

## Toronto Region Sustainability Program

### Table of Contents

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Focus.....page 1                        | Representative Case Studies.....page 6  |
| The Program.....page 2                  | Prokleen Washing Services.....page 6    |
| Recent Workshops of the TRSP.....page 3 | Halltech Inc.....page 9                 |
| P2 Benefits.....page 4                  | S & C Electric Canada Ltd.....page 10   |
| Actual Program Results.....page 5       | North York General Hospital.....page 12 |

### Focus

This issue of At the Source focuses on the Toronto Region Sustainability Program (TRSP) and its community-based projects to promote sustainability through pollution prevention in the greater Toronto region of Ontario, Canada. The program fosters sustainable behaviour among small to medium-sized manufacturers and hospitals. The TRSP is successful and cost effective: over 90% of participants implement all or most of their projects, and for every program dollar, clients are spending \$19 on pollution prevention (P2) opportunities. P2 promoted through the TRSP makes good business and environmental sense. The implementation of P2 opportunities yields a significant return on investment, with an average payback period of less than one year! The generation of pollutants and production of hazardous wastes are reduced or eliminated, and the volume of solid waste and sewer discharges are reduced.

We look at the program, some case studies, and their results, in an effort to promote expansion of the program, and to encourage other jurisdictions to develop and promote their own sustainability programs. Could your community or company join the TRSP, or could your community undertake a similar program to reap the benefits of positive environmental and financial results?

# The Program

Underway since 2001, the Toronto Region Sustainability Program (TRSP) operates in the Greater Toronto region of Ontario, Canada. It is an ongoing, action and results oriented program led by the Ontario Centre for Environmental Technology Advancement (OCETA), a private not-for-profit organization. Through P2 planning and implementation, the purpose of the TRSP is to improve the sustainable practices, economic and environmental performance of SMEs and health care facilities in the Greater Toronto Region. This purpose is achieved through the development and delivery of an integrated, transferable and community-based approach. The TRSP includes the subset programs: the Durham Manufacturers Sustainability Program; the Markham Manufacturers Sustainability Program; and the Vaughan Manufacturers Sustainability Program. Program funders have included: Ontario Ministry of the Environment (MOE), Environment Canada, Toronto and Region Conservation, Ontario Trillium Foundation, the Regional Municipality of Durham, the Town of Markham, the City of Vaughan, and the City of Toronto.

Although there are some minor differences amongst the subset programs, they share the same general objective: to foster sustainable behaviour among SMEs by providing technical and financial assistance to enhance their environmental performance while improving competitiveness. The programs help SMEs reduce their environmental footprint by optimizing processes, reducing wastes, and improving operational practices. How does the TRSP do this?

SMEs are offered the opportunity to conduct a P2 assessment and to develop a P2 action plan that will address priority environmental issues (i.e. toxics, sewer discharges, smog precursors, greenhouse gases, hazardous wastes, and

energy consumption) targeted by three orders of government—Environment Canada, MOE, and municipalities. Specific P2 projects are then developed to deal with the priority issues.

## **There are two components to the TRSP:**

- Manufacturers with fewer than 500 employees at any one facility are eligible to have a multi-media P2 assessment undertaken by a pre-qualified P2 consultant from OCETA's roster. The consultant identifies the root causes of priority pollutants and wastes, and energy inefficiency, and recommends improvements in technology, processes, and operating practices for the facility. The resulting P2 plan addresses priority environmental issues (e.g. toxics, sewer discharges, smog precursors, greenhouse gases (GHGs), hazardous wastes, and energy consumption) through specific P2 projects for the company to implement.
- Participants receive a funding incentive of up to 50 per cent (maximum \$5,000) to help offset the P2 assessment costs.

For more information on TRSP, visit  
<http://www.oceta.on.ca/TORSUS>

To ensure high quality P2 assessments, consultants are drawn from a roster of pre-screened, qualified individuals. Currently on the roster, there are 20 consultants with a wide range of expertise to best match the waste streams, processes and preferences of individual clients. The Toronto Region Sustainability Program Guidelines and Protocols set out the consultant roster selection process, and define OCETA's quality standards for proposals and P2 assessment reports done by consultants on the roster.

