Transportation Solutions for Oil Sands Production Phase

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Transportation Innovation in Alberta Oil Sands:
A Summit
The Van Horne Institute
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OUTLINE

- Company Overview
- Production Phase of Oil Sands
- CN's "Pipeline on Rail"
- Reliability
- Capacity
- Accountability
- Rail – a "green" Choice

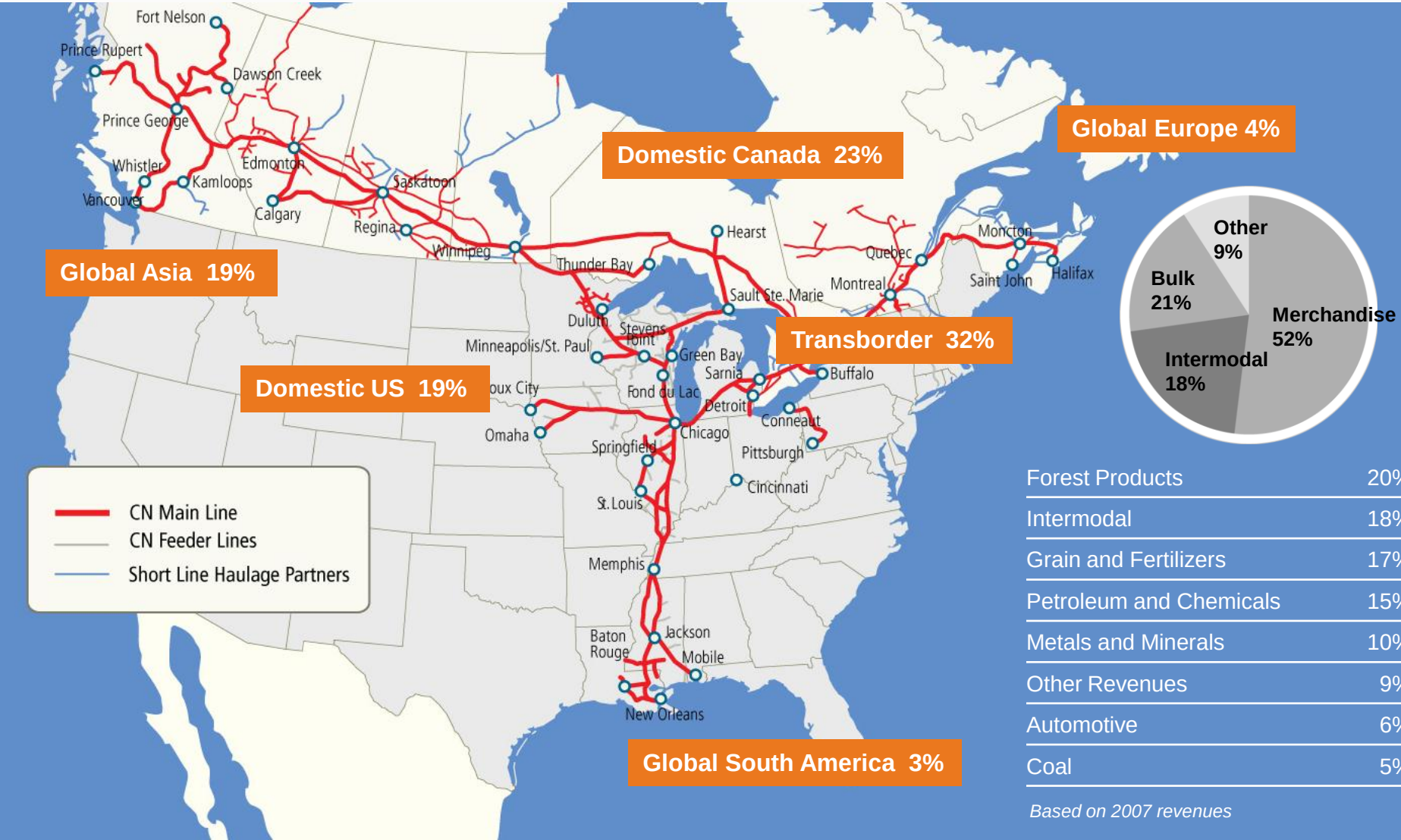
Company profile

CN operates the largest rail network in Canada and the only transcontinental network in North America serving ports on the Atlantic, Pacific and Gulf coasts. The company operates in eight Canadian provinces and 16 U.S. states.

- Shortest rail route from the Atlantic coast to the U.S. Midwest through the St. Clair Tunnel
- Originates approximately 85% of traffic
- An average of 21,000 employees
- Approximately 20,000 route-miles of track in North America
- $8 billion annual revenue

