IMPROVING THE BOTTOM LINE

THROUGH INTEGRATED WASTE MANAGEMENT IN FOOD PROCESSING OPERATIONS

Enviro-Stewards
Engineers & Scientists

NOV 19, 2012

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Drivers of Waste Management

Top Reasons F&B industry is integrating sustainability:

1. Operational Efficiencies
2. Stakeholder Demand
3. Risk Management

The "New Way": Prevention First

- ✗ Operational Efficiencies
- ? Stakeholder Demand
- ✓ Risk Management

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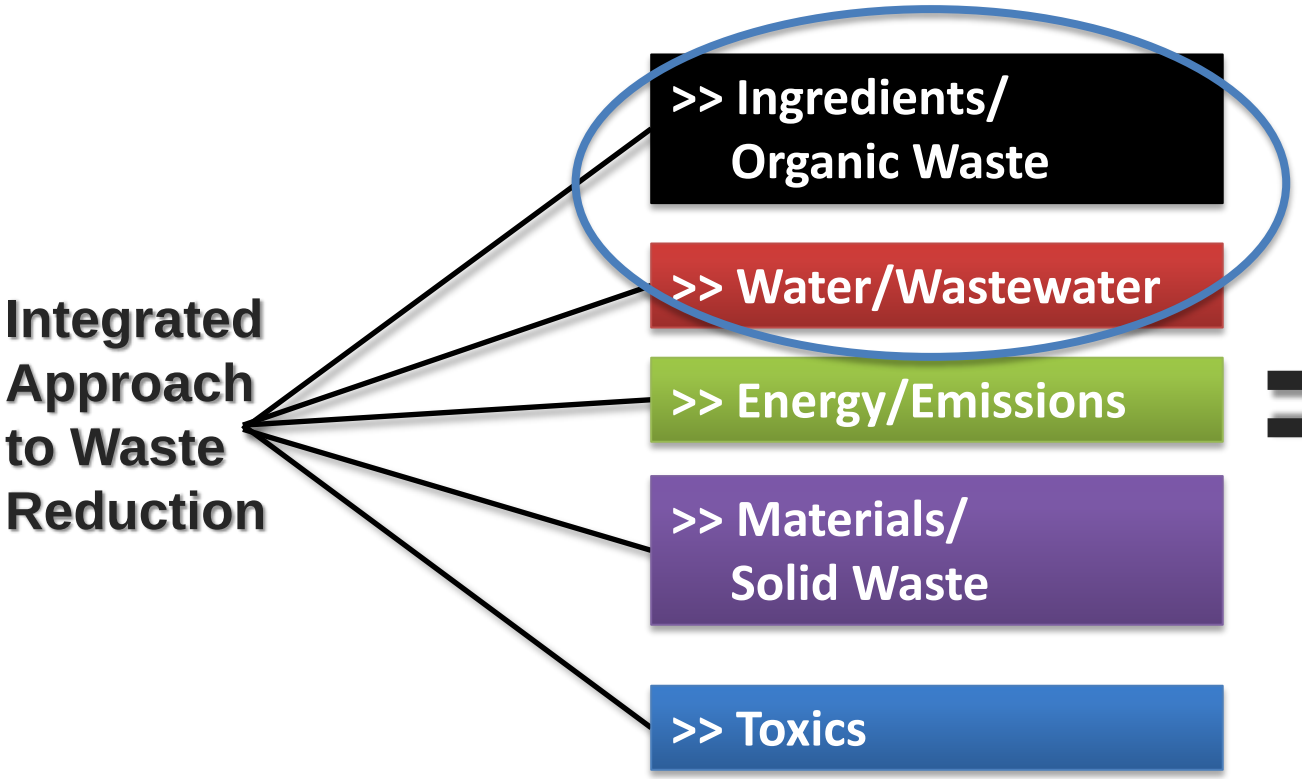
The “New Way”: Multi-faceted



- ✓ Increased product yield
- ✓ Increased resource efficiency
- ✓ Reduced waste handling & disposal costs

