



Alberta's Architecture/ Engineering/Construction (AEC) Sector

Alberta
Employment, Immigration
and Industry



Investment and Industry Development

- The Investment and Industry Development Branch acts as a catalyst for increased **capacity, competency** and **competitiveness** of Alberta industries.
- In cooperation with public and private sector stakeholders, we:
 - Deliver business and economic intelligence
 - Facilitate the development and maintenance of networks, alliances and partnerships
 - Serve as an industry advocate for policy change opportunities
 - Generate and service investment opportunities

Key Industry Sectors

- Architecture, Engineering & Construction
- Aerospace
- Building Products
- Chemicals & Petrochemicals
- Emerging Industries
- Environmental Products & Services
- Hydrocarbon Upgrading
- Energy Services & Technology
- Metal Fabrication
- Transportation & Logistics

Table 1

Alberta Employment in Value Added Goods and Services - 2005

(Thousands)

Sector	Manufacturing	Services	Total
Petrochemicals & Refined Petroleum	11.9		11.9
Metal Fabrication	22.3		22.3
Oil & Gas Field Goods & Services	13.4	76.1	89.5
Building Products	20.7		20.7
Aerospace	1.9	3.8	5.7
Plastics	5.3		5.3
Environmental Products & Services (1)			26.0
Architecture, Engineering & Construction		209.2	209.2
Tourism (2) - 2004		46.1	46.1
Processed Food & Beverages	22.3		26.0
Information, Communications Technologies	7.2	49.7	56.9
Forest Products	11.2		14.1
Total Value Added Employment	116.2	384.9	533.7
1. Estimate - no breakdown available between goods and services			
2. Direct employment only - excludes indirect and induced employment			

Table 2

Revenues of Value Added Goods and Services - 2005

(\$Million)

Sector	Manufacturing	Services	Total
Petrochemicals & Refined Petroleum	23,141		23,141
Metal Fabrication	7,532		7,532
Oil & Gas Field Goods & Services	4,820	11,605	16,425
Building Products	4,196		4,196
Aerospace (1)	241	910	1,151
Plastics	1,034		1,034
Environmental Product & Services (1,2)	820	2,287	3,107
Architecture, Engineering & Construction (1,2)		28,011	28,011
Tourism (1)		5,256	5,256
Processed Food & Beverages	9,617		9,617
Information, Communications Technologies (1)	1,715	7,715	9,429
Forest Products	4,577		4,577
Total Value Added Revenues	57,692	55,784	113,476
1. Estimate			
2. Services include environmental construction activity			
3. Excludes environmental and oil & gas construction activity			

Table 3

Exports of Value Added Goods and Services - 2005

(\$Million)

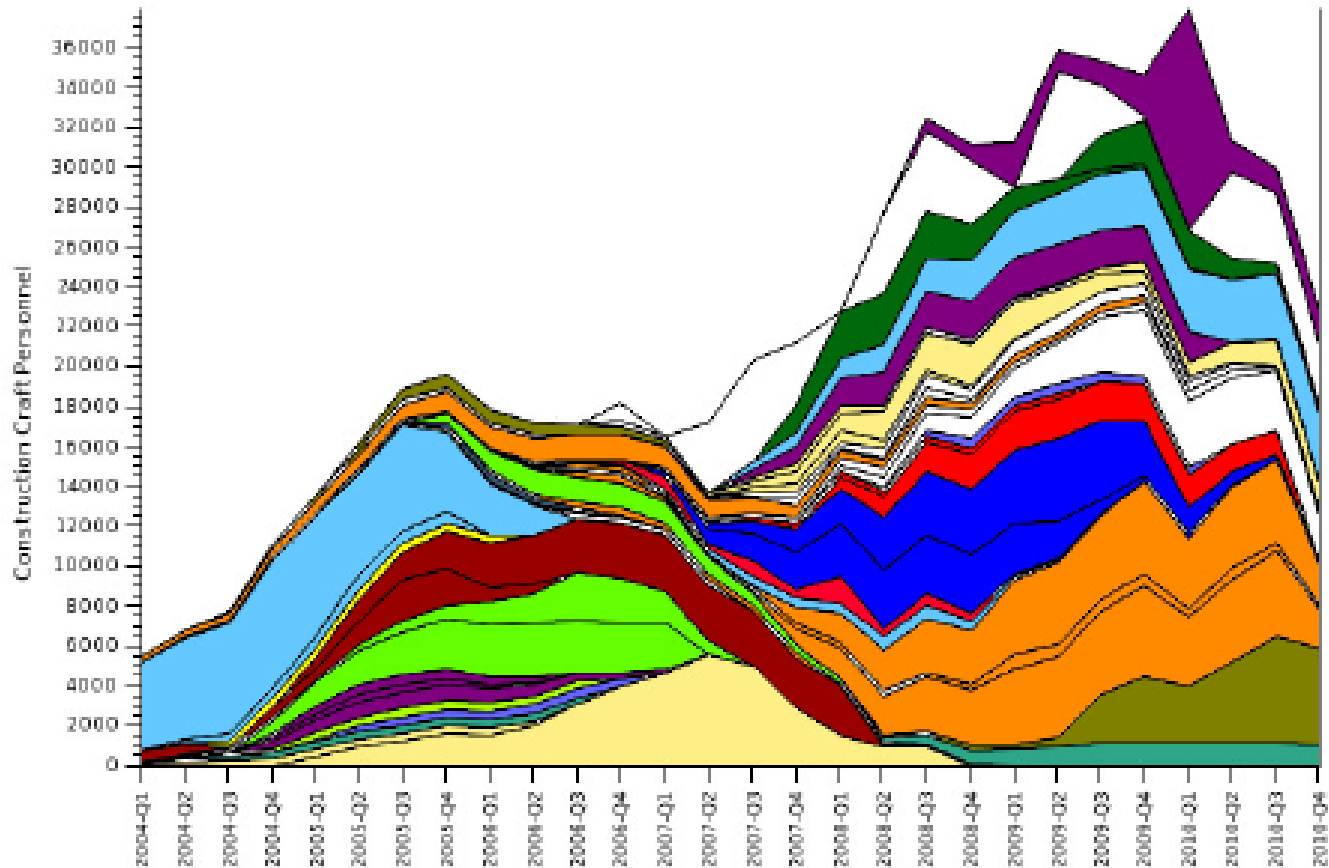
Sector	Manufacturing	Services	Total
Petrochemicals & Refined Petroleum	7,458		7,458
Metal Fabrication	2,154		2,154
Oil & Gas Field Goods & Services	1,481	199	1,679
Building Products	666		666
Aerospace (1)	256	273	529
Plastics	191		191
Environmental Product & Services (1)	172	33	204
Architecture, Engineering & Construction (1)		492	492
Tourism (1)		1,550	1,550
Processed Food & Beverages	2,915		2,915
Information, Communications Technologies (1)	1,170	469	1,639
Forest Products	2,931		2,931
Total Value Added Revenues	19,395	3,016	22,411
1. Estimate			

