VIET TRI PAPER COMPANY

COMPANY DESCRIPTION

Viet Tri Paper Company, a state company, was established in 1961 and is located in Phu Tho province. Viet Tri is ranked as fourth company in term of capacity amongst the 12 companies under the Vietnam Paper Corporation. Today, the company employs 1300 staff members and has an annual turnover of approximately 9.5 million US $. Total output (old production line) of Viet Tri is around 15,000 ton annually. In the time of starting project, the company has just expanded its production. The products of the company including printing paper, writing paper, toilet paper and wrapping paper are well sold in the market.

The company decided to participate in the project because the energy activities are seen as a means to save money. High energy costs had been a burning issue for management, because energy costs are mainly in relation to turnover.

PROCESS DESCRIPTION

- ***Raw material Preparation:*** In a pulp mill, the fibres are separated from one another into a mass of individual fibres. Processes used include debarking (for wood) and chipping.
- ***Pulping:*** There are two pulpers in the production line. These pulpers are hydro pulper and are used to mix/dilute the long fibre pulp of broken paper and imported pulp.
- ***Refining***: Imported pulp and washed pulp are sent to refiner to get the desired size of fibre. This mechanical action is carried out to develop the optimal papermaking properties with respect to the product being made.
- ***Paper machine***: The pulp mixture is then further diluted with water resulting in very thin slurry. This dilute slurry is drained through a fine mesh, forming a fibrous web. This moving web is pressed and dried into a continuous sheet of paper. When dried, this continuous web may be cut to size and rolls or sheets.

METHODOLOGY APPLICATION

The draft *Company Energy Efficiency Methodology* was used as a basis for the plant assessment to identify and implement options to reduce energy and other materials and wastes. Some of the interesting experiences are:

- ***Task 1b – Form a team and inform staff***

The Team was based the Cleaner Production Team that was formed in 1999 as part of a previous CP project. Almost all members were familiar with the CP methodology before the GERIAP project, so it made it easy to apply the *Company Energy Efficiency Methodology* because that is based on the CP methodology also.

Lesson learnt: Consider including staff in the Team who are already familiar with Cleaner Production.

- ***Task 3c – Screen options for feasibility analysis***

The Team raised the idea to install a new Fluid Bed Combustion boiler with a capacity of 15 TPH instead of 3 old coal boilers. However, this option had to be rejected for financial reasons because the company had already purchased two new oil-fired boilers from Korea before the GERIAP project started.

Lesson learnt: The Team should also consider what action the company has already taken to try and improve energy efficiency for the focus areas, as this may impact the feasibility of newly identified options.

- ***Task 4b – Rank feasible options for implementation***

Only low and no cost options with less than a two-year payback time were implemented. The other options with larger investments will be considered for implementation pending funding approval by banks or credit institutions.
Lesson learnt: Investment costs and payback time are important criteria for ranking options for implementation.

- ***Task 4c – Prepare implementation and monitoring proposal for top management approval***

Subsidies for investments in (technical) options seemed to have a strong psychological effect on the company in addition to improving the financial feasibility of the options. Often the measures would have been profitable anyway, but the subsidy is perceived by management as a signal that the options are worth investing in, because an outsider is willing to invest in them.
Lesson learnt: Subsidies can give a psychological push to management to approve the implementation of options because an outsider signals that the options are worth investing in.

- ***Task 5a – Implement options and monitor results***

Top management gave staff full support fully decentralized the planning and realization of option implementation and monitoring. This gave the Team the necessary freedom to try new paths with the testing and implementation of options, which sometimes resulted in failed options but many times in successful options.
Lesson learnt: If management gives staff the freedom to trial with the implementation of different options it is more likely to result in unexpected successes!

- ***Task 5a – Implement options and monitor results***

For some implemented options, mostly good housekeeping options, it was not possible to measure or calculate savings, although it is clear that these options contribute to reduced energy and material consumption. Specific consumption figures could help with finding out if after the implementation of such options there is still scope for further improvement, which will help value good housekeeping options.
Lesson learnt: Specific consumption figures (i.e. per unit of product) could help determine if there is further scope for improvement where it is not possible to determine the savings of individual options.

- ***Step 6 – Continuous improvement***

The company has a lot of trust in the Viet Nam Cleaner Production Centre (VNCPC) following excellent outcomes from a 1999 Cleaner Production project. Because of this the company is committed to continue with improving energy efficiency on its own.
Lessons learnt:

1. The external facilitator can play an important role in getting the company to commit to continue with energy efficiency.
2. The success of CP project has been found to be important for the company to engage itself to improve energy efficiency.

- ***Step 6 – Continuous improvement***

Top management of his company has become more aware of the need to act to improve environmental performance and is more willing to market their efforts in energy efficiency to the outside world and improve their public image because of the growing public debate on energy and environmental issues.
Lesson learnt: Public opinion and debate can have a positive influence on raising awareness amongst top management of companies about the need to continue to improve energy efficiency.