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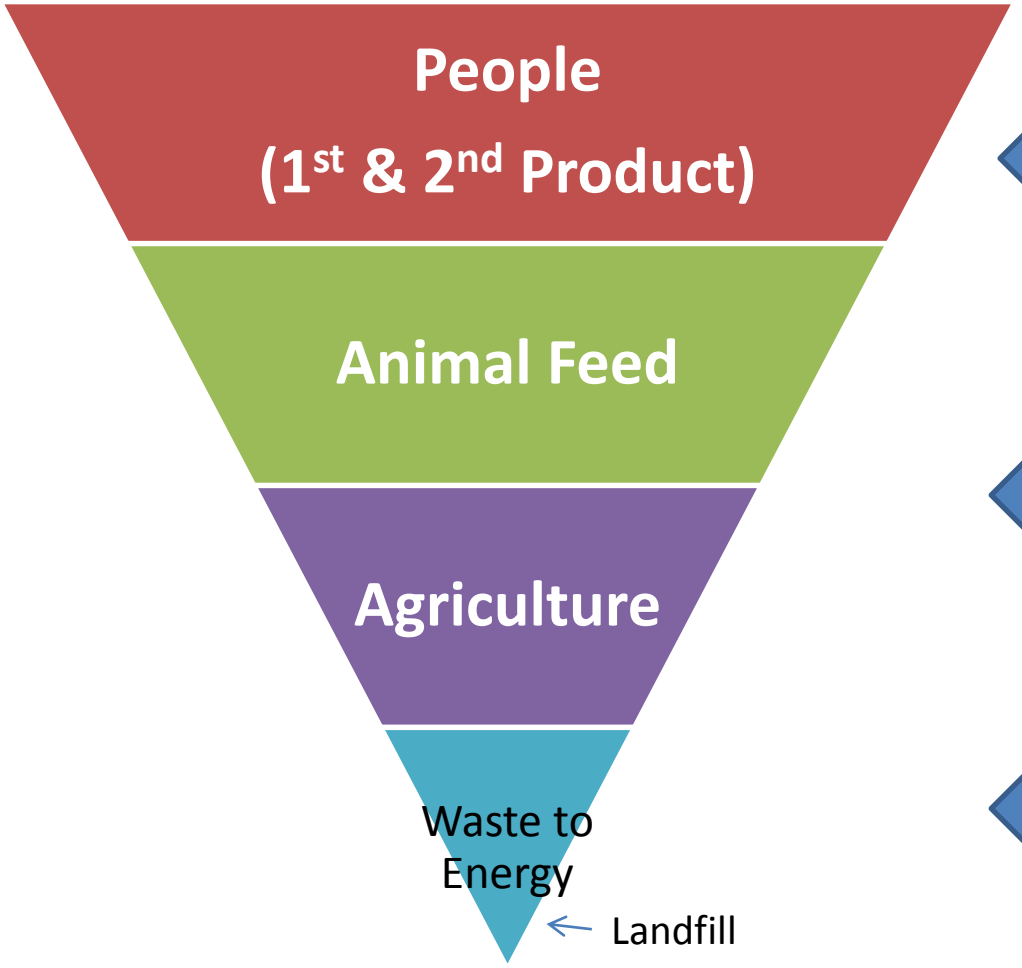
Organic "Waste" Use Hierarchy



Reduce/Reuse

Divert/Recycle

Treat/Dispose

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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 Has an Impact on Waste Management?

- Valuable input into investigation
- Soundboard for opportunities
- Early buy-in and preparation to facilitate change
- Multi-disciplinary team
  - Management, engineering, maintenance, operations, QA/QC, finance

