

16th Annual Pollution Prevention Conference & Trade Show

Business Value of Pollution Prevention & Sustainability International Case Studies

Fred Granek
Canadian Centre
for Pollution
Prevention



Bruce Taylor
Enviro-
Stewards Inc.





Business Value of Pollution Prevention & Sustainability

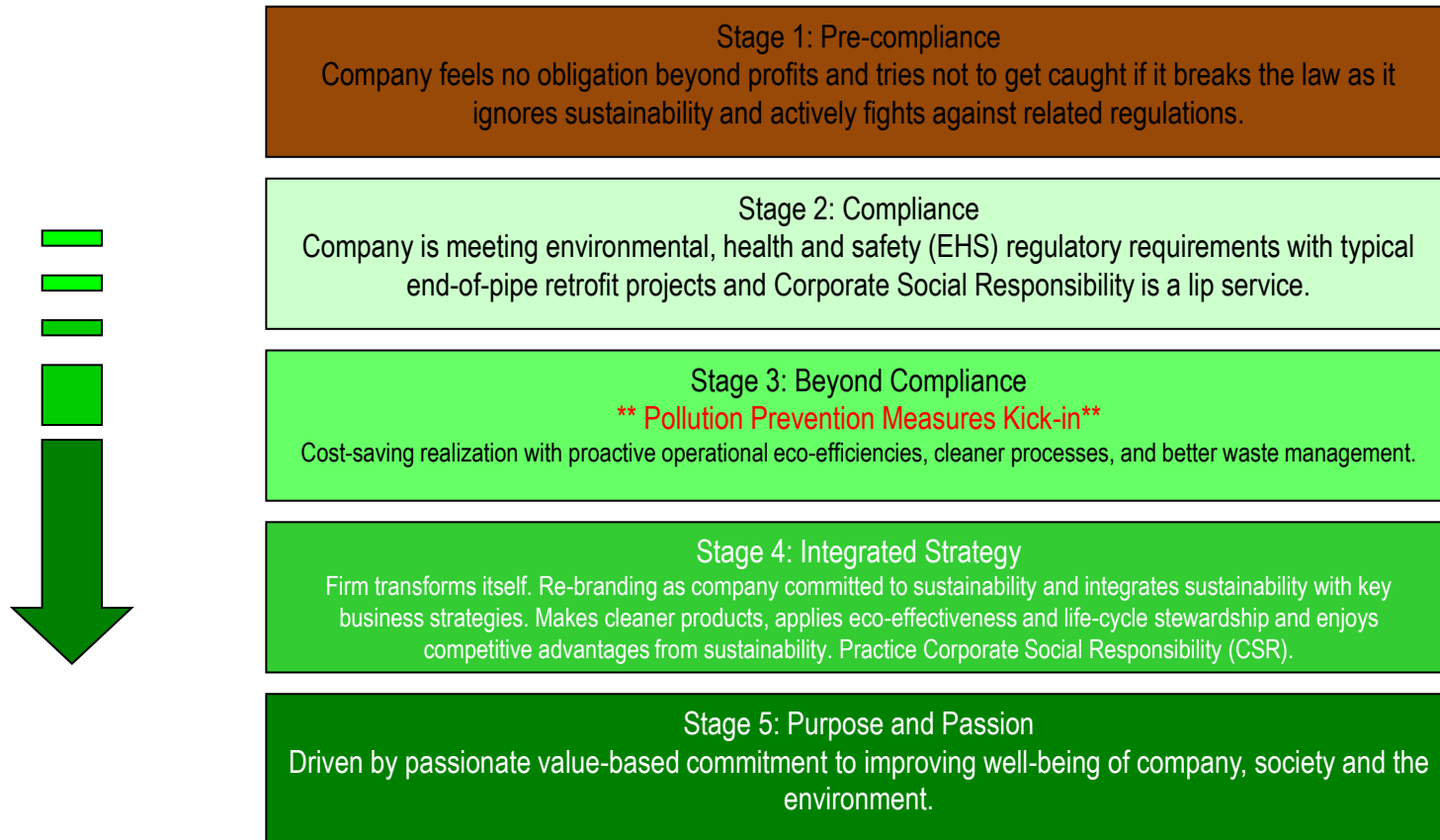
International Case Studies

Fred Granek

**Canadian Centre for Pollution
Prevention**



Motivating Behavior Change



Source: Adapted from Williard, 2005 and Freeman et al, 2000



What is Pollution Prevention (P2)?

P2 Practices

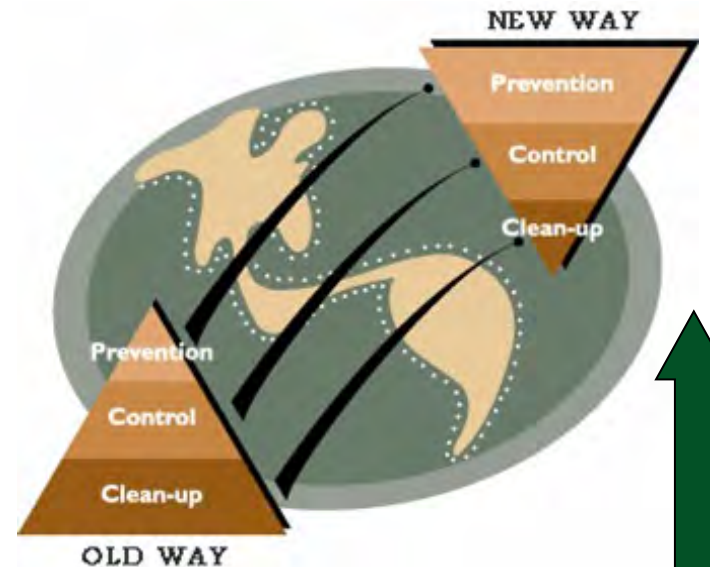
- Product redesign and reformulation
- Equipment modification and process changes
- Material and feedstock substitution
- Operating efficiencies and training
- Purchasing techniques and inventory management
- On-site reuse and recycling
- Spill and leak prevention

"The use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and wastes at the source" Canadian Council of Ministers of the Environment (CCME), 1996

What is NOT P2?

- Off-site recycling
- Waste treatment: Concentrating hazardous waste to reduce volume or toxicity; Dilution of waste to reduce concentration
- Transfer of waste from one medium to another (eg. wastewater contaminant becomes air pollutant)

ANTICIPATE AND PREVENT

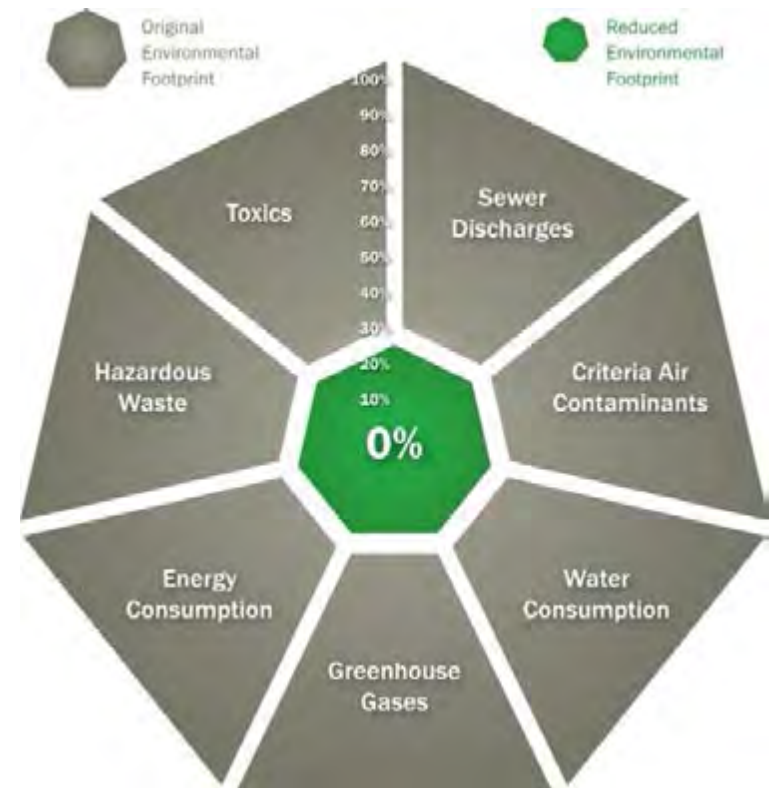


REACT AND CURE



Ontario On-Site Technical Assistance Program

A one-stop pollution prevention (P2), toxics reduction & energy efficiency **technical assistance** program with **funding incentive** for small-to-medium sized (SME) manufacturers in **Ontario**



Program Partners



Public Sector Priorities

➤ Ontario Ministry of the Environment

- ✓ Toxics Reduction Act, 2009
- ✓ Cleaner & Greener Manufacturing Program
- ✓ Criteria Air Contaminants & Climate Change Gases
- ✓ Hazardous Waste

