ICRR 11475
Report Number : ICRR11475

ICR Review
Operations Evaluation Department

1. Project Data: Date Posted : 04/28/2003

PROJ ID : P003616	Appraisal	Actual
Project Name : Tianhuangping Hydro	Project Costs 720.3 US$M) (US$M)	789.7
Country : China	Loan/ US$M) 300	
	Loan /Credit (US$M)	260.5
Sector (s): Board: EMT - Power (97%), Flood protection (3%)	Cofinancing US$M) (US$M)	
L/C Number : L3606		
	Board Approval FY) (FY)	93
Partners involved :	Closing Date 12/31/2001	06/30/2002

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2. Project Objectives and Components

a. Objectives

The project had seven objectives :

1. Alleviate an acute shortage of peaking power and enable more efficient use of power plants .

2) Support economic reforms and enabling environment for attracting foreign investments and promoting private sector development by improving the quality of the power supply and enhancing socioeconomic conditions in densely populated East China regions.

3) Improve load management and promote energy conservation by introducing appropriate peaking power pricing .

4) Support institutional development by strengthening the East China Electric Power United Company (ECEPUC), through an advanced management and staff training program .(ECEPUC, the implementing agency, was later restructured to East China Electric Power Group Corporation (ECEPGC). ECEPGC is responsible for the development and operation of East China power system, covering the Shanghai municipality and the provinces of Jiangsu, Zhejiang, and Anhui .)

5) Contribute to the development of an improved power utility regulatory framework .

6) Assist in transferring new power technologies and in applying modern power system operation optimization methods.

7) Extend technical assistance in project design and implementation, and in promoting prudent financial management.

b. Components

The project had four key components :

1) Construction of power facilities including : (i) a pumped-storage hydroelectric power plant with lower and upper

reservoirs, a water conveyance system, an underground powerhouse, and a switchyard; (ii) provision and installation
of six 300-megawatt reversible pump-turbine units and associated equipment; (iii) erection of 500 KV transmission
lines; (iv) provision of selected equipment for civil works and dam safety; and (v) provision of construction management and engineering services;
2) Studies on peak power pricing and optimal power plant operation .
3) Training for ECEPGC staff on utility management and financial planning .
4) Environmental management program (EMP) to administer and monitor the environmental impact of the project .
Revised component :
A new component, the Sijing and Hangdong 500 kV substations, was added in March 1999 with an estimated cost of
$25.97 million, funded from savings from contingency provision . The revised component was appraised and the
Project Agreement amended.

c. Comments on Project Cost, Financing and Dates
The total project cost was $ 789.7 million (including interest during construction and contingencies) compared to the
appraisal figure of $ 720.3 million. The Bank provided a loan of $ 260.5 million compared to the appraisal estimate
of $300 million. The Bank also provided an IDA Technical Cooperation Credit (TCC) of $2.9 million compared to the
appraisal estimate of $2.5 million. Of the Bank loan, $25.97 million savings from contingency provision was
reprogrammed to fund the construction of Sijing and Hangdong substations (see section 2b). The government
provided counterpart funds of $ 526.7 million compared to the appraisal estimate of $ 417.4 million. Counterpart funds
consisted of loans and equity from the following sources : ECEPGC ($219.5 million); Shenneng Power Development
Company (SPDC) ($131.7 million); Jiangsu Provincial Investment Company (JPIC)($87.8 million); Zhejiang
Provincial Power Development Company (ZPPDC)($58.5 million); and Anhui Provincial Power Development
Company (APPDC)($29.2 million). The difference between appraisal estimates and actual project costs can be
mainly attributed to: (i) reduced Bank financing because of lower tender bids compared to the appraised estimates;
and (ii) higher counterpart financing due to local cost overruns .

The project's closing was extended once to 30 June 2002.
3. Achievement of Relevant Objectives:
Five of the seven project objectives were achieved .
1) Alleviate an acute shortage of peaking power and enable more efficient use of power plants . This objective was
achieved. Although unit commissioning was delayed, construction of power facilities was completed in December
2000, and all facilities were accepted by the State Safety Inspection in September 2001. The additional component of
Sijing and Hangdong substations was commissioned in December 2000 and May 2001, respectively, albeit delayed
for 3 to 4 months. As planned, Tianhuanping added 1,800 MW of capacity which can be mobilizied at peak or as a
back-up in case of emergency.

