FINANCING STRATEGY FOR INDONESIAN NUCLEAR POWER PROJECT

Iyos M. Subki, Bakri Arbie, Adiwardojo, Arnold Y. Soetrisnanto
National Atomic Energy Agency, BATAN, Indonesia

ABSTRACT

In anticipation of the introduction in the early 2000s of a nuclear power plant, the Government of Indonesia (GOI), through the National Atomic Energy Agency (*BATAN*), has formulated a Bid Invitation Specification (BIS) in parallel with the completion of the NPP Feasibility Study. This BIS formulation assumed an open international tender for the first unit of the NPP with project financing as a conventional loan. The GOI's recent policy is to minimize government financial support for power development. This paper summarizes a financing strategy for the Indonesian NPP project to make the NPP economically viable, and provides a general discussion on project financing using a conventional approach, Build-Own-Operate (BOO) and a counter-purchase approach. Innovative approaches for financing are still being pursued in order to obtain an optimum solution for investors and owners, to fulfill the Indonesian government's requirements.

I INTRODUCTION

In anticipation of the introduction in the early 2000s of a NPP, the GOI has formulated a Bid Invitation Specification (BIS) in parallel with the completion of the NPP Feasibility Study. This BIS formulation assumed an open international tender for the first unit of the NPP of a proven type, with unit net power of 600 to 900 MWe, at the Ujung Lemahabang site. The contract for construction of the NPP is a turn-key type, with project financing of conventional loans (i.e. export credits and commercial borrowing) on a sovereign guarantee basis.

This kind of financing arrangement has been considered the best way as clearly stated in the Feasibility Study report. The provision of sovereign guarantees will enable Indonesia to set minimum conditions for the long-term credit provision. It also ensures better competition between supplier countries in appropriating the credit terms. The disadvantage of this arrangement, however, is obvious; the NPP will impact solidly on the external borrowing of the country.

The Government's evolving financing policy has been to encourage private sector enterprises and cooperatives to finance the development of projects to meet the increasing demand for electric power. Entering the Second Long-Term Development Programme (LTDP-II), the Indonesian State Owned Electric Power Company (PT. PLN) has been directed to prepare a long-term plan based on the projected power demand and in which private participation is put into consideration. This has necessitated, therefore, the formulation of the BIS on a kind of BOO basis, to anticipate the implementation decision on the NPP introduction.

The potential nuclear vendors will be given opportunities to participate in establishing a nuclear Independent Power Producer (IPP), if they ascertain the world-wide safety practice, environmental merits and the economic competitiveness to coal electricity in the Java-Bali electrical system. This project finance arrangement will reduce government funding requirements, encourage equity stakes by foreign investors, and will realize foreign exchange inflow from the equity and debt.

It has been understood, though, that the BOO approach implies additional costs and complexity, and specifically for a nuclear IPP, it does need some form of government support. Special problems of nuclear IPPs that need government encouragement are foreseen, such as public acceptance, third party liabilities, back-end fuel cycles, decommissioning and long-term waste management. The need to share risks at the side of foreign investors can require government participation in the form of partial equity. If it does, it would become in essence a "modified" BOO scheme.

As an example of the above, three vendors might be assumed to participate in sponsorship of the nuclear IPP. The equity (30% of total investment), obligations and risks are shared equally among the sponsors and increases their total expenditure. One possible way to ease this burden, as some potential sponsors have suggested, is some equity participation of the government in the nuclear IPP.

This paper provides a general description of financing approaches that have been pursued. They are: conventional export credit approach, BOO approach, modified BOO or joint venture approach, and another financial arrangement, some type of barter approach, that alleviates the problems of external borrowing but still keeps the NPP within the government's ownership.

II TYPES OF FINANCING APPROACHES

1. Conventional Financing

A cost and risk allocation benchmark was developed for a conventionally financed, GOI owned, NPP based on cost data from the Final Feasibility Study Report (FFSR), and current financing terms for Indonesian sovereign borrowing. For a conventionally financed NPP, a GOI entity would be the project owner and operator, and would also procure the project under the terms of a construction contract from an international construction consortium. Project financing would either be borrowed by the GOI or provided from Indonesian treasury sources. This is the model under which most international NPP projects have been procured. Like PLN, the government owner is assumed to be subject to income taxes.