➤ Environment Canada

- ✓ Canadian Environmental Protection Act (CEPA) 1999: Pollution Prevention Planning & National Pollutant Release Inventory (NPRI)
- ✓ Chemical Management Plan
- ✓ Clean Air Act

➤ Regional & Municipal Governments

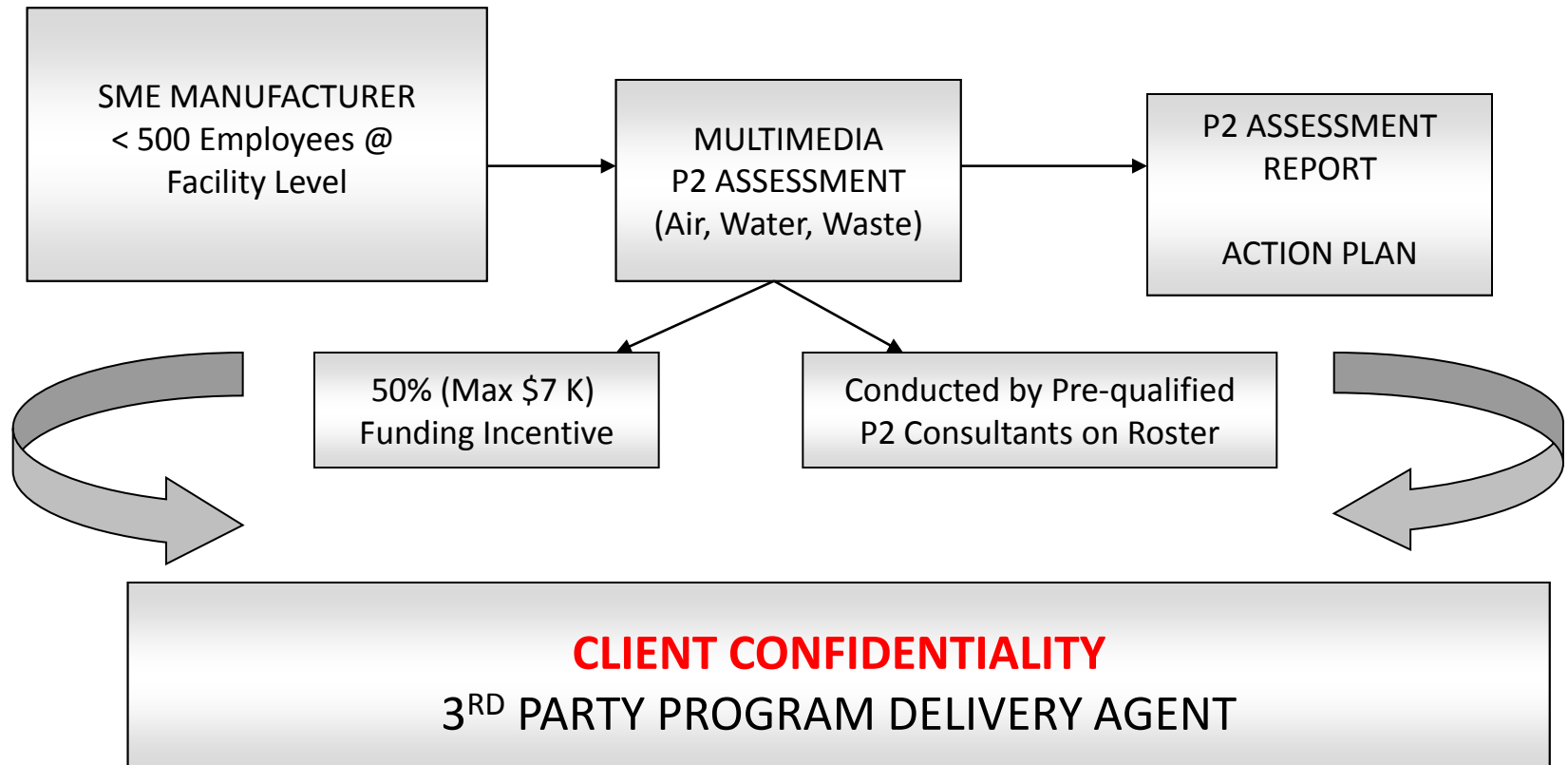
- ✓ Sewer Use & Storm Water By-Laws
- ✓ Greening & Sustainability Goals

➤ Conservation Authorities

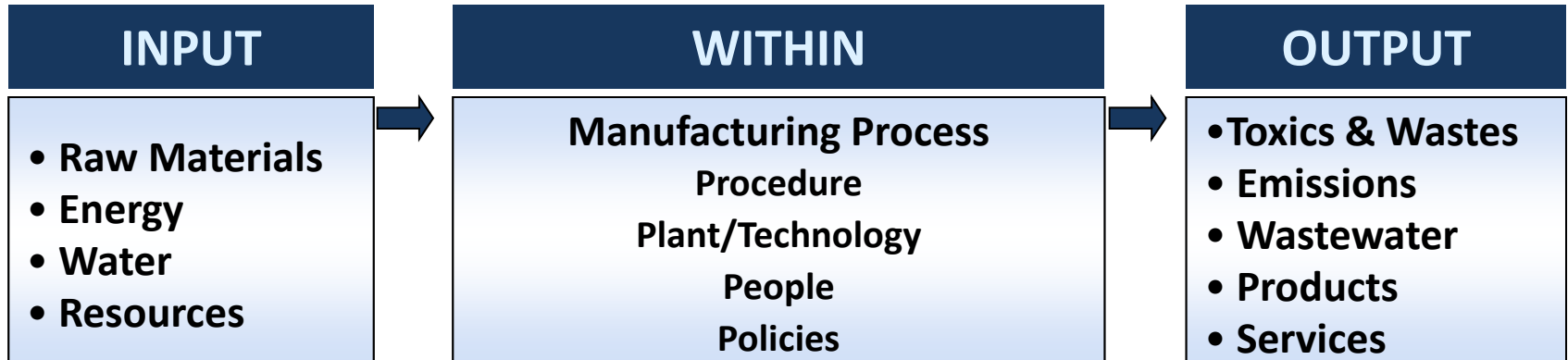
- ✓ Watershed Protection



Ontario On-site Technical Assistance Program Model

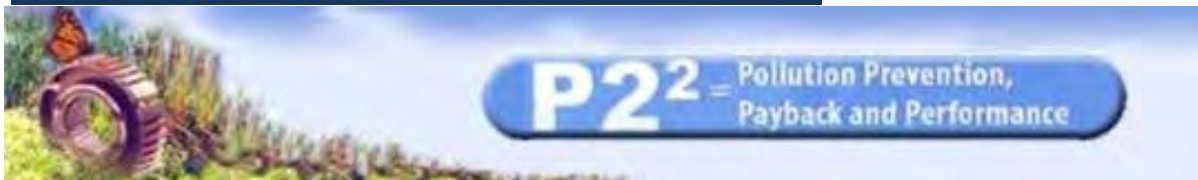


Process Mapping for Integrated Assessments



1. Process Mapping
2. Materials Accounting: Waste Inventory & Characterization
3. Prioritize Waste Sources
4. Root Cause Analysis: Root Causes of Toxics, Pollutants & Wastes
5. Development of P2 Alternatives
6. Business Case for Implementation

Cycle of Continual Improvement...



The Business Case

Financials

OPPORTUNITIES

RISKS

**Non-financials
/ Reputation**

Company Value

- **Cost Avoidance**
 - Cost savings
 - Payback period
 - Operational Efficiencies
- **Business Risks Reduction**
 - Hidden costs of non-compliance
 - Workers Health & Safety
 - Spills, fines, high remediation costs
 - Changing regulations
- **Competitive Advantage**
 - Green marketing
 - Access to Global markets



Case Study: Petroleum Products

Anonymous



- 80-person petroleum product producer
- Automotive & industrial motor oil and lubricant manufacturing, plastic bottle manufacturing

➤ Key Processes:

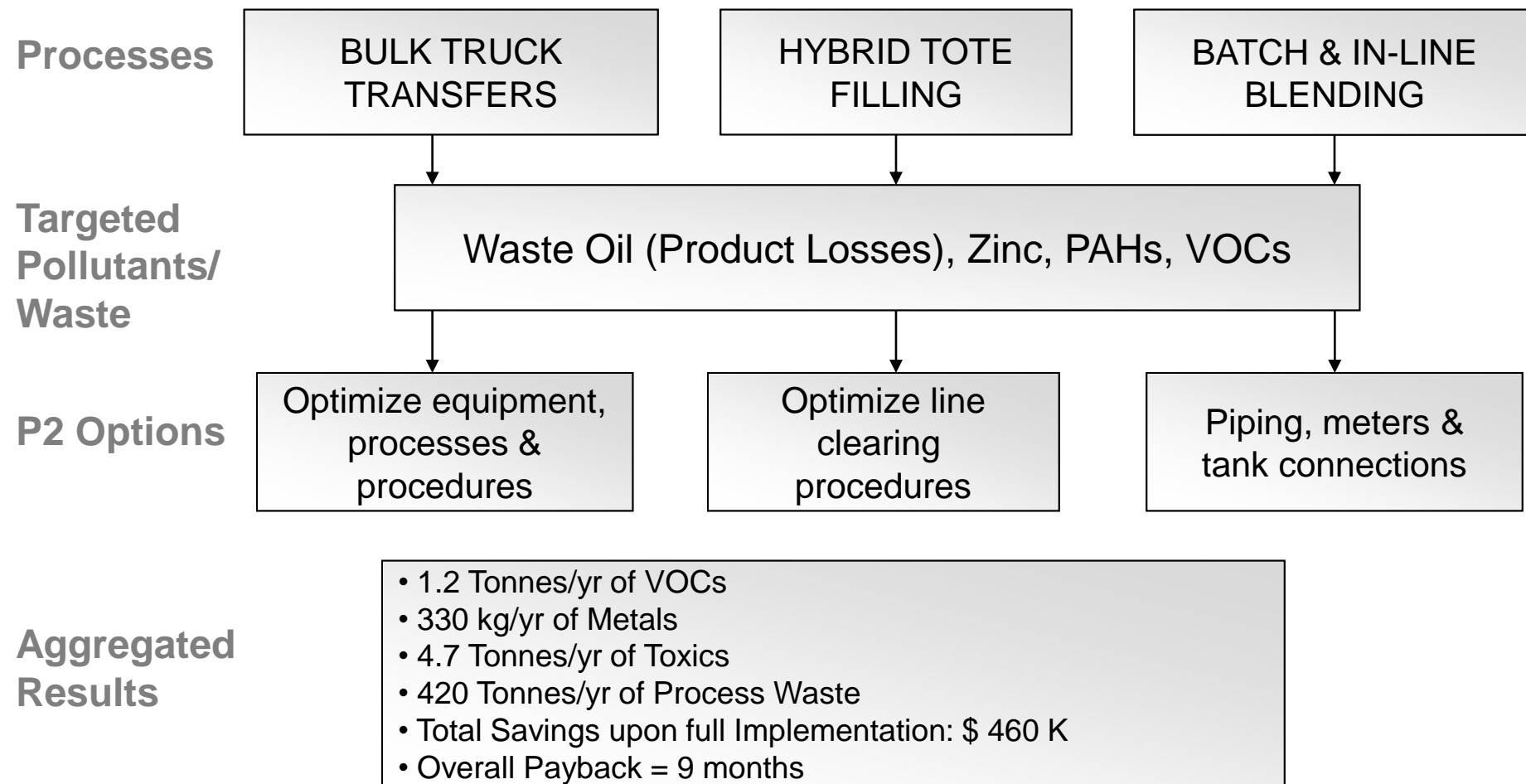
- ✓ Bulk truck transfer
- ✓ Hybrid tote filling
- ✓ Batch & in-line blending
- ✓ Filling operations

➤ Participation Drivers:

- ✓ Municipal sewer use by-law (storm water discharge)
- ✓ Cost savings
- ✓ ISO 14001



Case Study: Petroleum Products



Case Study: Printer

Bowne of Canada



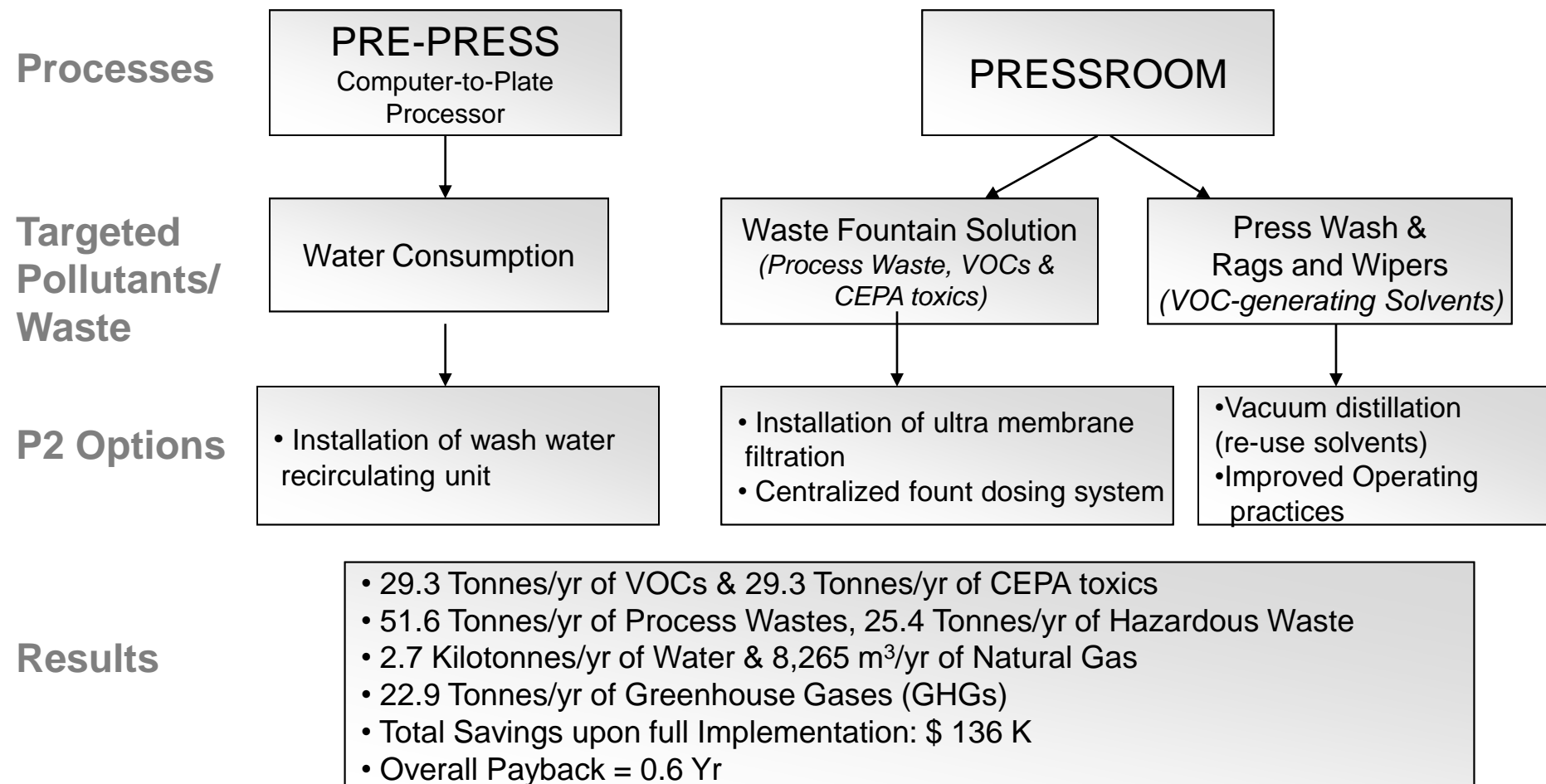
Bowne's Press Room

- 203-person document management & lithographic printing company
- *"BLOOM and EcoSafe have been instrumental in helping us re-align our goals. We now have a solid action plan in place which will pay dividends and assist us on the road to true environmental sustainability."*

