India: agro-based pulp and paper

A joint study by the National Productivity Council of India and UNIDO investigated the potential for waste minimization in three sectors: agro-based pulp and paper, pesticide formulation and textile dyeing and finishing. Before the investigation, one of the agro-based pulp and paper mills (30 tonnes per day) had prepared an estimate of the cost of meeting discharge standards based on end-of-pipe technology. As a result of implementing preventive measures, the mill achieved the following:

- Reduced its capital investment cost for end-of-pipe equipment by 25 per cent and its annualized operating and maintenance costs by 35 per cent
- Reduced the discharge of residuals 20-40 per cent
- Increased annual output by 22 per cent, improved the quality of the paper produced (specks were reduced) and made a new product (secondary fuel for brick kilns from the primary clarifier)
- Hired nine more employees to cope with increased production capacity
- Reduced offsite secondary pollution by reducing the consumption of sodium hydroxide and of energy (less suspended particulate matter and sulphur dioxide)

To achieve these results, the mill implemented 28 preventive measures at a capital cost of US$ 100,000 and an operating cost of US$ 40,000. The total savings form these measures were US$ 400,000, giving a payback period on capital investment of less than four months.

China: fine chemicals

A recent cleaner production project in China, funded by the World Bank and implemented by the Industry and Environment Office of the United Nations Environment Programme (UNEP) and the Environmental Research Institute (IVAM) of Amsterdam University, looked at the potential for cleaner production at seven companies. One of the plants is a major manufacturer of fine chemicals in China, specializing in the production of additives for the processing of higher-polymer materials. As a result of implementing preventive measures, the mill achieved the following:

- Reduced its capital investment cost for end-of-pipe equipment by 25 per cent and annualized costs by 15 per cent
- Reduced water use by 80 per cent and chemical oxygen demand by 95 per cent
- Increased output by 25 per cent
- Increased the expenditure for labour by 40 per cent

To achieve these results, the plant has implemented nine low-cost options and it is now considering four high-cost options. The investment needed for implementing the first batch of nine cleaner production options was less than US$ 1,200. The annual savings due to increased efficiency and decreased materials and water consumption was US$ 30,000, giving a payback period of less than two weeks. The investment needed for the four high-cost options would be US$ 520,000. The annual savings will be US$750,000, giving a payback period for the capital investment of less than nine months.