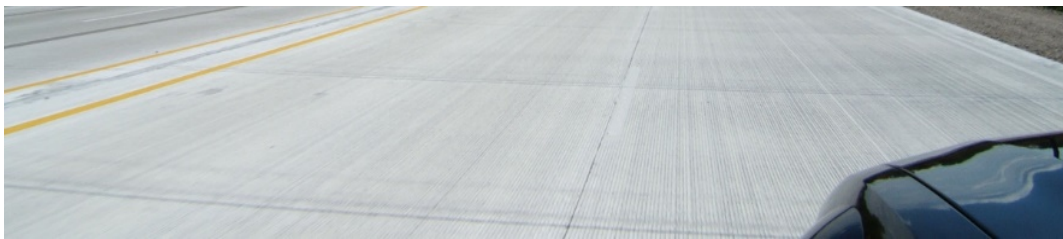
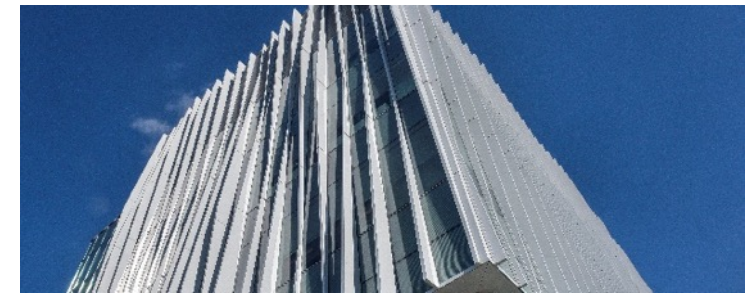


# Climate Policy & Economic Growth

PNWER 2019  
Saskatoon



Cement  
Association  
of Canada

Association  
Canadienne  
du Ciment

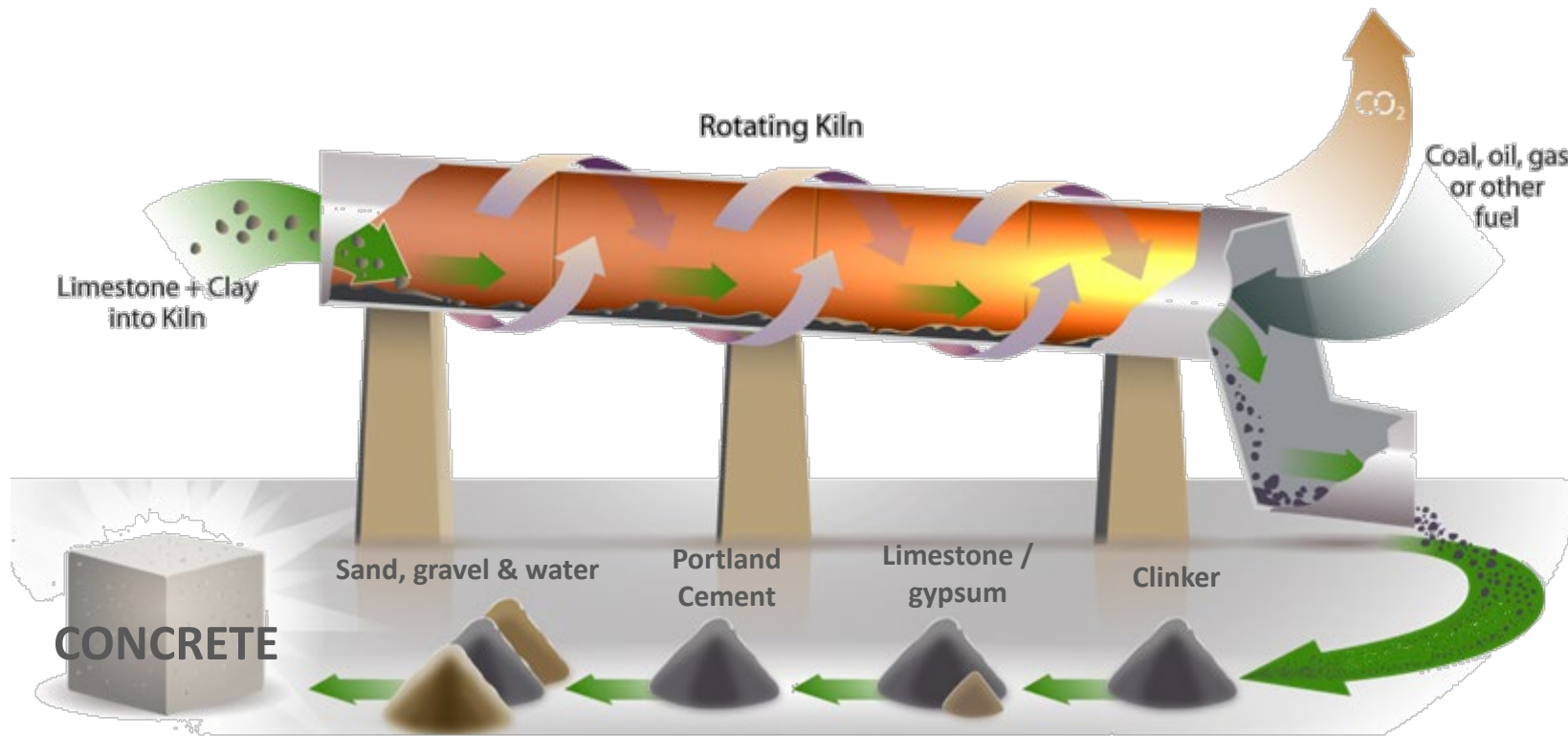
CONCRETE  
Build for life™

LE BÉTON  
Bâtir pour l'avenir™



# **FIVE THINGS LEGISLATORS NEED TO KNOW ABOUT CEMENT AND CONCRETE**

# 1. How cement and concrete are made



## Cement

- 1.4% of Canada's GHGs (~7% globally)
- ~40% combustion emissions
- ~60% industrial process emissions
- Multiple technology pathways needed to reduce emissions

