ASIAN CHEMICAL COMPANY LIMITED

COMPANY DESCRIPTION

Asian Chemical Co. Ltd. was established in 1976 and is located in Bangpakong in Thailand. The company produces various kinds of products that include copper solution, namely copper sulphate, copper oxide, copper chloride and etching solution with the total production of around 6,000 tons per annum. The company employs 120 staff who work in three 8-hours work.

Asian Chemical Co. Ltd. participated in the GERIAP project to increase its competency in applying the Company Energy Efficiency Methodology that is based on Cleaner Production, which was believed to be more effective than the conventional energy audit approach. A dedicated Team was established to cooperate with TISTR, the organization implementing the GERIAP project in Thailand.

PROCESS DESCRIPTION

The company production processes are described below:

- Copper solution is neutralized in a reactor obtaining copper oxide (CuO). CuO is then washed and filtered by a pressed-filter. Purified CuO cake obtained from this process is used for producing copper sulphate, copper chloride and copper oxide.
- The by–product, ammonium hydroxide (NH_4OH) solution, is mixed with additives to produce an etching solution.
- To produce copper sulphate, CuO cake or copper scraps is made to react with sulphuric acid and the mother liquor in the reactor. The solution is then cooled and crystallized. The crystals are further separated from the mother liquor and then dried. Similar processes are used to produce copper chloride.

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:

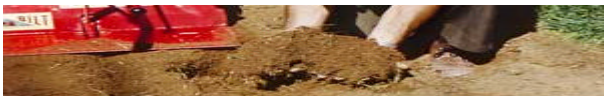
- ***Task 1b – Form a team and inform staff***

During the assessment there was a change over of the entire Team except the except for the Production Manager who was the Team Leader. However, this did not cause any difficulties in completing the assessment because the company has good management and information systems and procedures as part of its certified environmental (ISO 14001), quality (ISO 9001) and safety (OHSAS 18001) management systems.

Lesson learnt: If a company has good management systems then the assessment is less affected by a change over in Team members.

- ***Task 2d – Quantify inputs and outputs and costs to establish a baseline***

Although the company has a good information system, there is only one electricity meter that measures the total electricity consumption of the plant, and therefore electricity consumption for the focus area could not be determined.



Lesson learnt: It often happens that plants only have one meter that measures electricity consumption for the entire plant, which makes it difficult to find out electricity consumption for individual departments or equipments.

- ***Task 3b – Identify options***

Top management is very supportive for staff to take their own initiative to improve energy efficiency and environmental performance. This greatly contributed to staff identifying a range of energy efficiency options without the need for much encouragement by the external facilitators, such as the installation of a new boiler and an insulated condensate tank for collecting condensate for reuse as pre-heated feed water. In addition, the management approved all options for implementation proposed by the Team.

Lesson learnt: Trust of top management in staff contributes to staff taking ownership for the identification and implementation of energy efficiency options, which is beneficial to the company.

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

Top management was satisfied with the results of implemented options, in particular reduction in energy costs, GHG emissions and most importantly an increase in production output because production processes were operating more efficiently. These successes meant that the company is motivated to keep improving energy efficiency as part of its environmental management system.

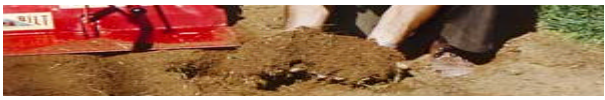
Lesson learnt: If implementation of options is successful then a company is more motivated to continue with energy efficiency in the future.

OPTIONS

- The Team identified several energy conservation options. Five options were implemented as summarized in the table below.
- The total investment for the implementation of the five options was US$ 72,753, resulting in US$ 20,232 annual savings. The total payback period was 3.5 years.
- The annual GHG emission reduction was calculated at 288 tons of CO_2.

Table: EXAMPLES OF OPTIONS IMPLEMENTED

FOCUS AREA/ OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Steam system – boiler/ Replacement of inefficient and unsafe boiler with a new boiler *(see case study)*	New technology/ equipment	▪ Investment: US$ 55,000 ▪ Cost savings: US$ 7,600 ▪ Payback period: 7.2 yr	▪ Fuel oil savings: 38,000 l/yr ▪ GHG emission reduction: 114 tCO_2/ yr	Option was implemented despite the long payback period as part of larger overhaul of steam system and because of safety concerns
Steam system – boiler/ Installation of insulated storage tank for collecting steam condensate water for reuse as boiler pre-heated feed water *(see case study)*	New technology/ equipment	▪ Investment: US$17,000 ▪ Cost savings: US$ 3,317 ▪ Payback period: >5.1 yr	▪ Fuel oil savings: 16,584 l/yr ▪ GHG emission reduction: 49.8 tCO_2/yr ▪ Water savings: 2,745.6 m^3/yr	Option was implemented despite the long payback period as part of larger overhaul of steam system
Steam system – distribution/ Replacement of damaged steam traps *(see case study)*	Good housekeeping	▪ Investment: US$ 400 ▪ Annual savings: US$ 6,495 ▪ Payback period: 23 days	▪ Fuel oil savings: 32,475 l/yr ▪ GHG emission reduction: 97 tCO_2/yr	Routine investigation of steam traps is needed to avoid future losses
Steam system – distribution/ Steam leak survey and repair of leaking joints and pipes *(see case study)*	Good housekeeping	▪ Investment: US$33 ▪ Cost savings: US$271 ▪ Payback period: 44 days	▪ Fuel oil reduction: 1,353 l /yr ▪ GHG emission reduction: 4 tCO_2/ yr	Routine investigation of steam system is needed to avoid future losses
Compressed air system/ Replace or repair pipe and filter connections to avoid compressed air leakage *(see case study)*	Good housekeeping	▪ Investment: US$155 ▪ Cost savings: US$2,267 ▪ Payback period: 25 days	▪ Electricity savings: 32,977 kWh/yr ▪ GHG emission reduction: 20 tCO_2/ yr	Routine investigation of compressed air system is needed to avoid future losses
Cooling Tower/ Install temperature sensor to switch the fan in Cooling Tower on when water temperature exceeds 28 ^{0}C *(see case study)*	Production process/ equipment modification	▪ Investment: US$165 ▪ Cost savings: US$282 ▪ Payback period: 7 months	▪ Electricity savings: 4,032 kWh/yr ▪ GHG emission reduction: 2.49 tCO_2/yr	



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