated as transfer payments and are excluded from the capital and operating costs for conducting the social or economic analysis

As per the practice being followed up by the Planning Commission, GOI the investment i.e. cash out flow is reduced by flat 15% on account of taxes and duties for calculation of EIRR and Interest During Construction (IDC) period is also not considered the part of the cost of projects.

Benefit Cost Ratio (BCR) is the main technique used for social cost benefit analysis which is the ratio obtained by dividing the present value of the benefit stream by the present value of the costs stream of the project. The BCR criterion suggests accepting all independent projects with a benefit-cost ratio of 1 or greater, when the cost and benefit streams are discounted at the opportunity cost of the capital.

6. Risk or Sensitivity Analysis

Several times when the project is under execution, certain things go wrong with the project with the result that the desired benefits cannot be achieved within the stipulated time frame. For example, the actual execution of the project is delayed (time over-run) or the cost exceeds the original estimated cost (cost over-run). Even on commissioning the production or sale rate may be less than the expected and the operation and maintenance expenses may be more than the anticipated. In such cases, the results get fairly changed and many a times the IRR, NPV etc. gets reduced.

Risk or sensitivity analysis which is also termed as Treatment of Uncertainty is conducted by the owners as well as by the lenders right in the beginning at the time of preparation of project report and project appraisal respectively. The process involve testing the viability of the project with certain assumptions like for 10-20% cost overrun, reduction in revenue on account of reduction

in sale price or less generation, increase in operation and maintenance costs etc. The NPV, IRR and BCR etc. worked out on the re-drawn figures of cost and benefits are made part of the appraisal report.

7.0 PROJECT APPRAISAL BY MULTI LATERAL DEVELOPMENT BANKS

In addition to the above discussed project appraisal process, presently in practice by the domestic financial institutions, the Multilateral Development Banks (MDBs) gives significant importance to **Social Appraisal** wherein, in addition to social cost benefit analysis, the land acquisition and resettlement impacts of the project are also studied in detail and are described in the Appraisal Report. It is also ensured that a Resettlement Action Plan (RAP) describing the measures to mitigate adverse impacts, and the institutional arrangements to implement them, is in place and that a proper budget for the implementation of RAP has been provided and taken in the cost of the project. MDBs also insist for preparation and implementation of Sustainable Community Development Plan (SCDP). As a part of appraisal process for taking a decision to grant term loan for the project, consultations are held with the various stake holders including local people, elected representatives, affected people, the media, government officials, youth and women organizations, to elicit their views and suggestions on the project activities.

Further, in depth **Environment Appraisal is undertaken by the MDBs**. The **Environment Appraisal** refers to systematic examination of the likely environmental consequences of the proposed project and the measures proposed for addressing the negative impacts on the environment. This involves preparation of **Environmental Impact Assessment (EIA)** study through independent environment consultants and **Environment Management Plan (EMP)**. The EIA describes, quantifies and then aggregates the effects of project activities on environmental attributes like air, water, land, ecology, sound, human effects, economics, renewal and non renewable resources etc. The EMP which sets out the action for monitoring and evaluation of the project during implementation and operation is also made fundamental part of the project documents. A typical EMP includes mitigation measures to minimize adverse impacts; measures to enhance environmental benefits; resources, funds, contractual and managerial arrangements; environmental legislation and standards which apply etc.

CONCLUSION

Project financing in hydro power projects in India has to be looked in different way compared to other types of project financing. This is due to the Risk Factor involved with such projects because of geological risks associated with underground works and uncertainties like unprecedented floods and landslides. In case of hydro project financing the lending institutions keep their eyes wide open and a stringent project appraisal is inevitable. All the financial institutions have their standard prescribed project appraisal format according to which the Appraisal Report is prepared and presented to the decision making authority. MDBs in general go in for more detailed project appraisal and have their own robust monitoring mechanism for assessment of progress for timely release of installments of term loan. They also assist the borrowing organization in mitigation of various associated risks through expert advice and ensure that beside implementation of the project, the proposed social programmes and

environmental safeguard measures are also implemented as envisaged. SJVN, having sufficient reserves for meeting the equity portion for the future upcoming projects from internal resources and established credentials in effective execution and successful running of the project as well as in repayment of existing term loans, do not for-see much of problem in raising debt capital for its new projects. However, the understanding of the dynamics of project appraisal makes it clear that all in the organization can contribute positively to the project appraisal process in a direct or indirect manner. The advance indepth knowledge of the appraisal procedures of various lending organizations also helps the borrower in making choice of the proposed lender considering the strengths and shortcomings of the organization.

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