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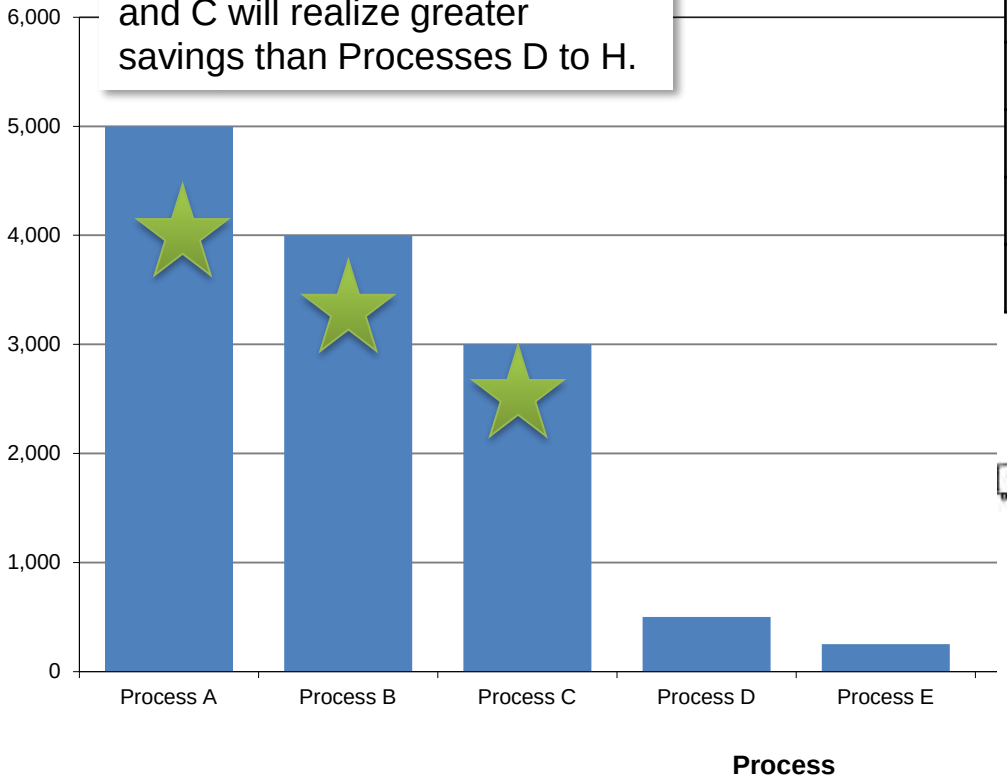
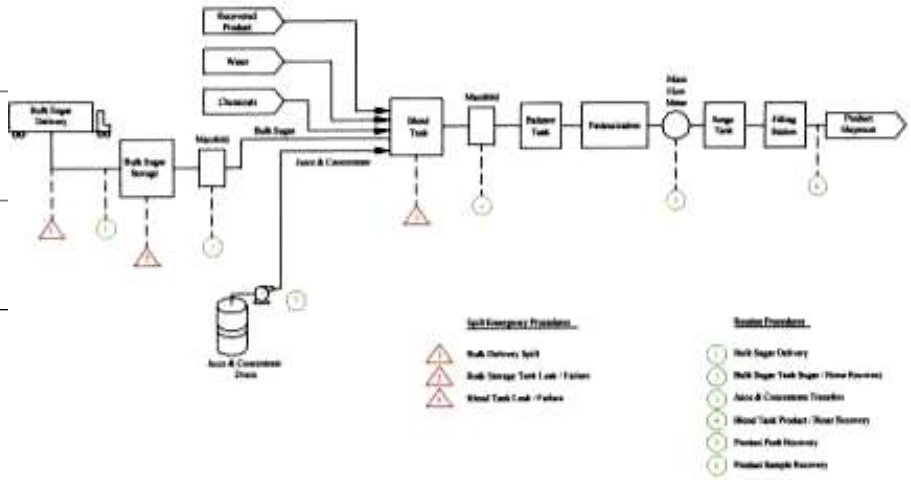
What Are the Wastes?

Focusing on Processes A, B, and C will realize greater savings than Processes D to H.



Parameter	Final Effluent Reported Range (mg/L)	By-Law Limit (mg/L)	Status
Biological Oxygen Demand (BOD)	500 to 1500	300	Non-Compliant
Total Phosphorus (P)	10 to 50	10	Non-Compliant
Total Kjeldahl Nitrogen (TKN)	50 to 500	100	Non-Compliant
Oil and Grease (O&G)	50 to 350	150	Non-Compliant
Total Suspended Solids (TSS)	500 to 1000	350	Non-Compliant



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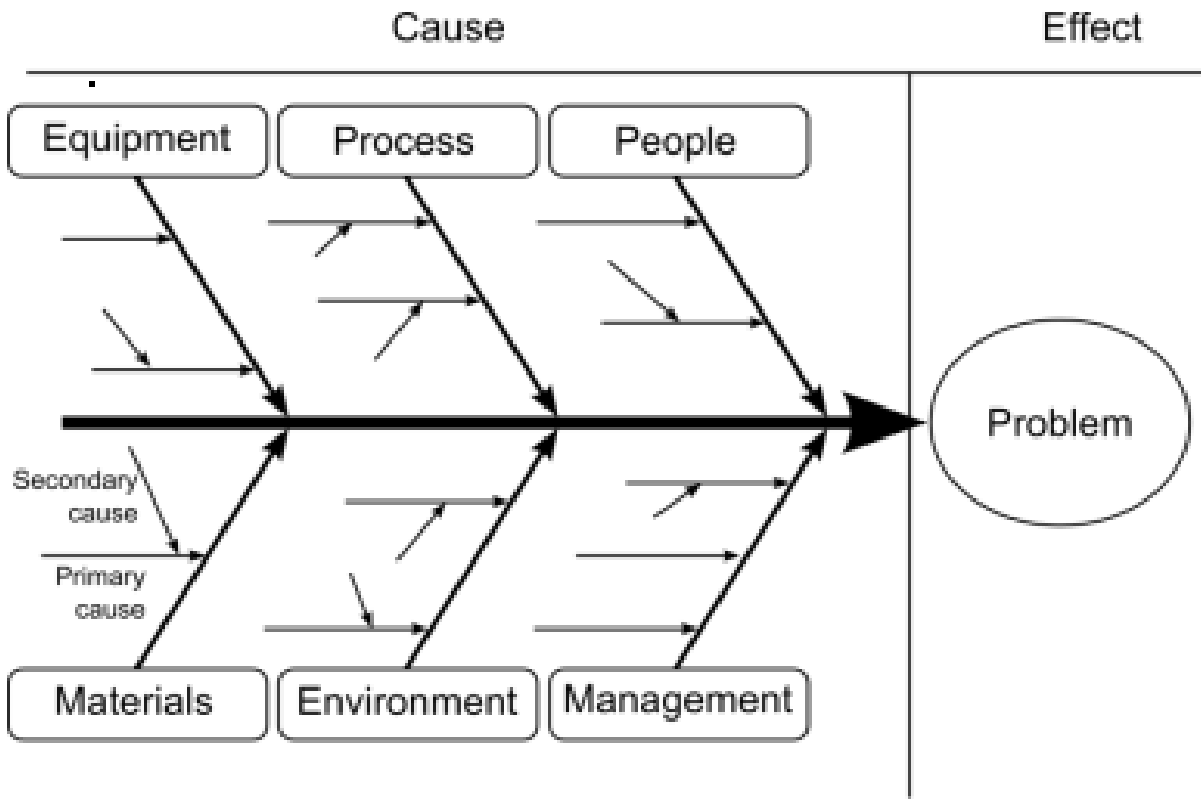
Why are They Generated and Where Can They Be Improved?



