Greenhouse Gas Reduction Program at St Lawrence Cement

Climate Leaders Partners Meeting
March 23rd, 2007
Arlington, VA

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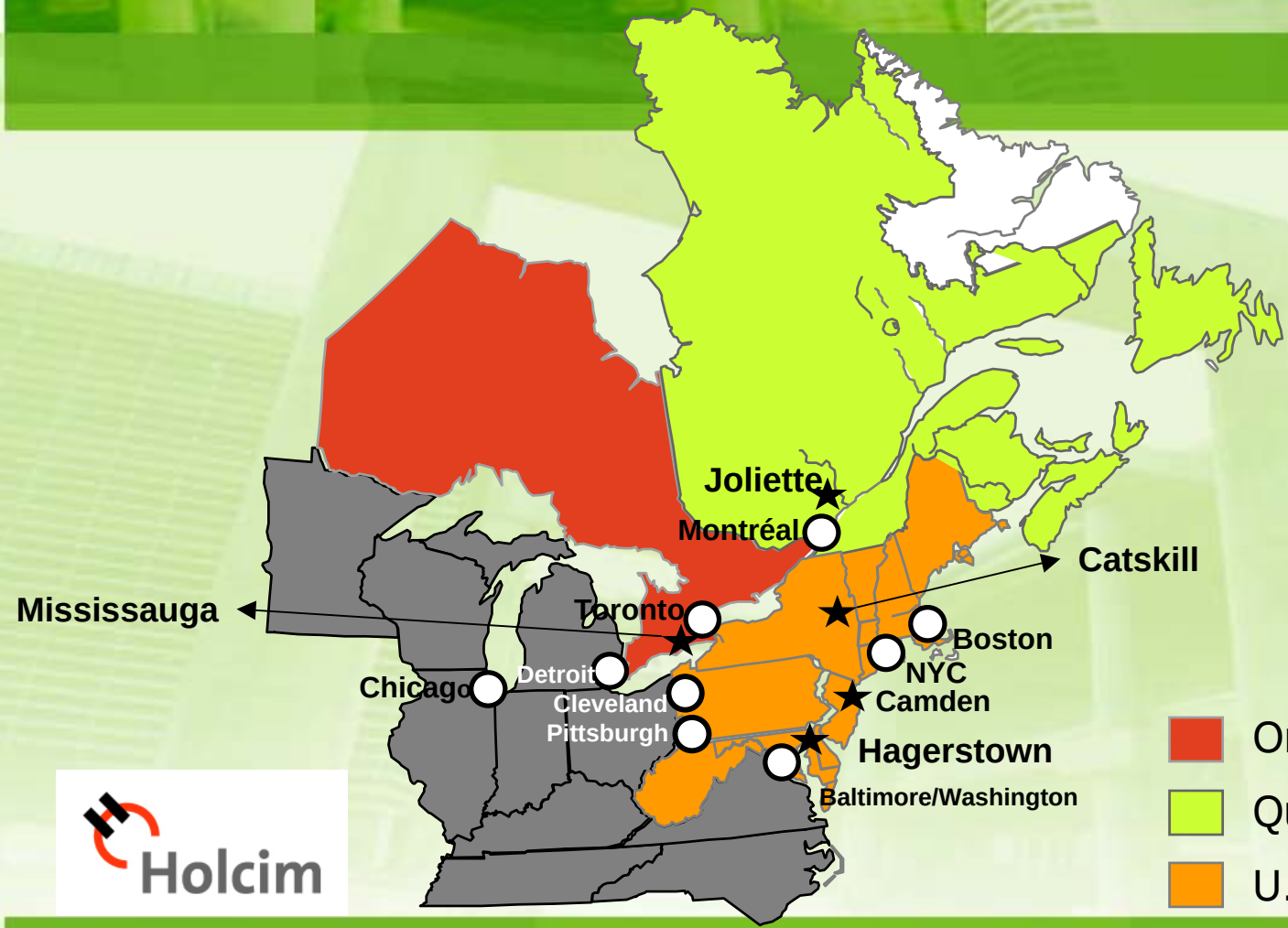
St Lawrence Cement



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Cementitious Products

Mississauga, ON
(1,450,000) **+**

Catskill, NY
(600,000)

Joliette, QC
(1,100,000)

Camden, NJ
(600,000) (Grinding Station)

Sault Ste. Marie, ON
(200,000)

Hagerstown, MD
(550,000)

(-,000): tonnes

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Concrete & Aggregates

Leader in the Greater Toronto and Greater Montréal markets

Dufferin Concrete/ Demix Béton

- 42 concrete plants
- 2.5 million m^3 of concrete

Dufferin Aggregates/ Demix Agrégats

- 25 quarries and sand pits
- 21.2 million tonnes

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Construction Services

Activities: airports, highways, bridges, concrete paving

2 entreprises:

- **Dufferin Construction**
  - TCG Asphalt
  - Cayuga Materials and Construction
- **Demix Construction**

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Management and valorisation of Alternate Fuels and Raw Materials

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- Used tires
- Waste oils
- Rubber by-products
- Plastics
- Wood dust/shavings