Table 4

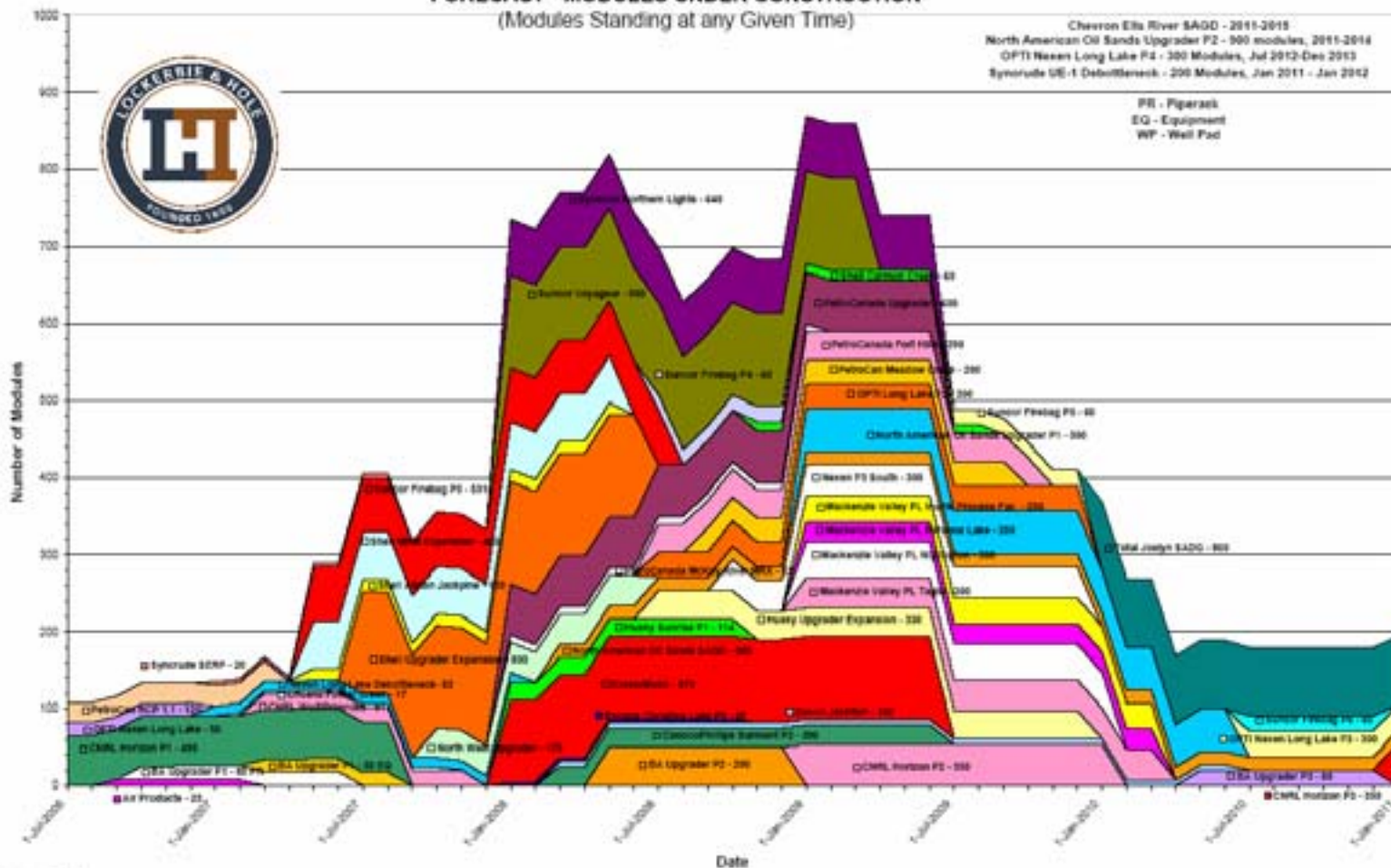
Number of Companies in Value Added Sectors - 2005 (1)

Sector	Manufacturing	Services	Total
Petrochemicals & Refined Petroleum	230		230
Metal Fabrication	1,080		1,080
Oil & Gas Field Goods & Services	563	6,658	7,221
Building Products	819		819
Aerospace	25	128	153
Plastics & Plastic Products	167		167
Environmental Product & Services (2)		1,085	1,085
Architecture, Engineering & Construction		23,589	23,589
Tourism		N/A	N/A
Processed Food & Beverages	543		543
Information, Communications Technologies	268	4,026	4,294
Forest Products	168		168
Total Value Added Revenues	3,863	35,486	39,349
1. Companies with employees			
2. 2002 Estimate - no breakdown available between goods and services			