### *The Program cont'd*

In 2008-2009, the TRSP was expanded to include energy efficiency in the existing program. It now offers P2 and energy efficiency technical assistance for SMEs. An additional program component in Durham Region includes the Ontario Trillium Foundation (OTF) funded Durham Sustainability Stewardship Program (DSSP). OCETA, in collaboration with the Canadian Centre for Pollution Prevention (C2P2) and Durham Sustainability (DSA), has launched this community-based, environmental education and outreach program for two main reasons: first, to generate awareness of the opportunities for reducing the environmental footprint of Durham Region stakeholders (governments, businesses, institutions, youth, and local citizens); and second, to encourage behavioural change and the adoption of sustainable environmental practices to achieve quantifiable reductions.

Outreach to promote the TRSP to communities, interest groups and SMEs includes networking, marketing letters, e-mails, telephone calls, newsletters, fact sheets, posters, brochures, published promotional articles, website, video, and workshops. For newsletters visit: <http://www.oceta.on.ca/TORSUS/news.htm>.

The 17 minute video, 'Journey Towards Sustainable Production: Featuring Toronto Region Sustainability Program Pollution Prevention Leaders', highlights the accomplishments and thoughts of TRSP companies from a variety of manufacturing sectors (including specialty chemical, paint, printing, and metal finishing) on integrating sustainability into their business strategy and operations. Key insights highlighted in the video include 'how to':

- Overcome internal hurdles for obtaining senior management approval and for gaining staff buy-in;
- Find non-capital intensive, cost-effective, intelligent solutions that go beyond a standard P2 assessment report; and
- Make the transition from process optimization to the integration of sustainability concepts into their day-to-day business operations.

Let's look briefly at some recent TRSP workshops.

## Recent workshops of the TRSP

**Greening Your Business Bottom Line and Pollution Prevention**, January 2009, Toronto. Presented by The City of Toronto's Water Division and OCETA. The 70 participants discussed and shared information on how businesses in Toronto can enhance their bottom line, reduce resource consumption and minimize waste through P2 practices. To view the presentations visit [http://www.oceta.on.ca/workshops/TorontoWater\\_jan09/](http://www.oceta.on.ca/workshops/TorontoWater_jan09/).

**Stakeholder Pollution Prevention Workshop: Reducing Ecological Footprint in the Sheridan and Cooksville Creek Watersheds, Part 2**, April 2008, Mississauga. Presented by Credit Valley Conservation, OCETA, and local Regional and Municipal partners. The 46 Stakeholders from communities across the two watersheds discussed and shared information on P2 opportunities

while strengthening partnerships across stakeholder communities. For more information and workshop presentations, visit, [http://www.oceta.on.ca/oceta\\_cvc\\_workshop\\_web.htm](http://www.oceta.on.ca/oceta_cvc_workshop_web.htm)

**Durham Region Stakeholders' Sustainability Forum**, September and December 2008, and April and November 2009. Presented by OCETA in collaboration with C2P2 and DSA. The forums created awareness of Sustainable Production and Consumption/Pollution Prevention principles and how these can be applied daily, at work and home. Also, the forums provided stakeholders with opportunities to build partnerships, share local environmental initiatives, best practices and showcase achievements of local environmental stewards from all sectors in Durham and other GTA communities. Local community members gained knowledge of local business efforts to optimize manufacturing processes to reduce pollution. For Forum proceedings, visit [http://www.oceta.on.ca/DSSP/forum\\_archive.htm](http://www.oceta.on.ca/DSSP/forum_archive.htm).

Why promote pollution prevention and sustainability through the TRSP?  
What are the benefits?

