



Canadian Metals Outlook '10

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Construction



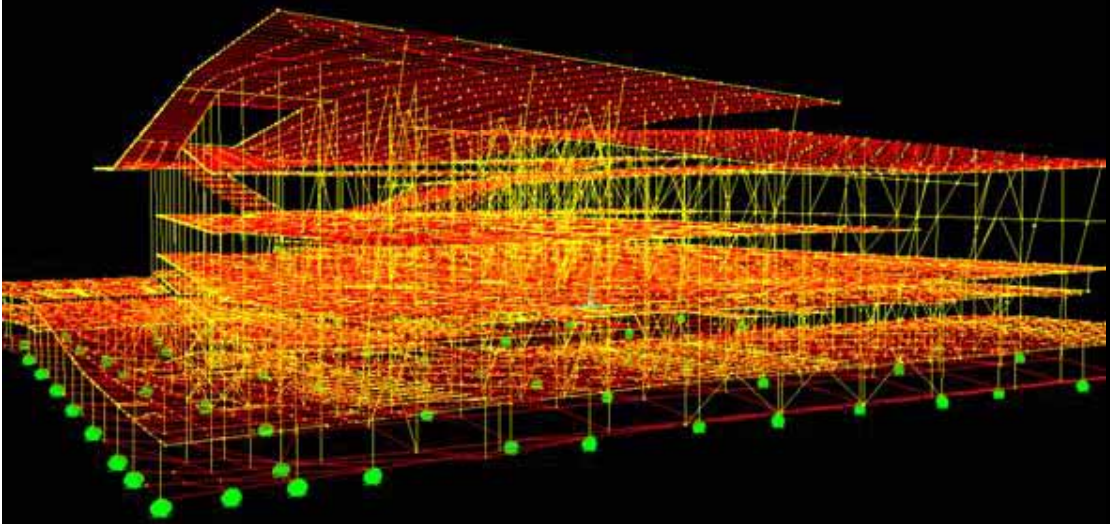
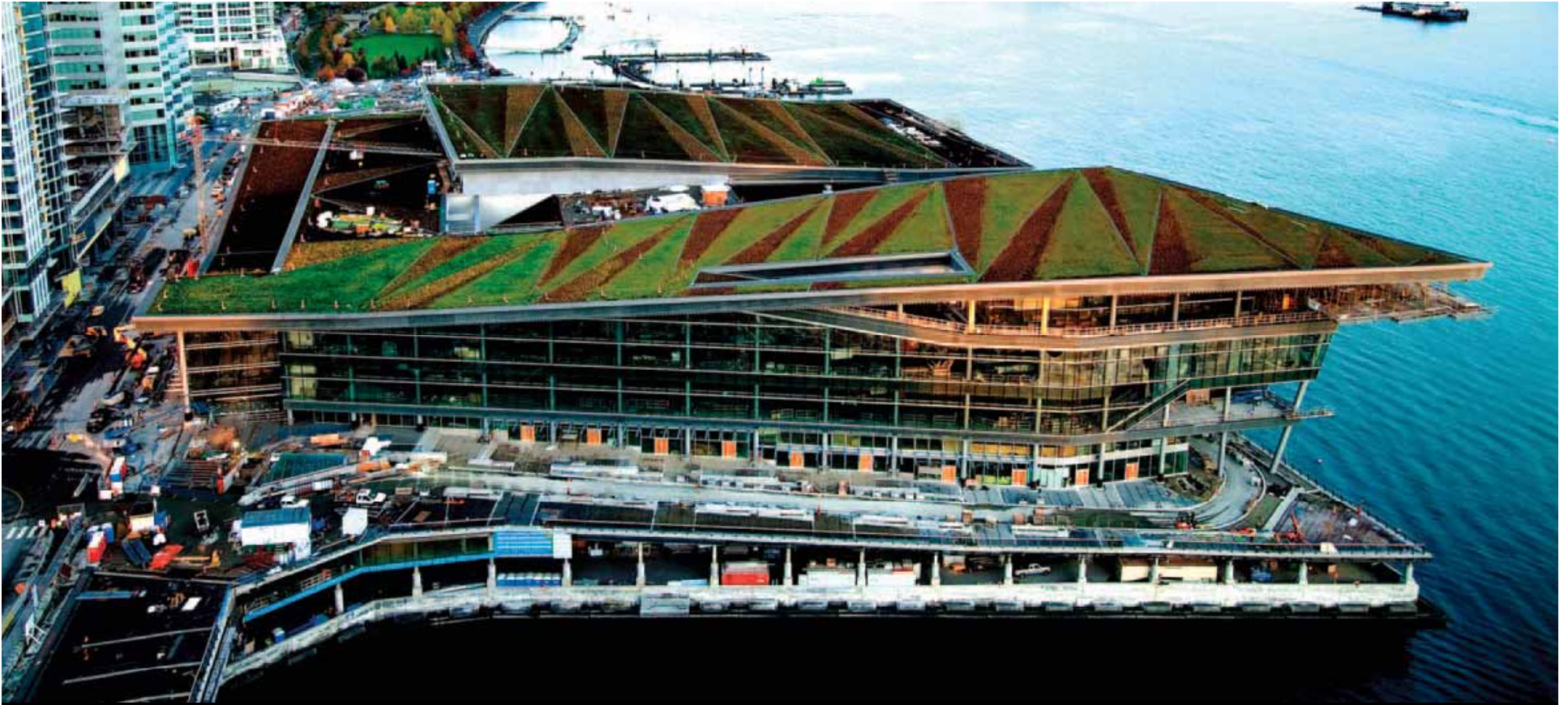
Construction Metals and the Green Rating Systems Race in the New Life Cycle Environment