Industrial Construction Projects
>100 MM Cdn (2004Q1 - 2010Q4)
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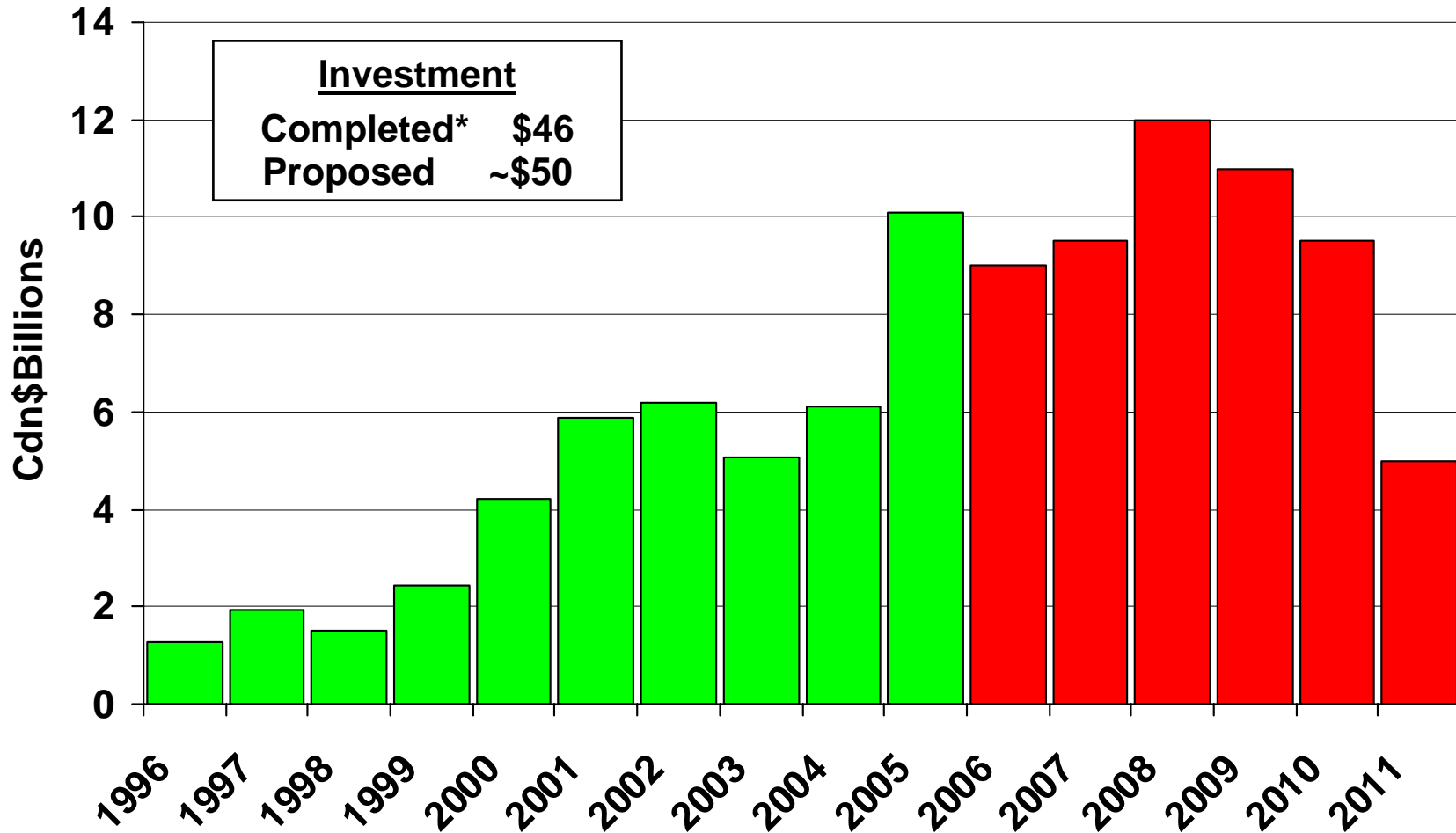
FORECAST - MODULES UNDER CONSTRUCTION (Modules Standing at any Given Time)



As of September 15, 2009
 This information was compiled by Lockerie and Hole for internal use.
 Lockerie and Hole does not accept any responsibility for the accuracy of the data.

Note: Data assumes 8 week construction schedule

Investment in Alberta's Oil Sands



*Completed – 1996 to 2005

Alberta is Busy

- \$158B – latest Inventory of Major Alberta Projects
- \$525M - latest Inventory of Alberta Regional Projects

The Inventories of Alberta Projects are available online at www.alberta-canada.com

Sector Challenge

- **PEOPLE, PEOPLE, PEOPLE**
 - World wide demand for labour
 - Demographics – Boomers are retiring
 - Alberta leads Canada in creating jobs

Can't get trained people fast enough, so need to maximize existing labour productivity

Outsourcing/Alliance Building

Best Practice Adoption

Benchmarking

Increase Productivity

- National Buyer Seller Forum
- iCOSMO – get registered!!
- Cold Climate Construction Conference & Expo
April 16-17, 2007, Edmonton
- Develop and implement Best Practices
 - Reduce Rework
 - Project Management
 - Lean Construction
 - Module Construction

Increase Productivity

- Benchmarking of large industrial projects
- Benchmarking for the infrastructure sector
- Support creation of innovative new construction technologies
 - University of Alberta Engineering Construction Research
 - University of Calgary Engineering Project Management



Next Presentation...

**Paul Godfrey and Alberta's
Energy Technology and Services**

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ENERGY TECHNOLOGY & SERVICES

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**Did you Know
that Canada is:**