## P2 Benefits

Pollution prevention makes good business sense. A P2 assessment and action plan with the implementation of specific P2 projects will lead to environmental and financial benefits including cost savings, reduced liability, and better marketing opportunities. Implementation of P2 opportunities can realize a significant return on investment, with an average payback of less than one year. By participating in the program, businesses can:

- Reduce or eliminate smog emissions, greenhouse gases, hazardous wastes, toxics and other pollutants, at the source;
- Save money and reduce costs;
- Reduce energy consumption;
- Reduce potential liability and preserve capital asset value;
- Reduce the need to report and meet or exceed the regulatory requirements from all

levels of government; and

- Enhance corporate image.

In addition, participation by a business can demonstrate its environmental excellence, enhance its corporate image, and align its environmental performance with its environmental management system objectives.

As these benefits accrue to individual businesses, there are cumulative benefits to the wider community, including a more prosperous business community, cleaner air, reduced water and energy use, less solid and hazardous waste for disposal, and reduced toxicity and loading on municipal sewage treatment facilities. P2 is a shared responsibility among governments and individuals, industrial, commercial, institutional, and community sectors. It makes very good environmental and economic sense for a municipality to join TRSP, or start and promote such a program.

Sounds good, but let's look at the TRSP's actual results and then at some case studies.

## Actual Program Results

The eight years of TRSP results are impressive in terms of: outreach and involvement, pollution reduction through P2, ancillary benefits and the effectiveness of TRSP dollars spent. Companies gained a clear understanding of bottom line benefits in terms of meeting legal requirements, reducing costs, reducing business risks, and improving environmental performance.

As of December 2009, OCETA staff had presented the program to 161 SMEs and hospitals and had 75 program clients. In addition, staff arranged and conducted joint presentations and scope definition meetings with qualified P2 assessment consultants for 105 manufacturers and hospitals. For these clients, consultants completed 60 P2 assessments. For the 60 plants/facilities where P2 Assessments have been completed—and 336 P2 projects are being implemented—total savings are \$4.8 million/yr, capital investment is \$4.1 million and the aggregated payback is 10 months!

These plants/facilities and their projects achieved the following annual pollution reductions:

- Volatile organic compounds (VOCs): 736 tonnes (t)
- Fine particulate (<10 $\mu$ ): 15.5 t
- Metals: 2.3 t
- Toxics: 95.4 t
- Hazardous wastes: 1,227 t
- Process wastes: 2,268 t
- Water use: 639,524 cubic metres (m<sup>3</sup>) (or 639,524 t)

- Greenhouse Gases (GHGs): 4,310 t
- Ozone depleting substances: 45 kilograms (kg).

In addition, they achieved the following ancillary benefits in annual waste and emission reductions (achieved through offsite recycling/reuse):

- Generic wastes (recycled): 51,411 t
- Hazardous wastes (recycled): 187 t
- Mercury (recycled): 5.06 kg
- Polychlorinated Biphenyls (PCBs) (ballasts removed): 90 grams
- GHGs (recycled/reused): 1,343 t

Based on follow-up surveys/discussions with the 60 program clients whose P2 assessments have been completed, 90 % of the companies are implementing all or most of their P2 projects. Of these program clients 50 % have published case studies, either posted on the TRSP website or under development. Based on the 60 P2 assessments, SME clients are investing \$19 for every TRSP dollar they receive toward their assessment.

TRSP's success is recognized by the larger community and reflected in the environmental and business awards received by program participants and the TRSP itself. These include:

- Colour Innovations received a number of Print Action Canada Awards in 2009. These included Most Environmentally Progressive Process 2009 (Gold), Most Environmentally

Progressive Project 2009 (Silver), Most Environmentally Progressive Printer 2009 (Gold).