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Canadian Institute of Steel Construction

- What's a green building?
- How do metals fit into LCA (Life Cycle Analysis)?
- Where's the green steel?



Vancouver Convention Centre

Calgary Water Centre



University of Edmonton Triffo Hall



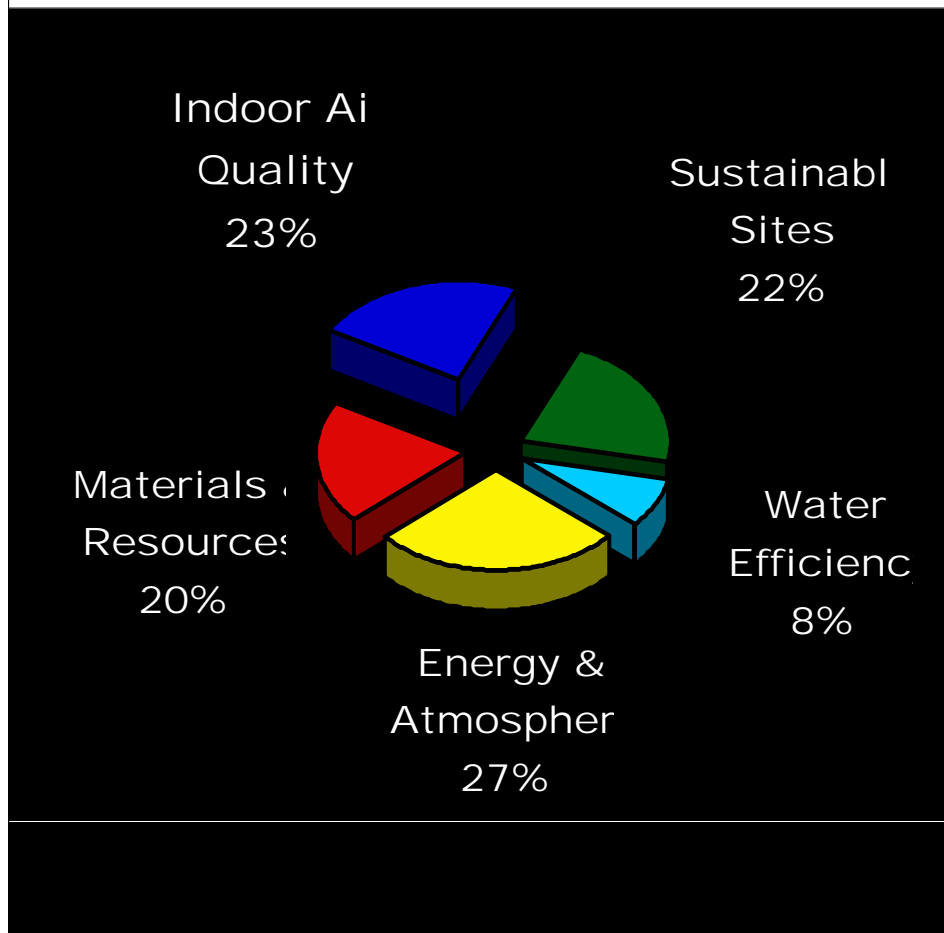


**Allstream Centre
Sept. 2, 2008**

Garage Legendre - STM



LEED: Leadership in Environmental and Energy Design



LEED NC 1.0 allows for 4 levels of certification :

- Platinumover 52 points / 70