Brian Arrol, Environmental Health & Safety Manager



Case Study: Printer



Case Study: Metal Finishing



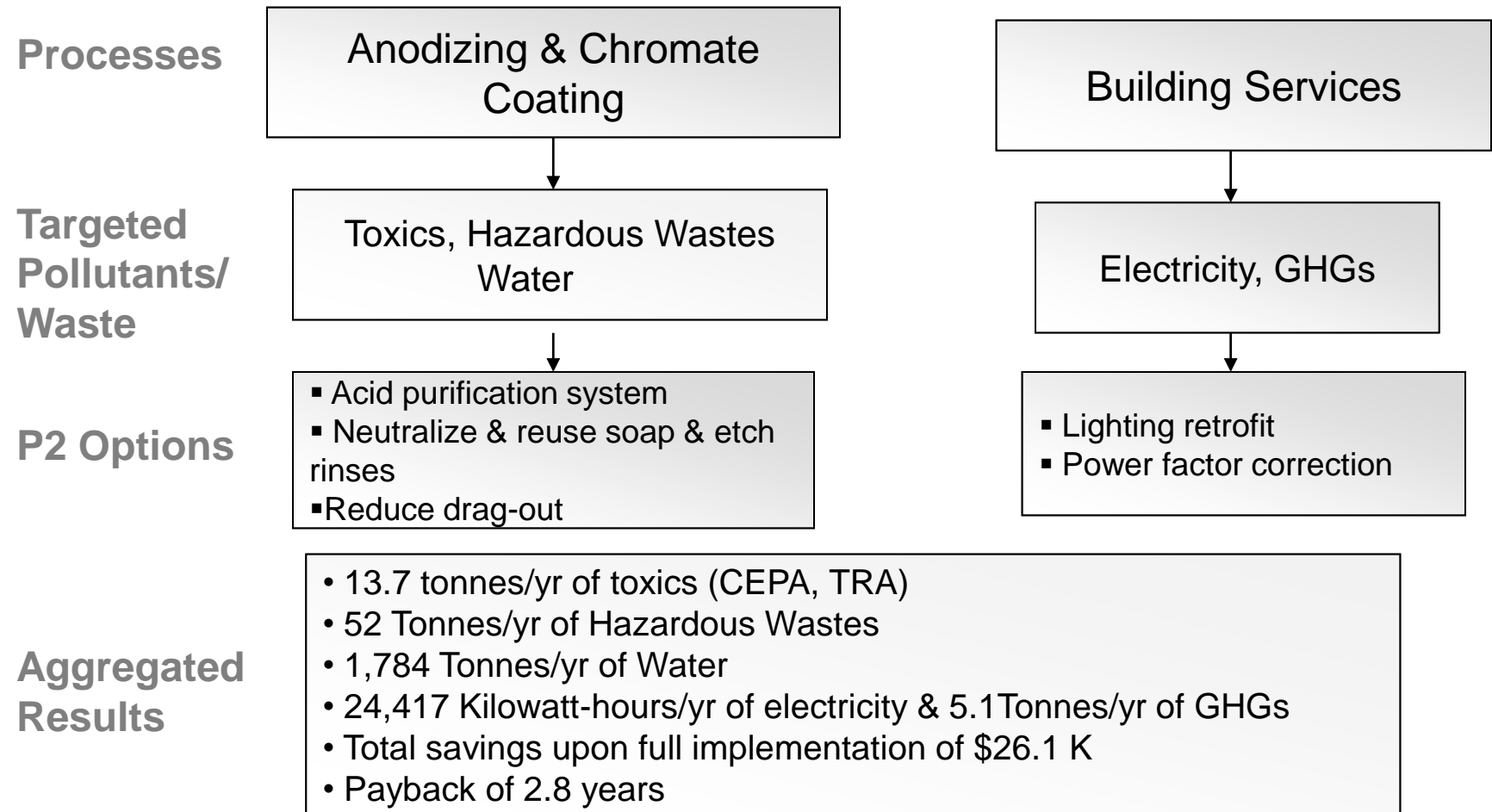
During the anodizing process, pieces are moved from one tank to another using a conveyor system.

West-Tech Finishing

- 18-person anodizing job shop specializing in applying finishes to aluminum parts
- Main processes: anodizing & chromate coating; building services
- Participation drivers:
 - ✓ Sewer-use by-law limits
 - ✓ Toxics Reduction Act
 - ✓ Desire to be most modern & efficient anodizer



Case Study: Metal Finishing



Ontario On-site Technical Assistance: Participation

Number of Program Clients (December 2012)	91
Number of P2 Assessments Completed	85
Total Number of P2 Projects Implemented or underway	638
Number of Case Studies	48

90% of program clients are implementing “all” or “most” of the P2 projects recommended in the assessment reports.



Ontario On-site Technical Assistance: Clientele By Sector

- Aerospace (1)
- Auto Parts (2)
- Chemical (13)
- Circuit Board (3)
- Container/Tanker Cleaning (3)
- Cosmetics (1)
- Courier Service (1)
- Electrical Equipment(1)
- Food Processing (7)
- Foundry (1)
- Furniture (3)
- Heat Exchanger (1)
- Hospitals (4)
- Metal Finishing & Fabrication (9)
- Packaging (3)
- Paint/Coatings (4)
- Petroleum Products (1)
- Pharmaceutical (1)
- Printing – Lithographic (24)
- Printing – Flexographic Plate (2)
- Printing – Plastic (1)
- Printing – Roller (1)
- Rapid Transit (1)
- Plastic Products(2)
- Steel Tubular Products (1)



Ontario On-site Technical Assistance: Reductions

P2 Reductions (Annual)

▪Volatile Organic Compounds (VOCs)	865 Tonnes
▪Fine Particulate (PM <10u)	16 Tonnes
▪Metals	326 Tonnes
▪Toxics (CEPA)	4,841 Tonnes
▪Toxics (TRA – from 2010)	639 Tonnes
▪Hazardous Wastes	3,047 Tonnes
▪Process Wastes	8,964 Tonnes
▪Water	1,027 Kilotonnes
▪Energy (Natural Gas)	4,802,418 Metres ³
▪Energy (Electricity)	11,435 MW-hrs
▪Green House Gases (GHGs)	13,617 Tonnes



Ontario On-site Technical Assistance: Reductions

Targeted Pollutants and Wastes	P2 Reductions (Annual)	Comparative Representation
CEPA Toxics	4,841 Tonnes	Weight of approximately 1,867 SUVs
Water	1,027 Kilotonnes (1 Billion Litres)	Flushing the Toilet approximately 171 Million Times



Canadian Centre
for Pollution Prevention

Leaders Shaping the Future of Sustainable Production & Consumption

Ontario On-site Technical Assistance: Financial Results

Totals

- Savings (Annualized) \$9.4 million
- Capital Investment \$9.1 million
- Payback **12 Months**



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Ontario On-site Technical Assistance: Tax Implications

- Additional Annual Federal & Provincial Corporate Taxes \$1.5 million
- Additional Future Corporate Taxes – 20 Years \$48.2 million



Key Program Outcomes

- Implementation rate: 90%
- Payback \leq 1 year
- Clients with public case studies: 50%
- Number of P2 projects/client: 7.5



Testimonials

- **Senior Executive Seminars & Facility Staff Workshops**

“My expectation was very focused on the Toxics Reduction Act and was not thinking about the bigger picture and our bottom line. Very helpful to think beyond regulations, thanks!”

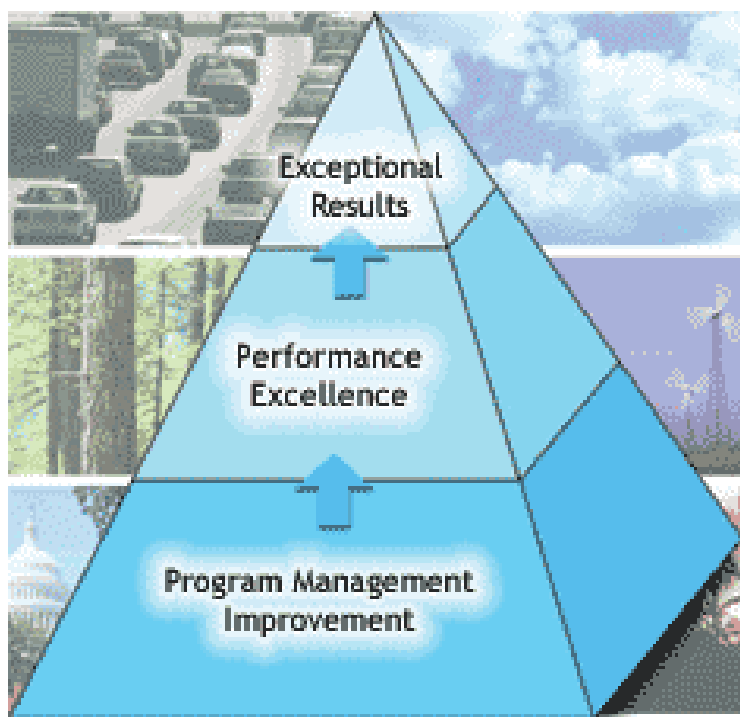
- **On-Site Technical Assistance Program**

“The on-site technical assistance program played an integral role in assisting Trimac with meeting and exceeding our environmental challenges. The smooth delivery of the program was exactly as we had anticipated which made our goals easier to attain.”

Paul Craig, Trimac Transportation



Insights & Lessons Learned



Building the Foundation for Our Future

- Third Party Delivery Agent Complements Regulatory Tools
- Integration of Multiple Government Priorities
- Mix of Regulatory & Non-Regulatory Drivers
- Flexibility & Broad Choice of Action



Canadian Centre
for Pollution Prevention

Leaders Shaping the Future of Sustainable Production & Consumption

Contact Information



Thank You!!