## Concrete

- Typically 7-15% cement added to water, sand and gravel
- Cement comprises up to 80% of concrete's carbon footprint

## 2. Concrete is the world's most important building material

- Concrete is the foundation of economic development and prosperity – **the world's most important building material**
  - Virtually all construction – above and below ground – needs concrete
  - Twice as much concrete is used than all other materials combined
  - Second most consumed commodity in the world, **second only to water**
- We are a major, indispensable participant in Canada's economy:
  - **158,000** direct and indirect jobs across the country
  - **\$76 billion** in direct, indirect and induced economic impact
  - Present in every community across Canada



# 3 (a). Cement is among the most emissions intensive & trade exposed (EITE) sectors in Canada and globally ...

Figure 10: Low-Carbon Comparative Advantage – Ability to Compete in North American Markets

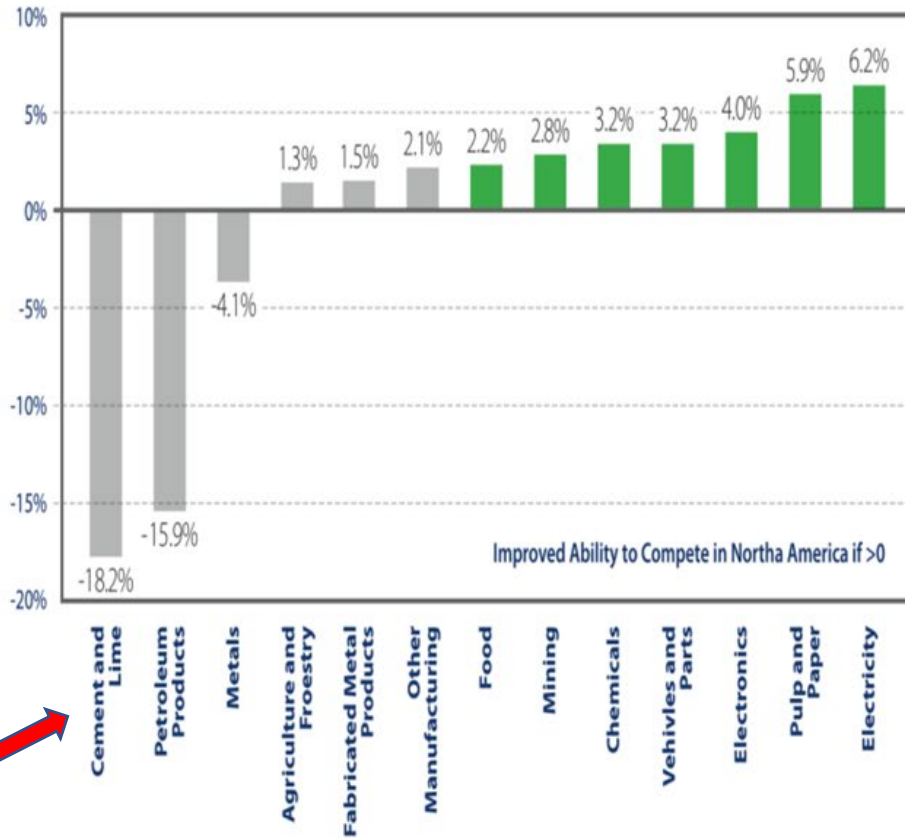
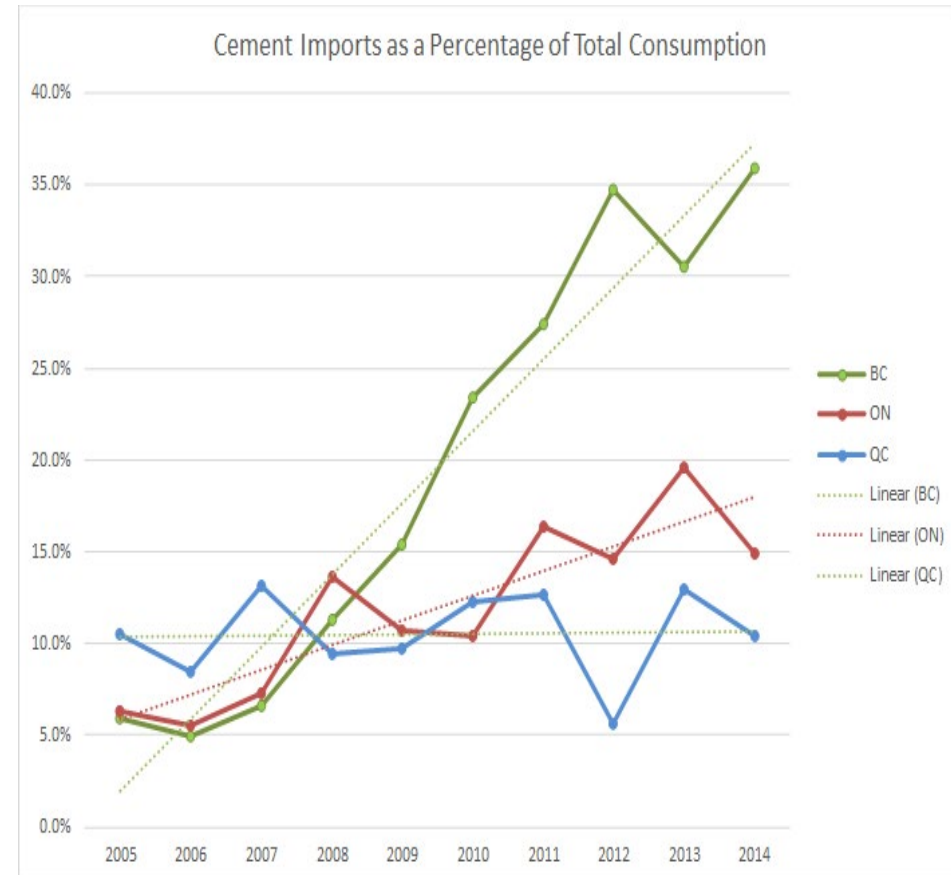