CN has the scope and power to provide unique oil sands transportation solutions

Great North American franchise

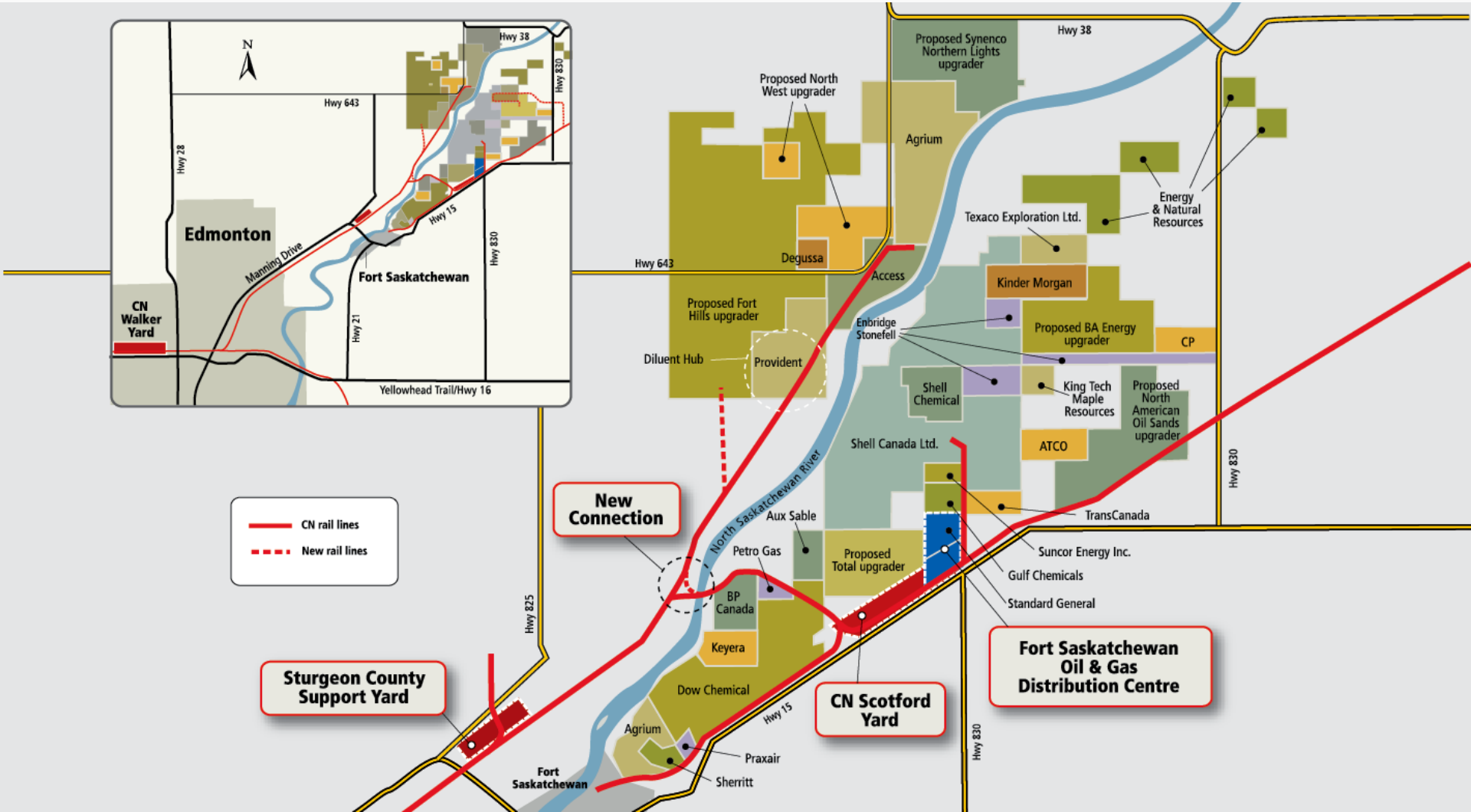


Forest Products	20%
Intermodal	18%
Grain and Fertilizers	17%
Petroleum and Chemicals	15%
Metals and Minerals	10%
Other Revenues	9%
Automotive	6%
Coal	5%

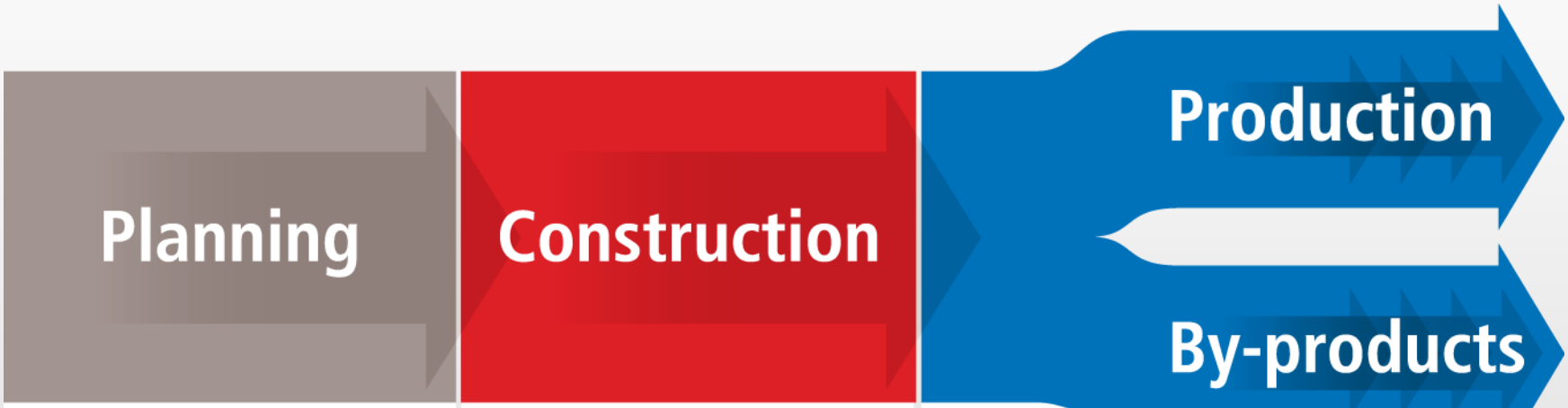
Based on 2007 revenues

Extensive reach into the oil sands? We go there.

Access to Alberta's Industrial Heartland? We provide it.



CN delivers:
from planning to full output



- **Take advantage of CN's logistics expertise for complete transportation solutions from the start**

- **Deliver building materials and equipment directly to your site**
  - Pipe for pipelines
  - Aggregate
  - Structural steel and cement
  - Dimensional loads

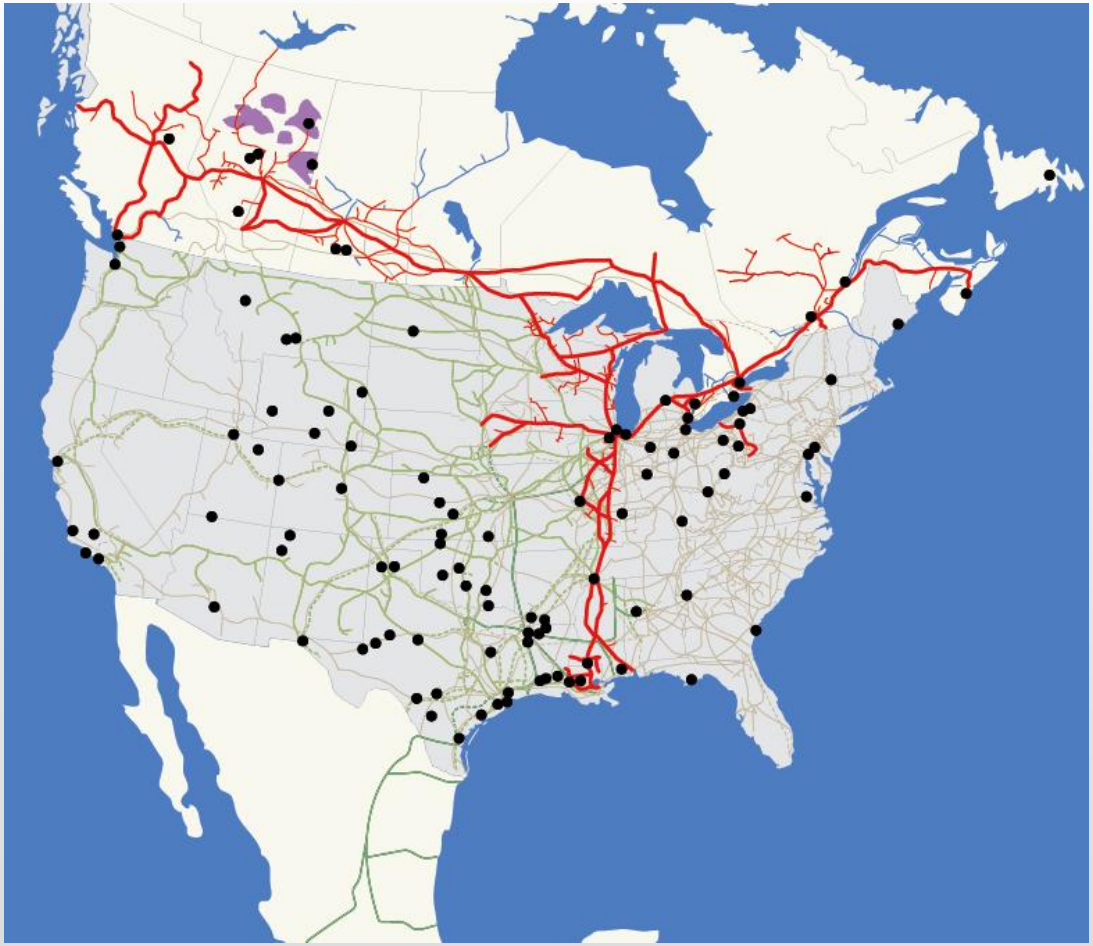
- **Move diluent to keep the bitumen flowing**
- **Use CN's "pipeline on rails" to reach refineries in the Southern U.S.**
- **Export by-products to Asian markets via the ports of Prince Rupert and Vancouver**

