GO AROUND IN CIRCLES

BEFORE  WATER USAGE PRIOR TO THE “WATER EFFICIENCY” INITIATIVE

- Problem:
  1. Too many instances where clean water could be better replaced by recycled purified water.
  2. The sole flotation unit was working at almost total capacity (and almost at the limits of its operational efficiency).

- Goals:
  1. To reduce consumption of clean water.
  2. To significantly increase the degree of wastewater purification.

- Tasks:
  1. Construct a closed internal water circuit to provide additional capacity for water recirculation.
  2. Purify a greater proportion of wastewater to allow this to be used instead of clean water.

AFTER  WATER USAGE FOLLOWING IMPLEMENTATION OF THE “WATER EFFICIENCY” INITIATIVE

- Technical measures:
  1. Installation of an additional flotation unit.
  2. Implementation of a further level of purification — i.e., a gravity filter. This resulted in a significant improvement in the quality of the wastewater, allowing this (after appropriate purification) to be used (instead of fresh water) in the most demanding production processes.
  3. Re-direction of a proportion of grey water (previously channeled into the equalization tank and thereafter to the flotation unit) for direct return for use in various production processes (specifically, the preparation of paper mass).
  4. Better processing of paper mass, resulting in greater retention of fiber on the cardboard production line, resulting in obvious savings in raw materials and also reducing the amount of fiber being discharged into the water channeled into the equalization tank (and ultimately being channeled to the flotation unit for treatment).

WHEN WATER FLOWS – SO DOES CASH

WATER EFFICIENCY CASE STUDY

THE PROBLEM

Together with wastepaper, water is one of the most essential inputs in paper production. When IFC first contacted the company, water consumption at the Umka mill was running at three million cubic meters per year — an average of 44.4 cubic meters per for every ton of cardboard produced. Worse, water usage could sometimes hit 56.3 cubic meters per ton at certain times of the year — far in excess of industry norms: and in what was becoming an increasing cause of concern for Umka’s management, sizeable volumes wastewater were being discharged directly into the river.

PROFITS DOWN THE DRAIN

Environmental impacts were not the only problem: the unnecessary production costs of such excessive water usage were having a serious impact on the company’s profitability. The price of water had increased by 30 percent since 2008, and were now running at an unprecedented 17 cents (euro) per cubic meter — not to mention the cost of the gas and electricity needed to heat the water, and the cost of gas and electricity used in preparation and post-production processing, also up 40 percent since 2008. In 2008 water, gas and electricity costs represented 13.5 percent of total production costs: if not held in check, these were likely to hit 22 percent within three years.

REAL COSTS

Environmental impacts were not the only problem: the unnecessary production costs of such excessive water usage were having a serious impact on the company’s profitability. The price of water had increased by 30 percent since 2008, and were now running at an unprecedented 17 cents (euro) per cubic meter — not to mention the cost of the gas and electricity needed to heat the water, and the cost of gas and electricity used in preparation and post-production processing, also up 40 percent since 2008. In 2008 water, gas and electricity costs represented 13.5 percent of total production costs: if not held in check, these were likely to hit 22 percent within three years.

See how Umka managed to reduce operational costs by 61%
LESS WATER, MORE CASH

A 'WATER EFFICIENCY' TASK FORCE

Forced to take action, Umka set in place a dedicated ‘Water Efficiency’ task force charged with investigating all production processes, identifying water-related issues, and developing practical, cost-effective solutions. The Water Efficiency Team included Umka’s chief executive, as well as the company’s chief technology officer and chief engineer, environment protection experts, economists and business-process specialist – 12 people altogether.

BETTER HANDS-ON ORGANIZATION

The task force set about introducing a number of measures, including:

• mandatory daily controls over water consumption
• weekly meetings (supported by fully comprehensive reports).

Most effective of all, however, was the team’s new responsibility in making the ongoing review of standard processes – and the introduction of new and innovative solutions – a core element of its day-to-day work.

Taken together, these initiatives helped the team improve internal communications, identify the reasons for spikes in water consumption, and develop a strategy for reducing water usage.

APPROACH

Having reviewed all production processes, the advice from the task force was quite clear:

• increase the recycling of wastewater – by wastewater from the paper machine being processed through two flotation units (to be used for dilution and concentration control) and, after secondary processing through a gravity filter, becoming processed sufficiently to meet health and safety standards
• use every opportunity to re-use clean water
• reduce the discharge of polluting substances into the river

AREAS FOR IMPROVEMENT

It was found out that some of the water which had been categorised as waste and discharged could be recycled with minimum processing and used in some part of production processes, which do not require higher grades of water treatment. Through processing the water streams on the basis outlined above, the team found that some water – previously categorized as ‘waste’ and thus simply disposed of – could, with often only minimum levels of processing, be treated to a standard sufficient for it to be used in other production processes. The technical measures necessary to achieve this were also often quite simple – for example:

• add one more level of purification to replace the clean water in several processes
• add one more flotation unit to lower pressure in previously overburned one
• improve the retention of paper mass
• return part of white waters directly to the production line

Better yet, the task force demonstrated how the use of additional equipment – much of it comparatively cheap (for example, a further flotation unit, a gravity filter, and water retention equipment) – would allow a greater proportion of water to be recycled, as well as reducing demand for gas, electricity, and chemicals for water treatment

Implementing the measures recommended by the task force led to a 50 percent reduction in the company’s water costs between 2008 and 2011 (including water intake and discharge fees, chemicals for water treatment, and wastewater), and also meant the company could avoid further increases in other water-related (and energy) costs while increasing capacity and output. Better efficiency in the use of paper mass has also led to savings in the cost of raw materials.

The introduction of the Water Efficiency program saw the company achieve savings of €250,000 on its water costs in 2011. The implementation of company’s most recent energy efficiency initiatives have also reduced gas consumption by 15 percent, resulting in savings of €70,000. These two amounts together – at €820,000 – are well in excess of the original €800,000 capital expenditure invested in the project, and the savings achieved have allowed this investment to be repaid within a period of three years – again, well in advance of the seven-year payback period originally anticipated.

"Reducing water consumption has also resulted in significant savings in energy and chemicals. We fully appreciate the potential of better resource efficiency in improving profitability and are now planning a similar initiative to fully optimize (and reduce) our costs in natural gas, electricity and other resources."