PEOPLE	METHODS
• Cause “A” • •	• Cause “B” • •
MATERIALS	**MACHINES**
• Cause “C” • •	• Cause “D” • •

When Should They Be Implemented?

- Operational Efficiencies
  - Ingredient costs / lost margins
  - Treatment O&M / surcharges
  - Shipping & disposal
  - Lost water rebate / offsets
  - Payback / NPV / IRR
- Stakeholder Demand
  - Product discard rates
  - Organic waste / kg product
  - Wastewater / kg product
  - Wastewater loading / kg product
- Risk Management
  - Fines / violations / rates
  - Community relations / reputation

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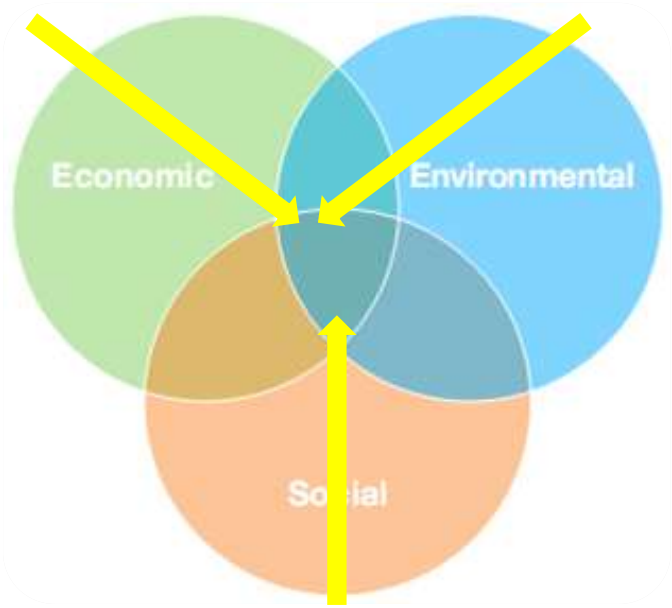
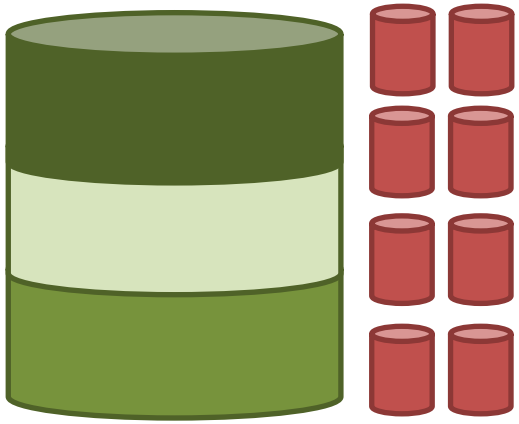
Case Study: Tim Hortons

Revenue **Compliance**



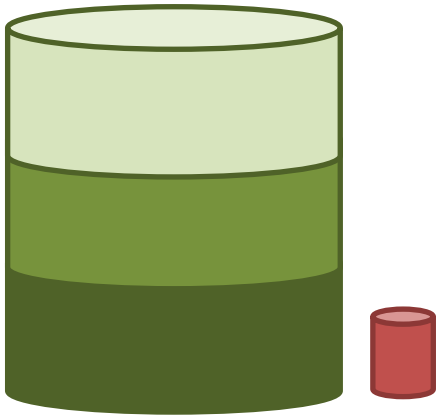
Responsibility

Results: Fondant Cleaning Process



THEN

- Cleaned fondant every 16 hours
- Batch process
- No colour sequencing
- 100 kg x 8 times/week to LF & sewer



NOW

- Cleaned once per week
- Continuous process
- Run colours light to dark
- First 100 kg to animal feed