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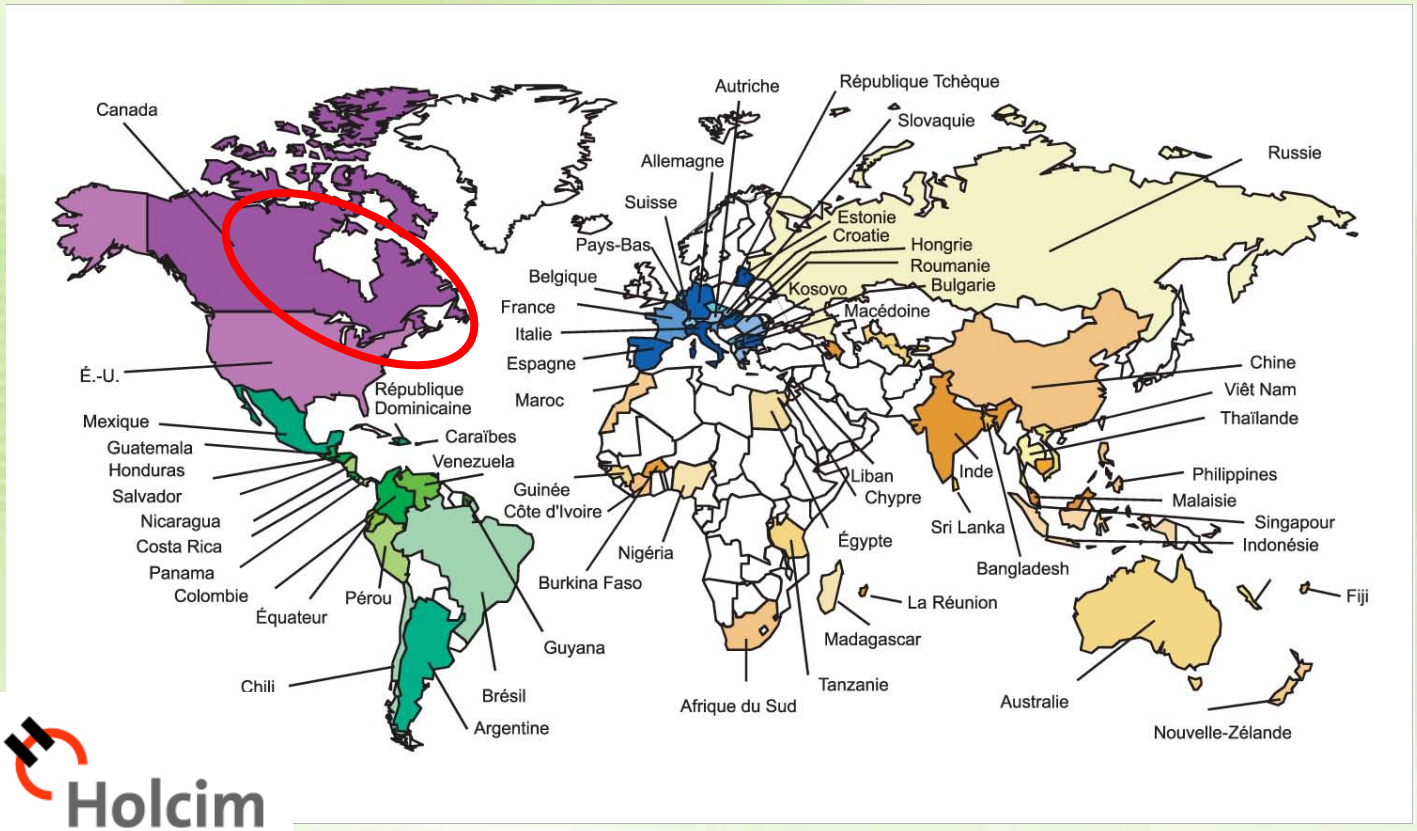
Holcim: Present in more than 70 countries



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SUSTAINABLE DEVELOPMENT

Holcim

World Business Council for Sustainable Development
Cement Sustainability Initiative

- Member of WBCSD
- Co-founder of the Cement Sustainability Initiative
- Ambitious SD targets applied across the Group
- Recognized as leader of the industry

Member of Dow Jones Sustainability Indexes 05

Member of Dow Jones Sustainability Indexes 06

ETHIBEL MEMBER OF THE ETHIBEL INVESTMENT REGISTER

ETHIBEL MEMBER OF THE ETHIBEL SUSTAINABILITY INDEXES

FTSE4Good

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Cement – active ingredient in concrete

- Solid, durable, versatile construction material
- Requires minimal care
- Important thermal mass (reduces energy requirements – heating & cooling)
- Recyclable
- Often considered to be a « green » building material

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Cement – our principal challenge

Our objective is to reduce the environmental footprint associated with the manufacturing while improving the life-cycle of our products

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Improving our environmental performance…