- CJ Graphics also won a number of Print Action Canada Awards in 2009. These included Most Progressive Environmental Printing Project 2009 (Silver) and Most Environmentally Progressive Printer 2009 (Silver).
- In 2008, Informco, CJ Graphics and Colour Innovations, all received Environmental Printing Awards from PrintAction Canada.
- North York General Hospital (NYGH) was recognized for its Overall Pollution Prevention Efforts (Organization/Institution/Group category) at the 2008 Canadian Council of Ministers of the Environment Awards at the Canadian Pollution Prevention Roundtable (CPPR) in Edmonton, Alberta.
- Bowne of Canada, which specializes in high-value document management and print solutions for financial and corporate clients across Canada, was honoured with the 2007 CCME P2 Award (Medium Business Category) at the Canadian Pollution Prevention Roundtable in Winnipeg, Manitoba.
- Metalon Technology Ltd, a provider of custom coated products to a variety of industrial clients, received the 2006 Environmental Excellence Award from the Dufferin County Chamber of Commerce.
- At the 2005 CCME P2 Awards held in Victoria, British Columbia, the Toronto Region Sustainability Program (TRSP) received an Honourable Mention (Organization/Institution/Group Category) for showing leadership in P2.

What does TRSP's success and recognition mean for individual SMEs?

## Representative Case Studies

Here are four representative case studies that show typical P2 projects and the results and savings SMEs can achieve. (Please note: all reductions and savings are annualized; all capital costs are one time capital investments; and payback equals one-time cost divided by annual savings.)

### Prokleen Washing Services

#### Overview

Prokleen Washing Services has a 20-person tanker truck and bulk tank cleaning facility in Oakville, Ontario. Its eight-bay automated wash rack provides cleaning services for industries transporting a variety of materials. Prokleen has become an innovative leader in food grade and chemical cleaning systems for all classes and sizes of trucks.

Halton Region had expressed concern over the amount of pollution released by Prokleen's wash facility. Key concerns were sewer-use bylaw parameters for biochemical oxygen demand (BOD)

and VOC levels, as well as hazardous waste. To address these concerns, Prokleen's management retained Enviro-Stewards Inc. to conduct a P2 assessment through participation in the TRSP. Other key motivators for Prokleen management were the P2 planning requirements for methylene chloride under the Canadian Environmental Protection Act and a commitment to improve their environmental performance.

### **P2 Assessment Process**

The objective of the P2 assessment was to assist Prokleen in complying with applicable environmental regulations and improve their environmental performance through P2—reducing pollutants and waste streams at the source. Also, this process would help the company save money through more efficient operational procedures. The P2 assessment had three primary components: a P2 training session for Prokleen staff, an in-plant study, and an engineering assessment. Based on intensive in-plant study with

Prokleen management and staff, Enviro-Stewards identified the largest pollution sources and recommended process modifications to address these. Processes targeted for P2 were food bay cleaning, chemical bay cleaning and wastewater treatment.

### **Summary of Findings**

A number of P2 opportunities were identified. In the food-grade wash bay, the largest and most expensive form of Prokleen's sewer surcharge came from BOD overload. An estimated 11.65 t of BOD waste was cleaned from tankers monthly. The majority was soluble and not captured in the existing filtration system but ultimately discharged to the sanitary sewer. Focussing on BOD reduction in the food-grade bay ensured the most significant reduction in organic pollution to the sewers. The majority of food bay BOD was from a few large, concentrated sources—sugars and syrups—with contributions from suspended solids, oil and grease.



Prokleen Washing Services, diversion and reuse of final rinses reduces clay consumption and solid waste generation in the wastewater treatment plant by 118 tonnes/yr. An alternate dewatering process can reduce solid waste by an additional 190 tonnes/yr.

The majority of VOCs in Prokleen's wastewater came from the chemical wash bay. The sewer-use bylaw prohibits elevated levels for a number of VOCs. VOCs that stood out in the Prokleen assessment included trichloroethylene and toluene. In addition to these hazardous materials, asphalt and resin heels contain VOCs that can leach into the water inside the interceptor. VOCs from cleaning chemicals, such as methylene chloride and suspended solids, which were used on plastic pellet trailers, were also wastewater pollution sources.

## **P2 Solutions, Environmental Results, and Related Cost Savings**

Diversion and reuse of food bay heels would reduce process waste BOD from sugar and food oil by 138 t/yr, yielding annual savings in wastewater treatment costs of \$82,000 with a payback of only one month.