Production Phase

CN has excellent connectivity to supply USGC refineries

Via our connections to other railroads we can access the majority of USGC refineries

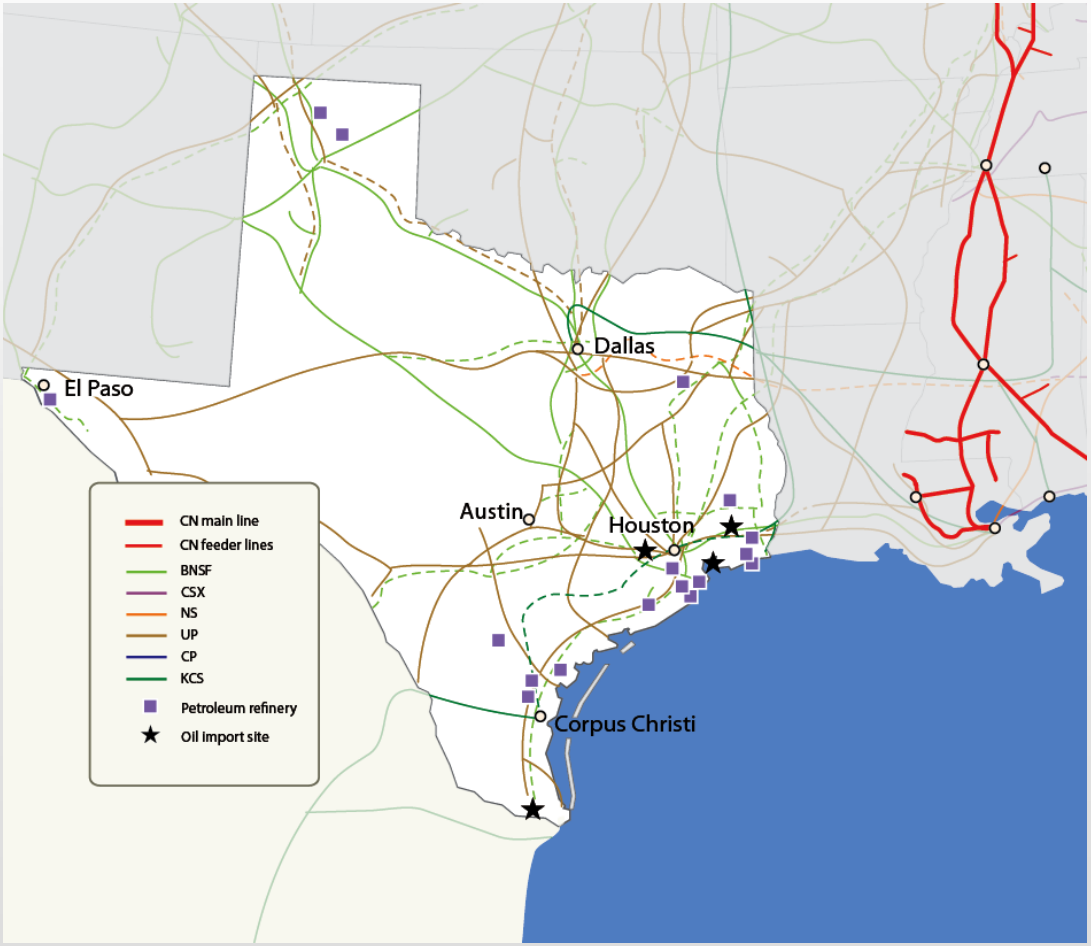
- **CN and the Kansas City Southern have a 15 year joint marketing agreement that extends CN's reach in the USGC**
- **CN's connections with BNSF provides access to the Houston, TX areas of the USGC**



Access to Texas markets? We have the connections.

CN's network connects you to the major heavy oil refineries in the USGC.

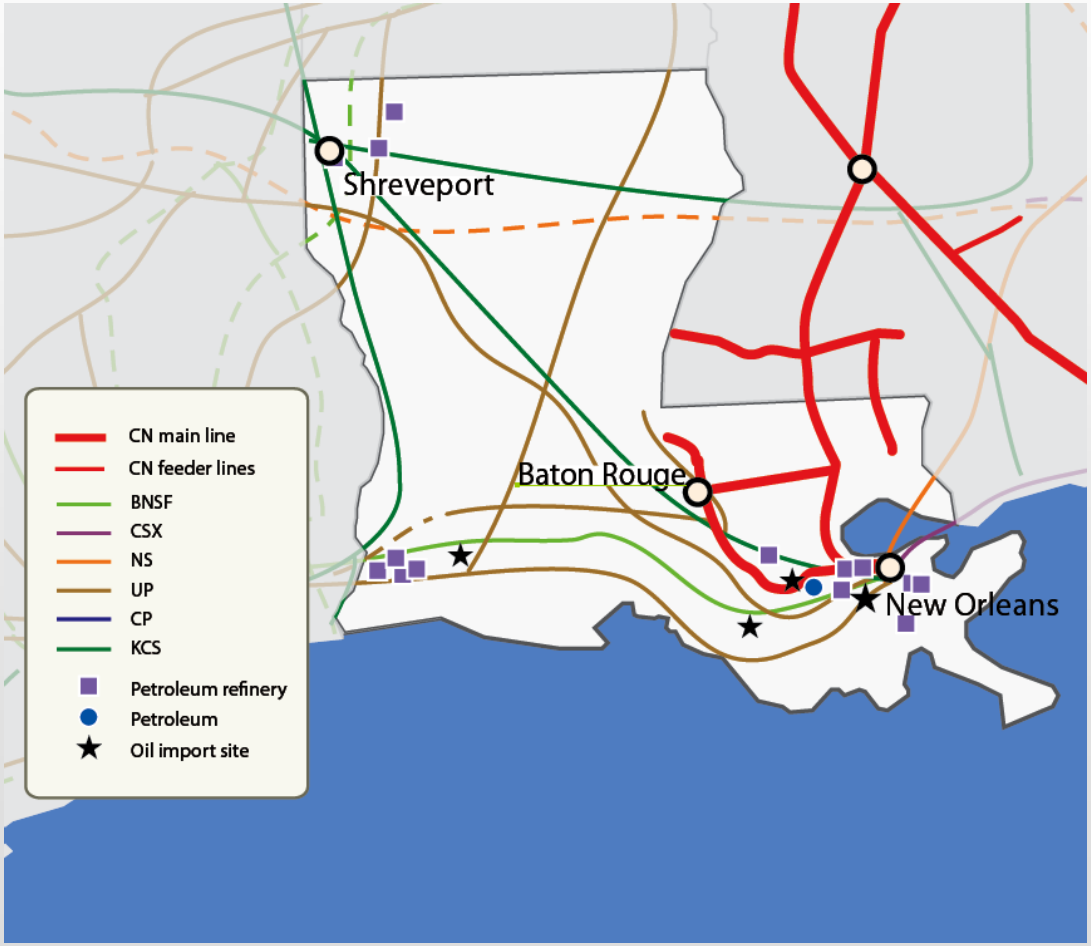
- **Via Kansas City Southern**
  - Port Arthur
  - Beaumont
  - Lake Charles
- **Houston Ship Channel / Texas City indirect through Chevron / Sunoco Port Arthur terminals to barge or via Shell Ho/Ho pipeline**