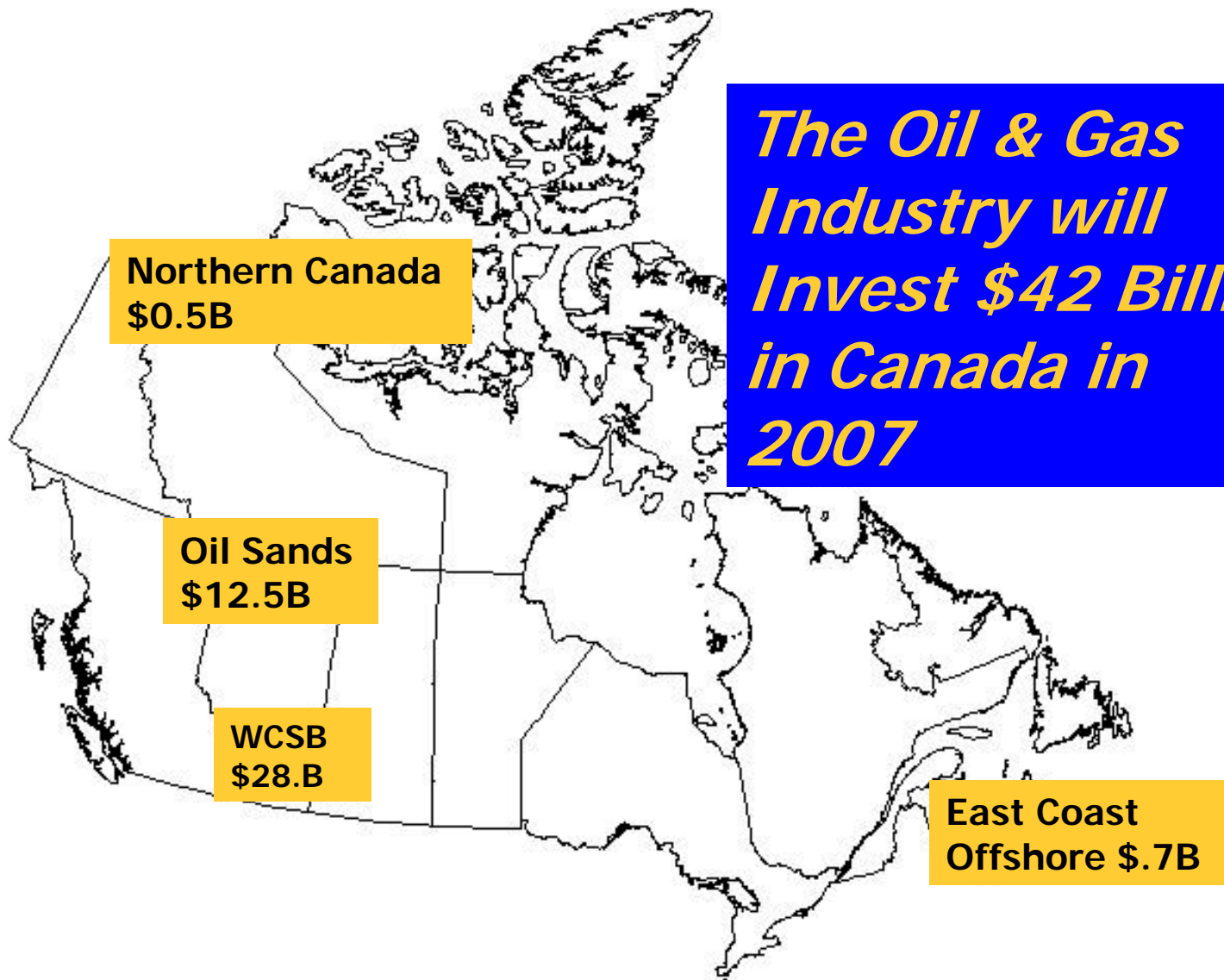
The third-largest producer of natural gas and
The ninth-largest producer of crude oil in the
world

That oil sands now account for approximately
30% of Canada's total oil production?

Alberta produces 68% of Canada's crude oil and 78% of its natural gas. Industry is branching out to other regions of Canada, however the focus continues to be in Alberta. Close to 80% of total industry spending takes place in Alberta.

- In fiscal 2005/2006, revenues to the province from crude oil and natural gas accounted for more than 40% or \$14.3 billion of Alberta's total revenues.
- In 2005, the industry paid a bonus of \$2.3 billion to acquire rights to explore and produce oil and gas. This was up from \$1.1 billion in 2004.
- Oil, gas and by-products account for more than 70% of Alberta's exports.

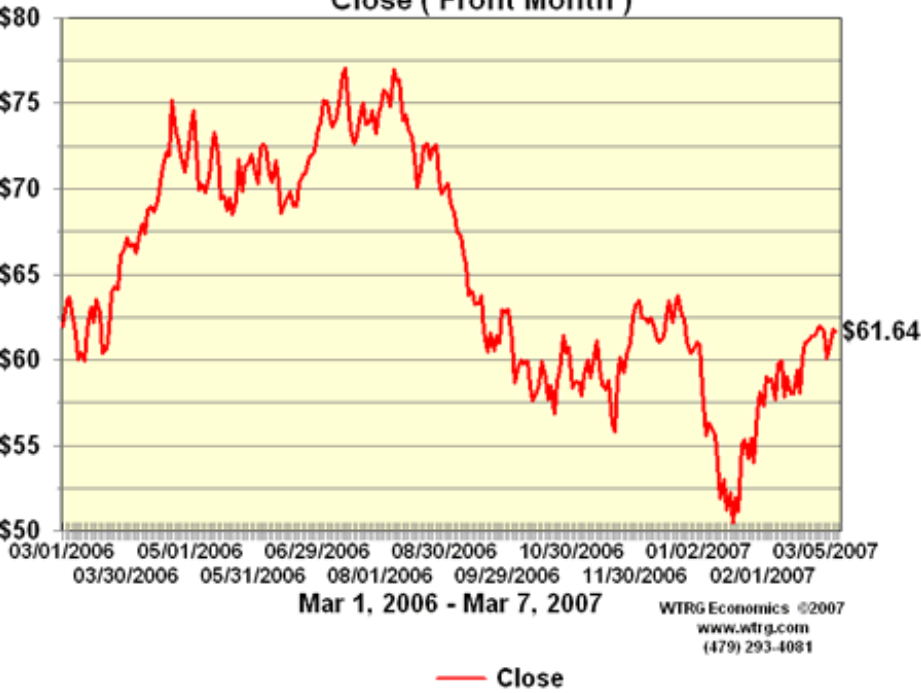
Capital Spending	Conventional	24.9 Billion
	Oil Sands	10.4 Billion
Wells Drilled	Conventional	3,221
	Natural Gas	13,268
Production	Conventional	571,000 bpd
	Surface Mining	383,000 bpd
	In-Situ Bitumen	609,000 bpd
	Natural Gas	13.3 billion cfd
Industry Revenue		\$81.5 Billion
Employment (Upstream)		275,000
Employment (Manufacturing)		90,000



