

# OED Précis



Operations Evaluation Department

May 1993

## Electric Power in India: Institutional Development, Sectoral Issues

In 1977-87, the Bank invested \$4 billion in India's National Thermal Power Corporation (NTPC), making NTPC the Bank's largest single borrower worldwide. A series of 13 projects, some still in progress, involved the introduction of advanced technology, on a scale unprecedented in India, by a newly created public sector institution. A new OED audit reviews the four most recently completed NTPC projects, which accounted for \$1 billion of loans and credits.\*

NTPC's development was a striking success. The corporation rapidly emerged as India's leading power utility and largest corporate entity in terms of fixed assets. But hopes that the NTPC projects would help to secure needed sectoral reforms were largely disappointed. Persistent financial weakness in the sector at large put NTPC itself at risk, and bill collection became such a problem that it started to undermine NTPC's financial position. The audit outlines the factors behind NTPC's successful development and draws lessons from the attempt to use a single agency to promote sector-wide reform.

### Background

Since 1948, India's installed power capacity has grown by more than 9 percent a year to a size (70,000 MW) broadly comparable with that of the United Kingdom.

Per capita consumption, at 270 Kwh/year, is still quite low; it compares with about 300 Kwh/year in Pakistan and 480 Kwh/year in China.

### Sector structure

At the federal level, the Central Electricity Authority (CEA) develops national power policy and coordinates sector activities within the framework of India's federal structure. The state electricity boards (SEBs) owned by state governments have authority to build, own, and operate power systems and sell power in their respective states. Together they generate about 75 percent of electricity supply and provide most of the distribution to final consumers. The regional electricity boards are relatively loose associations of utilities. The federal structure of the sector means that any adjustment in relations between central and state institutions is politically sensitive.

In 1975, growing power shortages led the government to create the NTPC and the National Hydroelectric Power Corporation as centrally owned utilities to sell bulk power to SEBs and other entities.

### Efficiency

Cost recovery and efficiency in power have featured recurrently in

dialogue with the Bank (see box). Today, few of the SEBs turn a profit and in FY90 their combined deficit was \$1.8 billion. The main problem is pricing. Typically, the SEBs' tariffs are equivalent to only 50-60 percent of long-run marginal costs. Given the fiscal situation, both the GOI and the states acknowledge the need to raise power prices. But movement toward cost-based pricing has been hindered by a long-standing view of electricity as a social benefit and development tool, rather than a service to be bought and sold commercially.

The power sector in general urgently needs to become more efficient, both to reduce the fiscal burden created by SEB deficits and to encourage more private investment in public electricity supply.

**\*\*Performance Audit Report, India: Korba Thermal Power Project; Ramagundam Thermal Power Project; Second Singrauli Thermal Power Project; Farakka Thermal Power Project", Report No. 10854, February 1993. OED reports are available to Bank Executive Directors and staff from the Internal Documents Unit and from Regional Information Services Centers.**

## Bank Support for Power in India

Early Bank support was directed to individual utilities. In 1965-75, the Bank sought to address broader issues through loans to government agencies which lent to SEBs for transmission and rural electrification projects in their states.

When the government created NTPC, the Bank concentrated its support in operations with NTPC as the beneficiary. Between 1977 and 1987, \$4 billion of loans and credits made the new agency the largest beneficiary of Bank lending worldwide.

Eight of the NTPC projects supported mine-mouth, coal-fired thermal power plants (two projects for each plant):

- Singrauli (2,000 MW) for the Northern Region;
- Korba (2,100 MW) for the Western Region;
- Ramagundam (2,100 MW) for the Southern Region; and
- Farakka (2,100 MW) for the Eastern Region.

Two further projects were for transmission only, and another three supported coal-fired and oil-fired combined-cycle facilities.

In 1983, seeing that the NTPC projects were not leading to the fundamental changes needed in the sector—in particular, higher efficiency and more economic tariffs in the SEBs—the Bank began lending to well-managed SEBs and the private Tata Electric Companies in parallel with NTPC.