Access to Louisiana markets? We have the connections.

CN's network connects you to the major heavy oil refineries in the USGC.

- **New Orleans direct**
  - Baton Rouge
  - Norco
  - Garyville
- **New Orleans indirect through terminal to barge**
  - Belle Chase
  - Chalmette
  - Pascagoula



Access refineries directly with CN

		Capacity BPD	Coker BPD	CN Rail Direct	Barge Miles from IMTT Terminal
Exxon	Baton Rouge	514	118.5	✓	—
Marathon	Garyville	254	37.4	✓	—
Motiva	Norco	242	23.6	✓	—
Valero	Norco	157	56	✓	—
Motiva	Convent	255	0	✓	—
Conoco	Belle Chase	260	26.7	—	55
Exxon	Chalmette	190	34.5	—	28
Chevron	Pascagoula, Miss.	325	97	—	125
Total		**2197**	**393.7**		

Access refineries directly with CN-KCS

		Capacity BPD	Coker BPD	KCS Rail Direct
Exxon	Beaumont	363	50.7	✓
Valero	Port Arthur	260	90	✓
Motiva*	Port Arthur	270	57.5	✓
Conoco	Westlake	260	52	✓
Citgo	Lake Charles	338	107	✓
Sunoco / Chevron	Beaumont Terminals			✓
Total		**1491**	**357.2**	

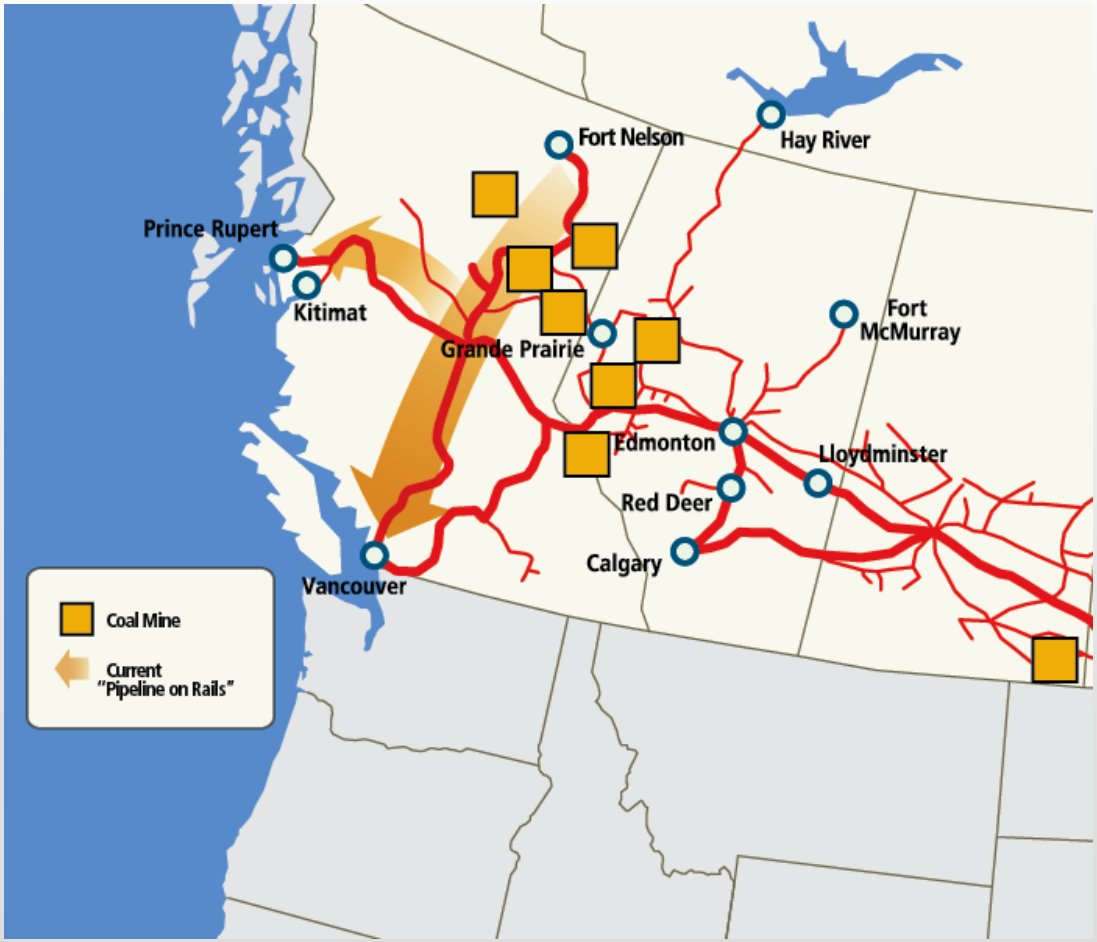
**Undergoing expansion to almost double the capacity*

CN's "Pipeline on Rail"

CN coal "pipeline on rail"

Alberta and BC coal energy companies rely exclusively on CN's coal "pipeline on rail"