OPTIONS

For three selected audit focus areas coal fired boilers, steam pipelines, and steam utilization, the Team has identified a total of 14 energy and wasted minimization options in which nine options are already implemented and summarized in Table 1. The implementation of these options can generate considerable economical benefits and greatly reduce the emission of greenhouse gas. Total investments for the implemented options were approximately US$ 112,784, financed by the company own resources and generate net annual savings of US$ 123,390. The overall payback at the company was therefore 11 months.

Table 1. EXAMPLES OF OPTIONS IMPLEMENTED

FOCUS AREA/ OPTION	CP TECH NIQUE	FINANCIAL FEASIBILITY	ENVIRONMEN TAL BENEFITS	COMMENTS
Install a VSD to control motor speed of paper machines	New technology/ equipment	▪ Investment: US$ 95,240 ▪ Cost savings: US$ 76,190/yr ▪ Payback period: 15 months	▪ GHG emission reduction: 836 tCO2/yr	
Recover condensate from paper machines 1, 2, 6	On site recovery/ reuse	▪ Investment: US$ 3,175 ▪ Cost savings: US$ 6,348 ▪ Payback period: 4 months	▪ GHG emission reduction: 693 tCO2/yr	
Steam Utilization/Insulat ion of steam pipelines.	Good house keeping	▪ Investment: US$ 2,540 ▪ Cost savings: US$ 5,524/yr ▪ Payback period: 6 months	▪ GHG emission reduction: 602 tCO2/yr	
Use of better quality coals (dust coal 4a instead of dust coal 5a) and strictly control quality of input coals.	Input material substitution	▪ Investment: negligible ▪ Operating cost: US$ 50,793 ▪ Cost savings & payback period: included in ▪ overall results	▪ GHG emission reductions: included in overall reduction	Contribute to increase boiler efficiency
Steam Pipelines/Fixing steam leaks of steam pipelines	Good house keeping	▪ Investment: US$ 83 ▪ Cost savings & payback period: included in ▪ overall results	▪ GHG emission reductions: included in overall reduction	It is impossible to estimate the actual result of this option
Repair Leaks and maintain steam traps	Good house keeping	▪ Investment: US$ 635 ▪ Cost savings & payback period: included in overall results	▪ GHG emission reductions: included in overall reduction	Reduced heat loss on steam distribution line.
Installation of economizers on boilers	Production process/ equipment modification	▪ Investment: US$ 4,762 ▪ Operating cost: US$ 368 ▪ Cost savings: US$ 8,750/yr ▪ Payback period: 7 months	▪ GHG emission reduction: 950 tCO2/yr	Feed water temperature increase from 25°C to 60°C
Construct a coal storage to reduce the moisture in coal	Good house keeping	▪ Investment: US$ 6,349 ▪ Cost savings: US$ 1,375/yr ▪ Payback period: 4.6 years	▪ GHG emission reduction: 148 tCO2/yr	Reduce moisture in coal from 15% to 10%

Table 2. EXAMPLES OF OPTIONS NOT IMPLEMENTED

FOCUS AREA/ OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Coal fired boilers/ Install a fluidized bed combustion (FBC) external furnace for the coal fired boilers	Good housekeeping	▪ Investment: negligible	▪ Reduction of GHG emissions	Contribute to increase boiler efficiency

For the nine options implemented, the total annual energy reductions were 1,200 tons of coal, 1,545,000 kwh. As a result of options implemented, the company's GHG emissions were reduced by 4,063 tons CO_2 between the start of the project in 2003 and the end of the project in 2005. Besides costs and energy savings, it also contributed to a decrease in wastewater of 3,821 m^3, to an improvement in product quality and working conditions.

Table 3. RESULTS FROM THE GERIAP PROJECT

Material/ Energy	Savings	Annual energy saving	Annual environmental savings	Annual financial savings
Coal	0.08 tons/ton paper	1,200 ton coal	3,012 t CO_2	US$ 27,600
Electricity	103 kWh/ton paper	1,545,000 kWh	1,051 t CO_2	US$ 95,790
Water	16 m^3/ton paper	240,000 m^3	240,000 m^3 wastewater	US$ 24,000
TOTAL			**4,063 tCO_2 and 240,000 m^3 wastewater**	**US$ 123,390**

Notes:

- *Total output of products in 2004: 15,000 tons papers*
- *Electricity: US$ 0.062 /k Wh*
- *Coal: US$ 23 /ton*
- *Water: US$ 0.1 /m^3*
- *Emission factor: 2.51 tons CO_2/ton of coal; 0.00068 tons CO_2/k Wh*

FOR MORE INFORMATION

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