In this conventional financing arrangement, the GOI would retain substantially all risks, except for insurable risks and risks allocated to the construction contractor or vendor consortiums under the construction or supply contracts.

A number of key requirements for a successful conventionally financed nuclear power program should be discussed, including institutional structure, capital costs, schedule, taxes, procurement, performance guarantees, financing, staffing, operations and maintenance, fuel supply, insurance, and decommissioning. These elements, have implications for schedule, risk and cost of nuclear power, and provide the basis for the assumptions used in the economic and financial analysis computer model.

The conventional financing plan assumes that the contractor would arranges financing for its offshore scope of supply and services. Export credit agencies (ECA) are assumed to provide financing for 85% of the offshore scope of work, local cost financing equal to the remaining 15% of offshore scope, interest during construction on their export credit loans, and their exposure fee. The remainder of the financing would be from GOI Treasury funds and commercial banks. Treasury funds are treated as quasi-equity in the financial model with a required return equal to the Indonesian social opportunity cost of capital.

Implementing conventional financing for the construction of 600 or 900 MWe units can be done

like any other construction of power plants. Feasible or viable sources of financing can be conducted, for example: US component 50%-Japanese component 50%, US component 100%, French component 50%-German component 50%, and Canadian component 100%.

The results show that the energy price of the 600 and 900 MW class NPP units are competitive to the energy price of similar capacity coal fired plants equipped with deSOx and deNOx.

2. BOO Financing

Since the first Indonesian coal-fired private company, Paiton, achieved financial close, Indonesia has continued to refine its BOO model for implementing fossil-fueled power projects. However, there is currently no precedent for a BOO NPP project. The extent to which BOO-type commercial arrangements can be applied to Indonesia's first NPP project will depend on a number of factors. The most important of which is the manner of risks associated with nuclear power which are allocated to project owners, such as nuclear accident liability, regulatory risk, operating risk (e.g., the risk of a protracted shutdown to modify the plant design, equipment or materials based on incidents or accidents at similar plants or generic safety defects identified by vendors after the plant is constructed), and decommissioning risk. Although there is no precedent for building a BOO NPP project, previous attempts to implement such an approach indicate that private investors and lenders will accept very little "nuclear risk".

Therefore, a modified BOO-type commercial structure has been postulated that allocates substantially all risks specific to nuclear power to the GOI. The intent is to achieve private owner and lender risk profiles similar to what they would be for a fossil-fueled BOO power plant project, except for the higher level of "non-nuclear " completion risk inherent in a NPP lump sum, turnkey (LSTK) construction contract.

The implementation of the BOO/BOT financing scheme for 600 and 900 MWe unit nuclear power projects in Indonesia should be supported by the Government through the following instruments:

1. The need for a bilateral agreement between the GOI and the related country concerning the use of nuclear energy for peaceful uses.
2. Activities related to the decommissioning and back-end of the fuel cycle.
3. Guarantee of fuel supply.
4. Third Party Liability insurance from nuclear hazards.

Furthermore a power purchase agreement is necessary between PLN with the company, covering the following guarantees and requirements :

a) The obligation of PLN to remit payments according to the requirements, using the agreed exchange rates.

b) A guarantee by the Government to return loans, dividends, and other financial arrangements in the determined exchange rate and currency.

Alternative BOO arrangements could potentially reduce the BOO power cost premium. These include:

a) Foreign Government Ownership. In this arrangement a public sector company backed by the full faith and credit of a foreign government is the sole shareholder of the Indonesian nuclear power company. This would be the case should a government-owned utility become the owner and operator. A recent example of this is the Illijan fossil plant BOO in the Philippines where Korea Electric was the successful bidder.

b) A GOI/Foreign Government Joint Venture. In this arrangement a public sector company and the GOI are co-owners of the Indonesian nuclear power company.

c) A GOI/Private Sector Joint Venture. In this arrangement private sector companies and the GOI own the Indonesian nuclear power company.

d) Private Sector Refinancing. Conventional sovereign credit debt financing during construction that is refinanced with a mix of debt and commercial-risk debt financing.

e) Nuclear Generating Company Initial Public Offering. A portfolio approach in which full or partial nuclear power privatization happens through a sale of shares in a nuclear generating company that consists of several operating NPPs.