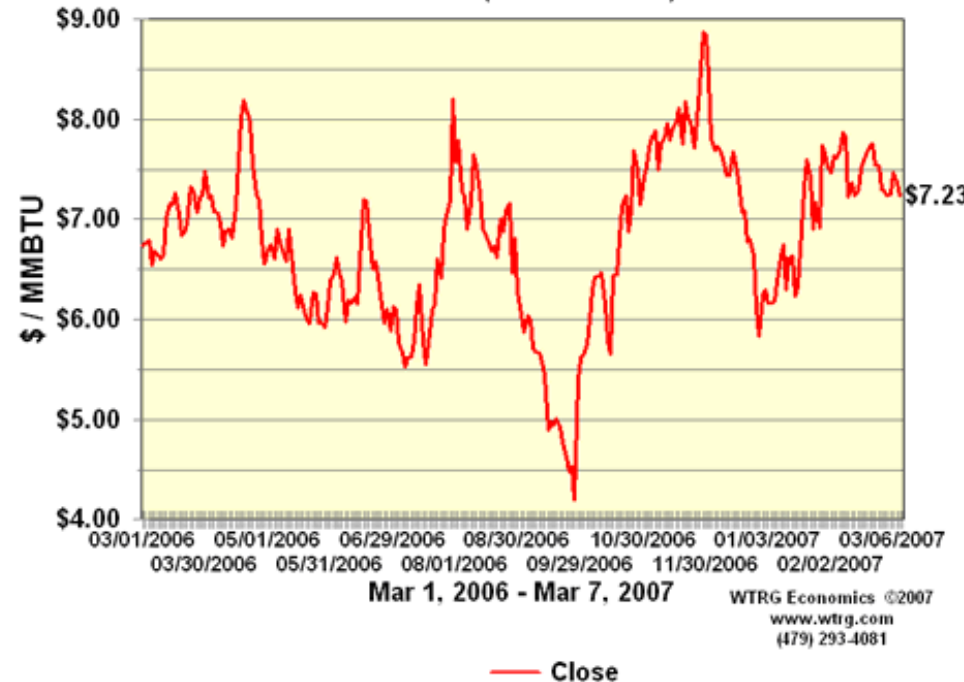
The Oil & Gas Industry will Invest \$42 Billion in Canada in 2007

Crude Oil & Natural Gas Prices

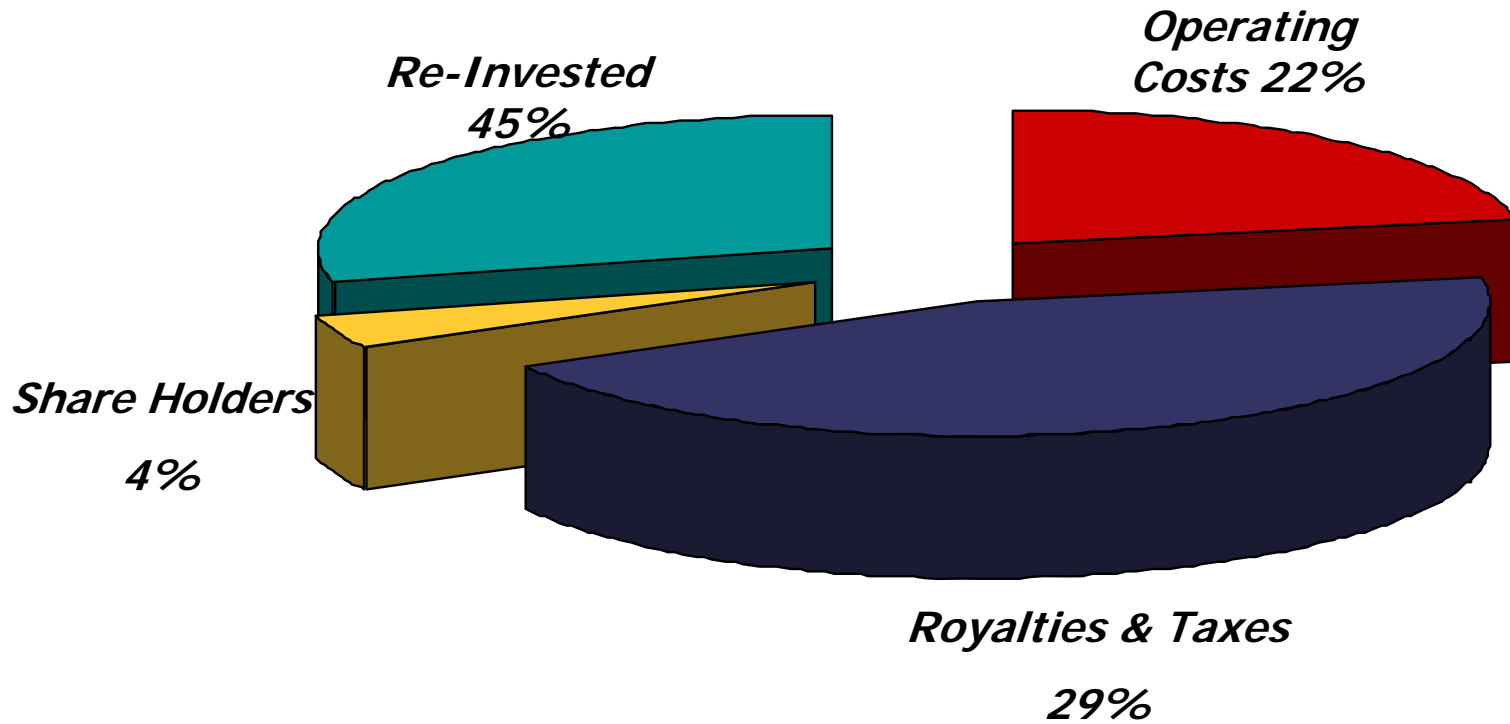
**NYMEX Crude Oil Futures
Close (Front Month)**



