



# Pha Lai Thermal Power Plant Project (1) - (4)

Contributing to increased power supply and economic revitalization in northern Vietnam by constructing an additional thermal power station

**[External evaluator]**

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**Rating**

Effectiveness, Impact	a	Overall rating <b>A</b>
Relevance	a	
Efficiency	b	
Sustainability	a	

**Project Objectives**

To meet the increasing power demand and ensure a stable power supply in northern Vietnam by constructing an additional anthracite coal fired power plant, adjacent to the existing power plant, namely the Pha Lai Thermal Power Plant No.1 located in Hai Duong Province near Hanoi City, together with two substations and related transmission lines, thereby contributing to revitalizing the regional economy.

**Outline of the Loan Agreement**

- Loan amount / disbursed amount: 72,096 million yen / 65,118 million yen (total)
- Loan agreement: April 1995 (I)
- Terms and conditions: Interest rate: 1.8-2.3%; 30-year repayment period (including a 10-year grace period); general untied
- Final disbursement date: September 2004 (IV)
- Executing agency: Vietnam Electricity (EVN)
- Website URL: <http://www.evn.com.vn/>

**Effects of Project Implementation (Effectiveness, Impact)**

The power plant constructed in this project has produced since 2005 more electric power than the value planned at the time of the appraisal (3,680 GWh/year). The annual power production in 2006 stood at 4,317 GWh. The maximum output has been on par with the planned value. The plant load factor has been about 80% since 2005. The availability of the desulfurization equipment to generator operation hours has remained high, above 90% since 2005. In both the northern region and the country as a whole, power consumption in the commercial and manufacturing sectors grew 70% to 100% between 2001 and 2005. This power plant accounts for some 19% of the power production in the northern region and about 7% of the national power production. It is therefore reasonable to conclude that this project has significantly contributed to increased power supply in Vietnam and supported rapid economic growth in recent years throughout the country as well as the northern region.

Therefore, this project has largely achieved its objectives and its effectiveness is high.

**Relevance**

This project has been highly relevant with the Vietnam's national policies and development needs at the times of both appraisal and ex-post evaluation. At the time of the appraisal, there was a need to meet the growing demand for power and ensure stable power supply in both the dry and rainy seasons. In addition, at the ex-post evaluation, meeting the increasing power demand remained an important issue to be addressed.

**Efficiency**

This project cost less than planned (72% of planned cost for Phase IV) but took longer (126% of planned period); therefore the evaluation for efficiency is moderate. The extension of the project period was caused by delays in a number of aspects, including employment of a consultant in the engineering services, the procurement process, the construction of the power plant itself (bankruptcy of a member of the joint venture contractors affected by the Asian Financial Crisis and delays in land acquisition), and the construction of the transmission lines / substations (delays in land acquisition).

**Sustainability**

No major problems have been observed in the capacity and the operation and maintenance system of the executing agency; therefore, sustainability of this project is high.

**Conclusion, Lessons Learned, Recommendations**

In light of the above, this project is evaluated to be highly satisfactory. Experiences and technologies acquired through this project have indirectly contributed to technical transfer to other power plants in the country. Therefore, in a country where construction of a number of power plants are planned, more effective contribution is expected by placing more importance on technical transfer. Another lesson is that construction of the resettlement site needs to be carried out as promptly as possible.

**Operation and output performance of the Pha Lai Thermal Power Plant**

	Availability factor		Maximum output	Plant load factor	Annual electric energy production	Auxiliary power ratio	Gross thermal efficiency
Planned at the appraisal	Around 83-90%		300 MW x 2 units	Around 70-90%	3,680 GWh	Around 8%	35-40%
	Unit1	Unit2					
2003	57.04	85.21	300	61.45	3,230	9.37	36.68
2004	78.76	76.51	300	67.03	3,533	9.26	36.05
2005	87.07	93.14	300	81.89	4,304	8.95	36.30
2006	86.31	83.47	300	82.13	4,317	8.67	36.17
2007	78.44	95.10	300	79.87	4,198	8.78	35.52

Source: Pha Lai Thermal Power Joint Stock Company