Diversion and reuse of chemical bay heels would reduce waste by 12 t of food oil, 10 t of chemical oil, 14 t of asphalt, and 5 t of VOCs, and contribute to savings from diversion and reuse of final rinses due to the reduced burden on the wastewater treatment system. Use of an alternative cleanser, and installation of a solvent reuse sink would eliminate 5 t/yr of methylene chloride (a CEPA toxic), giving savings of \$4,000/yr and a payback of one month.

Diversion and reuse of final rinses would reduce solid waste (clay) by 118 t/yr and water

consumption by 5,000 m<sup>3</sup>/yr (5,000 t/yr), producing savings of \$97,000/yr and a payback of one month. Direct heel recovery would reduce interceptor sludge load and sludge (waste class 251L) by 94 t/yr, and contribute to savings from diversion and reuse of final rinses through reduced burden on the wastewater treatment system. Clay dewatering would reduce solid waste by 190 t/yr, yielding savings of \$15,000/yr and a payback of 3.5 years.

The P2 measures at Prokleen should eliminate 5 t/yr of toxics, 5 t/yr of VOCs, 30 t/yr of hazardous wastes, 550 t/yr of process wastes, and decrease water consumption by 5000 m<sup>3</sup>/yr (5000 t/yr), with an overall payback of five months (\$198,000/yr savings).

Prokleen's P2 implementation has significantly reduced the company's sewer-use surcharges, and provided opportunities for green marketing. Prokleen was able to acquire a new client who saw the facility's dedication to P2 as a major selling point, meeting the client's high standard for environmental and social responsibility. Impressed with the results of the P2 assessment, Prokleen management requested further services from Enviro-Stewards to perform an energy efficiency audit. The assessment identified opportunities with the potential to reduce electricity consumption by 27 to 41%, thermal energy consumption by 30% and greenhouse gases by 361 t/yr (24%).

*"At Prokleen Washing Services, we believe in providing top-of-the-line service to our customers at the best possible value with minimal impact to the environment. OCETA and Enviro-Stewards helped us identify and seize opportunities to go beyond environmental regulatory compliance through available technologies and process optimization. These internal changes now enhance our bottom line."*

*- John Corrigan, General Manager, Prokleen Washing Services*

# Halltech Inc.

## Overview

Halltech Inc. is based in Toronto and has 18 staff. The company manufactures a wide variety of high quality polymer emulsions and adhesives. Company management is committed to reducing hazardous waste, as well as pursuing ISO 14001 certification and Responsible Care verification.

## P2 Assessment Process

To meet TRSP objectives, Halltech underwent a P2 assessment by Cotter Associates. The assessment mapped all Halltech processes, identified five main ones (loading, mixing, reacting, packaging, and washing), and identified P2 opportunities.

## Summary of Findings

Adhesive and polymer emulsion manufacturing involves several process steps. It starts with the addition of different solids and liquids

to a vessel where they are heated and mixed under controlled conditions. The reacted product is cooled and filtered through an open 'bag filter' to remove solids, then transferred to drums, pails, or storage tank. When the filter bag is full, its contents are washed into a floor trench fitted with a screen to capture coarse solids. During open filtration, the product contacts air which contributes to skin formation, increasing product loss and associated sewer loading. After production, floors and kettle are washed with city water.

## P2 Solutions, Environmental Results, and Related Cost Savings

The consultant made P2 recommendations for reducing product losses during adhesives and product filtration, bulk tanker loading, tank sampling, and steam condensate recovery. The majority had large cost savings and short payback.

The most significant recommendation was to install closed-system product filtration,

"It is our philosophy that providing our employees with the tools to work in a safe and environmentally friendly manner will lead to improved morale and have a positive effect on production and quality, which translates to customer satisfaction. To this end, we have found that our involvement in this program has provided us with further insight that not only meets or commitment to our employees, community and customers, but it also makes financial sense,"

- Al Deli, Plant Manager, Halltech Inc.



