



## The Philippines

# 27 Improvement in Power Grid Project

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The objective was to install additional transformers at those substations in Luzon and Mindanao Islands where the load on the transformer was predicted to exceed the capacity. With the purpose of realizing a stable power supply by eliminating the overloading of transformers, the project would, thereby, contribute to the economic development of the region.

**Loan Amount/Disbursed Amount:** 2,224 million yen / 1,366 million yen

**Loan Agreement:** August 1995

**Terms and Conditions:** Interest rate, 2.7%; Repayment period, 30 years (grace period, 10 years); General untied

**Final Disbursement Date:** December 2000

**External Evaluator:** Takeshi Yamashita (KRI International Corp.)

**Field Survey:** July 2003



## Evaluation Result

In this project, additional transformers were installed at 5 substations on Luzon Island\* in northern Philippines, and 3 substations on Mindanao Island\* in the southern Philippines, almost as planned. The project implementation is taking longer than planned due to the change of locations, and due to the fire that took place at the headquarters of National Power Corporation (NPC), the then executing agency. Installation has not been completed at 2 substations in Abaga and Lugait (completion is scheduled for January 2005). The project cost was lower than the estimate as a result of efficient contracting through competitive bidding and other reasons. After the installation of additional transformers under this project, overloading of the existing transformers, which caused problems in supplying electricity, has been eliminated and, as a result, a stable power supply to households and companies has been ensured on Luzon and Mindanao Islands. In the survey of beneficiary companies, they said “there is no problem with power supply”, “restrictions on factory operation were removed because rotation outages became unnecessary”, and “failure of factory lines have decreased thanks to the reduction in sudden outages”, showing that the project made it possible for factories to operate on a stable basis. As a result of

the reform of the electric power sector in 2001, NPC’s transmission facilities, including the target substations of this project, were placed under the control of National Transmission Corporation (TRANSCO). The current executing agency, TRANSCO, has no problem with the technical capacity, operation and maintenance system, or financial condition. At the substations where installation work has not been completed (especially Lugait Substation which is overloaded), prompt completion is advisable.

\*Luzon Island: population 4.3 million, barangay (the smallest local administrative unit in the Philippines) electrification rate 96%

Mindanao Island: population 1.8 million, barangay electrification rate 81%

## Third-Party Evaluator’s Opinion

The predicted power demand on which this project had been based was too high however, it helped stabilize the power supply by allowing flexibly to its contents. The sector-wide reform such as reform of NPC, proper introduction of privatization and liquidation of debt is the issue to be solved.

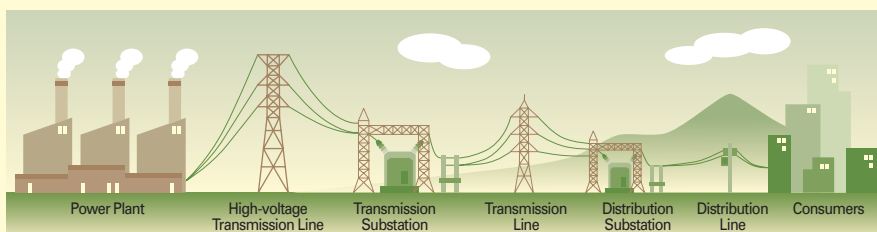
**Third-Party Evaluator:** Mr. Ruperto P. Alonzo

Obtained a doctorate in economics from University of Chicago. Presently holds the post of Professor of Economics, University of the Philippines, specializing in poverty reduction, informal sector and economic analysis.

## Functions of Substations

The higher the voltage, the lower the transmission losses. Electric power generated at a power plant is transmitted to localities while kept at as high a voltage as possible, and then the voltage is reduced by the transformer at the substation. The substation plays a pivotal role in transmitting electric power efficiently. Its functions are to distribute electric power and adjust voltage. Therefore, even though a sufficient amount of electricity is generated and the voltage at the generating end is stable, if the transformer at the substation is

insufficient in capacity or voltage adjusting function, it might result in a stoppage of power to users (outage) or unstable voltage. When demand is predicted to exceed the capacity of the transformer, measures such as rotation outages (scheduled outages) need to be taken to prevent fault of the power supply grid. In order to prevent such situations from occurring and to stabilize the power supply, each substation needs to be equipped with transformers with sufficient capacity.



Electric Power Facilities and Flow of Electric Power