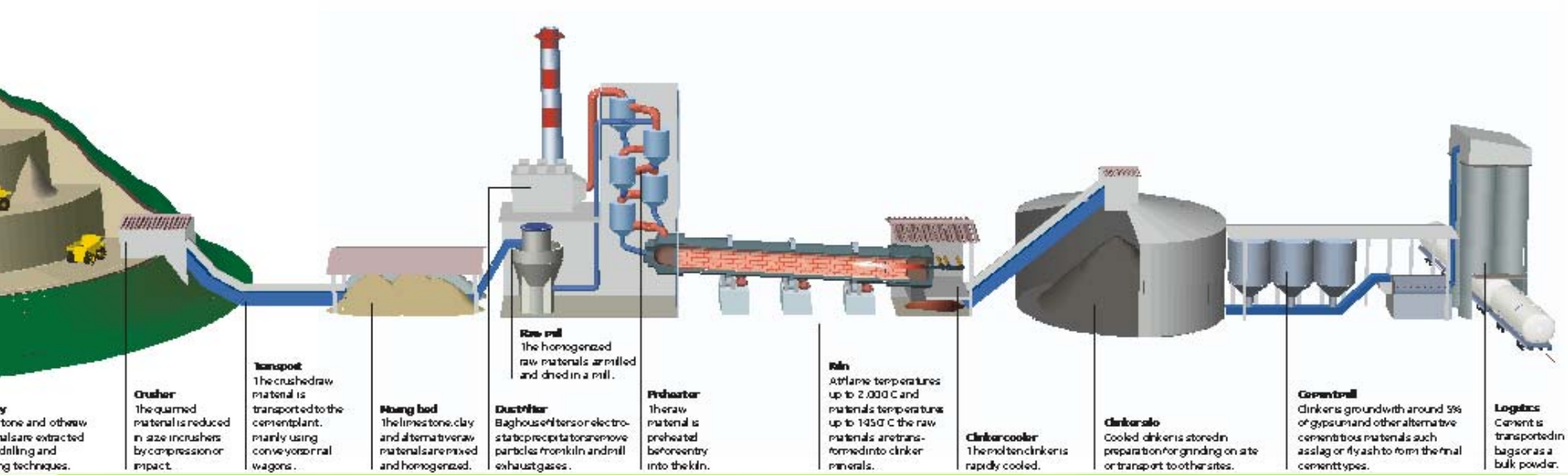
Concrete is the second most important product used worldwide

Worldwide Production : +/- 500 kg/person

1 tonne cement = 0,8 à 1,0 tonne of CO_2 (5 % of man-made CO_2)

In 2006 St Lawrence Cement consumed more than 6Mt of raw materials

more than 14,500 TJ of energy



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Improving our environmental performance…

The environmental footprint of the cement industry

Emissions

(CO_2, NO_x, SO_2, Dust…)

Raw Materials

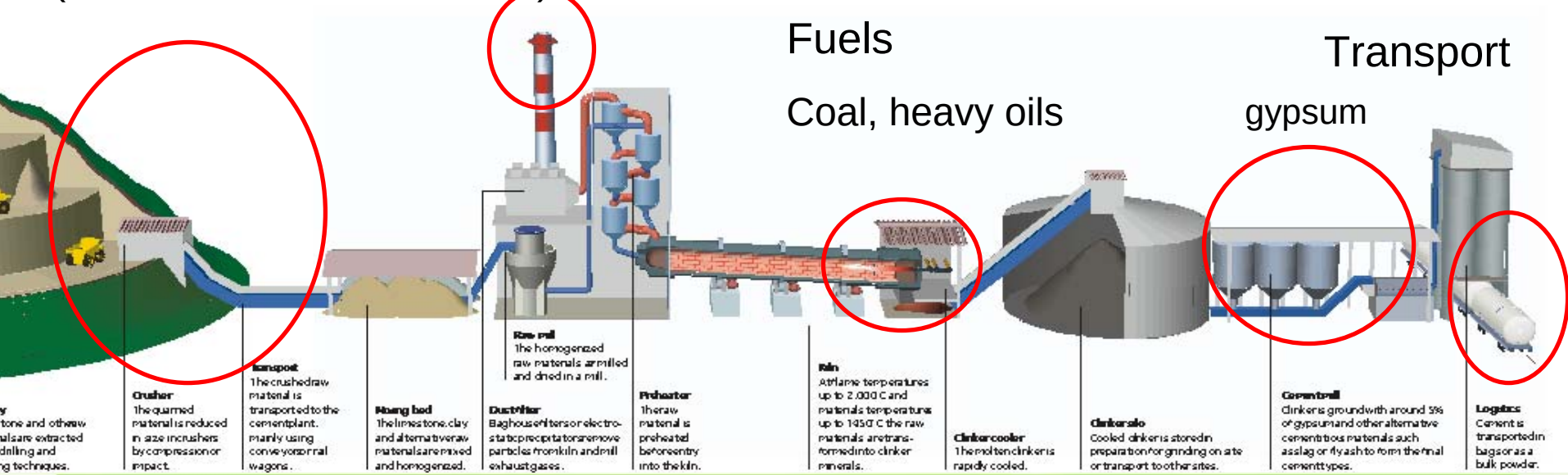
(limestone, shale, bauxite…)

Fuels

Coal, heavy oils

Transport

gypsum



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The Cement Sustainability Initiative

In partnership with the *World Business Council for Sustainable Development* with the help of the Batelle Memorial Institute.