Fred Granek

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Prevention**

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**Canadian Centre
for Pollution Prevention**

Leaders Shaping the Future of Sustainable Production & Consumption

Business Value of P2 & Sustainability

International Case Studies

ENVIRO-STEWARDS

Sustainability Catalysts

Certified



Corporation
bcorporation.net



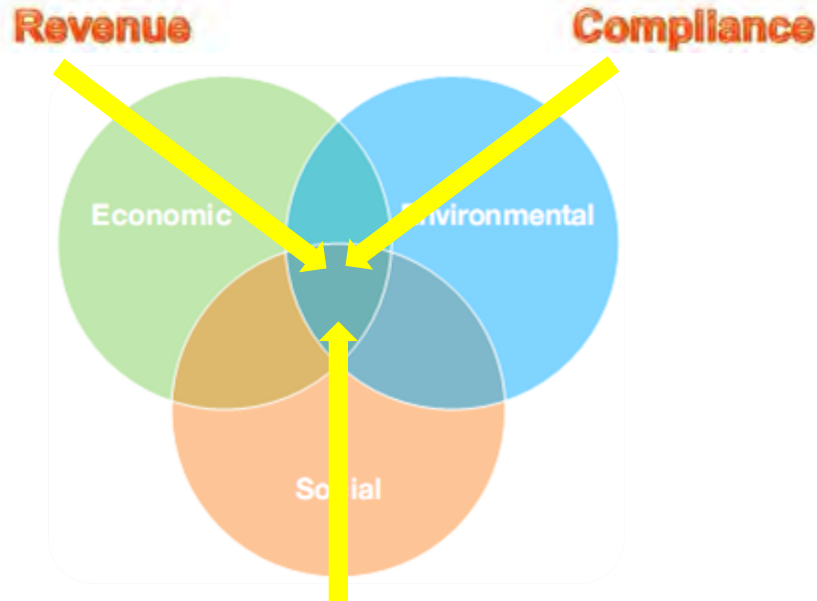
September 26, 2013

SAVE.SUSTAIN.SHARE.
www.enviro-stewards.com

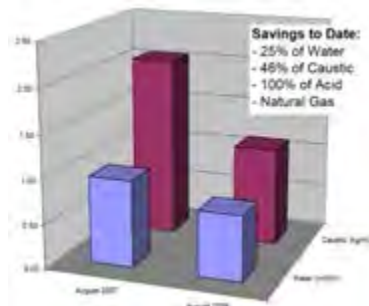




Sustainability Catalysts



As of Aug 2008:
Savings \$0.064/bottle



Water Conservation

Case Study: Brick Brewing Co Limited

Location: Kitchener, ON
 Potential water savings: 68,300 m³/yr
 Potential dollars saved: \$157,000/yr

Introduction

Brick Brewing Co Limited operates a packaging and distribution centre located in Kitchener, Ontario. Beer from Brick's brewing facility is trucked daily to the distribution centre, where it undergoes further processing and storage prior to packaging. The distribution centre also receives returned bottles which are washed at the facility and refilled.

Under the Regional Municipality of Waterloo's W.E.T. Program, Brick retained the services of Enviro-Stewards to complete a water conservation assessment. The purpose of the assessment was to identify conservation opportunities, quantify savings and approximate their financial returns.



Immediate Conservation Measures Presently Being Implemented

- A reduction of 59,500 m³/yr in water consumption (39%);
- Net savings of \$150,000/yr;
- 0.3 year payback.

Total for Recommended Conservation Measures

- A reduction of 68,300 m³/yr in water consumption (44%);
- Net savings of \$157,000/yr;
- 0.4 year payback.



Enviro-Stewards' Approach

Save



**Increase net
profit margin**

Sustain



**Implement Feasible
Sustainability Measures**

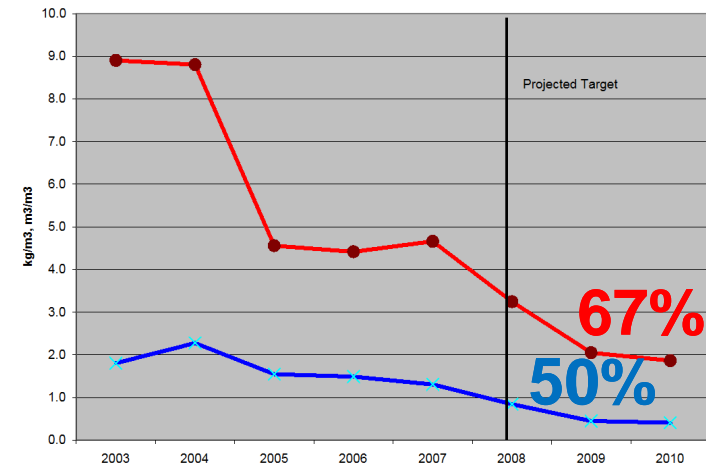
Share



**Track, Report and
Reinvest**

Approach

1. Who are Your Champions?
2. What are Your Wastes?
3. Why are Your Wastes Generated?
4. Where can they be Improved?
5. When should they be Implemented?



Who? – Gaining Buy-In

- To facilitate change, a multi-disciplinary team participates in kick-off training and progress meetings.

We engage representation from management, engineering, maintenance, operations, QA/QC, etc.



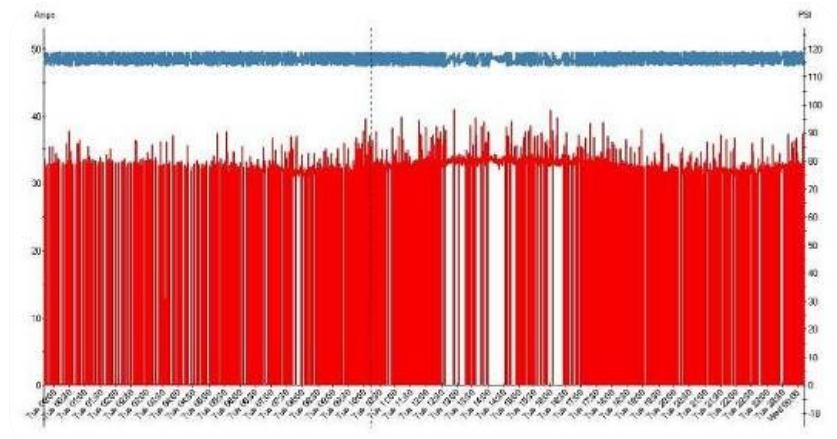
What?

What? – Collecting Reliable Data:

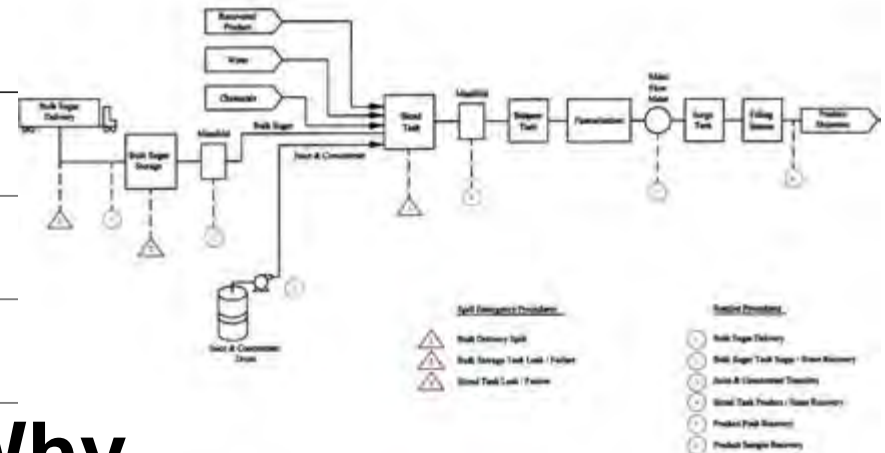
- A detailed and systematic assessment of consumption and waste generation is conducted.



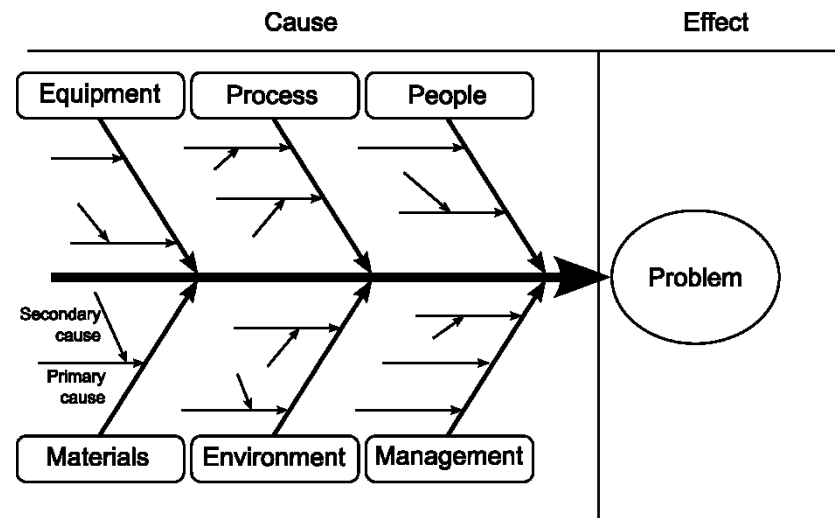
Data loggers, flow meters, amp meters, and visual observation are just some of the tools we use to collect consumption and waste generation data.