Halltech Inc., closed-system product filtration that reduces product loss and sewer use bylaw pollutants, resulting in significant cost savings.

with an in-line cartridge or bag filter, pumped directly to the destination vessel. With closed-system filtration, it was estimated that bag changes could be reduced from up to five per batch to only one, reducing product loss by 80% to only 10 kg per batch, and saving 40 t/yr of product. A closed system would reduce the discharge of zinc by 7.4 kg/yr and alkylphenol ethoxylates by 1.8 kg/yr (both pollutants are subject to the sewer use bylaw). Overall cost savings are \$142,000/yr, with another \$10,000/yr savings in sewer surcharges, giving an estimated payback of less than five months.

Another recommendation to prevent product loss and yield savings, was to install check valves in the flexible transfer lines. The existing loading of bulk tankers using flexible hoses resulted in significant product loss. When disconnecting hoses, product flowed to the floor and sanitary sewer. A check valve on the lines would eliminate this loss. In addition, transfer lines are flushed clean after each use. Permanent lines would not require cleaning after each use and would reduce product loss by 37 to 74 t/yr, saving approximately \$12,000/yr in product losses and sewer surcharges. Estimated payback is four to five months.

## S & C Electric Canada Ltd.

### Overview

S&C Electric Canada Ltd. (S&C) makes electrical power switching and protection devices at its 270 employee plant in Toronto, Ontario. Processes include machining, sheet metal fabrication (shearing, punching, and forming), brazing, welding, thermal spraying, and paint finishing. S&C is an ISO 9001:2001 and 14001:2004 company. S&C's management committed to improving their environmental performance through commissioning a P2 assessment under the TRSP. Key reasons for S&C's TRSP participation were to improve wastewater effluent quality and reduce hazardous wastes. Also, management wanted to improve the company's environmental performance and reduce costs.

### P2 Assessment Process

To meet TRSP objectives, S&C underwent a P2 assessment by Enviro-Stewards Inc., a consulting firm. The three primary components of the assessment were: a P2 training workshop, an in-plant study and an engineering assessment. The half-day workshop, led by Enviro-Stewards staff, showed S&C's project staff the potential benefits of P2 and presented case studies of successful P2 measures in a broad range of industries.

For significant resource consuming and waste generating processes and operations identified through the in-plant study, the consultant identified and screened potential reduction, reuse and recycling opportunities. Processes targeted for P2 included wastewater treatment, laser cooling water and air compressors. Selected alternatives were then subjected to technical and economic assessment, and an implementation plan was developed based on payback periods and cost/benefit analysis.



S & C Electric Canada Ltd., in-plant assessment identified and economically corrected the root cause of an intermittent effluent quality problem.

## Summary of Findings

Process wastewater from S&C's paint finishing system is treated in a wastewater treatment plant (WWTP) prior to discharge to Toronto's sanitary sewer. The WWTP was experiencing effluent quality and operational problems associated with sludge floating and bridging (simultaneous attachment of two or more polymer molecules which disperse as a long chain in a sludge medium). Also, effluent quality fluctuations appeared to coincide with upstream, concentrated discharges of specific products (alkaline, acidic and phosphate solutions) from the paint finishing system.

S&C generated approximately 88.7 t/yr of hazardous waste, paying approximately \$70,000/yr for its disposal. Filter cake (28.1 t/yr), liquid sludge (22.6 t/yr), and emulsified oils (18.6 t/yr) were S&C's most significant hazardous wastes. Over 50% of the emulsified oils were associated with the simultaneous recycling of coolant from several machines. This recycling overloaded the existing oil skimming facilities, and the excess coolant was sent for disposal.

S&C was using 600,000 m<sup>3</sup>/yr of natural gas at a cost of \$215,000 and 6,800,000 kWh/yr of electricity at a cost of \$645,000. The natural gas was consumed primarily in building heating, ventilation units, and ovens used to bake on powder paint. A subsequent energy efficiency assessment was conducted by Enviro-Stewards to identify opportunities to reduce natural gas and electricity consumption at S&C.

## P2 Solutions, Environmental Results, and Related Cost Savings

In wastewater treatment, S&C now uses sodium permanganate to break down detergents into simpler compounds, thus reducing coagulant usage by 24% (8.4 t) and filter cake generation by 37% (10.4 t reduction in hazardous waste). This change produces savings of \$43,500/yr, with a payback of less than four months. In addition, the change reduced potential business risks, since the

filter cake is now considered non-hazardous.