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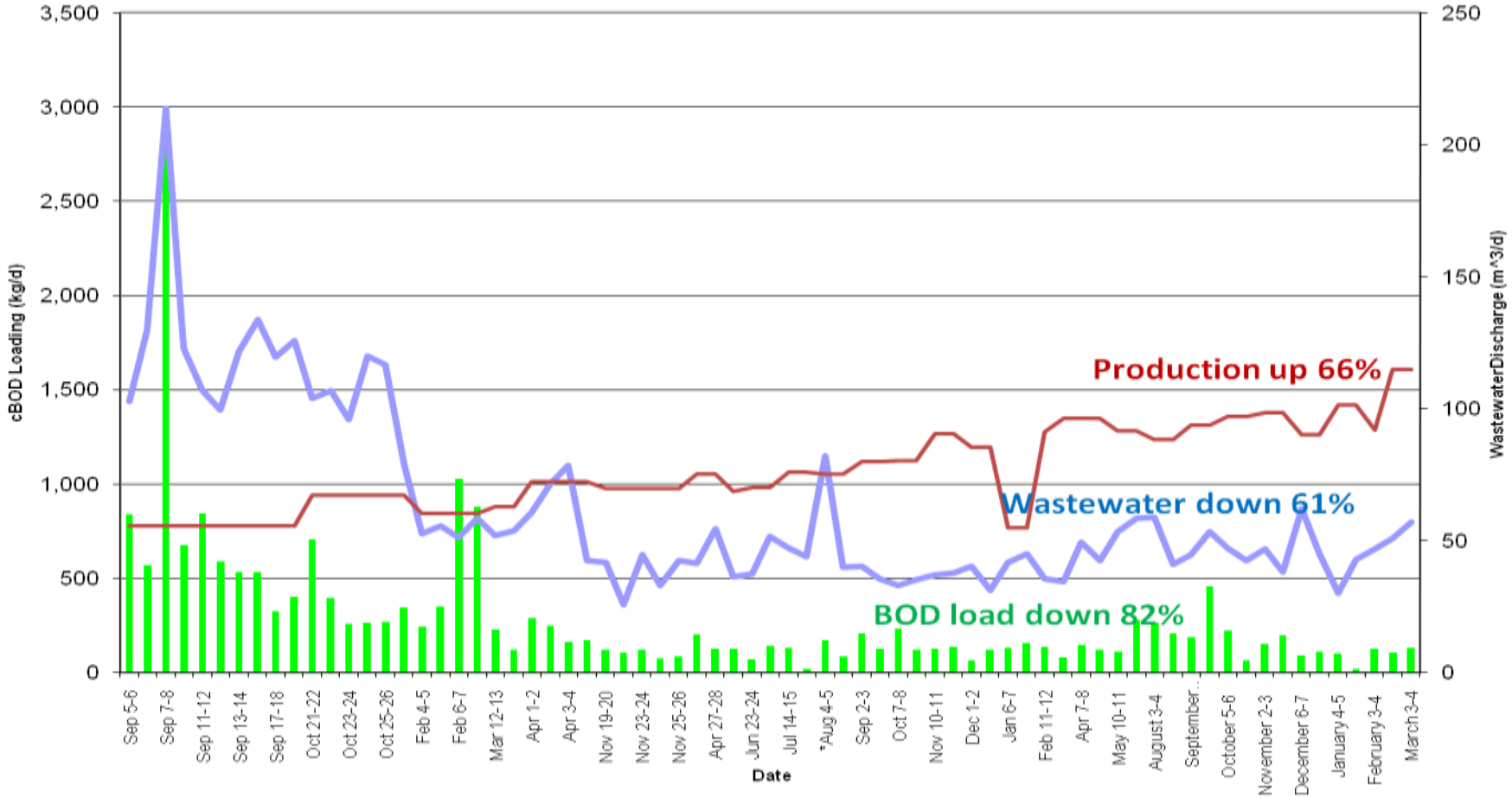
Results:



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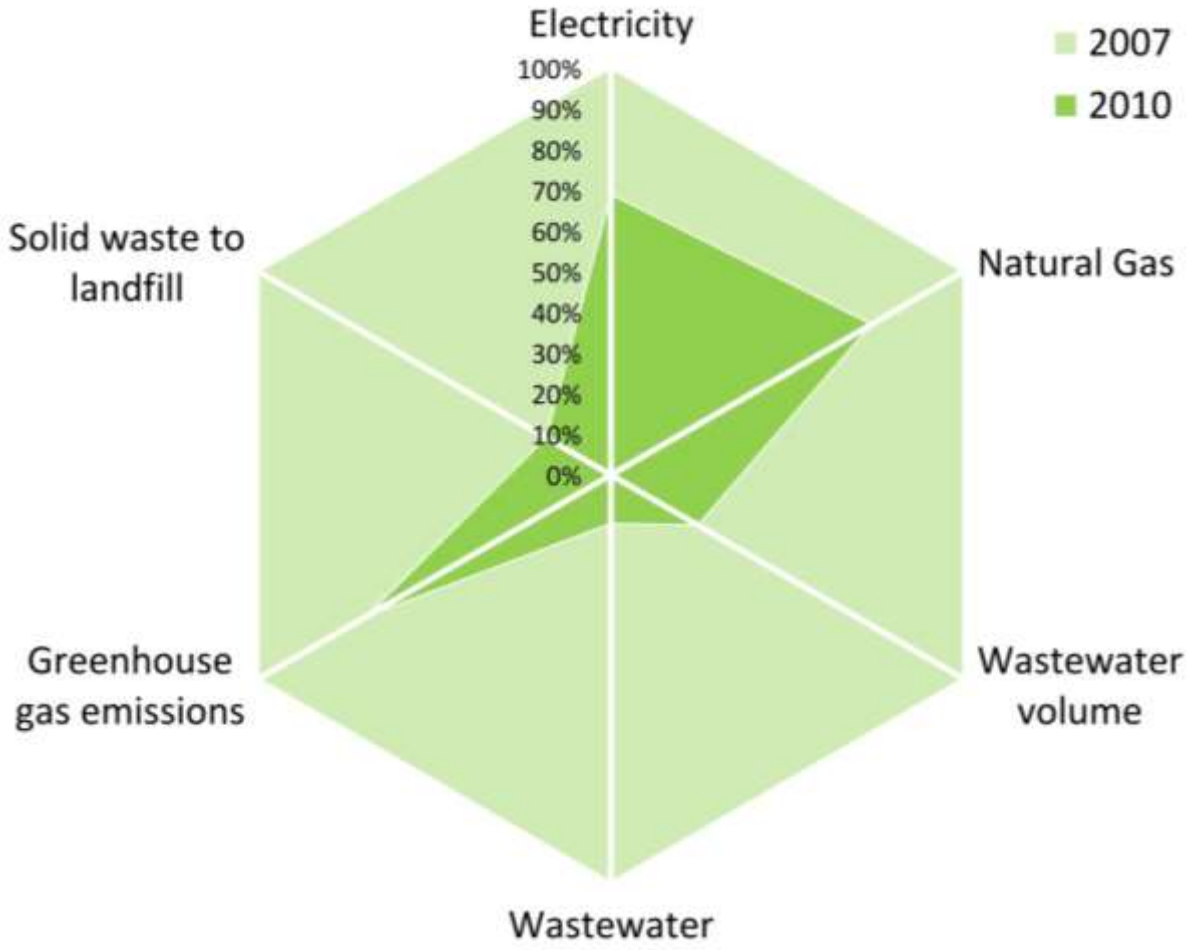
Multimedia Footprint:



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Cost Savings:

Category	Annual Savings		Canadian/US
	(Quantity)	(Units)	($)
Electricity	852,277	kWh	$ 85,227.72
Natural Gas	164,294	m^3	$ 49,288.32
Wastewater volume	36,748	m^3	$ 91,869.02
Wastewater organic loading	240,024	kg	$ 120,011.93
Greenhouse gas emissions	560	tonnes	N/A (yet)
Solid waste to landfill	510	tonnes	$ 3,750.00
Sewer surcharge	140,285	$	$ 140,285.40
			$ 490,432.39

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Stakeholder: Employee

1. Employee Bonus Structure
2. Job security (thriving employer)
3. Worker engagement
4. Working environment (dust, water)

Stakeholder: Facility

Company Perspective

Expenditure	**$187,500**		
Return	**$490,000**	per year	
Payback	**0.4**	years	(20 weeks)
ROI	**261%**		
20 Year NPV	**$ 5,918,983**		

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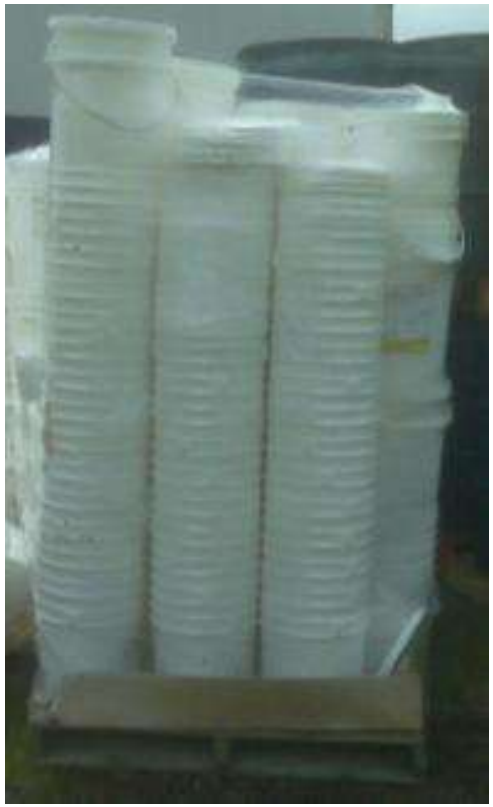
South Sudanese Solar Mango Project:



Solar dryer (based on a design by ECHO)

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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 typhoid, cholera, and dysentery.