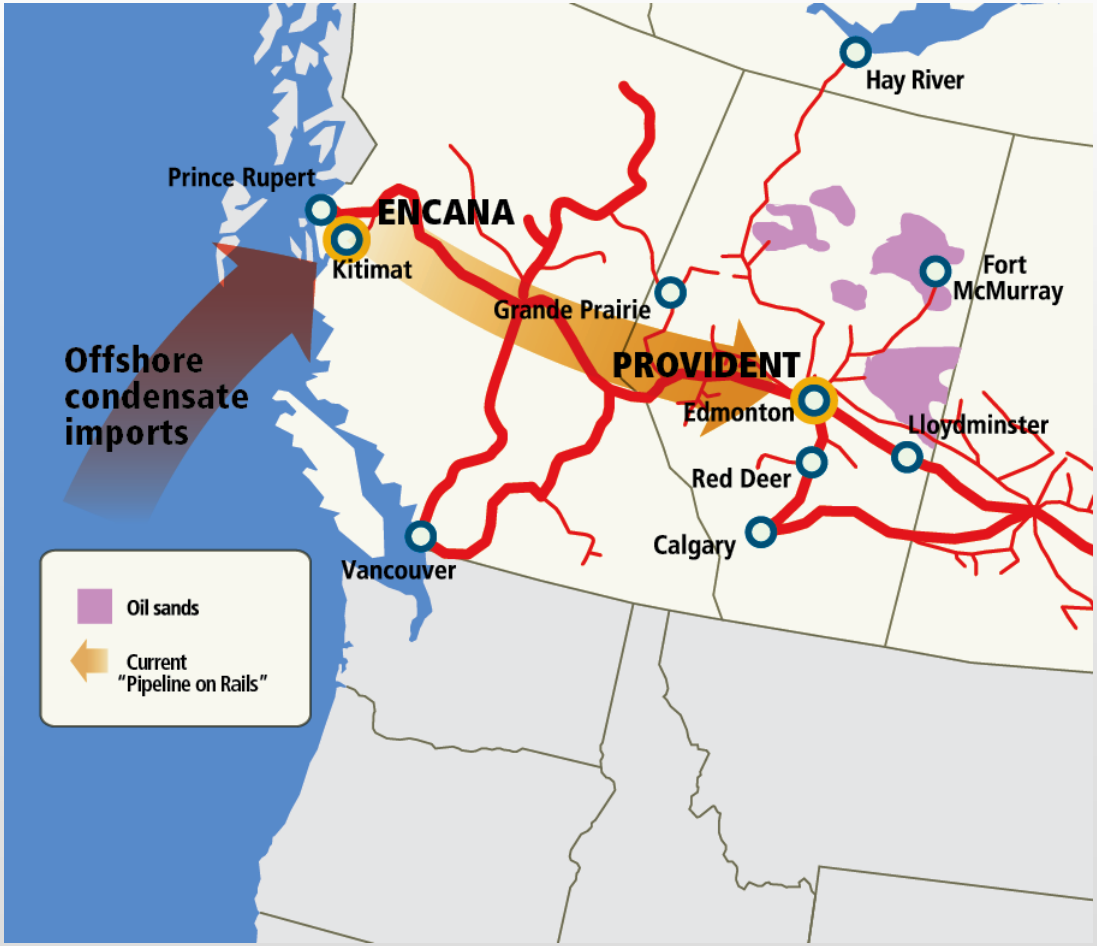
- **CN moves 13M MT CDN coal**
- **Equivalent of 130,000 cars loads/year**
- **Equivalent of over 210,000bbl/day**
- **Efficient pipeline operations managed by CN staff**
  - Port interfaces
  - Mine interfaces
  - Equipment allocation



CN's diluent "pipeline on rail"

Get your product to market quickly and avoid lengthy time lines to build pipelines

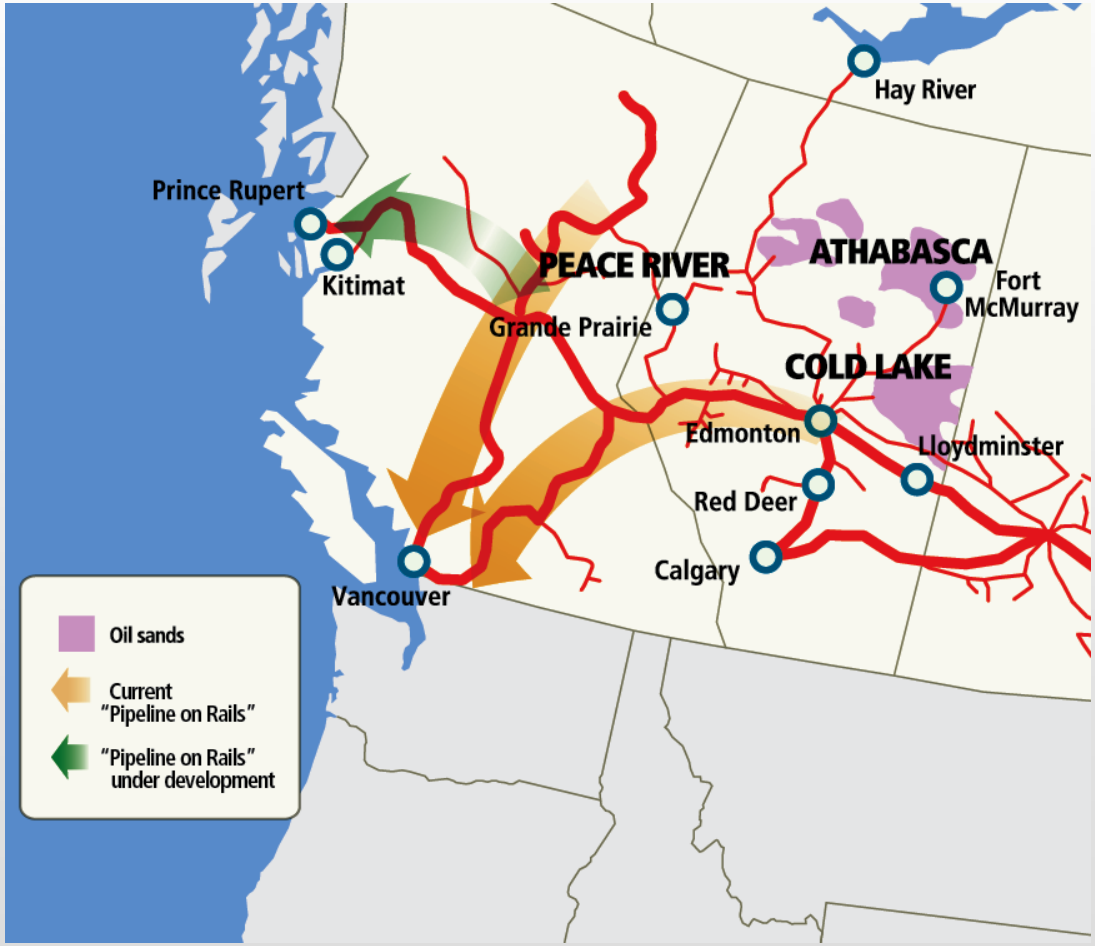
- **Partners**
  - Encana
  - CN
  - Provident
  - Methanex
- **Ramping up 14,000 cars per year or equivalent of 23,000bbl/day**
- **Rail is not a limiting factor to growth**



