

# Economic Feasibility Analysis of Power Engineering Project

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**ABSTRACT.** This article first systematically summarizes the background of the power engineering project and the evaluation basis, criteria and evaluation steps of the economic feasibility analysis of the project, and then from the evaluation of the investment estimation and fund-raising plan, the profitability of the project, the debt repayment ability, and the uncertainty of the project. Analysis of the economic feasibility of a transmission and substation project in the power industry is carried out in terms of performance analysis and risk analysis. It can be seen from the analysis data that the project is economically feasible.

**KEYWORDS:** power industry; project engineering; economic feasibility analysis

## 1. Introduction

Power engineering projects play an important role in the national economic construction, and there are many investors who invest heavily in this field. However, due to the large investment in the construction of the project, the long period, and the existence of certain risks, it is necessary to conduct an economic feasibility analysis of the investment project. Economic feasibility analysis is to analyze whether the project is worth investing and the degree of feasibility of the investment, which can provide a systematic, comprehensive and comprehensive basis for project construction and decision-making. It provides investors with a scientific and reliable theoretical basis for investment decision-making, which can effectively reduce and avoid project construction investment risks, so that the project can be completed on schedule and obtain the best investment benefits. The feasibility analysis includes technical feasibility analysis, economic feasibility analysis and policy feasibility analysis. This article combines specific power engineering projects to explore its economic feasibility [1].

## 2. Evaluation basis for economic feasibility analysis

The economic feasibility analysis of a project is to evaluate the desirability, quality and value of a project. The essence is to ensure that the net value between project benefits and costs is maximized or losses are minimized. Evaluation basis and

criteria: project profitability, debt repayment ability, financial net present value, investment payback period, investment profit rate, financial return rate, and the impact of uncertain factors on the fluctuation of pre-tax financial internal rate of return and pre-tax financial net present value And the social risk coefficient[2].

Evaluation steps: First, evaluate the project investment estimate and fund raising plan; second, evaluate the corporate finance based on the previous step, from the financial internal rate of return, financial net present value, investment recovery period, and investment profit rate Wait to calculate the profitability of the corporate financial project. When the profitability is greater than a certain value, it can ensure that the project is economically feasible. At the same time, it is also necessary to calculate whether the project's debt repayment ability can be repaid within a short period of time. What cannot be ignored is that uncertain factors need to be analyzed from the perspective of sensitivity and break-even. Sensitivity analysis includes operating costs and product selling prices. , The impact of capital construction investment and product output fluctuations within a certain range on the pre-tax financial internal rate of return, pre-tax financial net present value, investment profit rate and investment recovery period; finally, the investment risk of the project should be analyzed to estimate Whether the project is economically feasible[3-4].

### **3. Key points of economic feasibility analysis**

The investment estimate of a power engineering project is mainly an estimate of the total cost of equipment purchase, construction, installation, etc. of the investment project. It includes static investment estimate and dynamic investment estimate. The former generally uses the probability index estimation method, and the latter is estimated by the product of the former's value-to-fund rate and the total value of static assets. They are all important parameters required for project economic evaluation, and affect investment decisions to a certain extent. According to the Design Control Indicators for Thermal Power, Transmission, and Substation Project Quotas issued by the General Institute of Power Planning and Design in 2003, the design indicators are controlled within the scope specified in the document during the implementation of the project, and material prices, equipment prices, and quotas The preparation estimates are also calculated in accordance with industry standards and regulations promulgated by relevant state agencies.

The fund-raising plan needs to be drawn up based on the capital cost rate and the proportion of the source of funds. You can choose the best from different fund-raising plans, and choose the fund source structure that minimizes the capital cost rate. A large part of the financing of the financing plan comes from bank loans. Financial evaluation is based on the country's current fiscal and taxation system, price system, and project evaluation regulations, analyzing and predicting the financial benefits and costs of the project, using current prices, current wages and benchmark rates of return to calculate financial evaluation indicators, starting from the perspective of the enterprise, Analyze the financial status of the project's profitability, debt solvency, and anti-risk ability to judge the financial feasibility of the project [5]. Financial evaluation has qualitative and quantitative evaluation strategies, which directly

involve the economic benefits and investment assets of the enterprise. The evaluation content mainly includes project profitability analysis, project solvency analysis, project uncertainty analysis and sensitivity analysis. The following is an assessment of corporate finance from the following four aspects.

Project profitability analysis is an important criterion for investigating the scale of corporate profitability. For companies, in project feasibility analysis, project profitability occupies a major position, and it is also an important indicator of whether the project is economically viable.

a) Financial internal rate of return

As a dynamic indicator of profitability analysis, financial internal rate of return takes the time value of project funds as an evaluation parameter to consider the rate of return obtained after project engineering investment. In general, as long as the financial internal rate of return can exceed the industry's benchmark rate of return in terms of finance, the project is feasible from the perspective of the financial internal rate of return [6].

b) Financial net present value

The financial net present value is the same as the financial internal rate of return. It is also used as a profitability evaluation. A dynamic indicator of estimation. From the analysis of the indicator measurement formula, it can be seen that as long as the value is greater than or equal to 0, that is to say, the return rate of the project exceeds the set indicator, it can bring profit to the enterprise. When the capital invested by the company is equal to the cash inflow, the required period is the payback period, which can be said to be a true reflection of the company's debt repayment ability. The length of the investment payback period determines the enterprise's rate of return. The smaller the investment payback period, the greater the rate of return and the higher the feasibility of project investment. The investment profit rate is a static indicator for evaluating profitability. By comparing the investment profit rate of the project with similar industries, if it is greater than the average investment profit rate, it has a certain profitability.

Although sufficient preparations have been made for the decision-making and evaluation of the project, it cannot be ruled out that some things that deviate from the initial assumptions will cause the actual results of the project to deviate from the initial forecast. Therefore, some uncertain factors should be taken into account in the evaluation. Include the scope of assessment considerations, and estimate the project operation risks and economic losses caused by uncertain factors. The uncertainty analysis mainly includes sensitivity analysis and break-even analysis break-even analysis diagram. As long as the break-even point is greater than this value, the project will not lose money, and the profit will be relatively large. Sensitivity analysis shows that when operating costs, product selling prices and product output fluctuate within a certain range, the internal rate of return and pre-tax financial net present value.

Since the research, design and establishment of the project are predicted on the basis of the future society, politics, economy and environment, once a certain factor is

disturbed, the original project plan and plan will be subject to fluctuations, which are unpredictable and uncertain external and the interference of internal factors to the project can be called project engineering risk. The purpose of risk analysis is to analyze the particularity of engineering project risks, and then identify various risks, analyze their relationship, action path, and compound laws of various risks, so as to evaluate, control and manage project risks. To evaluate project risks, we must first determine the various impact weights of risk factors on the project, then establish a risk weight set, and then establish an evaluation set and fuzzy evaluation matrix to further calculate the consequences of project risks. A comprehensive comparison of project risks was carried out for this project, and the project risk level was average and it was economically feasible.

#### **4. Conclusion**

The article analyzes the economic feasibility of a certain power station project from multiple angles. From the data of enterprise profitability analysis, uncertainty analysis and project risk analysis, the project is economically reasonable and feasible. However, for a specific engineering project, its feasibility analysis is not a purely economic feasibility analysis. Technical feasibility and social feasibility must also be analyzed. Only comprehensive consideration of various factors and corresponding feasibility analysis can truly provide investors with a scientific and reliable theoretical basis for investment decision-making, ensure that the construction project is completed on schedule and bring better economic and social benefits.

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