2) Support economic reforms and enabling environment for attracting foreign investments and promoting private
sector development by improving the quality of the power supply and enhancing socioeconomic conditions in
densely populated East China regions . Non-evaluable . The ICR rated this objective as satisfactory noting that the
project enhanced the power system frequency stability and reduced load shedding; but it also noted the difficulty of
measuring and attributing increased foreign investment and private sector development to the project .

3) Improve load management and promote energy conservation by introducing appropriate peaking power pricing .
This objective was not achieved . The introduction of peak pricing was applied only to output sales to the grid, thus
limiting load management and conservation by end -users. Power pricing at the retail level is the responsibility of the
central government which was involved only towards the end of the project, and thus, constraining the ability of
ECEPGC to achieve this objective.

4) Support institutional development by strengthening ECEPGC through an advanced management and staff
training program . This objective was achieved . Training provided to ECEPGC staff has contributed to developing
adequate capacity in managing the construction of the power plant, in implementing the Resettlement Action Plan
(RAP), in power sales pricing and marketing, and in managing the East China Tianhuangping Pumped Storage
Power Company Ltd. which has been operating the plant since December 2000.

5) Contribute to the development of an improved power utility regulatory framework . This objective was moderately
achieved. Although the government was involved only towards the close of the project, the ICR noted that the study
on power pricing was instrumental in helping launch the competitive power pool in Zhejiang province and in the
government's power sector reform initiated in April 2002 that involved introducing wholesale power markets and
re-structuring retail tariffs.

6) Assist in transferring new power technologies and in applying modern power system operation optimization
methods . This objective was achieved . East China Investigation and Design Institute (ECIDI) developed its
competence on pumped storage design, change order management, and environmental assessment .

7) Extend technical assistance in project design and implementation, and in promoting prudent financial
management . This objective was achieved . Prudent financial management was established in ECEPGC including
budget control, fund management, investment appraisal, and credit guarantee procedures . ECEPGC has also
become highly skilled in large project implementation management and plant operation . ECEPGC has more than met
its financial covenants.

An Environmental Impact Assessment for the project was prepared in November 1991 and updated in 1992 taking
into account the the Bank's comments and suggestions . The EMP for the project was implemented, including the
establishment of a monitoring and mitigation program unit of 15 full-time staff members. The RAP for Hangdong and
Sijing substations, reviewed and approved by the Bank in 1998, was also implemented.
4. Significant Outcomes/Impacts:
Training provided to ECIDI has enabled it to undertake six large -sized pumped storage projects in Taian, Tongbai,
Yixing, and Baoquan; and to conduct Environmental Assessment for several other projects in China including
Bank-financed small and medium sized hydro -power projects.
5. Significant Shortcomings (including non-compliance with safeguard policies):
Delays in unit commissioning up to fourteeen months were partly attributable to manufacturing defects in three of the
main transformers.

6. Ratings :	ICR	OED Review	Reason for Disagreement /Comments
Outcome :	Satisfactory	Satisfactory	
Institutional Dev .:	High	High	
Sustainability :	Likely	Likely	
Bank Performance :	Satisfactory	Satisfactory	
Borrower Perf .:	Satisfactory	Satisfactory	
Quality of ICR :		Satisfactory	

NOTE:
NOTE ICR rating values flagged with ' * ' don't comply with OP/BP 13.55, but are listed for completeness.
7. Lessons of Broad Applicability:
1. Central government involvement should be secured at the early phase of the project, especially when sector
reforms that are outside the responsibility of the implementing agency are involved .
2. In undertaking hydro-power projects, a thorough geological study is required to ensure against unnecessary
delays during implementation and to avoid incurring high cost overruns .
3. Local procurement procedures should be in place prior to implementation and should apply the same rigorous
standards as international procurement to ensure reliability and quality of materials and equipment, and thus, avoid
holding up project completion.
4. Choosing the right consultants and focusing them on well -defined issues are key to ensuring that their outputs are
relevant and timely.
8. Assessment Recommended? Yes No
9. Comments on Quality of ICR:
The ICR is concise, candid, and thorough . The ERR analysis went beyond re -calculating the ERR and provided a
more robust analysis using willingness -to-pay (WTP) .