CN sulphur "pipeline on rail"

CN is the largest carrier of sulphur in North America shipping 4.1M metric tonnes annually

- **"Pipeline on rail" created using a blend of dedicated sulphur trains and scheduled train service**
- **Move 3.2M MT, 36,000 rail cars or equivalent of 59,000bbl/day**



Modes of delivery: rail vs pipeline

RAIL	BUSINESS EFFECT (+ / −)	PIPELINE
Short term • Low capital	Risk	Long term • Diluent • Production timing
Diverse • Flexible • Dispatchable	Market access	Limited • Inflexible
High • Variable • Multidirectional	Capacity	High • Invariable • Unidirectional
Low • Millions • Majority sunk	Capital	Very high • Billions • Majority new
Low entry barrier • Low market impact	Scale	High entry barrier • High market impact
Low fixed, standby • High variable	Cost	High fixed, standby • Low variable
Fast • USGC 8–10 days	Speed	Very slow • USGC 50 days
Completely isolated	Segregation	Possible mixing • Specification limited
Almost limitless • Machinery, fuels, pipe	Commodities	Very limited • Only liquids

Reliability

Service plan creates reliability

CN's scheduled service plan creates a reliable "pipeline on rails" network. This is why so many companies in the grain, fertilizer, coal and sulphur industries depend on CN's efficient service on a daily basis and in some cases for their very existence.

- Gas plants, refineries and upgraders depend daily on CN's rail service to keep them running.
- Suncor is a good example. Upgrader serviced by remote rail line, furthest from markets with little alternative sulphur outlet.
- Coal energy companies have relied on CN's rail service to grow from 2M MT in 2004 to 13M MT
- Weather can create disruptions but CN continued to operate when some oil sands producers shut down due to extreme weather.

Investments to enhance reliability

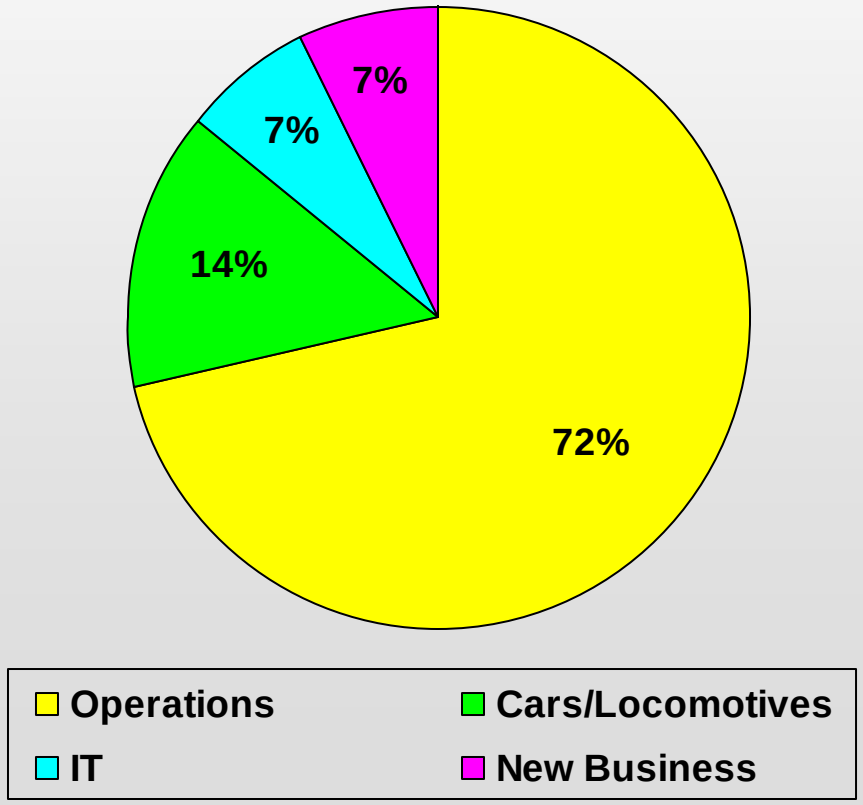
CN has committed significant capital to infrastructure to increase reliability and enhance capacity.

Estimated $1.8B CDN Capex 2008

Investment Highlights

- 2006 purchased the Mackenzie Northern (MKNR) Railway and Lakeland & Waterways Railway (LWR) for C$26 million and the Savage Alberta Railway,Inc., (SAR) for C$25 million.
- Spent more than C$60 million upgrading the three railways in 2006 and 2007 and plans C$26million on further upgrades to the properties in 2008.
- C$300 million in Canada during 2003-2007 to extend sidings, to increase network train speeds and to improve the fluidity of yards and terminals.

Capex Breakdown



Investments to enhance reliability

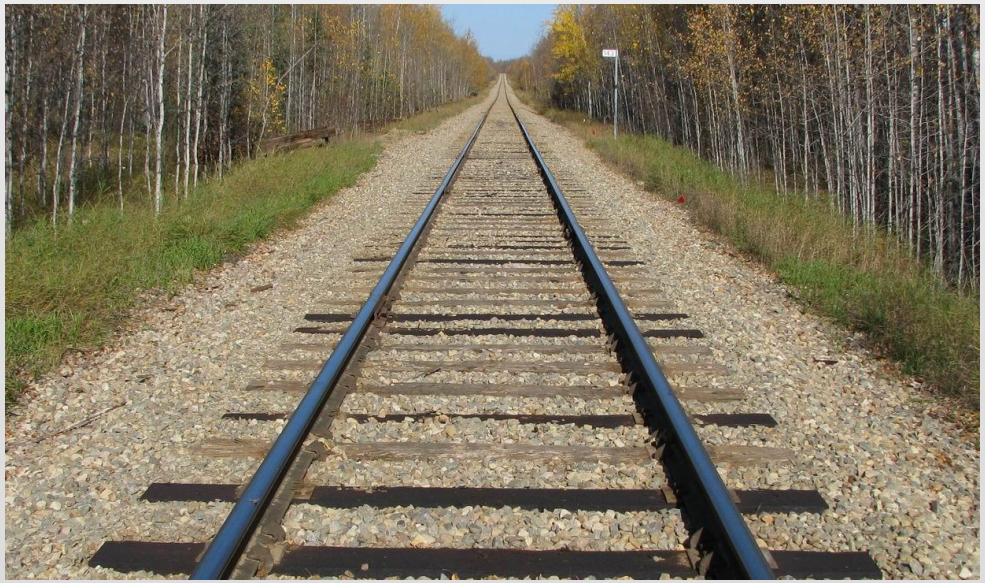
Former Athabasca Northern Railway - $160Million Investment