- Gold 39-51 points / 70
- Silver33-38 points / 70
- Certified26-32 points / 70

For steel, two direct credits:

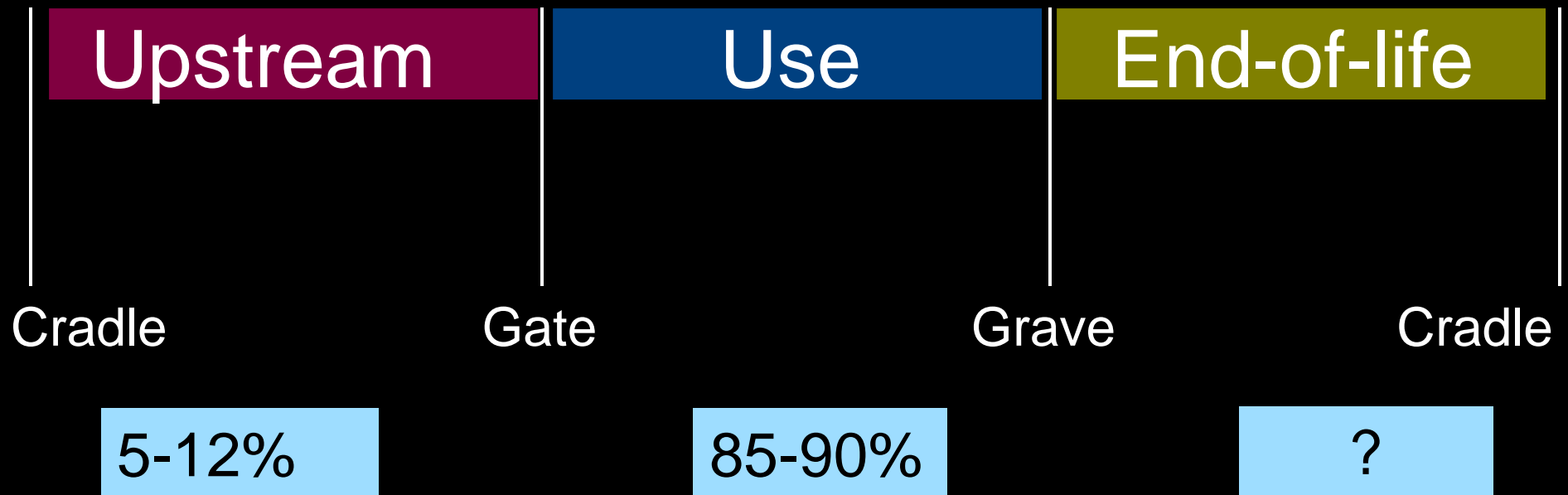
- Recycled Content
- Regional Material

LEED plus others

- LEED® (American and Canadian)
- BOMA Go Green Plus, BOMA BESt
- ASHRAE (American) – 189.1
- IBC (International Building Code)
- California Green Standard
- LCA (Life Cycle Analysis) - GaBi (Europe) for LCI
- Athena (Forintek Canada) - *not good for steel industry*
- ISO 14000 (International)
- BREEAM (English)