The major issues identified following a world-wide consultation were:

- **Climate protection and the management of CO2;**
- **The responsible use of raw materials and fuels;**
- The health and safety of our employees;
- A reduction of our emissions;
- The impacts on the ecosystem and the neighboring communities;
- The public reporting of our results and progress

Joliette Plant

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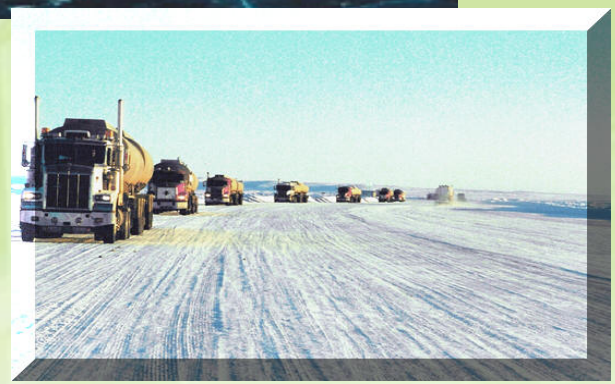
Climate Change in Canada

- The 10 warmest years on record have been measured since 1990
- The Maritime Provinces were hit by a « one in one-hundred year storm » in 2002, 2003 and 2004
- Costs associated with climate related events has increased by 500% since 1990 (2,5$ billion/yr)
- Permafrost (ground that remains below 0°C for more than 12 consecutive months) underlies almost half of Canada and provides important structural stability for much of our northern transportation infrastructure (ice roads, airport runways, etc…)



Thousand of Km of Ice Roads are used to supply northern communities

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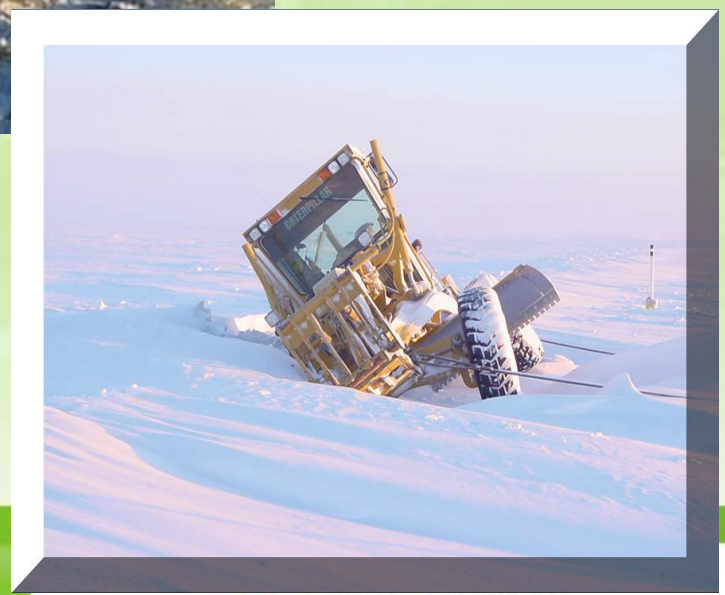

Global Warming has real and measurable economic impacts for the communities of Northern Canada who depend on Ice

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Climate Leaders Original St Lawrence Cement target

- Reduce net CO2 emission per tonne of cementitious product by 15% between 2000 and 2010

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CO2 Emissions from cement manufacturing

- The manufacturing of cement results in important quantities of CO2
- More than half of the CO2 produced comes from the chemical transformation of limestone into clinker (calcination)
  - No technology for CO2 reduction at the stack currently exists
  - Other sources of CO2 include kiln fuels, raw materials drying, on-site transport, heating, etc…

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SLC's CO_2 reduction approach

1. Improved overall energy efficiency

   Closure of the least efficient kilns

   (Beauport, Northstar & 2 wet kilns at Mississauga)

Former Beauport Cement Plant

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SLC's CO2 reduction approach

2. Use of Alternative Fuels

- replace fossil fuels
- biomass (climate neutral)
- possible GHG offsets

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A division of St Lawrence Cement

Eco-efficient and sustainable solution

Vs

Environnemental Risk

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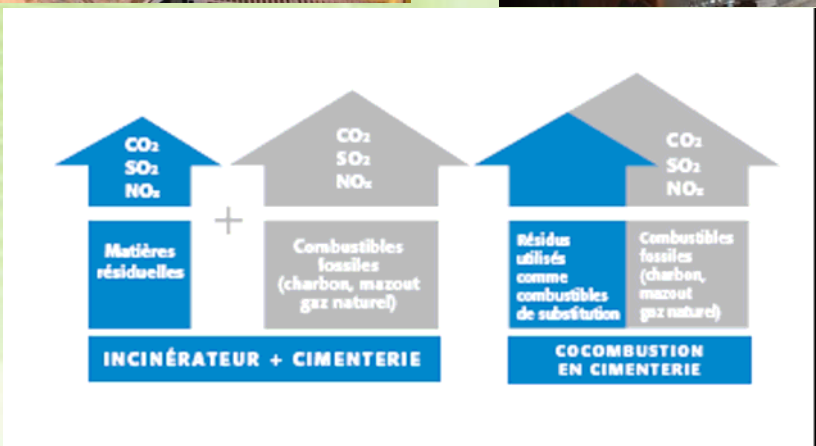
Use of Alternative Fuels to reduce GHG



Co-processing alternative fuels in a cement kiln reduces overall emissions as it displaces a portion of the fossil fuels (coal) used in the kiln and eliminates the need for incineration

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Co-processing of residual materials in a cement kiln

- Temperature of the flame of more than 1850°C
  - (1/3 the temperature of the sun)
- Temperature of the solids of more than 1450°C
- Residence time of more than 20 seconds
- High turbulence
- Better combustion than using an incinerator
- All materials incorporated into the clinker (no ash)

Granular material injection in Joliette

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Intensity reductions through the use of supplementary cementitious products

3. The most effective method to reduce CO2 is the development and increased use of supplementary cementitious materials

These materials are for the most part derived from industrial by-products

Ex: blast furnace slag (iron) , flyash (electricity), silica fume (electronics)