Before

Investments to enhance reliability

Safer, Faster, Reliable

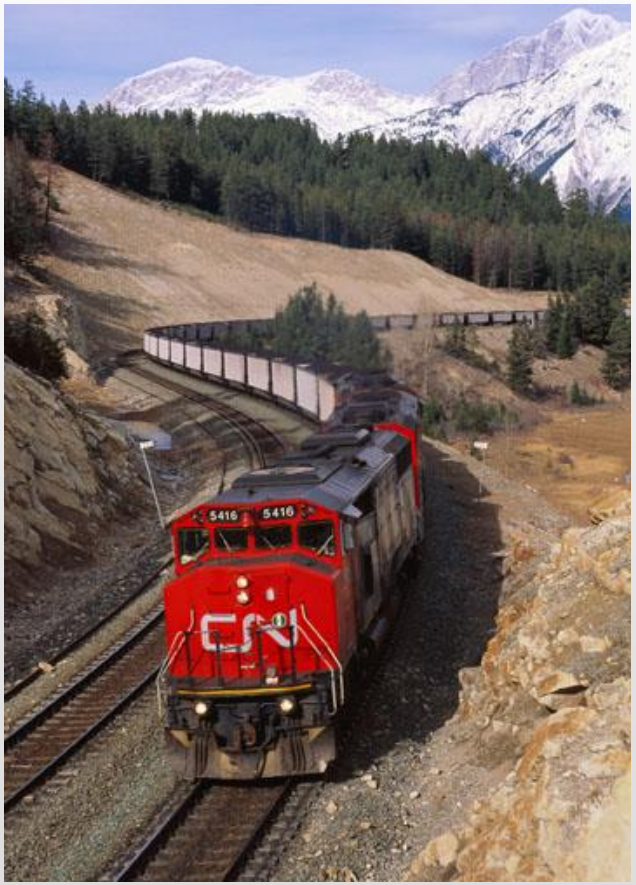
After



Capacity

Capacity management

CN responds to sustained, profitable growth with a controlled and measured application of assets to meet business demands.



- Four years ago, CN served one active coal mine in Western Canada now there are six.
- In 2002, the sulphur industry served by CN shipped less than 1Million MT of dry sulphur. CN now moves 3.2Million MT.
- Bitumen shipments are far more consistent and reliable than any of these business segments. Rail would be ideally suited to this type of business.

Capacity investments

Industry has a place in capacity management and availability. In-plant trackage, loading and unloading facilities are key considerations.

- CN's mainline can accommodate growth to USGC
- New shipper supplied rail cars
  - $10 MM for 100 railcars, ~ 60,000 bbl
- Loading and unloading requires new racks, sidings, transfer facilities

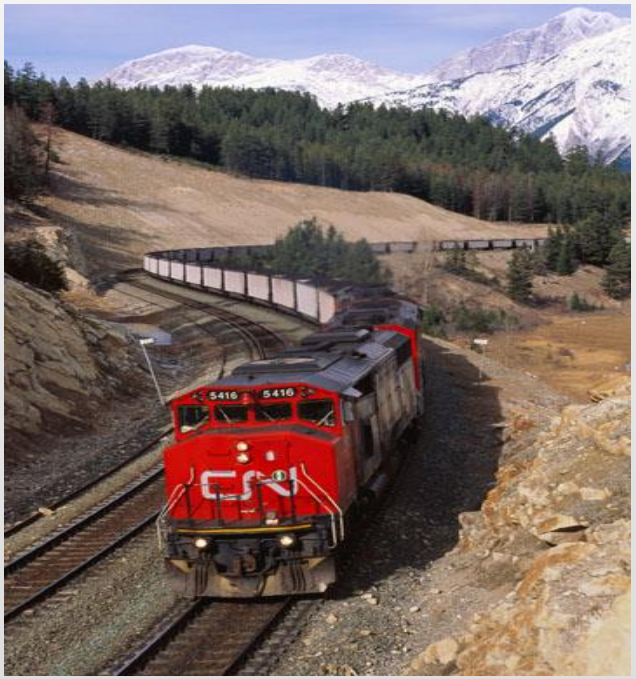
Accountability

Accountability

CN's guiding principals are service, cost control, asset utilization, safety and people.

"Safety means 100% compliance 100% of the time" – E. Hunter Harrison, President and CEO, CN

- CN was the first railway certified as a member of the Responsible Care Program.
- CN is regulated by the Canadian Transport Agency.
- CN promoted and developed a commercial arbitration process with the Canadian Transport Agency to provide a non-confrontational approach to dispute resolution.
- Management staff have a defined code of ethics.
- Operations employees adhere to a strict code of operating rules and are tested regularly.