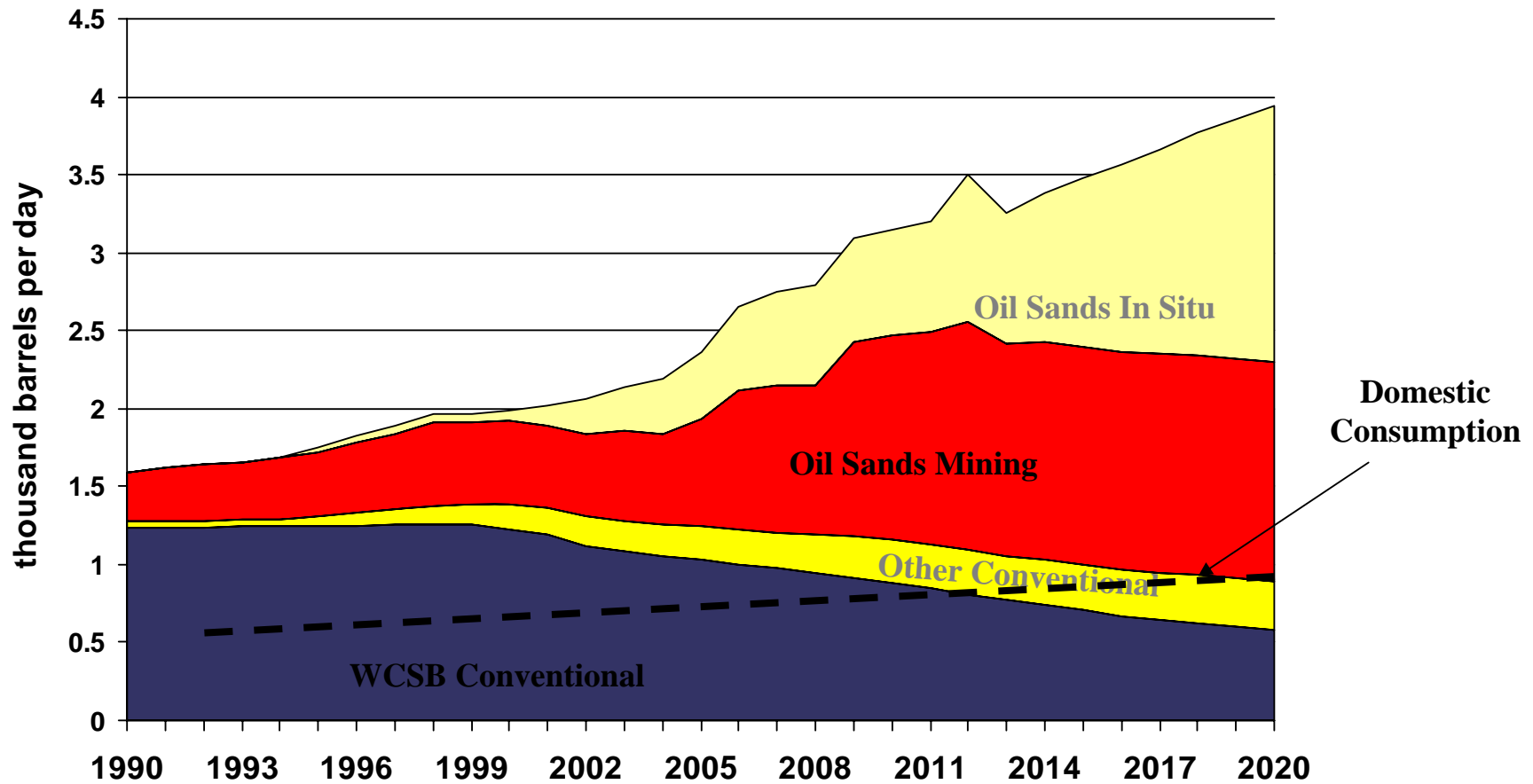
**NYMEX Natural Gas Futures
Close (Front Month)**



Revenue Distribution



The Future of Alberta Oil has shifted to the Oil Sands



Sources

Consumption – NEB 2003 Supply and Demand Report

Conventional - CAPP 2005-2015 forecast

Oil Sands and trend extrapolation beyond 2015 - ADOE

The Size of the Resource

Alberta's oil reserves contribute to 16% of total global reserves



Reserves (2003)

(Billion Barrels)

	<u>Oil Sands</u>	<u>Conv.</u>
<i>In Place</i>	1,629	62
<i>Remaining Est.</i>	175	2
<i>Rem. Ult. Pot'l</i>	310	5

Production is expected to reach 50% of Canada's crude oil output and 10% of North America's by 2010