World Trade Center, NY

« Green » LEED Building

Optimal use of GranCem (35%)

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Other methods for the reduction of GHG

- Reuse of cement kiln dust
- Energy improvements for the mills and other equipment
- Increased use of concrete in buildings (important energy savings)
- Concrete Highways
  - Increased durability and performance and reduction in the fuel consumption for heavy vehicles

Benny Farms Project (Montreal)
Bronze Award (worldwide)
Holcim Awards
for Sustainable Construction

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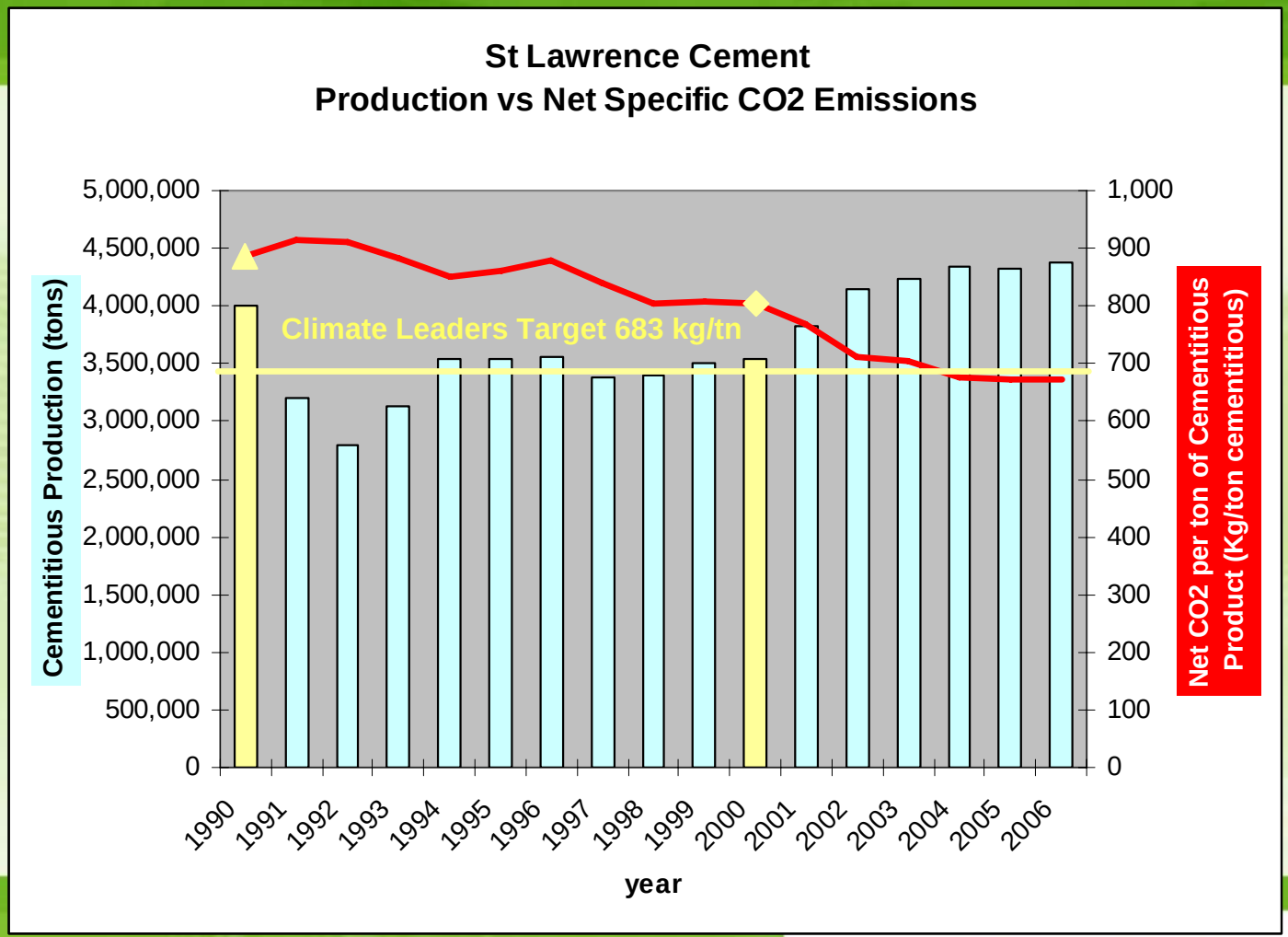
GHG Intensity Improvements at SLC



