# Shuikou hydroelectric project

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The Implementation Completion Report (ICR) on the Shuikou Hydroelectric Project (Loan

2775-CHA, approved in FY87), was prepared by the East Asia and Pacific Regional Office and reviewed by the Operations Evaluation Department (OED). The Borrower contributed with a detailed self-evaluation report, a summary of which is included as Annex 2. The loan, in the amount of US$140 million, was fully disbursed and closed on June 30, 1993, with a delay of one year. It was the first of two loans for the Shuikou Hydroelectric Project (the second being Loan 3515-CHA, approved in FY93).

The project objectives were: (i) to develop a major hydroelectric site to supply peak power generation to the Fujian and East China grids, (ii) to introduce the latest technology for dam and power station construction, (iii) to link the East China and Fujian power grids and promote their effective integrated operation, and (iv) to upgrade the capability of the Fujian Provincial Electric Power Bureau (FPEPB) in financial management and management of large civil works contracts. The project comprised: (a) construction of the Shuikou dam on the Min River; (b) installation of seven generating units of 200 MW each and related transformer station; (c) construction of a 500 kV transmission line between Shuikou and Hangzhou in Eastern China; (d) resettlement of about 63,000 people and reconstruction of their production systems and communities; (e) consulting services for engineering and construction management; and (f) various technical studies and training. The 500 kV transmission line to Eastern China was dropped soon after project start-up, when the Government and the Bank realized that electricity demand in the Fujian area was growing faster than expected and that the full output of the Shuikou plant would be consumed locally.

The project met all its physical objectives, albeit with some delays due to procurement problems and delays in the manufacturing of the turbine-generator units (the last unit is expected to be commissioned by end-1996, 18 months behind schedule). The resettlement of about 67,000 persons in rural areas and 17,000 in Nanping city (subsequently added to the project) was successfully implemented between 1988 and 1992: by mid-1995 about 34,000 new jobs had been created, average income had increased, and per capita housing space had grown (by about 26 percent). Although higher than estimated resettlement costs caused a project cost overrun of about 7 percent (in US dollars), the re-estimated economic rate of return (15.1 percent) is in line with the appraisal estimate thanks to higher than forecast tariffs. Institutional objectives were also met: Bank-financed studies and training led to the upgrading of FPEPB's capabilities in management of the large civil works contract and systems operations as well as financial management. Moreover, FPEPB met the loan's self-financing and debt service coverage covenants.

In view of the above, OED rates project outcome as highly satisfactory and its institutional development as substantial. Sustainability is rated as likely in light of the good quality of the civil works and installed equipment, the satisfactory completion of the resettlement program, the competency of FPEPB's technical staff, and the adequate level of prevailing tariffs, which ensure cost recovery and FPEPB's financial solvency.

OED rates Bank performance as highly satisfactory (as in the ICR): the Bank maintained a very good dialogue with the Government and FPEPB throughout the project cycle and was particularly responsive in helping FPEPB deal with project implementation problems. It showed flexibility in agreeing to the elimination of the 500 kV tie-line and restructuring the project accordingly, when it became clear that electricity demand in Fujan was growing much faster than planned–a development which could clearly not be forecast by the Bank in light of demand growth in the early 1980s and China's macroeconomic prospects at the time of project appraisal.

Two important lessons can be drawn from this project: (i) a two-stage approach can be a viable option for the financing of large monolithic power projects with long execution time, as it reduces the need for early debt repayments before plant commissioning; and (ii) resettlement programs should be implemented as early as possible, to reduce or eliminate the time lag between reservoir filling and full restoration of income, particularly if the resettlement program requires substantial land development for agriculture.

The quality of the ICR is satisfactory, although it should have included key indicators necessary for monitoring future project operation and performance.

The project may be audited together with other power projects in China.