Oil Sands Mining and Upgrading Process

4 tonnes
material



2 tonnes
oil sands



1.2 barrels
bitumen



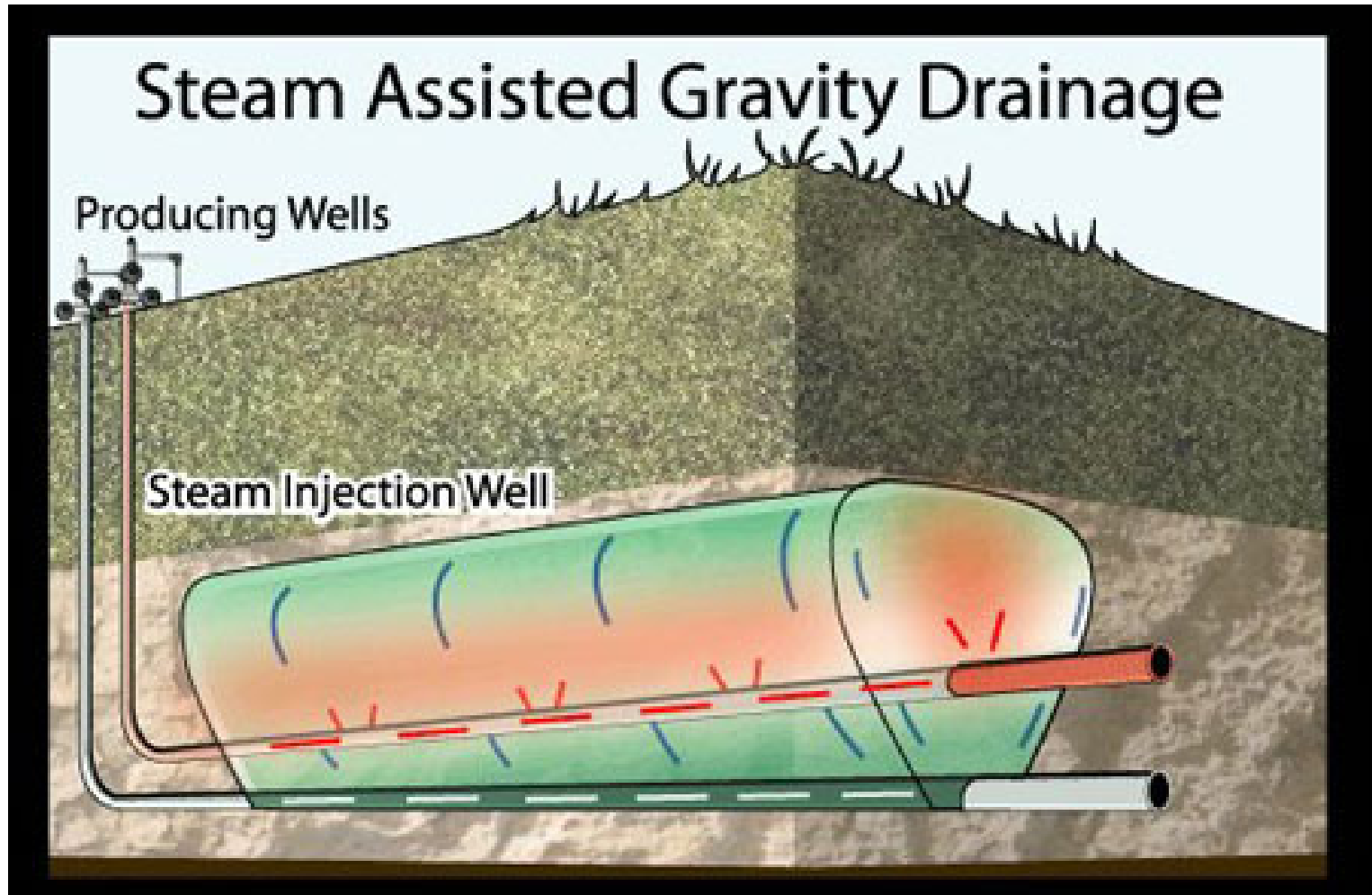
1 barrel synthetic
upgraded crude oil



0.5-0.7 mcf/barrel



New Oil Sands Technologies



Source: Canadian Heavy Oil Association

Sturgeon County

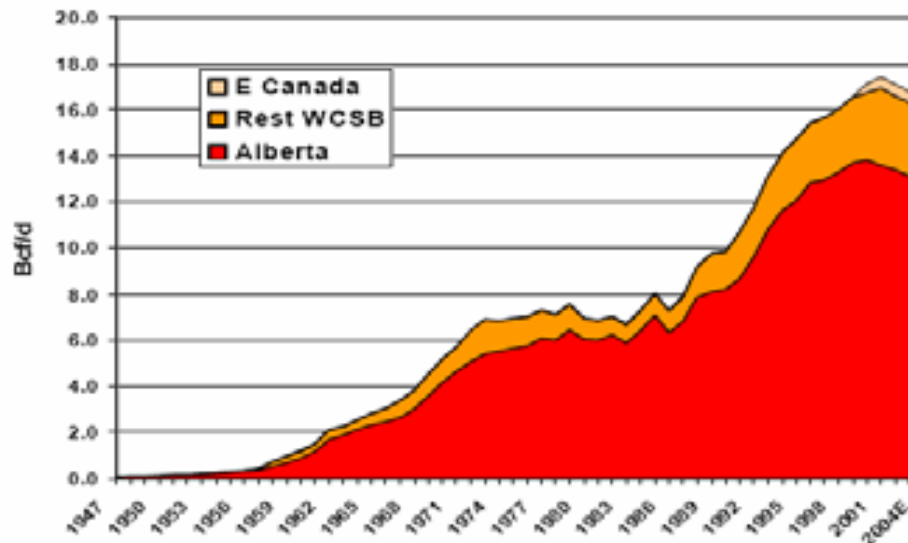
Strathcona County

Greater Edmonton Upgraders	Current Status
<ul style="list-style-type: none"> Petro-Canada Edmonton Refinery Conversion Project 	Under Construction – Mid 2008 Start-up
<ul style="list-style-type: none"> BA Energy – Heartland Upgrader 	Phase 1 Under Construction – 3 Qtr. 2008 Start-up
<ul style="list-style-type: none"> Shell Scotford Upgrader Expansion 	Nov. 1, 2006 - AOSP Expansion 1 to proceed – 2010 Start-up (more phases announced)
<ul style="list-style-type: none"> Northwest Upgrading 	EUB Submission Feb. 2006 – Detailed Eng underway - Planned Start up 2010
5. Synenco – Northern Lights Upgrader	EUB Submission Sept. 2006 – Expect First Oil 2010 / 2011
6. Petro-Canada / UTS Fort Hills Upgrader	EUB Submission Dec. 2006 – Project Sanction 2008 -Plan for 2012 Start up
7. Total SA	CAPP List / Media Announcements
8. North American	CAPP List / Media Announcements
9. Another	CAPP List / Media Announcements