Figure 1b: Competitiveness Pressures by Sector in Alberta



### 3 (b) ... which means poor climate policy design can lead to “Carbon leakage” putting local jobs & economy at risk

**Carbon leakage** occurs when there is a shift in production and its associated GHG emissions to countries with laxer emission constraints (e.g. from a carbon priced jurisdiction to a non-carbon priced jurisdiction).



# 4. Working with governments on climate solutions is among our top priorities

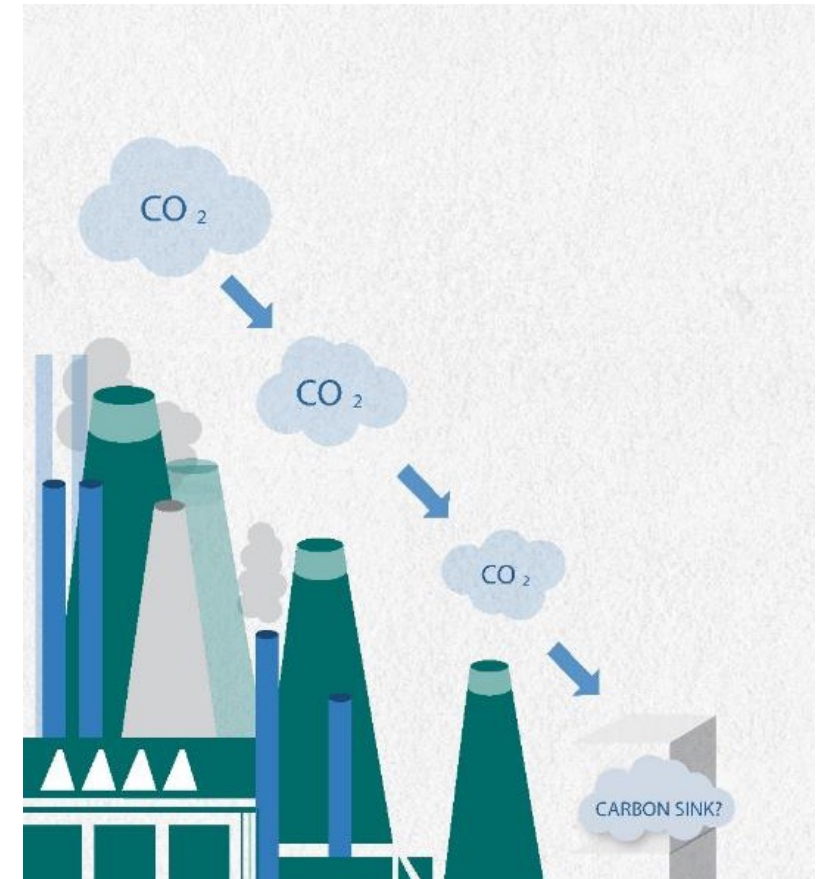
*Our priorities are to ...*

- help Canada meet its **GHG reduction** commitments
- build **low carbon, climate resilient** buildings, roads and communities
- support the development and implementation of forward thinking **policies and innovation**
- be a local and national **champion of the clean economy** transition



# 5. We have plenty of climate solutions!

- Cement manufacturing GHGs reduced by **20%** over last 20 years
- Lower carbon Portland Limestone Cement (PLC) reduces CO<sub>2</sub> emissions by another **10%**
  - Could avoid almost 1 MT of GHG emissions per year across Canada
- Substituting traditional fossil fuels with lower carbon alternatives
  - Could reduce GHGs by 2-3MT per year – another **20%-30%**
- Aiming towards carbon neutrality - incubator for transformative carbon capture and utilization (CCUS) technologies
  - e.g., CarbonCure, Solidia, Pond Technologies, Carboclave, Inventys, Blue Planet,