From 1987 on, the Bank stopped direct lending to the public power companies and SEBs. Instead it has supported private utilities and, through a financial intermediary for the power sector, public utilities with good performance.

Power shortfalls persist and in 1992 were equivalent to about 9 percent of total energy needs. Government power policy still concentrates disproportionately on expanding supply, with too little attention to the efficiency of supply and to pricing.

Bank assistance in the 1970s and 1980s helped to create the transmission links and other physical underpinnings of a national grid, but little progress was made toward integrated sector operation. The result was a costly underuse of generation and transmission capacity, which persisted until recently.

### Project achievements

The main goals of the NTPC projects were to expand capacity and build a major new central institution. Though there was a strong technical, economic, and political case for establishing NTPC, this was a risky undertaking—in size and technological sophistication the proposed facilities had no precedents in India. Despite the risks, NTPC achieved almost all that was expected of it and, in some areas, more.

The projects helped increase the annual growth of India's installed capacity from 5 percent in 1970-75 to 8 percent in the 1980s. They reduced India's chronic shortage of electricity.

NTPC is now India's leading power utility, with an installed capacity of more than 11,000 MW, producing a fifth of India's electricity. As an institution it has broken new ground in organization and management, successfully progressed from construction to operation, and generally coped well with the problems of rapid growth.

Areas where NTPC did not perform as expected—especially

the collection of accounts receivable—reflect the lack of progress in reforming the sector, its regulatory framework, and its cost recovery policies and practices. NTPC's managerial techniques have not proved infectious. SEBs do not have NTPC's freedom of action or financial means, and they lack the corporate culture that has been so important in the development of NTPC.

### Issues

The Bank saw the NTPC lending program as a promising vehicle to promote sector-wide long-term planning, integrated operations, improvements in sector organization and training, and reform of SEB finances. Recognizing that these goals were not entirely shared by the government, the Bank's approach to sectoral reform through this program was slow and circumspect. It outlined broad sectoral reform objectives at the start of the series of projects, and made them increasingly explicit as the series progressed. Given the constitutional authority of the states, the Bank believed that basic reform was best pursued through "a policy of persuasion rather than one of explicit leverage." Indeed, the whole \$4 billion series of projects contained only three conditions calling for specific action on sector matters; none of these was covenanted or complied with.

#### *Sector reform*

The creation of NTPC strengthened the government's leverage in the sector. But the projects did not induce major changes in sector regulation and operation.

#### *Finances*

The NTPC program did not improve the recovery of power supply costs. Soon after NTPC began selling power, the flaw in the hope that it could be used to "lever" an increase in the tariffs of SEBs—its

## How Did NTPC Succeed?

### *Internal strengths*

- *Being newly created*, with no a priori limitations on its managers' freedom of action.
- *Dynamic leadership*.
- *Emphasis on corporate planning*, taking a long-term strategic approach.
- *Use of the systems approach* as a primary management tool. This makes it possible to combine a high degree of centralization with adequate authority on-site.
- *Strong emphasis on quality assurance*.
- *Drive for technical self sufficiency and technological innovation*.
- *Attention to recruitment and training*: NTPC can pay its staff little more than other central government organizations, but

its comprehensive manpower development program helped attract and retain very high-quality staff.

### *External advantages*

- *Operating autonomy and political support*: NTPC had a free hand in organizing and staffing as well as in project implementation. It could count on the Ministry of Energy to provide the resources it needed and to otherwise promote and protect its interests within the government. This reflected the desire of ministry officials to foster the growth of their protege, their confidence in NTPC's management, and their early recognition that their role should be supportive rather than supervisory.
- *Ample resources*: No other utility in the developing world has received comparable financial support. NTPC received generous budgetary

support early on, while as a Bank borrower it was always well supplied with foreign exchange. It could afford to invest adequately in recruitment, training, and other long-term institution-building efforts. And its ability to pay in cash, and promptly, gave suppliers a strong inducement to meet its quality standards, delivery deadlines, and other requirements.