S&C is investigating the feasibility of installing a sludge holding tank which would optimize filter press operation efficiency and save two to three hours press time per day.

By characterizing and classifying laser cooling water, S&C has further reduced hazardous waste by 1 tonne/yr, yielding savings of \$1,000/yr with immediate payback.

A new air compressor room along an exterior wall would allow access to cold outside air for compression, rather than warm inside air. Using cooler, drier air will increase compressor efficiency by 1% per 4°C drop in temperature and reduce electricity consumption by 14,500 kWh, producing savings of approximately \$1,500/yr.

Installation of variable frequency drives on dust collection systems will reduce electricity consumption by 60% (26,000 kWh), giving savings of \$3,700/yr with a 2.4 year payback.

S&C is investigating retrofitting their T12 VHO lighting with T5 lighting, which will decrease electricity consumption by 81,000 kWh, saving \$10,100/yr with a payback of 1.9 years.

Overall, it is projected that these measures will eliminate 11.5 t/yr of hazardous wastes and reduce GHG emissions by 32 t—energy consumption reduced by 121,500 kWh/yr (1.8%)—with a payback ranging from immediate to 2.4 years and savings of \$59,800/yr.

"S&C Electric Canada Limited has had a long conviction of ensuring protection of the environment beginning with the manufacture of its product and use of these products at customer sites. This conviction and commitment led to Enviro-Stewards, through OCETA, conducting a pollution prevention assessment of our facility. This review revealed several opportunities for improvements, a number of which have been implemented. This not only improved S&C's environmental performance, but also provided cost savings."

- Keith Higgins, Director-Facilities, S&C Electric Canada Ltd.

# North York General Hospital

## Company Overview

North York General Hospital (NYGH) is a multi-site community teaching hospital serving north-central Toronto and southern York Region. As part of its vision to lead in shaping healthcare for tomorrow, NYGH's Green Team retained the services of Enviro-Stewards to conduct a P2 assessment under the TRSP at its General Division. The assessment led to implementation of NYGH's P2 Plan and addressed the hospital's compliance status with Toronto's Sewer Use By-Law. Hazardous wastes and toxic substances in the Canadian Environmental Protection Act (CEPA) were also focal points of the assessment.



North York General Hospital.

## P2 Assessment Process

Enviro-Stewards began and completed most of the work on the P2 assessment in 2002. Some recommendations were implemented at this time but due to budget constraints and the SARS outbreak full completion was delayed until 2007.

## Summary of Findings

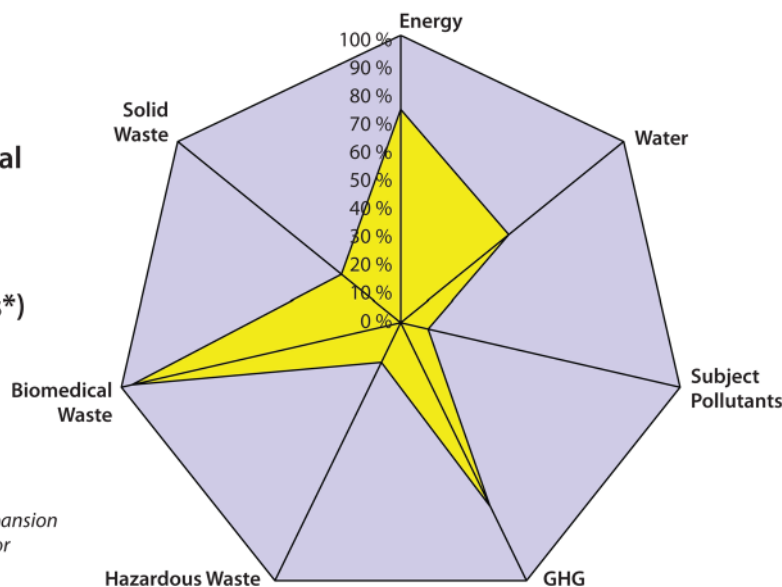
Nonylphenol ethoxylates (NPEs), present in a variety of cleaning products, were commonly used in NYGH's maintenance and housekeeping procedures. Wastewater analysis revealed NPE levels in the hospital's effluent above the sewer use by-law limits. By replacing NPE-containing products with more environmentally friendly cleaners, NYGH reduced NPE effluent by 97% and is now well below the by-law limits.