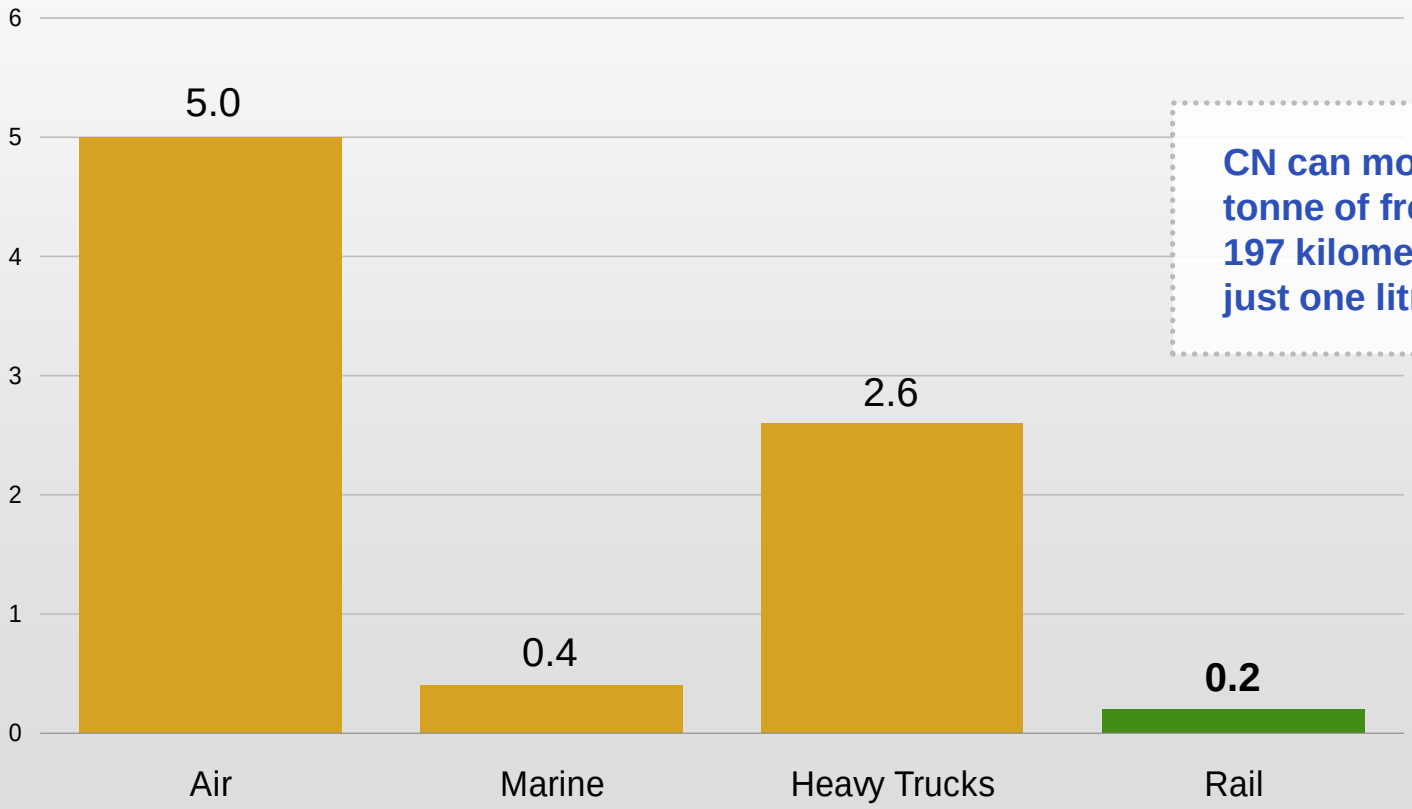


Environmental Benefits of Shipping Rail

Shipping by rail is energy efficient

ENERGY INTENSITY OF FREIGHT MODES, 2004

Megajoules / Tonne-kilometre



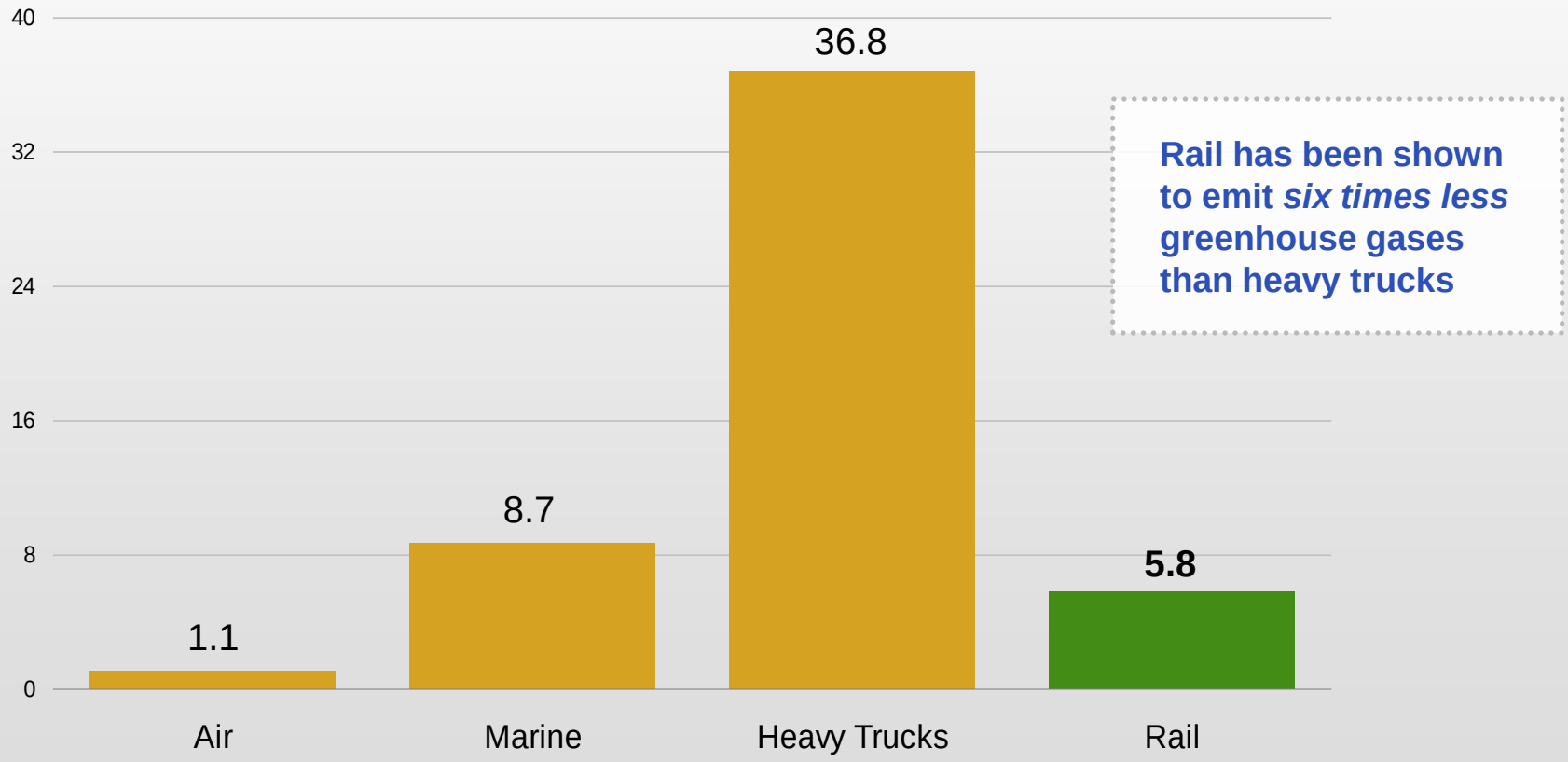
CN can move one tonne of freight 197 kilometres on just one litre of fuel

Source: National Resources Canada, Office of Energy Efficiency. Energy Use Data Handbook, August 2006.

Shipping by rail reduces greenhouse gases

GHG BY TRANSPORTATION MODE

Mt of CO_2E



Rail has been shown to emit *six times less* greenhouse gases than heavy trucks

Source: National Resources Canada, Office of Energy Efficiency. Energy Use Data Handbook, August 2006.

CONCLUSION

CN has capacity and financial strength to grow

CN's network serves the oil sands, Alberta Industrial Heartland and USGC refineries

CN's reliable network is the "pipeline on rail" for coal, sulphur and many other industries

CN can be the bitumen "pipeline on rail" to the Alberta Industrial Heartland and USGC

www.cn.ca