Life Cycle Analysis (LCA)

Energy distribution for a building



Life Cycle Inventory (LCI)

www.worldsteel.org

Upstream

- Material extraction
- Transport
- Manufacturing
- Construction

End-of-life

Cradle

Gate

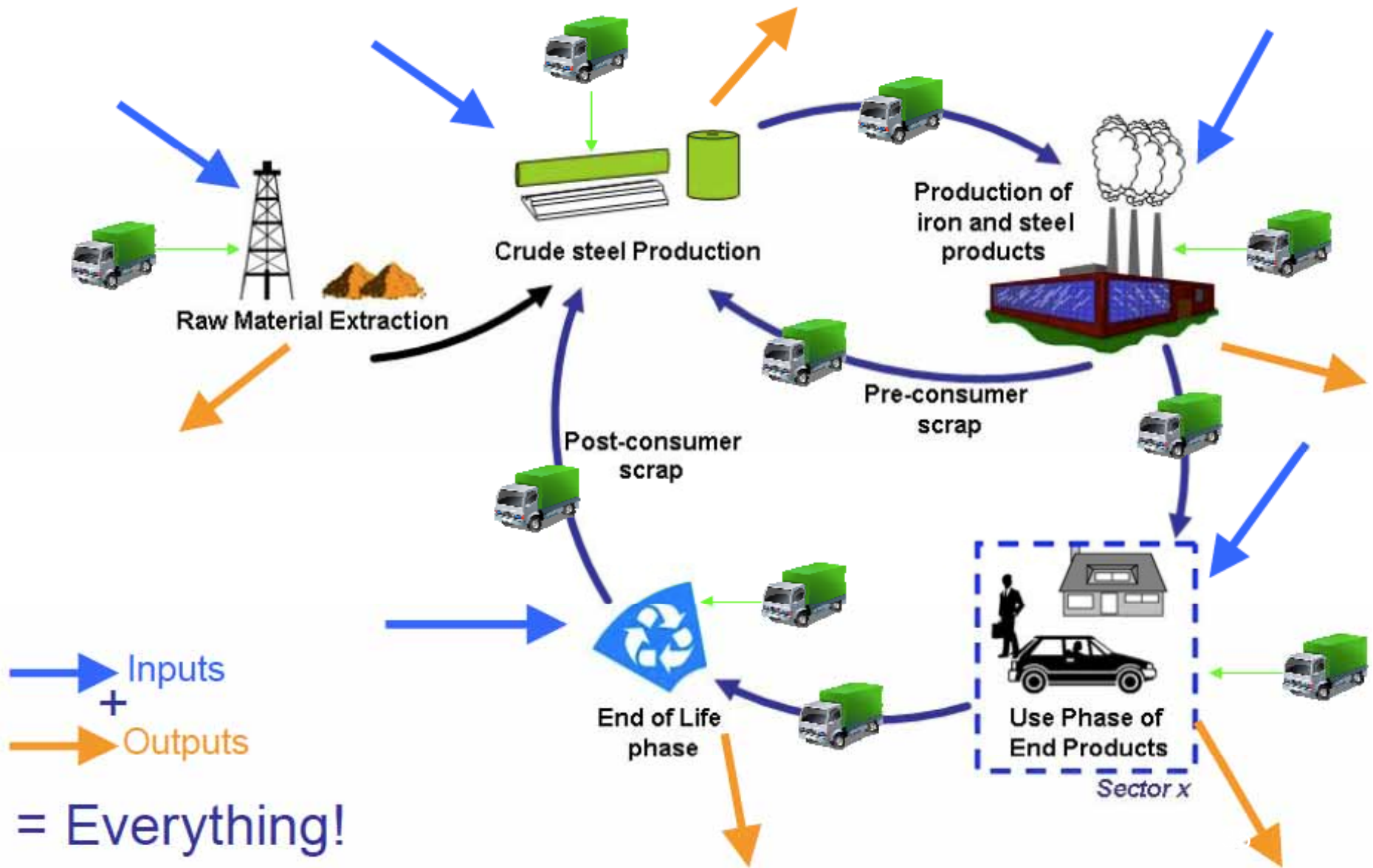
Grave

Cradle