# **FOUR THINGS LEGISLATORS CAN DO TO HELP LINK CLIMATE POLICY WITH ECONOMIC OPPORTUNITY**



# 1. CERTAINTY AND PREDICTABILITY

# Carbon Pricing in Canada (2018)

	Pricing Policy	Benchmarks/Price/Funding
<b>Federal</b>	<ul style="list-style-type: none"> <li>Output Based Pricing System (OBPS)</li> <li>Clean Fuel Standard</li> </ul>	NOT APPLICABLE
<b>BC</b>	<ul style="list-style-type: none"> <li>Carbon Tax on Fuels</li> </ul>	<p><u>Benchmark</u>: None</p> <p><u>Price</u>: \$30/t (no scheduled increases)</p> <p><u>Revenue Recycling</u>: Ad Hoc (e.g. \$28M for Cement Alternative Fuels Program)</p>
<b>AB</b>	<ul style="list-style-type: none"> <li>Carbon Competitiveness Incentive Regulation (CCIR)</li> </ul>	<p><u>Benchmark</u>: 785kg / t CO<sub>2</sub> CGL (declining 1% per year)</p> <p><u>Price</u>: \$30 rising \$10/yr to \$50 in 2022.</p> <p><u>Revenue Recycling</u>: Emissions Reductions Alberta Tech Fund</p>

	Pricing Policy	Benchmarks/Price/Funding
<b>ON</b>	<ul style="list-style-type: none"> <li>WCI Linked Cap &amp; Trade System</li> </ul>	<p><u>Benchmark</u>: ~803 kg / t CO<sub>2</sub></p> <p><u>Price</u>: Market based (~\$18)</p> <p><u>Revenue Recycling</u>: GreenON \$ OCE Target GHG (e.g. \$60M for Alternative Fuels Program)</p>
<b>QC</b>	<ul style="list-style-type: none"> <li>WCI Linked Cap &amp; Trade system</li> </ul>	<p><u>Benchmark</u>: Facility Based</p> <p><u>Price</u>: Market based (~\$18)</p> <p><u>Revenue Recycling</u>: Green Fund</p>
<b>NS</b>	<ul style="list-style-type: none"> <li>Unlinked Cap &amp; Trade System</li> </ul>	<p><u>Benchmark</u>: TBD</p> <p><u>Price</u>: TBD</p> <p><u>Revenue Recycling</u>: TBD</p>

# Carbon Pricing in Canada (2019)

	Pricing Policy	Benchmarks/Price/Funding		Pricing Policy	Benchmarks/Price/Funding
Federal	<ul style="list-style-type: none"> <li>Output Based Pricing System (OBPS)</li> <li>Clean Fuel Standard</li> </ul>	<p><b><u>NOT APPLICABLE</u></b></p> <p><u>Benchmark:</u> 733kg / t CO<sub>2</sub> CGL (static to at least 2021)*</p> <p><u>Price:</u> \$20 rising \$10/yr to \$50 in 2022</p> <p><u>Revenue Recycling:</u> TBD</p>	ON	<ul style="list-style-type: none"> <li><del>WCI Linked Cap &amp; Trade System</del></li> <li>Federal OBPS</li> <li>Industrial Emission Performance Standards ??</li> </ul>	<p><u>Benchmark:</u> ~803 kg / t CO<sub>2</sub></p> <p><u>Price:</u> Market based (~\$23)</p> <p><u>Revenue Recycling:</u> GreenON \$ OCE Target GHG (e.g. \$60M for Alternative Fuels Program)</p> <p><b>Federal OBPS now in effect</b></p>
BC	<ul style="list-style-type: none"> <li>Clean BC Program                             <ul style="list-style-type: none"> <li>Carbon Tax (on Fuels)</li> <li>Industrial Incentive</li> <li>Industry Fund</li> </ul> </li> </ul>	<p><u>Benchmark:</u> <del>None</del>-TBD. Will be required to access the Industrial Incentive and Fund</p> <p><u>Price:</u> \$30/t (no scheduled increases) \$40 rising \$5/yr to \$50 in 2021</p> <p><u>Revenue Recycling:</u> Based on performance against a TBD "best in class" performance</p>	QC	<ul style="list-style-type: none"> <li>WCI Linked Cap &amp; Trade system</li> </ul>	<p><u>Benchmark:</u> <del>Facility Based</del> ~781kg / t CO<sub>2</sub></p> <p><u>Price:</u> Market based (~\$18 \$23)</p> <p><u>Revenue Recycling:</u> Green Fund</p>
AB	<ul style="list-style-type: none"> <li><del>Carbon Competitiveness Incentive Regulation (CCIR)</del></li> <li>Technology Innovation and Emissions Reduction (TIER)?</li> <li>Federal OBPS?</li> </ul>	<p><u>Benchmark:</u> 785kg / t CO<sub>2</sub> CGL (declining 1% per year)-TBD!</p> <p><u>Price:</u> \$30 rising \$10/yr to \$50 in 2022. \$20 TBD?</p> <p><u>Revenue Recycling:</u> : Emissions Reductions Alberta Tech Fund? (TBD)</p>	NS	<ul style="list-style-type: none"> <li>Unlinked Cap &amp; Trade System</li> </ul>	<p><u>Benchmark:</u> <del>TBD</del> Historical intensity</p> <p><u>Price:</u> <del>TBD</del> \$20 floor price (+5% and inflation)</p> <p><u>Revenue Recycling:</u> <del>TBD</del> Green Fund</p>