Where



Why



When?

TOTAL ESTIMATED CAPITAL COSTS **\$70,000**

TOTAL ESTIMATED ANNUAL O&M COSTS
(RELATIVE TO STATUS QUO) **(\$54,457)**

STRAIGHTLINE PAYBACK PERIOD (yrs) **1.3**

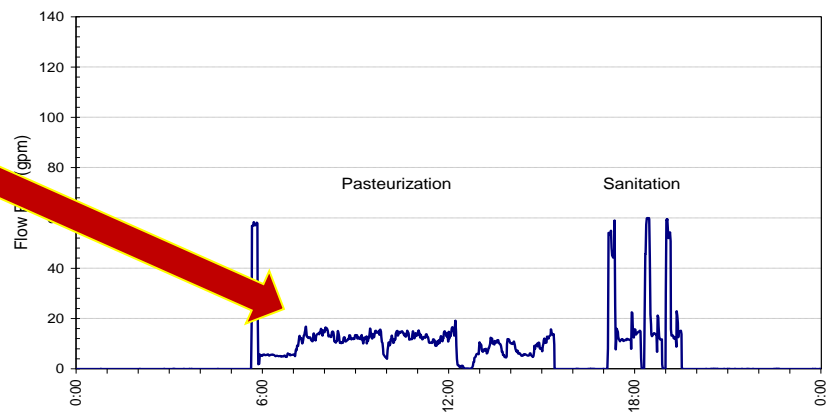
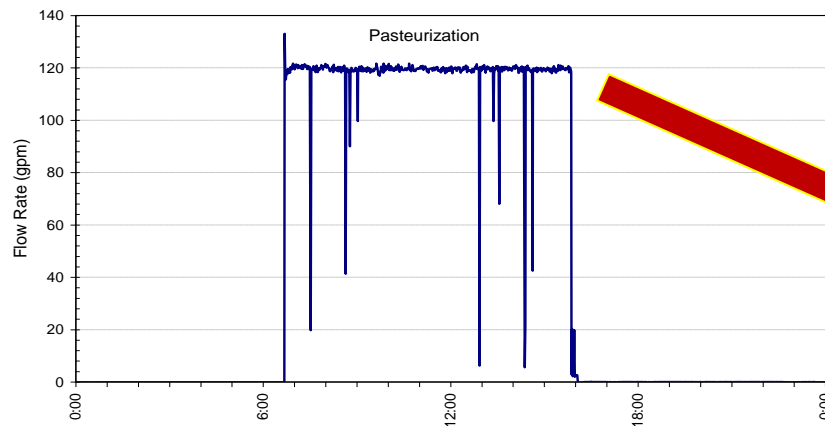
77% ROI

NET PRESENT VALUE BEFORE TAXES
(assuming 20yr project life, 5% interest) **\$748,656**

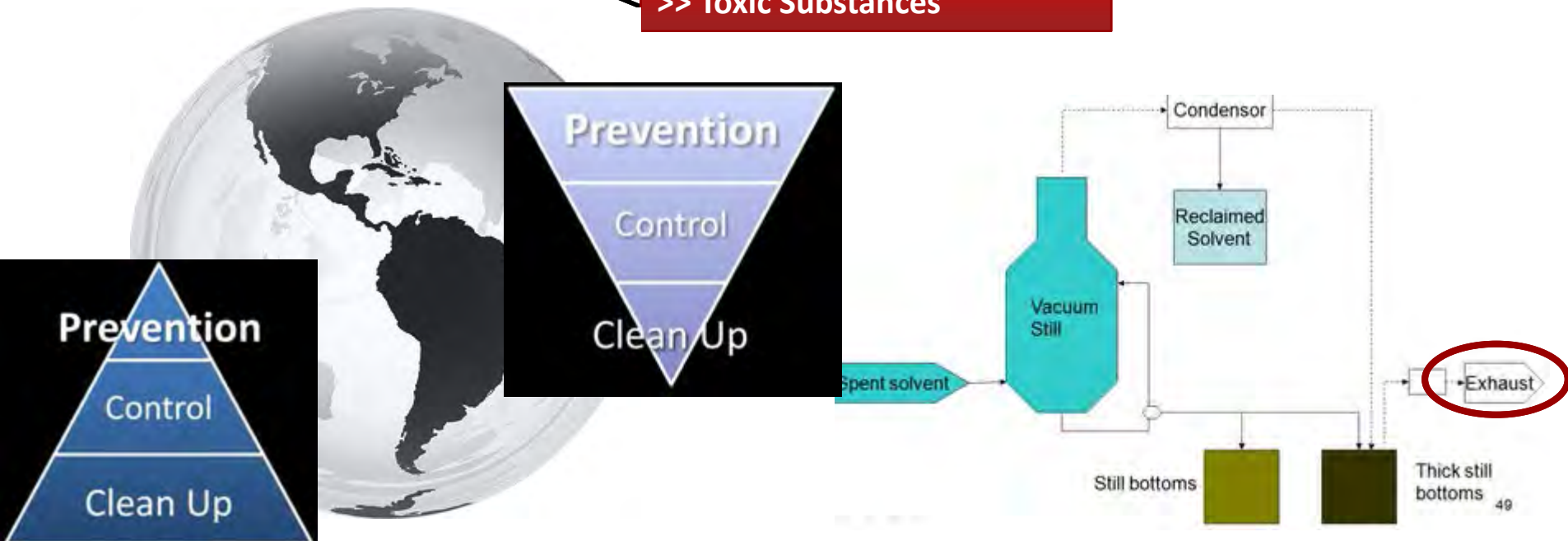
Monitoring, Tracking and Reporting

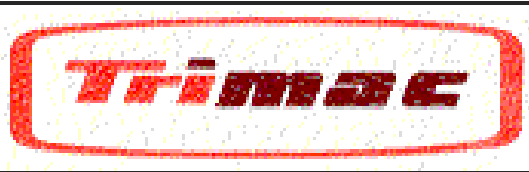
Documenting & Retaining Gains:

- Data loggers, email alerts, and quarterly conservation certificates verify and retain economic, environmental and social gains