World Steel Association collects data.



LCI



GHG Emissions according to previous LCI data of the World Steel Association (previously IISI)

84% = Direct GHG Emissions (on-site)

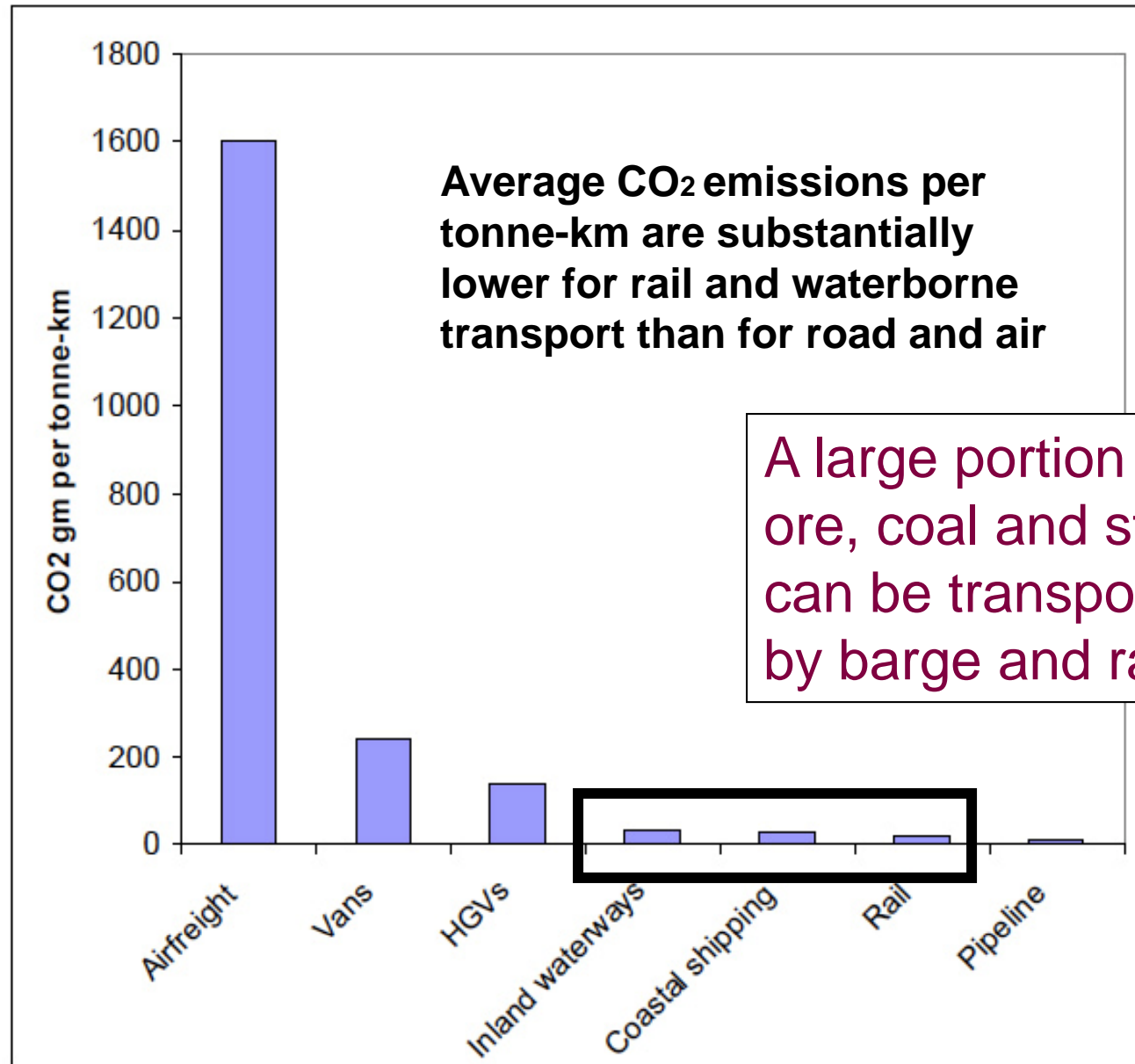
8% = Electricity indirect GHG emissions (purchased)