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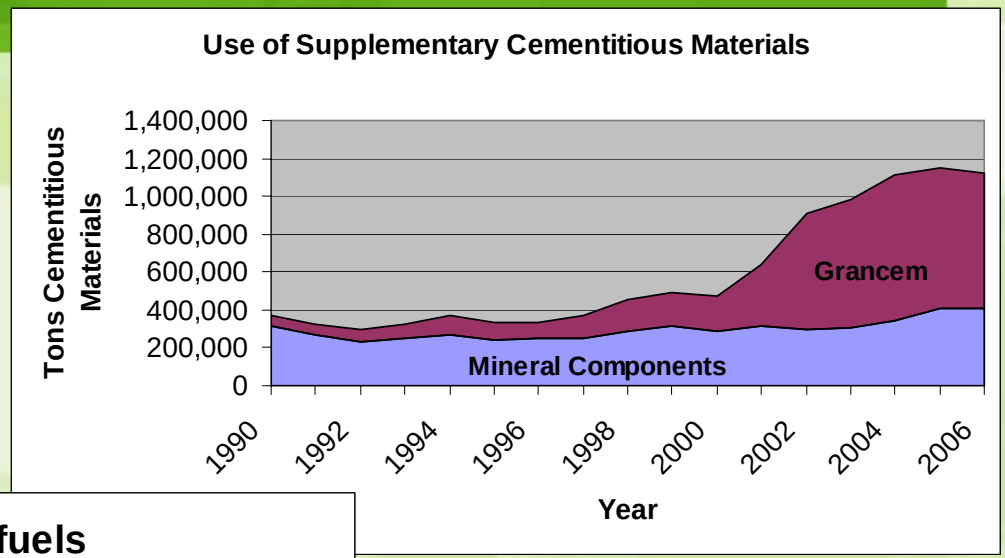
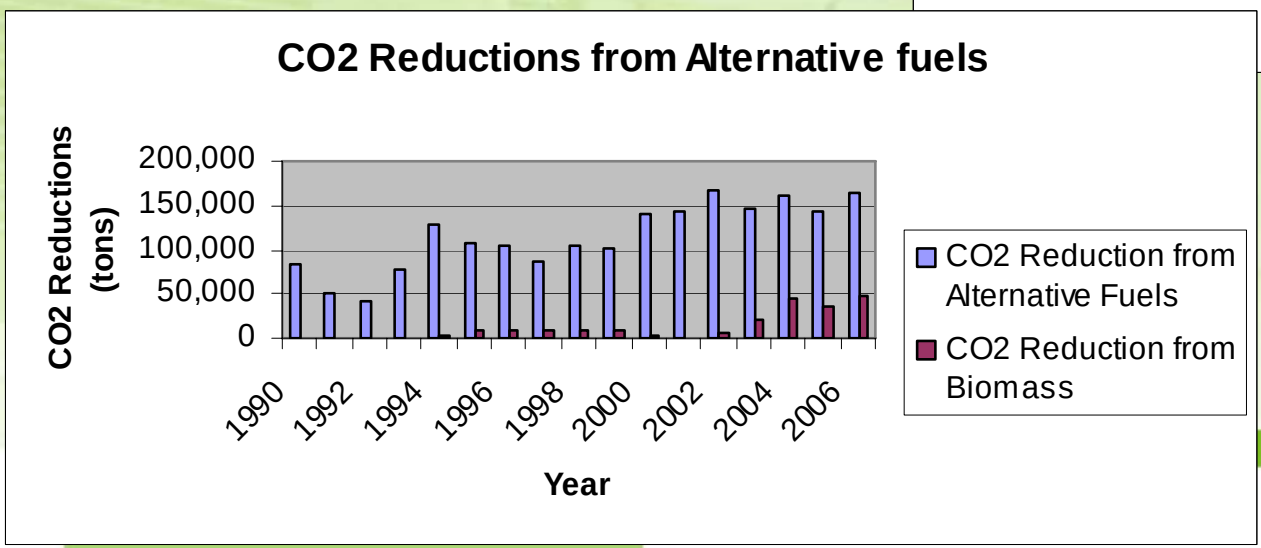
Main Contributors to CO2 Reduction at St Lawrence Cement





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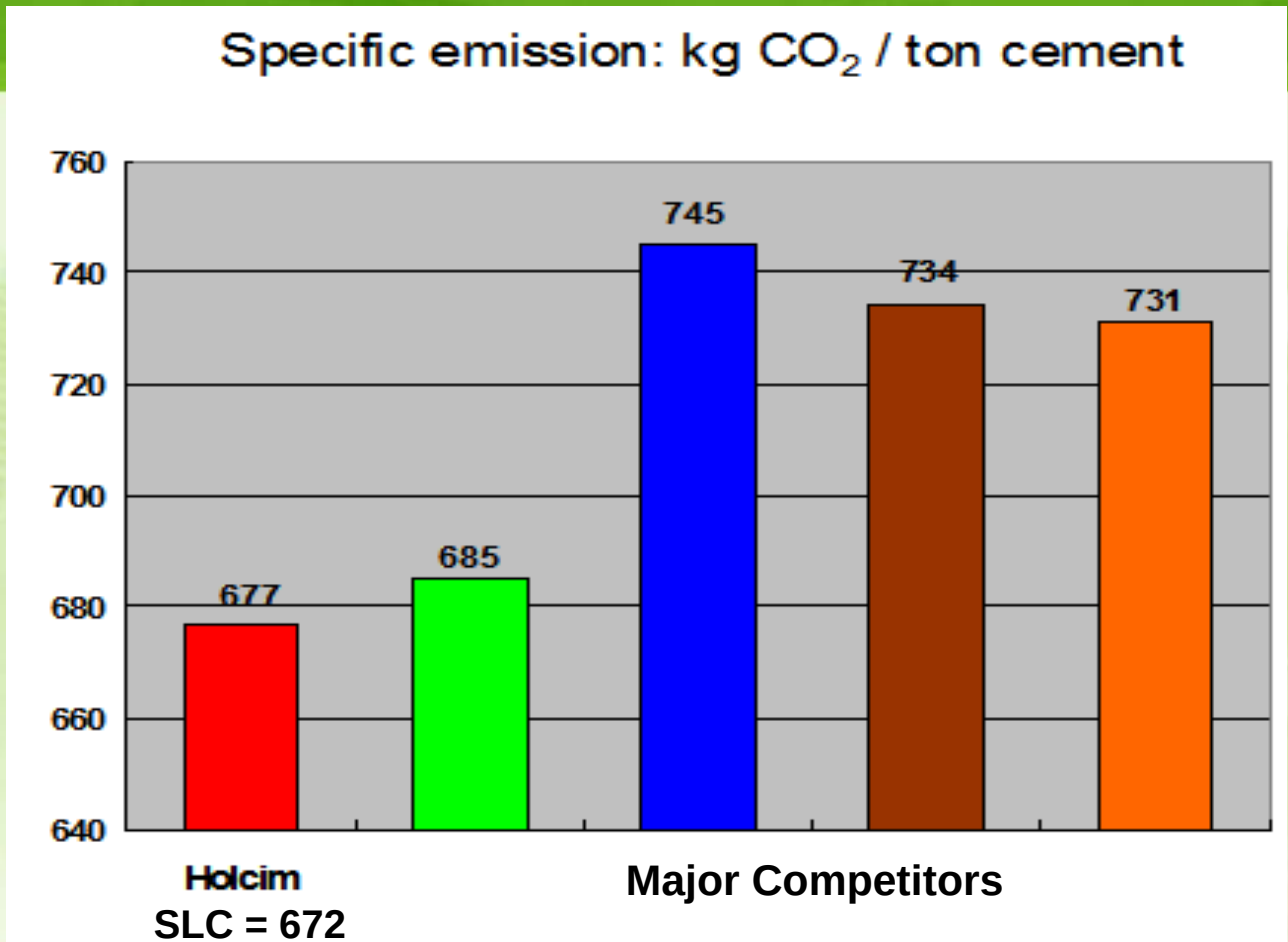
ENVIRONMENTAL BENCHMARKING