The "New Way": Preventative Approach



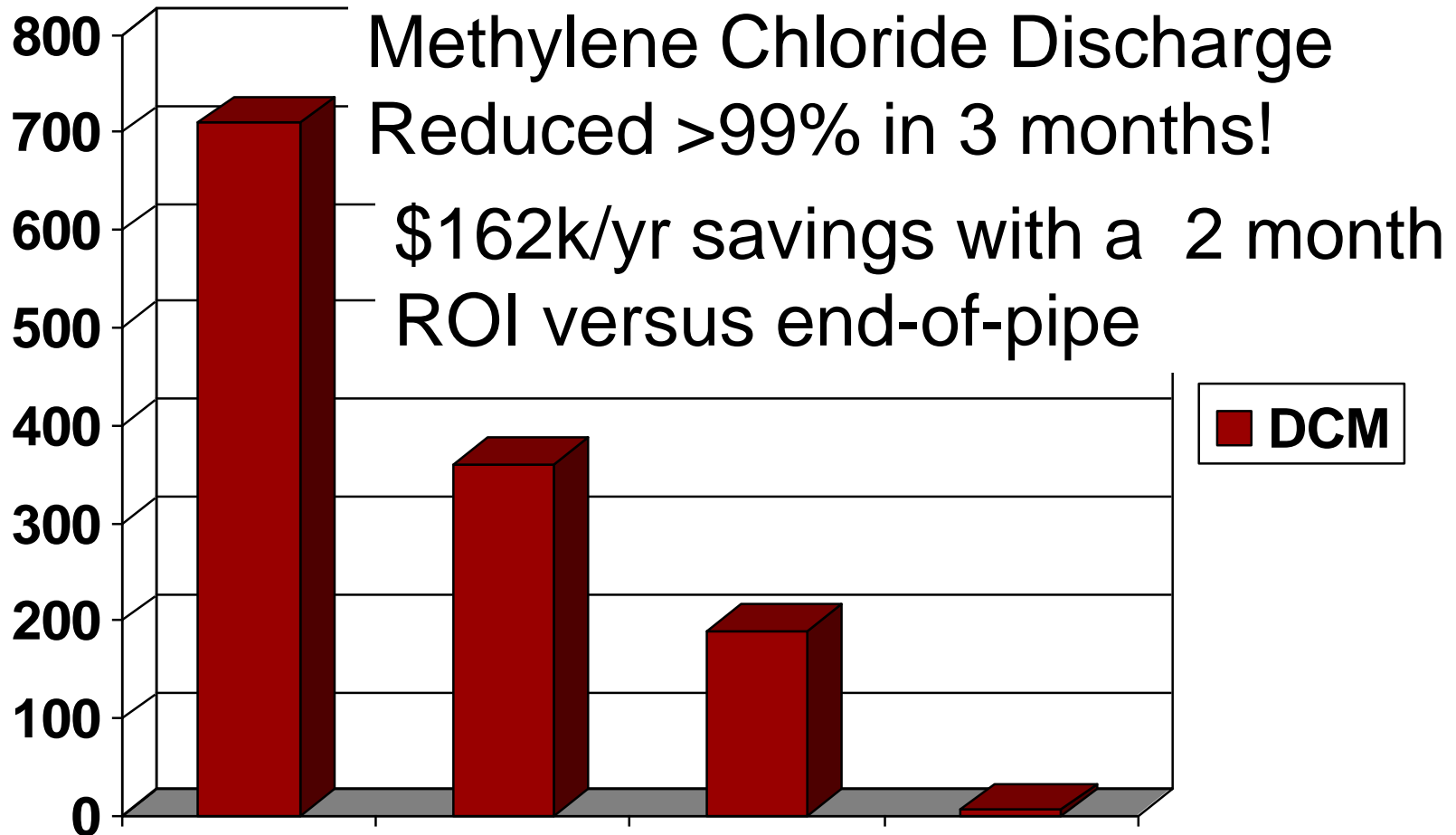


Trimac (Automotive)



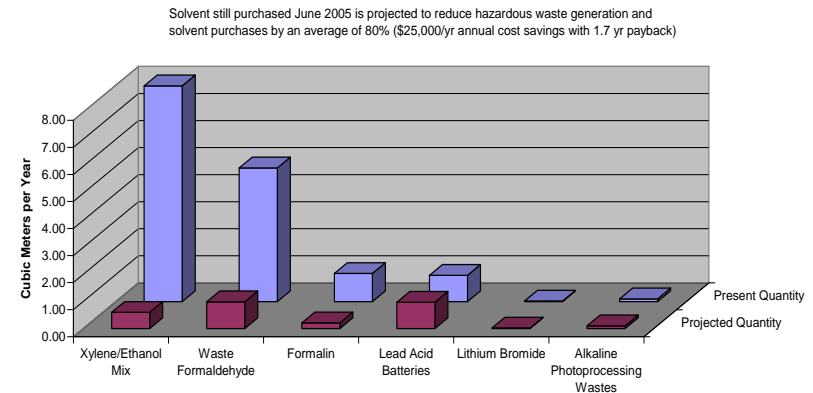
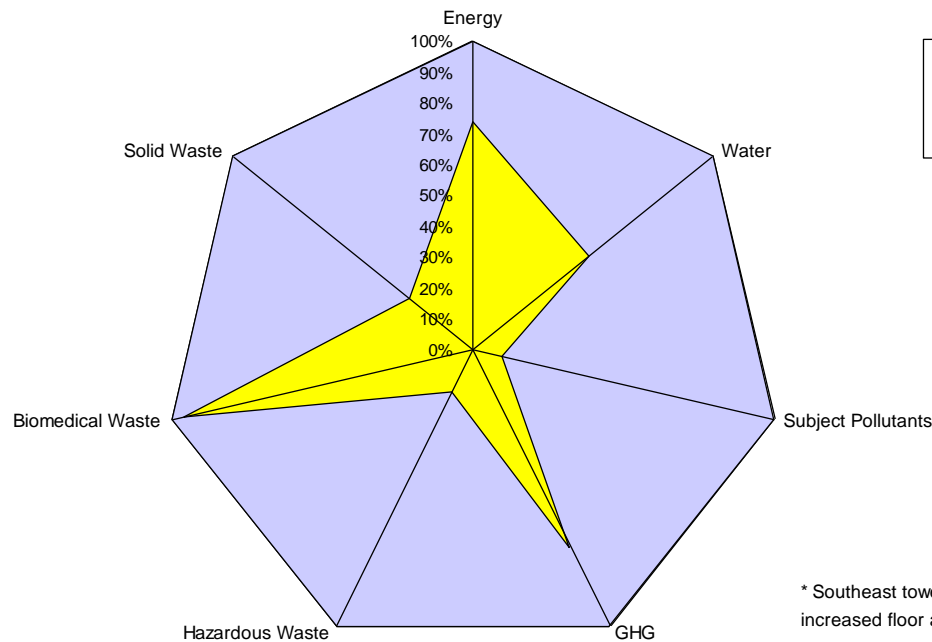


Trimac (Automotive)



Health Care Case Study

(per m² Basis*)



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



NYGH receiving the CCME Award for their toxics reduction achievements.





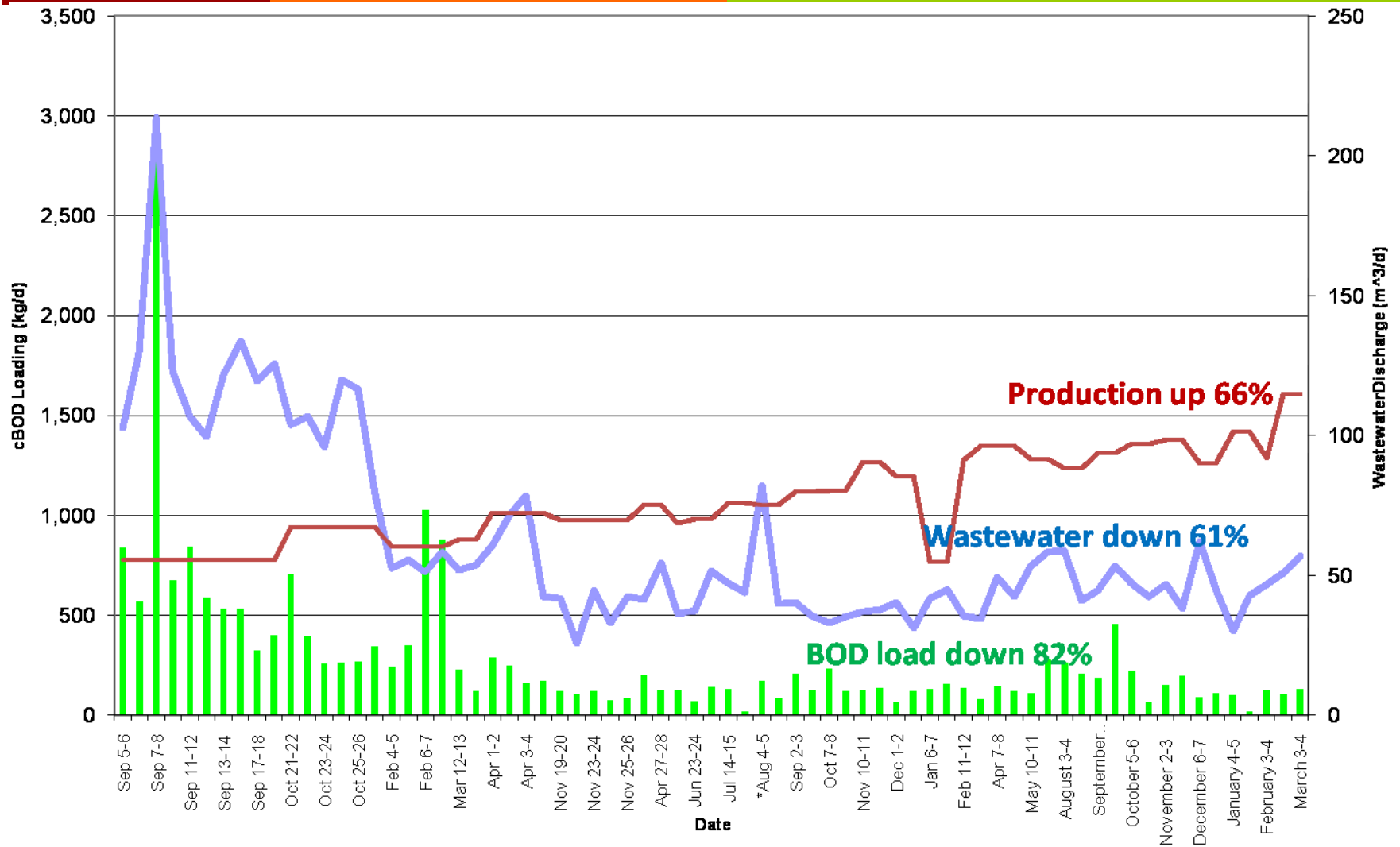


Case Study: Tim Hortons

Enviro-Stewards Builds Pathways to Sustainability



Results:



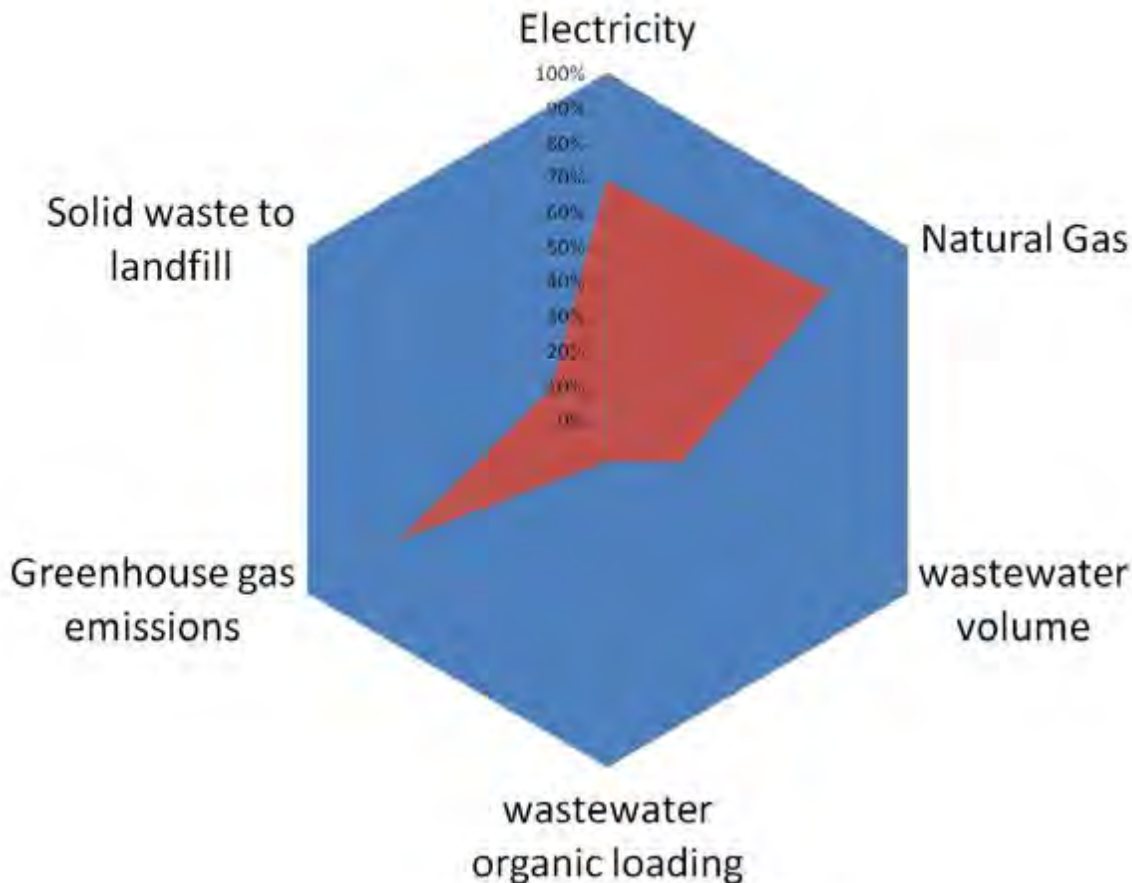
Cost Savings:

Category	Annual Savings		Canadian
	Quantity	Units	Dollars
Electricity	852277	kwh	\$ 85,227.72
Natural Gas	164294	m3	\$ 49,288.32
wastewater volume	36748	m3	\$ 91,869.02
wastewater organic loading	240024	kg	\$ 120,011.93
Greenhouse gas emissions	560	tonnes	N/A (yet)
Solid waste to landfill	510	tonnes	\$ 3,750.00
Sewer Surcharge	140285	\$	<u>\$ 140,285.40</u>
			\$ 490,432

Note: 260% ROI on company's total expenditure of \$187.5k
3,500% ROI for government's incentive (\$140k/yr of taxes)

Multimedia Footprint:

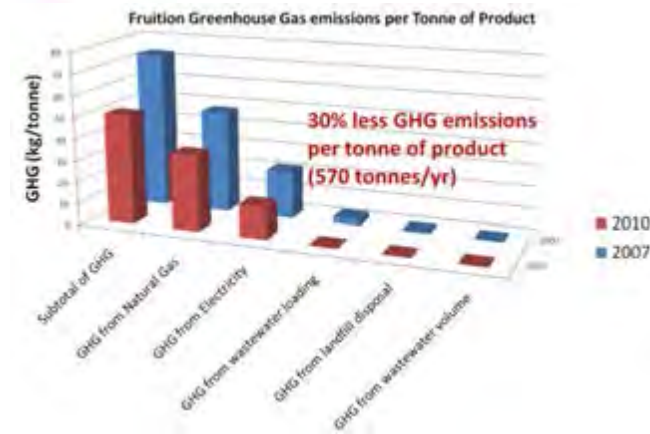
Fruition Fruit & Fills' Footprint per tonne of Product



Stakeholder Benefits:

1. Employee Bonus Structure
2. Job security (thriving employer)
3. Worker engagement
4. Working environment (dust, water)
5. less use of commons (water, ingredients, energy, land)

■ 2007
■ 2010





SHARE YOUR FEEDBACK WITH US!

GO

2011 SUSTAINABILITY & RESPONSIBILITY REPORT

OVERVIEW

INDIVIDUALS

COMMUNITIES

THE PLANET

GRI INDEX

DID YOU KNOW ?

Since 2010, our Fruition Fruits and Fills facility has purchased BioSand filters to help offset some of its water use. These filters have provided 800,000 L per year of clean drinking water to the people of South Sudan, which helps prevent water-related illnesses such as

Revival Movement Centre: BSF Construction



ion business

Local company earns B Corporation certification

Gail Martin
Independent Editor

An Elmira company is one of 70 companies in Canada that has been certified as a B Corporation.

If you don't know what that means, you're not alone.

B Corporations are a relatively new concept. It is a certification that tells the world that at your business, maximizing profit is not the only bottom line.

Environmental and social concerns are also at the forefront.

At Enviro-Stewards, however, the B Corporation certification is merely a recognition of the way the business has always run, since day one.

Bruce Taylor, founder of Enviro-Stewards in 2001, after reining in his career in a chemical engineer

not-for-profit, or a for-profit corporation, he opted to go the for-profit route, in part because that would make it easier for him to work with prospective clients.

"You wouldn't find a company asking Greenpeace to come in and do an environmental audit," said Taylor. "A for-profit has more credibility in the business field."

From so, Taylor incorporated many of the tenets that are hallmarks of an NGO — donating 10 per cent of profits to charitable organizations, providing a living wage to his employees, and providing volunteer and work projects for his employees.

"Because of this, we get incredible loyalty from our staff," said Taylor.

In the recent economic downturn, instead of laying off employees, staff took on a quick

lead of Fruition, came with Taylor on a future trip, donating water filtration units, as well as empty pails and a fruit-drying unit, providing a way for families in the area to preserve fruit, something they couldn't do before.

The way he treats his employees combined with the heart of Taylor's work — helping corporations find environmental efficiencies that are not only good for the environment, but also good for the bottom line (and staff morale as well) — made the B Corporation designation an easy fit.

Taylor was encouraged to go through the certification process after attending a recent conference.

See red pin in above map for location of the Revival Movement Centre (zoom into cluster of markers near the bottom of the map view).

How BSFs Work

- Constructed using locally available materials
- Provides local employment
- Improves the health & productivity of the community

120 tonnes/yr
GHGs avoided

stewards.com

Enviro-Stewards Inc.
(519) 578-5100
mail@enviro-stewards.com
Increase, Sustain, Share.























Top 15 Projects

A Journey Towards Sustainability

Enviro-Stewards & Tim Hortons:
Waste discharge reduction



Enviro-Stewards
Engineers & Scientists

Certified



Corporation
bcorporation.net

SAVE.SUSTAIN.SHARE.
www.enviro-stewards.com



Contact Us



Enviro-Stewards
Engineers & Scientists
2000 - 2010

Thank You!

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www.enviro-stewards.com



Business Value of Pollution Prevention & Sustainability

International Case Studies

Question and Answer
Fred Granek & Bruce
Taylor



Question & Answer

- Do you have questions or comments for speakers?
- We have three questions for you:
 1. How can we help the executives of small to medium sized manufacturers understand that a P2 approach to sustainability is one of the most profitable and secure investments that a firm can make?
 2. How can we overcome the cultural inertia that leads to perpetuation of the status quo, ie. To achieve both corporate and employee buy-in?
 3. How can we go beyond the low hanging fruit project mentality to a true culture of continuous improvement?

Thank You!

Fred Granek
Canadian Centre
for Pollution
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Bruce Taylor
Enviro-Stewards Inc.