Formaldehyde, formalin, xylene, and ethanol are used in the laboratory procedures. These materials are photo-chemically reactive VOCs and, once spent, must be handled and disposed of as hazardous wastes.

Installation of a solvent recycling still has been highly effective in reducing hazardous waste creation, purchase and disposal costs for these materials. The recommended further investigation and pilot testing of alternatives to xylene should yield even greater environmental benefits.

### NYGH Environmental Footprint 2002-2006 (per m2 Basis\*)

- 2002
- 2006



\*Southeast tower expansion in 2004 increased floor area by 22,000 m2.

"As a large multi-site health care provider, North York General Hospital is committed to continuous improvement of its environmental performance. The hospital's partnership with Enviro-Stewards and OCETA has assisted the organization-wide Green Team to focus its efforts on pollution prevention, energy efficiency and on-going education. Successful outcomes include the positive change in hospital culture, from basic compliance to environmental stewardship. More than ever, we are challenging each other and helping each other become environmentally friendly co-workers."

- Janak Jass, Director, Support Services, North York General Hospital

A 2007 follow-on study to the original assessment confirmed that the recommended P2 actions were successful, and the associated projected reductions of toxics, metals, VOCs and hazardous waste were achievable. In many cases the reductions had already been achieved.

### **P2 Solutions, Environmental Results, and Related Cost Savings.**

In maintenance, housekeeping and general usage, material substitution and improved purchasing procedures have reduced usage of NPEs by 83 kg/yr (97%), molybdenum by 6.73 kg/yr (98%) and zinc by 26.6 kg/yr (77%), with potential for cost savings and negligible capital cost.

Adoption of water conservation measures (e.g. water saving toilets) should reduce water consumption by 4,270 m<sup>3</sup>/yr (4,270 t/yr), saving \$42,000/yr with a payback of 4.7 years.

Distillation and reuse of waste solvents, material substitution and improved purchasing procedures have reduced usage of formaldehyde by 5.5 t/yr (92%), formalin and xylene/ethanol mix by 4 t/yr (63%) yielding savings of \$20,500/yr and payback in two years.

Improvement of classification procedures for biomedical waste should reduce non-hazardous waste (improperly classified as biomedical) by 2.5 t/year (5%) saving \$1,200/yr with immediate payback.

When implementation is complete, NYGH's P2 measures should eliminate 9.5 t/yr VOCs, 33.3 kg/yr metals, 83 kg/yr toxics, 12 t/yr hazardous wastes, and reduce water consumption by 4,270.5 m<sup>3</sup>/yr (4,270.5 t/yr), saving \$64,000/yr with a payback of 3.8 years.

For more on these and other case studies, visit <http://www.oceta.on.ca/TORSUS/> and click on 'Case Studies'

### **Conclusion**

Both program results and case studies show the TRSP has been successful in outreach and involvement, pollution reduction through P2, ancillary benefits, effectiveness of TRSP dollars spent and producing significant P2 results and savings for SMEs. Why not join the TRSP or encourage your community to undertake a similar program?

### **More Information**

For more information on the OCETA and the TRSP, visit <http://www.oceta.on.ca/> or contact Fred Granek, Vice President Sustainability (905-822-4133 ext. 224; [fgranek@oceta.on.ca](mailto:fgranek@oceta.on.ca)) or Meena Hassanali, Manager Sustainability Programs (905-822-4133 ext. 233; [mhassanali@oceta.on.ca](mailto:mhassanali@oceta.on.ca))

Compiler and Editor: Peter Fischer  
Formatting: Leah Nielsen