

PARADIP PORT SUBSTITUTION OF COOKING FUEL PROJECT - INDIA



Paradip Port, on the Bay of Bengal in Orissa, India



Location of Paradip Port

Note: More photos available at: http://www.paradipport.gov.in/ph_gallery.php

Introduction

The Paradip Port Substitution of Cooking Fuel Project was initiated and funded by the Paradip Port Trust.

The Trust was set up by the Government of India to administer the port of Paradip, an autonomous body under the Major Port Trusts Act, 1963. The Trust purchases electricity in bulk from the Grid Corporation of Orissa Limited (GRIDCO) and then supplies electricity directly to its employees for household use. The Trust supplied electricity to its employees at a subsidised average flat rate of INR132 per month and had to bear an annual loss of around INR31 million.

The objective of the Paradip Port Substitution of Cooking Fuel Project was to reduce system peak demand by introducing LPG as a domestic cooking fuel through replacing electric stoves used by Trust employees. The project was targeted at cooking in the residential sector because this activity comprised approximately 60% of the electrical usage in each household. Almost 90% of the 3,592 households in the residential facility provided by the Trust used electric stoves for cooking, adding 3 to 4 MW to the electricity demand.

The maximum contract demand of Paradip Port under its supply contract with GRIDCO was 7.5 MVA. The peak demand often reached 9 to 10 MVA, resulting in penalty charges. The industrial load did not exceed 4 MVA at any point in time but the domestic use exceeded the contract quantity by 2 to 3 MVA during peak periods. Because electric stoves were the largest contributors to the peak demand, replacing these with LPG cooking stoves would result in considerable electricity and cost savings.

Description of Project

The replacement package offered by the Paradip Port Trust included both stoves and LPG cylinders. An LPG cylinder bottling plant, with assured gas supplies from Paradip Port, was also established in the area to ensure an adequate supply of LPG cylinders.

The Trust offered its employees the following incentives to move from electric stoves to LPG stoves:

- 100% subsidy on purchase and installation of an LPG stove;
- 100% reimbursement of the cost of the LPG cylinder;
- reduction in the flat rate electricity tariff from INR132 to INR80 per month;
- a limit on electricity consumption under the flat rate tariff fixed at 108 kilowatt-hours per month; consumption above this limit to be charged at the full price of INR3.37 per kilowatt-hour.

As the two-part tariff was introduced, meters were installed to monitor the electricity consumption by individual households and to enable accurate charging for electricity consumption.

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The Paradip Port Trust was the main stakeholder responsible for the financing, procurement, implementation and monitoring of the project. The housing department of the Trust was responsible for the entire project. The major investment in the project was the procurement and installation of the LPG stoves and electric meters in individual households. The entire cost was born by the Trust and was recovered through electricity and cost savings.

The end-users in this project were employees of the Trust and thus directly connected to the project implementor. Therefore, it was relatively easy for the Trust to create awareness, and market and control the project. The Trust motivated the end-users in the stove replacement project through various awareness programs.

Results

The Paradip Port Trust replaced a total of 2,874 electric cooking stoves with LPG stoves. The morning peak was reduced by 2.3 MW and the evening peak by 3.2 MW. The project resulted in ongoing annual savings to the Trust of INR15 million.

The total implementation cost for the Paradip Port Substitution of Cooking Fuel Project was INR19.7 million. The additional cost of running the project was identified as INR200,000 per year. The entire cost was born by the Trust and was recovered through electricity and cost savings. A detailed breakdown of the implementation cost is shown in Table 1.

Table 1. Implementation Costs for the Paradip Port Substitution of Cooking Fuel Project	
Expenditure Item	Cost (INR)
LPG gas stoves for 2,874 houses	3.4 million
Enrolment fees for 2,874 houses	2.9 million
Fire resistant panels in huts	1.3 million
Fire extinguishers for huts	1.0 million
Security cages and pipes for LPG cylinders	1.0 million
Electricity meters for 2,874 houses	9.0 million
Publicity and safety training	1.1 million
Total implementation cost	19.7 million

This article was contributed by David Crossley, Managing Director of Energy Futures Australia Pty. Ltd and Senior Advisor at The Regulatory Assistance Project. For more information on this case study and others, visit Task XV, Network Driven DSM at:

<http://www.ieadsm.org/ViewTask.aspx?ID=17&Task=15&Sort=1>.