8% = Other indirect emissions (mining, transport)

Data is being revised

To date, insufficient data to have “North American” specific values.

Transport





LCA is all about having the right metrics so we can change modes of production and consumption.

How have we reduced our environmental impact as an industry so far?

- Energy Reduction
- Emission Reduction
- Air and Water Releases
- Material Efficiency
- Scrap Utilization
- Steel Recycling



> www.sustainable-steel.org

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USE

Integration of steel in a green building by working with other materials

- Glass, Wood, Concrete
- Reuse Existing Materials
- Innovative Systems

740 Bel-Air

Consortium: ABCP, Beauchamp Bourbeau, Busby & Assoc.



The use of steel helped gain points in 3 of 6 LEED categories.

Steel and glass for improved energy efficiency with the concrete structure.

Espace 400e

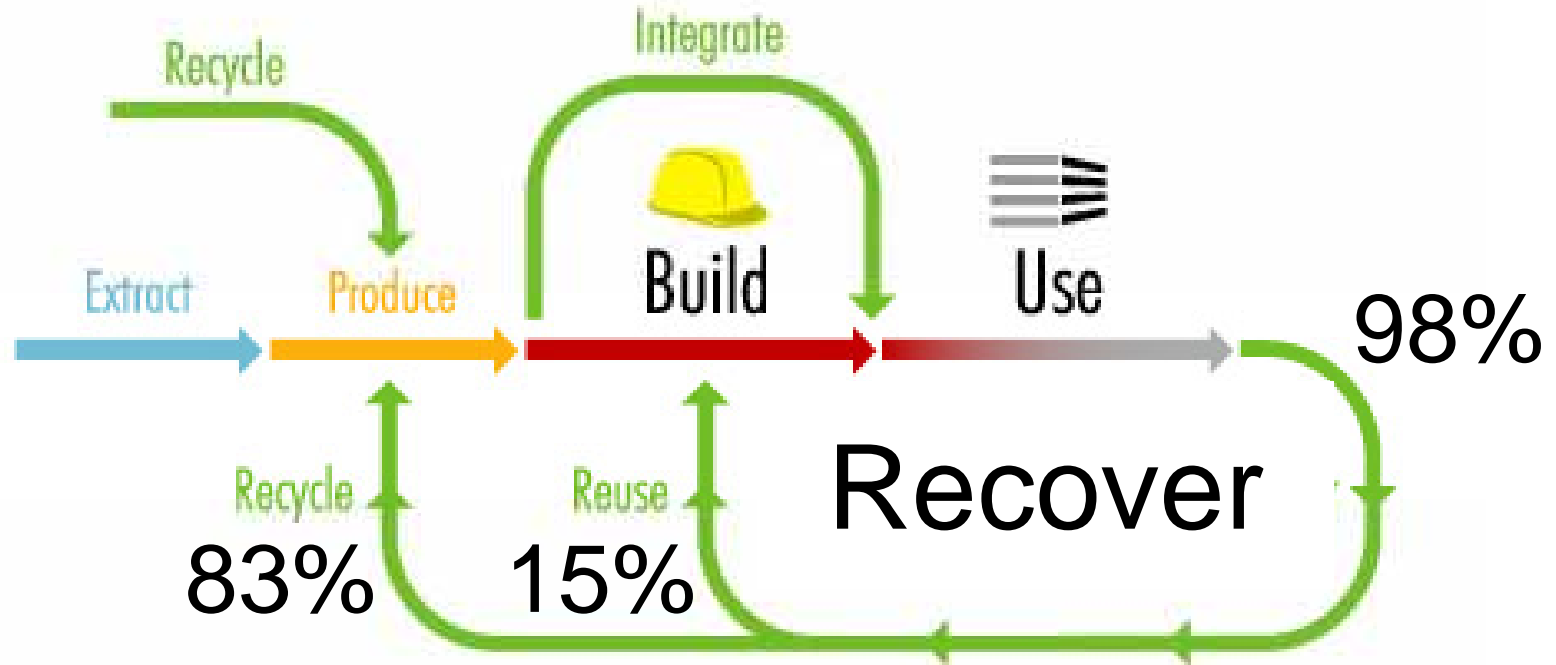


Pointe-Valaine, Otterburn Park



Smith & Vigeant architectes

End-of-life



www.recycle-steel.org

www.reuse-steel.org

www.cisc-icca.ca/sustainability



Recycle

Closed loop recycling follows the Cradle to Cradle paradigm

BOF (Basic Oxygen Furnace)
25-35% Recycled content
1.6-1.9 tons of CO₂ / ton of steel
Ex. Steel studs, steel decks

EAF (Electric Arc Furnace)
90-95% Recycled content
0.4-0.6 ton of CO₂ / ton of steel
Ex. Beams, columns, angles

But do we have the right numbers?

- **By process**
- **By product**
- **By LCA**

What's next in LCA?

CO₂
Breakthrough
Programme

Athena

Improved performance
with other materials

Gaps from
fabricators,
erectors,
specialty
suppliers