Locally constructed BioSand filters (BSFs) sponsored by Tim Hortons Fruition Fruit & Fills waiting to be installed to purify water in homes in Kajo Keji County, South Sudan.

VIEW CERTIFICATE

Fruition Fruits & Fills

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Enviro-Stewards Inc. is pleased to present the following

Sustainability Credit

To Fruition Fruits & Fills, for providing 800,000 L per year of clean drinking water to the people of South Sudan, which will avoid approximately 120 tonnes per year of greenhouse gas emissions resulting from deforestation associated with boiling a portion of this water to make it safe to drink.

Certified by Bruce Taylor, President, Enviro-Stewards Inc.

February 15, 2012
Date of Issue

x40

This Sustainability Credit sponsors the construction and installation of **40 BioSand Filters** in Kajo Keji County, South Sudan. The filters purify water to prevent water-related illnesses such as typhoid, cholera, and dysentery, which account for over 50% of hospital visits in Kajo Keji.

800,000 L/yr
Clean drinking water

120 tonnes/yr
GHGs avoided

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

For more information, please visit: www.enviro-stewards.com

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Increase, Sustain, Share.

Certified B Corporation

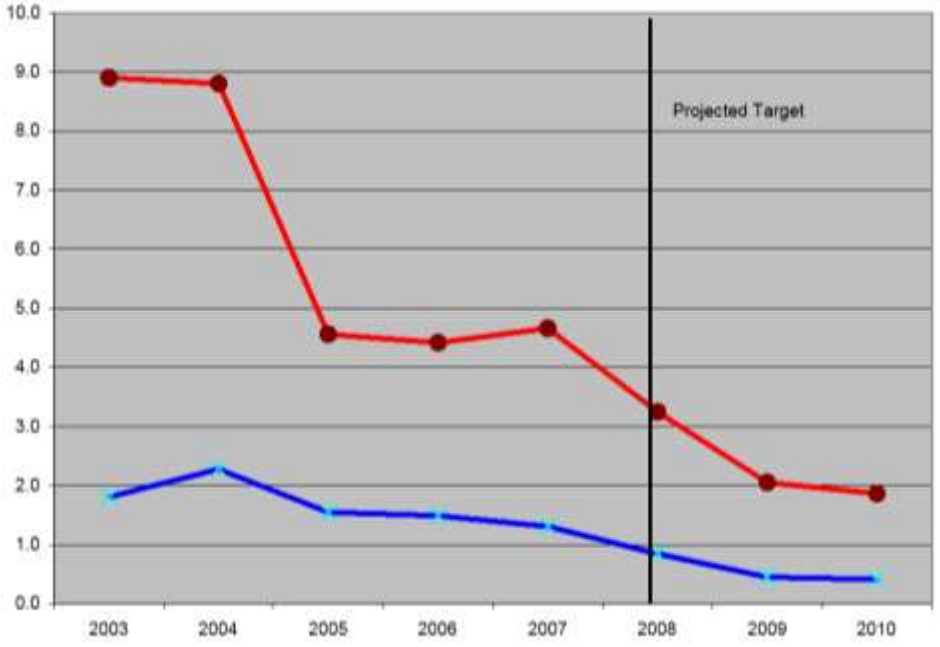
Case Study: Jackson Triggs, BC

Phase 1: Conservation at Source

- In plant measures reduced

Organics by 67%

Water by 50%



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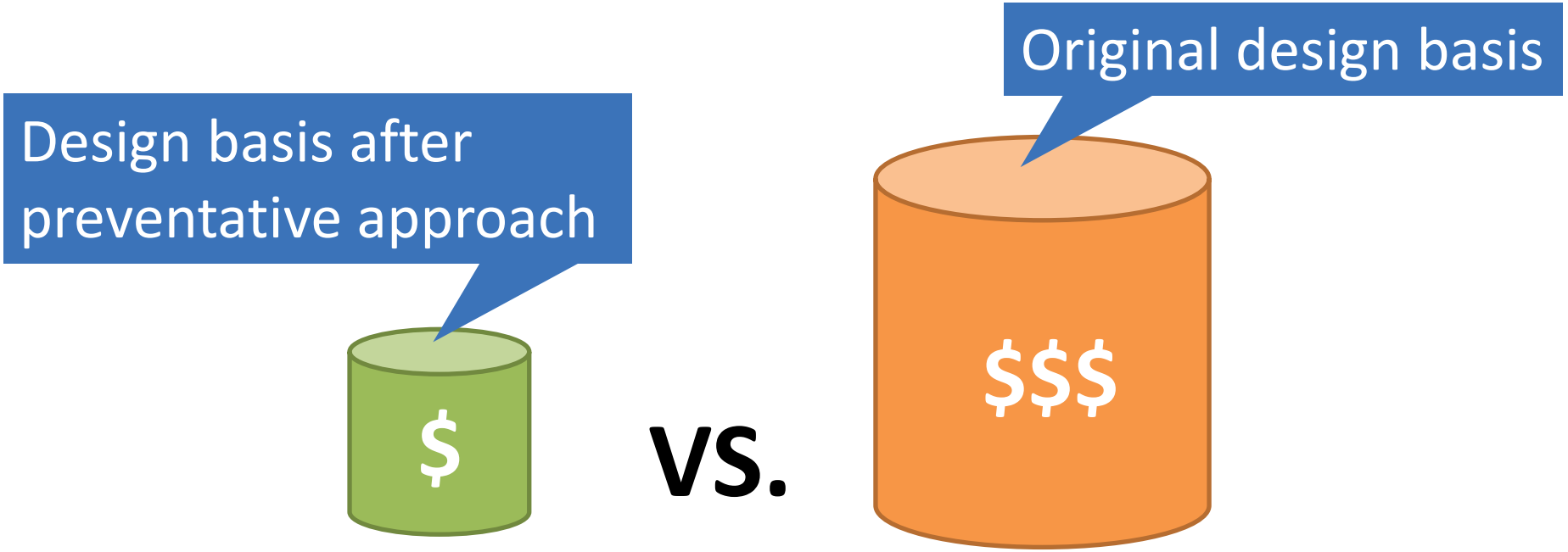
Case Study: Jackson Triggs, BC

- Capital projections on the new design basis were **$1.5 million less** than the original basis



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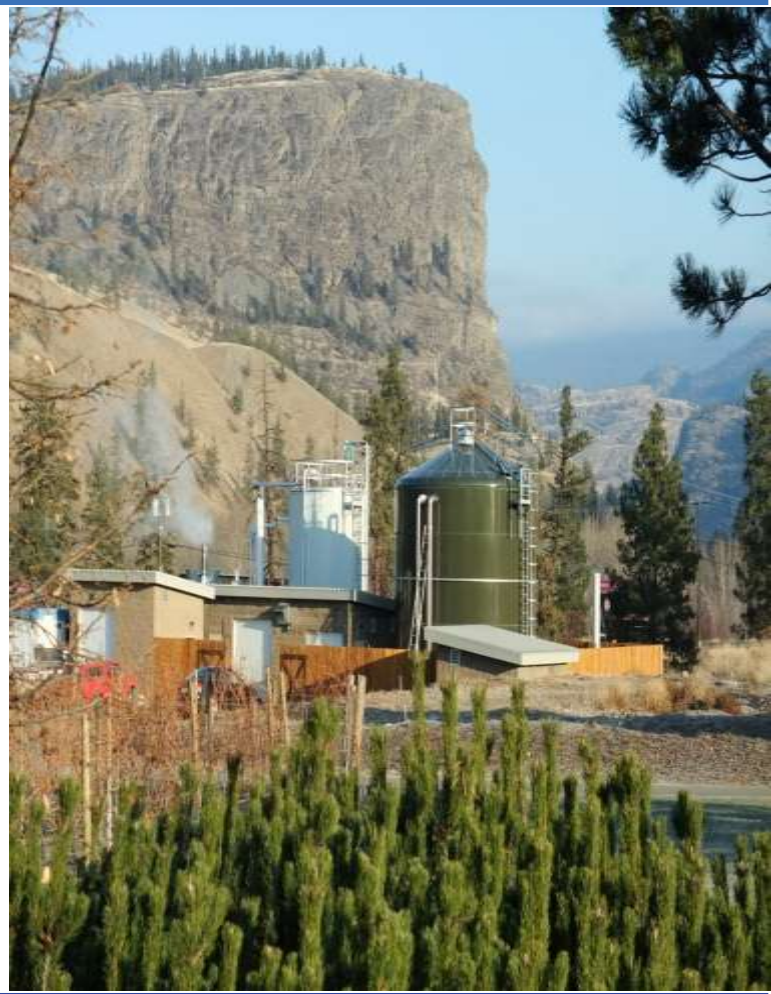
Case Study: Jackson Triggs, BC

Phase 2: Effluent Pre-treatment

- High rate anaerobic
  - Achieving **95% reduction**
  - **Eliminated** sewer surcharge
  - **Recovers biogas** for boiler
- Received co-funding based on avoided electrical consumption based on aerobic design
- Provides compelling sustainability story



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