# Certainty / Predictability: October 2019?





**2 (a) MAKE COMPETITIVENESS A CORE DESIGN PRINCIPLE**  
**2 (b) AVOID ONE SIZE FITS ALL SOLUTIONS**

# Output Based Performance Standards

- Output based standards are the baseline for tailoring climate policy to each sector's unique circumstances and GHG reduction pathways

## Allows standards to be tailored to each sector's unique circumstances

- How is your benchmark determined?
- Comparators: Facility or Sector? Domestic or International? Average or Best in Class?
- What is the level of EITE Assistance (% of free allocations)
- Are process and combustion emissions differentiated?
- What is the carbon price?
- Stringency (tightening rates)?
- Compliance flexibility?
- Reporting criteria? Review schedule?
- Revenue recycling?
- Interactions with other climate policies?





### 3. ENSURE ALIGNMENT OF OTHER REGULATORY POLICIES WITH YOUR CLIMATE OBJECTIVES



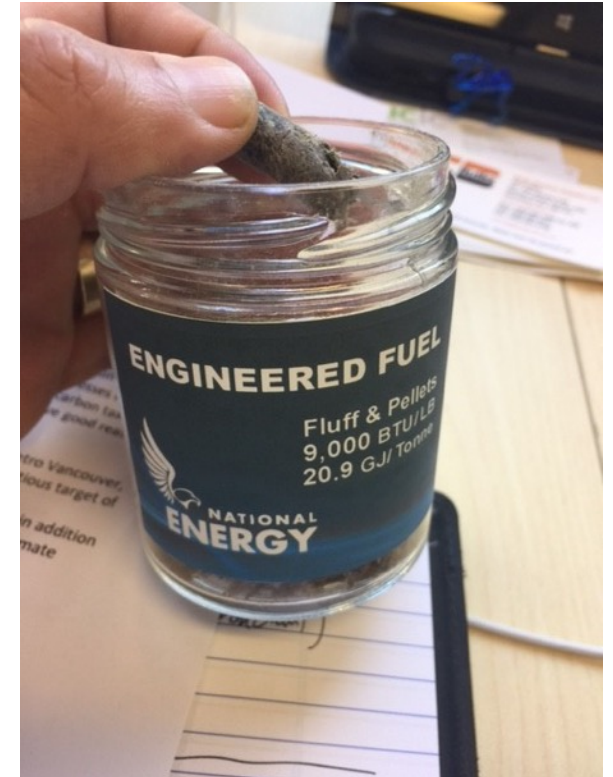
# Complementary Policy Case Study #1 – Low Carbon Fuels

## OPPORTUNITY

- Replacing fossil fuel (coal, petcoke, natural gas) with lower carbon alternatives from the waste stream (e.g. urban construction waste)
- Cost competitive pathway to reduce emissions by 20-30%
- Spurs jobs, investment and innovation by material and energy from waste

## BARRIERS

- Regulatory permitting agencies/processes too cumbersome
- Waste management policies not aligned with GHG reductions
- ***Supply and investment uncertainty = missed opportunity***