Proper account of by-products
and end-of-life attributes





The competition

The wood industry focuses on being renewable; leverages policy makers.

The concrete industry has its thermal mass, easily exposed structure; provides LEED info readily.



The competition

- FSC wood
- EcoSmart concrete

Where's the green steel?

Common goals are to “get green data for steel”, understand metrics, provide numbers to Athena (a popular LCA tool developed in Canada).

...

CIRAIG*

CISC

AISI

**North American
Construction
Sustainability
Taskgroup**

...

AISC

**Steel
Framing
Alliance**

CSSBI

* Interuniversity Research Centre for the
Life Cycle of Products, Processes and Services

If we don't define green steel, the design community will for us. **Now.**

They are going to:

- Encourage use of EAF vs BOF produced steel
- Consider weathering steel the greenest of them all
- Impose a maximum CO2 emission of 1,6 ton
- Require entire supply chain to be ISO 14001
- Impose penalties for not meeting LEED credits
- Request several pollution controls are in place
- Ask for proof that open hearth furnace not used!

What can the industry do?

- Develop a 'green steel' label, by establishing a benchmark for EAF and BOF in terms of:
 - Energy Use
 - Emission Reduction
 - Air and Water Releases
 - Material Efficiency
 - Scrap Utilization
 - Steel Recycling
- Make sure your LEED letters are clear and accessible
- Provide data for Life Cycle Inventory
- Have an EMS in place to brag about, like ISO 14001
- Support research, research, research

**“We don't
inherit the
earth from our
parents, we
borrow it from
our children”**

Antoine de St-Exupéry

Change of Attitude