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What has St Lawrence Cement Done to date?

- SLC also participated in other voluntary initiatives;
  - Voluntary Challenge Registry (Canadian Program)

  - Various working groups with Environment Canada
  - Consultation working Group on CDM and JI with the Ministry of Foreign Affairs

- SLC has reduced its net CO2 emissions intensity by 24.2% since 1990 and by 16.3% from a 2000 baseline, meeting its Climate Leaders target several years ahead of schedule.

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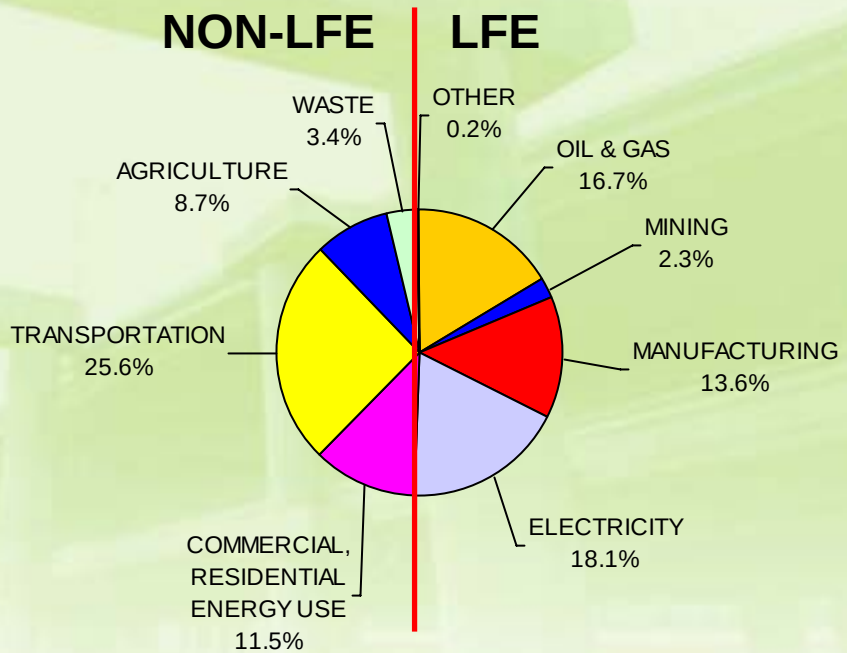
Canadian Climate Change Regulatory Context

Phase 1 deals only with the Large Final Emitters

Electricity, Oil & Gas, Steel, Aluminum, Glass, Chemicals, Paper, Cement, Lime, Mining, Smelting, Fertilizers

GREENHOUSE GAS EMISSIONS BY SECTOR 2003
TOTAL = 740 Mt CO2e



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Large Final Emitters (Previous Liberal Gov Proposal)

- All sectors are required to reduce their non-process emission intensity by 15%
- Fixed Process emissions have a reduction requirement of 0%
- Cap on emission credits maintained at $15/tn
- Acces to the Canadian GHG market and the International Markets (green CERs or AAUs and priority to Canadian technologies)
- Can invest in Technology Fund to meet compliance
- Mandatory Program for LFEs (no deminimus)
- New Facilities must apply BACTEA Intensity levels for 10 yrs
- Broad consensus that the program would never meet the Canadian reduction objective

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Cement Industry Proposal

- The cement industry, in Canada and around the world, has a strategy for reducing CO_2 emissions based on four important pillars:

1. Energy Efficiency
2. Supplementary Cementing Materials *
3. Alternative Fuels and Raw Materials
4. Concrete Technologies

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Proposed Solution

- ✓ An allocation formula based on cement emissions intensity
- ✓ A single formula for all Canadian cement manufacturers
- ✓ A formula acknowledging reduction from base year 2000 (original Canadian baseline)

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Proposed Regulation

- The formula proposed by the cement industry is:

National Average 2000 CO2 clinker-based Intensity (consolidated by the Cement Association)

$$CO_2 = 0.854 \left(\frac{\text{Cement}_{\text{yref}} \times \text{Clinker}_{2000}}{\text{Cement}_{2000}} + \text{Clinker}_{\text{sold}} \right)$$

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Looking forward

St Lawrence Cement's New Climate Leaders Target

- **Reduce our net CO2 emissions by 20% between 2000 and 2012 per tonne of cementitious product**

  (*revised from 15% reduction between 2000 and 2010*)

  How will we meet our new target?

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New Vertical Roller Mill Mississauga, ON

Investment of more than $70M

Construction began in fall 2006

Designed to grind blast furnace slag to produce GranCem, a cement substitute

VRM also allow more effective grinding of clinker produced at the plant (lower electric consumption)

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New Vertical Roller Mill Mississauga, ON

Scheduled to come on line in June or July 2007

Most important investment in recent years to reduce St Lawrence's greenhouse gas emission intensity

The use of GranCem also reduces the impacts of other emissions such as NOx and SO2 and reduces the need for natural limestone resources

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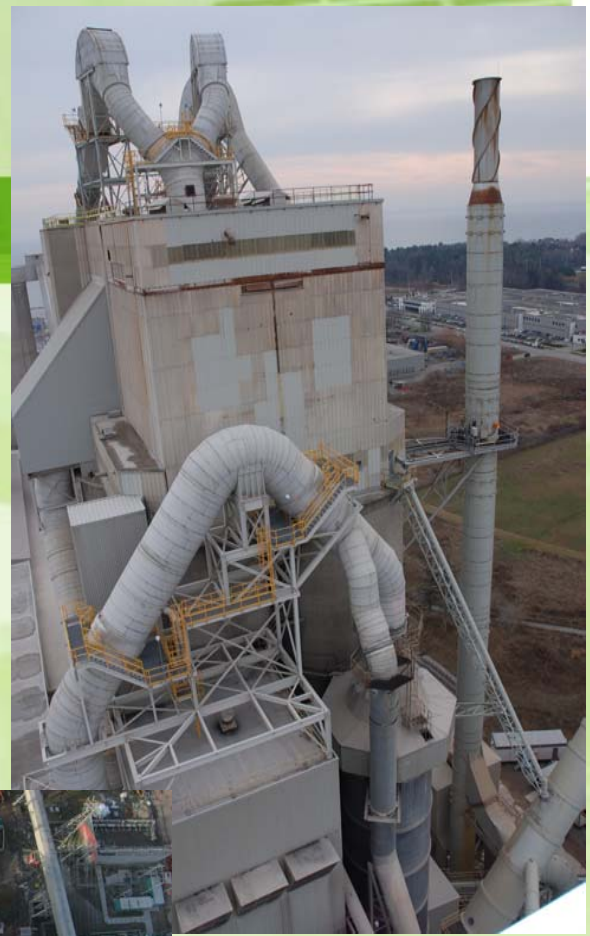
Heat Recovery System

Hot gas from the kiln is re-routed, high dust load is removed using cyclones

Heat is used to dry the materials going to the mill

Believed to be the first time this type of system is installed on a cement kiln

Will greatly reduce the need for natural gas and electricity



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New Alternative Fuel Platform in Joliette, QC

- New alternative fuels platform has been constructed within one mile of the Joliette cement plant
- Will improve stability of kiln
- Will allow for the use of more challenging alternative fuels (fluff)
- Will offer flexibility to replace the historical use of tires (1994) as the old tire stockpiles have been safely eliminated

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New Alternative Fuel Platform in Joliette, QC

- Construction began in late fall 2006
- First residual material shipments received in February 2007
- Grinding and blending capabilities
- eliminates problematic landfilling (for example: formaldehyde treated particle board and treated wood)
- reduces demand for imported fossil fuels (coal)

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New Ship Unloading Installations Camden, NJ

Loading and off-loading of ships and barges was taking place at an off-site pier

All material was transported through mostly residential streets in Camden (eliminates 37,000 truckloads per year on average over a distance of approximately 1 mile each way)

Ship unloader was constructed in 2006 after the pier was improved by the Port Authority, also an adjoining site was remediated to bring the material stockpiles in closer proximity to the plant

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What will be the challenges?

- **Construction Standards are too restrictive in allowing for a more efficient use of supplementary cementitious products**
- **Elimination of tire stockpiles historically our most important Alternative Fuel (most new tires going to recyclers)**
- **Intense competition for waste oil and other liquid alternative fuels in all our markets (greenhouses & on-site heating)**
- **Anticipated competition for biomass (carbon neutral fuel)**
- **Potential impacts of air quality regulations**
  - **Increased energy consumption, reduced production**

- **Regulatory Uncertainty**
  - **Uncertainty around the recognition of Alternative Fuels as offsets**
  - **Presently regulations not well aligned with the principles of Industrial Ecology**

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