# Complementary Policy Case Study #2 – Procurement

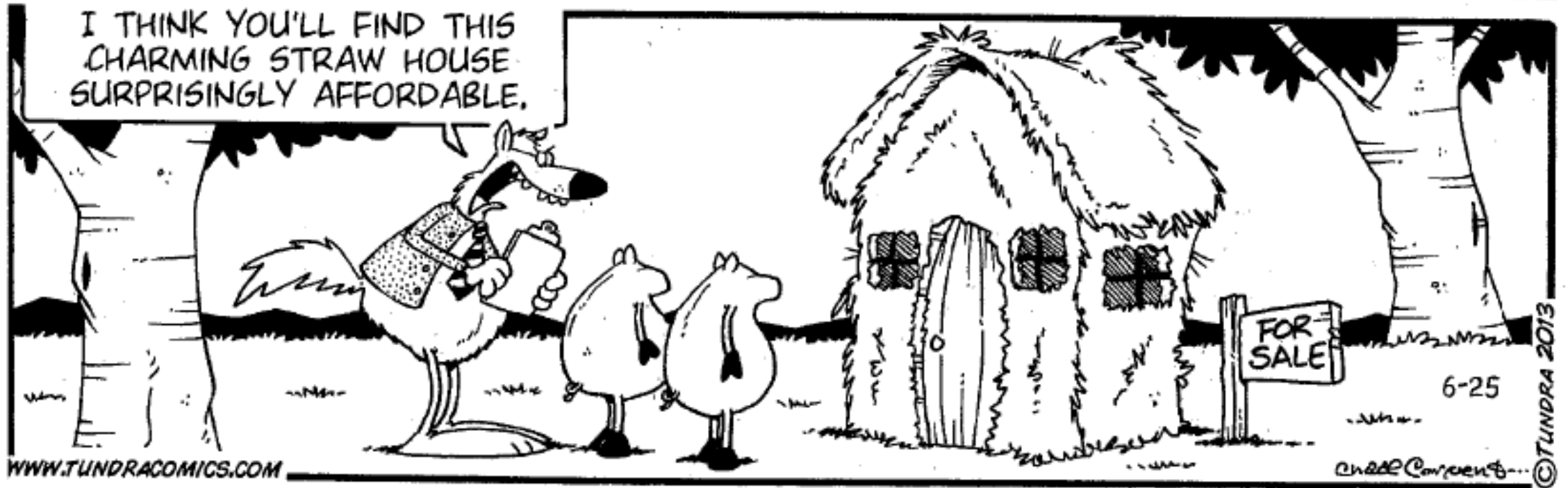
## The Power of Procurement

“Procurement is the *how* of reducing emissions. The only way to you’ll do things differently is by buying things differently.”

- Ron Dizy, Advanced Energy Centre

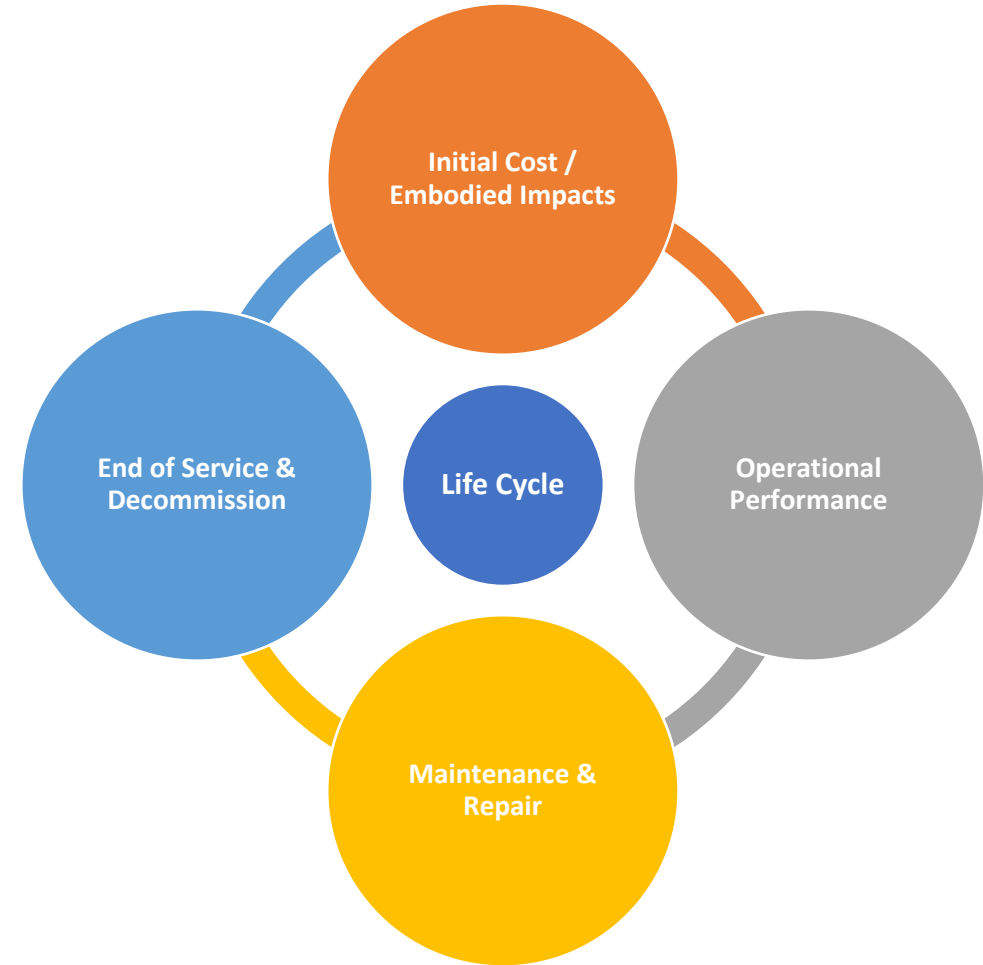
# Initial Cost Decision Making: An Outdated Approach

**TUNDRA** by Chad Carpenter



# Emerging Best Practice: Life-cycle Approaches to Asset Management

- Governments need to become champions of implementing a 'three-screen' lifecycle approach to align infrastructure investments with economic and climate objectives:
  - **LCCA:** Full economic lifecycle cost assessment vs. traditional initial lowest cost
  - **Lowest Carbon Footprint:** Comprehensive carbon cost assessment, including embodied carbon, operational carbon, end-of-life carbon and sequestered carbon impacts
  - **Best Available Solution:** Assessment that considers whether the need associated with a given infrastructure project can be met using new approaches, technologies or designs that perform better than the first two criteria



***Build it once. Build it right. Build it to last.***

# Example: Low Carbon Cement

## Portland Limestone Cement (PLC)

- Reduces GHGs by up to 10%
- Produces concrete with the same durability and performance
- Could reduce Canada's GHGs by about 900,000 tonnes per year, at no cost premium
- *The lack of requirement for public procurement to consider GHGs is a significant barrier to the widespread adoption of PLC and other low carbon technologies.*
- Bar even higher for low carbon technologies that may come with a cost premium – dampens investment and innovation



