

Eco-efficiency opportunities fact sheet

Manufacturers and Processors: Minimizing Water Loss

Introduction



The Eco-Efficiency Program for Manufacturers (E2PM) was created by Dalhousie University's Eco-Efficiency Centre to help small- to medium-sized manufacturers and processors, across Nova Scotia, identify eco-efficiency and pollution prevention

opportunities. The program focused on business initiatives to reduce costs by utilizing energy, water, and materials more efficiently. The program consisted of four components, two offered by Eco-Efficiency Centre staff and two by private consultants. Both Eco-Efficiency Centre staff and consultants conducted site visits of local manufacturers and prepared recommendations on opportunities available. Formal opportunity and implementation assessment reports were prepared by the consultants for participating companies.

Before the program ended in March 2009, data was collected from 70 Nova Scotian companies on various eco-efficiency and pollution prevention opportunities. A survey of a subset of these 70 companies, that recorded savings from implemented opportunities, identified \$2.8 million saved and over 8000 tonnes of greenhouse gas reductions annually over the life of the project. It should be noted that these numbers show only quantifiable results. Additional companies benefitted from the program but were unable to quantify their savings at the time of the survey.

To demonstrate common trends found in opportunity and implementation assessments, data was compiled and sorted to identify the top five most common recommendations with examples of specific recommendations from each category.

Recommendation

Reduction of the use of water in processes.

Rank

This recommendation was suggested to 49% of E2PM participants, making it the fourth most common recommendation (tied with increasing boiler efficiency).

Details

Water is another resource that is frequently used in businesses and their processes; much like electricity, it is all too often used inefficiently. Water also tends to be much less expensive than electricity, reducing the economic incentive to improve water efficiency. Unfortunately, the environmental impacts of water wastage and contamination can be immense, causing the pollution of freshwater resources and harming biodiversity in aquatic systems. There may also be additional fees associated with water use that can lead to substantial costs and can also easily be reduced.

For example, the costs of disposing of contaminated or hazardous wastewater can be significant, as it must be hauled away or treated properly. An easy way to reduce these costs is



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to simply reuse water wherever possible either after treatment or until it is no longer usable in the process. This can be accomplished by using a closed loop system to feed water back into the process.

Wastewater is also often discarded with some latent heat; this heat can be used to improve efficiency and reduce costs. Using another closed loop system, the heat can be salvaged using a heat exchanger and used elsewhere in the process. The water, if usable, can also be re-circulated into the system, further increasing the overall efficiency.

Water use in processes can often be excessive, due largely to the low costs associated with the resource. Many washing stages and cooling applications use excessively high flows and can easily be decreased to reduce costs and environmental impact. A classic non-industrial example would be the replacement of high flow toilets to low flow toilets. Rainwater can also be collected for use in non-potable applications, further reducing water costs.

Payback Period

Payback periods for these kinds of recommendations are difficult to generalize, as they tend to be specific to the project. The low cost of water also makes many projects unfeasible, but those that are viable usually have a payback period of 2-5 years.

Company Examples

A food processor had an opportunity assessment completed in 2006 by Enviro-Stewards. They determined that both their distilled water process and compressed air system were using excessive amount of water. The report found that the distilled water process could have its flow reduced by 50% without affecting the process, instantly saving \$116 each year. The compressor cooling flow used was too high for most applications. The installation of a temperature regulated valve at a cost of \$500 was recommendation and had the potential to reduce water consumption by 75%. This recommendation had the potential to save \$360 each year resulting in a payback period of 1.5 years.

An opportunity assessment by Neill and Gunter identified that a power generation company could drastically reduce their water consumption when assessing equipment replacements. The report recommended the replacement of urinals with low flow models and the water cooled air conditioner with an air cooled model. This recommendation would only be considered when replacement was necessary, as it would have no economic benefit. Due to the large amount of water the business uses it does not pay a fee based on the amount of water used, so this reduction was not quantified in dollars saved. The changes had the potential to reduce 2590 m³ of water each year.

This eco-efficiency opportunities fact sheet was prepared by the *Eco-Efficiency Centre*, a non-profit, non-government educational and environmental management support centre for small- and medium-sized enterprises in Nova Scotia. The Eco-Efficiency Centre was established in 1998 as a partnership between Dalhousie University and Nova Scotia Power Inc., and is supported by private corporations, governments and foundations. The Centre assists companies to achieve better environmental and economic performance through resource conservation, pollution prevention, recycling, reuse, and general good environmental practices.