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MORUPULE POWER STATION, BOTSWANA

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The Project

This 1983 project consisted of the phased construction of a 180 MW coal-fired steam power station, and a transmission link to the main centres of demand, co-financed by 10 agencies including IBRD, EIB, ADB and CDC. ODA provided an ATP grant of £5.4m towards the purchase of 3 turbine generators and a coal and ash handling plant, in Phase I an ECGD credit of £12.7m met the balance of the cost of the turbines, while an Arab Bank for Development in Africa loan of £6.5m met the balance of the cost of the coal and ash plant.

The Evaluation

The evaluation was carried out in 1987 by an ODA economist, a Department of Trade and Industry economist and an independent consulting engineer when only one turbine had been taken over by the Botswana Power Corporation (BPC).

Overall Conclusions

The project was *partially successful*. Because demand was over-estimated, the expected rate of economic return of 4%-5% is lower than at appraisal, but this has to be balanced against security of supply. Disregarding currency fluctuations, the work was within budget, but there were construction delays and technical problems with the plant.

The Main Findings

- BPC will benefit from the transmission link and from reducing the reliance on imported power from South Africa. Some of the extra capacity, however, is premature. As BPC's tariffs are relatively high and regularly adjusted, it should meet its financial obligations, although tariff increases may be required meet interest repayments. BPC is an efficient utility but it depends heavily on expatriate staff. Skill shortages mean it is likely Morupule will depend on expatriate management for approximately 10 years.
- A detailed appraisal including a technical assessment, was undertaken by the World Bank. ODA's development assessment was thorough but no separate technical assessment was made.
- Changes to contracts resulted in many of the performance conditions being removed and the consultants considered they were required to sign some payment

certificates without regard to the performance of the contractors. Delays in tendering for equipment and the decision to commence civil works before the plant was selected delayed construction. ODA monitoring was unstructured. Consultants' reports were not received on a regular basis and ODA staff did not visit the site during construction. The sophisticated technology of some of the equipment may not be appropriate to the operating conditions found in Botswana.

- An ecological report on the possible impact of emissions was prepared in the feasibility stage. The project meets the anti-pollution requirements of the Government of Botswana and is in accord with World Bank guidelines. Provision has been made in the site design for additional exhaust gas cleaning equipment.
- The placing of the ATP orders is likely to have deferred some redundancies. Indirect benefits to the companies include a broader knowledge of installation work. Subsequent orders at Morupule were not won by the companies which received ATP assistance.

Lessons

- Forecasts of demand for power should be rigorously analysed and the implications for the project of a change in the rate of growth clearly stated. In addition to the least cost option, factors such as simplicity of design and ruggedness should be taken into account when selecting generating plant.
- Where complex contractual arrangements have to be negotiated between several financial institutions, the project timetable should allow for delays. On large projects there should preferably be a 4-6 months lag between placing plant and civil contracts, allowing the building design to reflect the actual choice of plant. Care should be taken to ensure that modifications to loan agreements or contracts do not vitiate performance conditions.
- Where in-house expertise is unavailable, donors may find it cost-effective to employ independent consultants for technical assessments and project monitoring. To permit a comprehensive judgement of project impact, any evaluation should take place when a station has been operational for at least 2-3 years.
- The idea that an ATP-backed order for generating plant will necessarily help to promote further orders on commercial terms should be treated with caution. Subsequent orders tend to be judged independently by the customer, in relation to a number of factors, including the availability of finance.

Further Information

This evaluation was used to prepare a "Synthesis Report on Large Power Generation Schemes" which is available from Evaluation Department.