Place Victoria, Gatineau, built with Contempra-based concrete

## 4. DON'T PICK WINNERS!

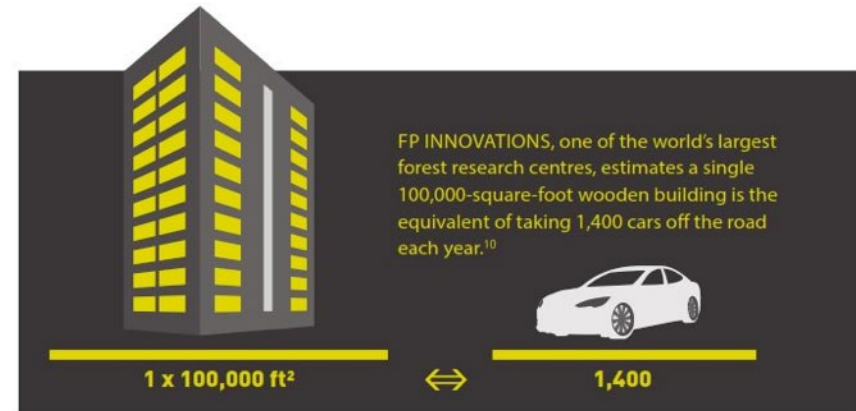
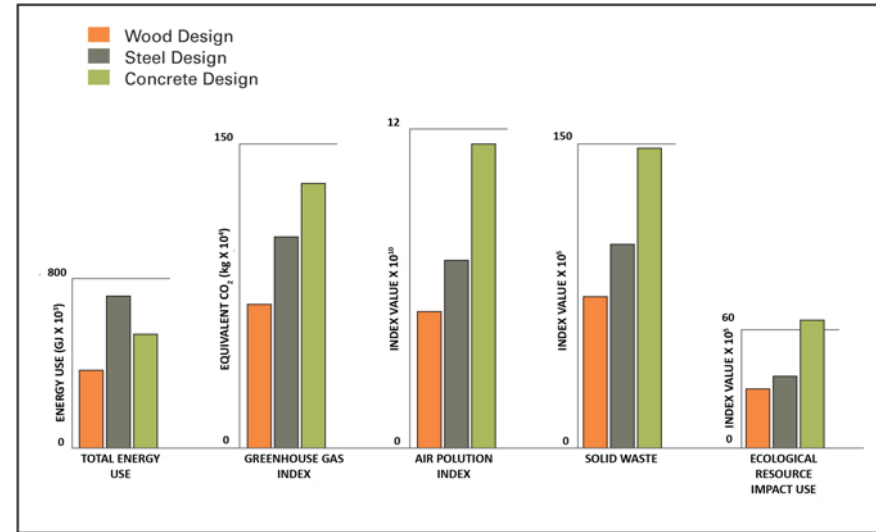
# Should we just build with wood?



Resources & Agriculture

## Serious about addressing climate change? Build with wood

By Paul Lansbergen | July 5, 2016, 4:02pm



# Unlevel Playing Field: Legislative and Funding Agenda

## Recent Legislative Activity

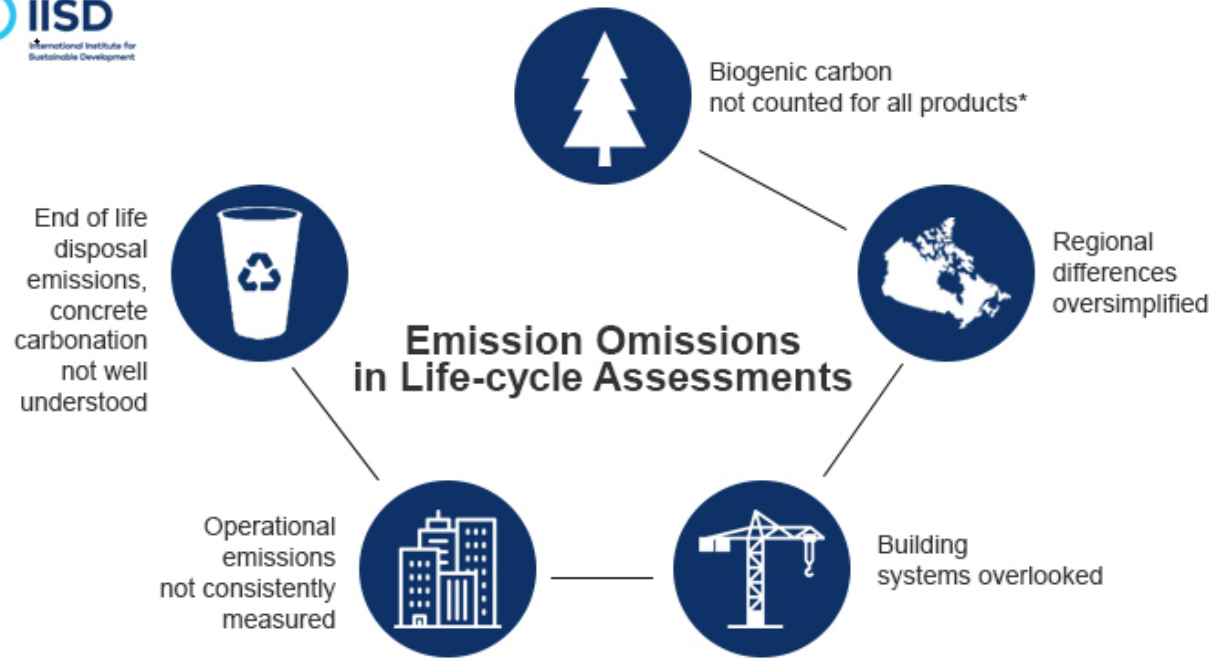
- B.C. **Wood First Act**
- Quebec's **Wood Charter**
- Ontario Bill 19, **Ontario Forestry Revitalization Act** (14 Storey Wood Frame Buildings)
- Recent federal **Bill C-354**, An Act to amend the Department of Public Works and Government Services Act (use of wood)
- House of Commons **Standing Committee on Natural Resources Report: Value-added products in Canada's forest sector: cultivating innovation for a competitive bio-economy**
- **Ontario's Tall Wood Building Reference**, released late last year, offers a "distinctive Ontario-made solution" to the development, design and construction of tall wood buildings