- *Financial policy*: NTPC reached its large size in record time without compromising its financial viability, despite the accounts-receivable issue. An important reason is the government's original design—for example, a debt/equity ratio set at a conservative 1:1; and a tariff formula (even though not fully applied) to pass on all investment, operation, and financial costs.
- *Bank assistance*.

main customers—became apparent. NTPC and the SEBs are public entities serving different constituencies, and many aspects of their relationship have thus been more political than commercial. Some of the SEBs have been unwilling to regard NTPC as a commercial supplier and NTPC has been unable to treat them as it would treat commercial customers.

Though NTPC's own tariffs were much below economic cost, they were equivalent to 90 percent, on average, of the SEBs' unit revenues. The SEBs' low sales revenues on power purchased from NTPC left them too little to cover their other costs. Rather than raising their tariffs to meet NTPC's charges, the SEBs:

- Delayed the payments they owed NTPC, beyond the average of

two months covenanted with the Bank.

- Minimized their use of NTPC power, which they saw as expensive.
- Strenuously opposed any increase in NTPC's tariffs.

By 1987, difficulties with cost recovery led the Bank to stop lending to NTPC. Project approvals drastically slowed down, partly for lack of external finance, and partly because of growing congestion in the environmental clearance process. Recently, however, NTPC's collection performance has improved. Structural improvements in electricity tariffs are being implemented, and new investment and commercial policies are being introduced. (See box on page 4.)

### **Bank assistance**

As well as financial resources on a large scale, Bank support conferred on NTPC a status that helped reinforce the operating autonomy and political support that were so important in its development. Bank scrutiny of NTPC projects helped build confidence in the company, making it easier to secure prompt planning approval and cofinancing for investments.

### *Consultants*

NTPC made adroit use of consultants from several countries to obtain access to the latest technology and advanced utility practices, and today regards this as a major benefit from its relationship with the Bank.

## Working relationships

Bank and NTPC staff developed close working relationships. As well as giving advice on project management, quality assurance, and the use of financial controls, Bank staff seem to have helped form NTPC's corporate culture through their emphasis on the maintenance of high professional standards and on the need to develop the company along strictly commercial lines.

## Overoptimism

Over time, the Bank increasingly recognized the risk to NTPC's financial viability if the SEBs' performance did not improve, but it continued to portray the prospects for institutional improvements, including tariff reform, in an unduly favorable light. Unfortunately, many of the Bank's documents on the NTPC program lacked realistic presentations of constraints and risks.

## Lessons

- *Enclave projects:* New agencies free of established sector constraints can be highly effective, for a time, in getting particular jobs done. But unless policies and incentives are favorable in the

## Recent Developments

Since the audited projects were completed, the government has implemented the following reforms:

- *Established the Powergrid Corporation,* a transmission company and grid operator, to operate a national grid to improve efficiency in power transmission and system operations. NTPC is now a generating company only, having devolved its transmission operations on to Powergrid.
- *Further opened the sector to private investment* in generation, transmission, and distribution.

- *To encourage reforms in the SEBs,* established the Power Finance Corporation to lend to SEBs that implement action plans, endorsed by their state governments, to improve resource mobilization and operational efficiency.

- *Adopted new investment and commercial policies and electricity tariffs for NTPC.* The policies, approved (October 1992) after prolonged dialogue with the Bank, are designed to improve NTPC's operational and financial performance and help it recover its costs, while also promoting reforms by SEBs.

sector at large, these agencies will not be adopted as models by established agencies and will not long escape the penalties imposed by their surroundings.

- *Public sector:* When free to do so, public utilities in India can achieve high standards of efficiency, making use of modern management techniques.
- *Efficiency:* Massive and efficient investment by NTPC cannot alone eliminate India's power shortages.

India needs a strategy that gives at least equal priority to the efficiency of resource use and to demand management.

- *Shared views:* Loan conditionality should complement but cannot replace broad agreement on ends and means between the borrower and the Bank.
- *Bank optimism:* There is a clear need for more realistic description of constraints and risks affecting proposed projects.

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