3. Barter Financing

Another financial arrangement that alleviates the problems of external borrowing, but still keeps the NPP within the government's ownership is some type of barter approach. As a matter of fact, the total project cost and disbursement schedule can be proposed in detail; external borrowing can be assessed to a certain precision. Liquified Natural Gas (LNG) or coal as commodities can then be bartered for the delivery of NPP equipment to the construction site. Some amount of bartered commodity is delivered to the NPP Main Contractor country as having equivalent value to partial payment of periodic (scheduled) disbursements to the NPP construction. It was found that only partial payments of periodic disbursements are likely feasible. The barter arrangement will then decrease monetary loan, and therefore, the advantage as a result of avoiding or reducing the Interest During Construction (IDC) can be reaped.

As a consequence of this arrangement, however, the administrative burden of both parties will substantially increase in shipping, shipping documentation, bank clearing activities, etc. Complete and precise details on the transaction framework should be known and frozen beforehand. More importantly, risks in the delivery and price changes of commodities would then become inherent.

To visualize the approach, the above example is further used. Suppose a certain nuclear vendor from one foreign country has agreed to perform a barter trade with Indonesia on LNG to cover 50% of the required foreign borrowing. The remaining 50% is then foreseen to be covered by some conventional ECA borrowing. The bartered value of 2 to 2.3 billion US$ will be distributed throughout the 8-year construction time according to the NPP disbursement schedule. By this arrangement it is estimated that around 200 to 230 million US$ worth of IDC would be avoided.

The time required for the pre-contract arrangement is much longer for the BOO scheme than the one for the conventional financing scheme since all BOO parties tend to secure the protection of their interests from any foreseeable risks. The barter approach still has the ECA financing, although only partial, in parallel with barter arrangement activities. Therefore, the timeframe required for pre-contract preparation is only a little more than the conventional approach. For comparison of the cost impacts, the BOO approach has the obvious complexity of risk protection and time schedule which leads to a substantial cost increase. Whereas the Barter approach provides a certain bonus from the partial IDC avoidance, but this gain is paid by the delivery of LNG, which readily represents a convenient revenue source.

III. CONCLUSION.

Financing for NPPs in developing countries, due to the high investment capital cost, is a major hurdle. That is why, at the present, we have been studying various approaches to finance the construction of NPPs in Indonesia. The financing approaches should achieve two objectives:

minimal costs to the government and affordable electricity prices.

The LSTK contracting approach for nuclear has never been accomplished satisfactorily, and is unlikely to be viable for the first NPP in the country. Accordingly, we believe that a contracting approach will be required that provides some of the incentives to contractors to minimize costs and maximize performance, but with less cost and completion risk transfer than a traditional LSTK contract. This approach contemplated a LSTK contract, GOI investment and conventional debt financing (e.g. export credits).

The GOI's recent policy to minimize government financing support for power development and recent successes in implementing "Build-Own-Operate" ("BOO") fossil-fueled power plants prompted it to investigate the applicability of BOO to nuclear power.

Finally, we have to conclude, that:

a. Innovative approaches to financing exist and are viable. Modified BOO is one, and the barter approach is the other that possess some advantages. Both facilitate solutions to the projects that would otherwise not be done, but both still need much work and further elaboration. Therefore, the simplest way to proceed for the construction of the first NPP unit is through a turnkey contract with a conventional financing arrangement.

b. In order to prevent financial matters later becoming a hindrance, it is very important to anticipate this matter as early as possible through efforts to increase cooperation among nuclear "concerned" countries so that financial institutions will support, and favour building nuclear power plants.

IV. REFERENCES.

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