## Recent Government Funding

- The **federal government's Green Construction Through Wood** program. The 2017 budget allocated **\$39.8** million over four years, beginning in April 2018, to the initiative
- The Government of **British Columbia** announced in April it will invest **\$7.8** million to **advance wood building products and systems** and promote B.C. wood overseas
- **Ontario** is investing **\$7.8** million into a **Mass Timber Program** to investigate the construction of wood frames for tall buildings
- **Quebec** budget 2017-18 ... **\$46** million for innovation in engineered wood products
- Government subsidies for specific tall wood projects like **Brock Commons** (Vancouver), **The Arbour** (Toronto), **project Origine** (Quebec City), etc.



# New Research: Emission Omissions



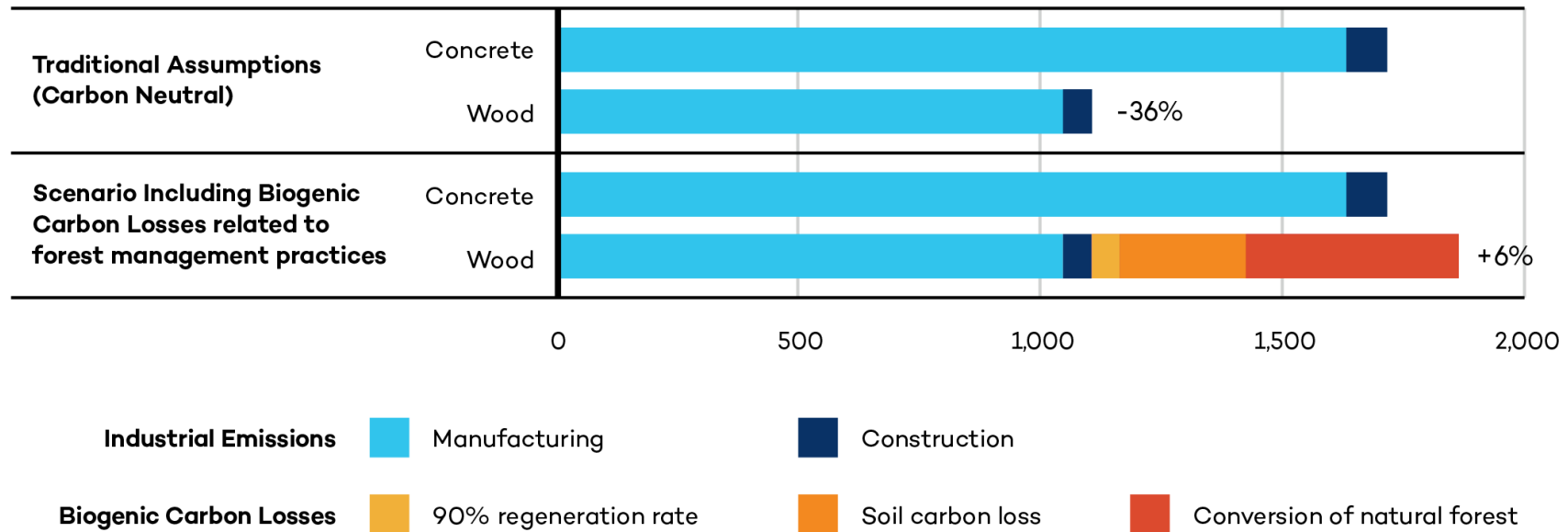
\*For wood products up to 72 per cent of life-cycle emissions could be missing



**Decisions need to be based on the best possible environmental information and data**

# Q: Which material is better for the climate? A: It's complicated!

**Table ES1. Cradle-to-grave building embodied emissions (tCO<sub>2</sub>e)**



*When combined factors such as forest regeneration rates, soil carbon loss and primary-to-new-growth-forest-conversion are all accounted for, the cradle-to-grave embodied emissions for a wood building could be 6% greater than for a concrete building.*

# Summary of Recommendations

- Certainty and predictability
- Integrated competitiveness mechanisms with unique sector specific considerations
- Balance regulatory “sticks” with “carrots”
- Recognize and address existing regulatory barriers to innovation
- Level Playing Field – don’t pick winners!

**Thank you!**

**Adam Auer**

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