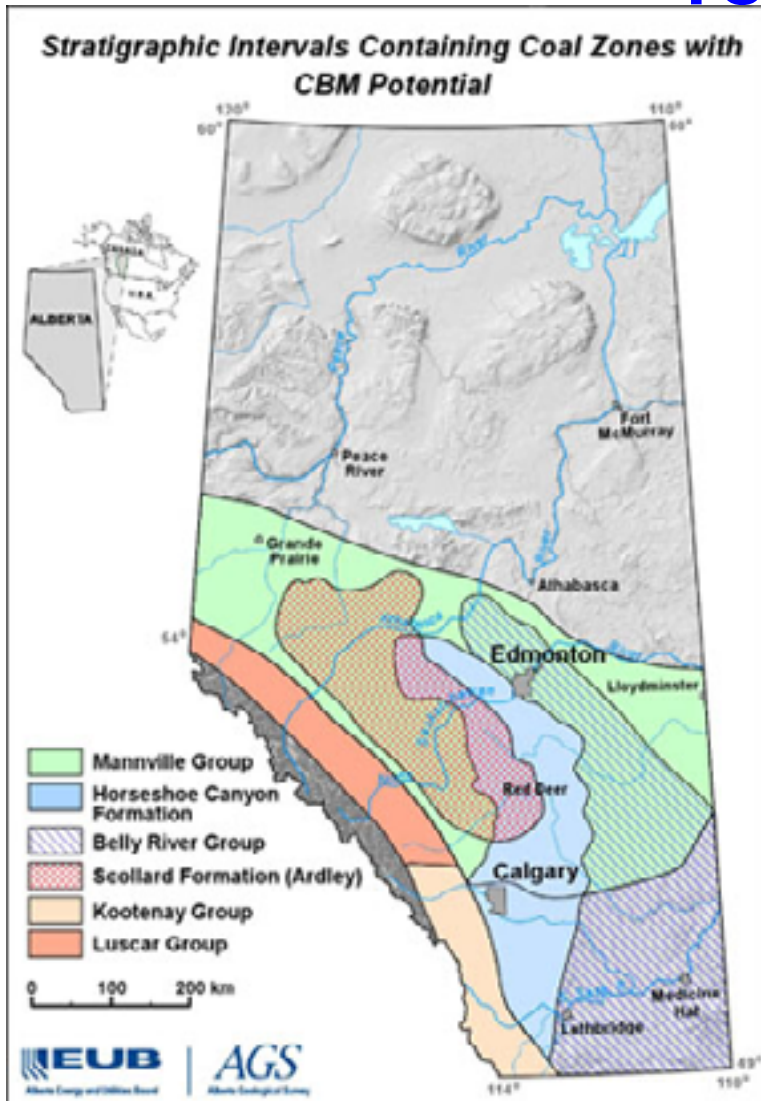
Conventional Natural Gas is in Decline

1. *The Decline in Conventional Gas*

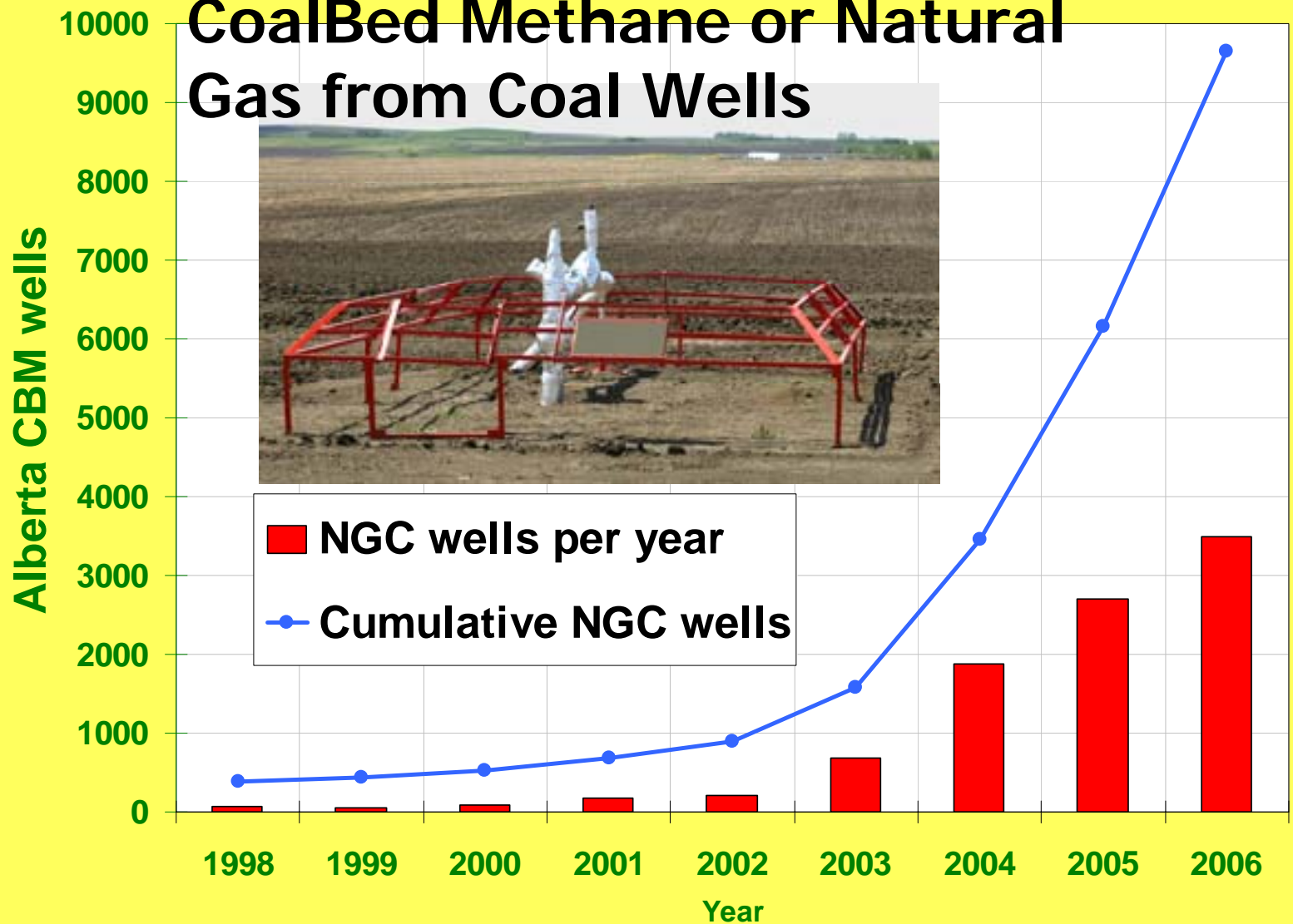
The Canada Gas Potential Committee (CGPC) had stated in their 2001 report that the estimated remaining reserves of conventional gas is around 233 Tcf. Furthermore, the CGPC stated that in order for Canada to continue meeting its energy demand, new substantial gas finds must be discovered.



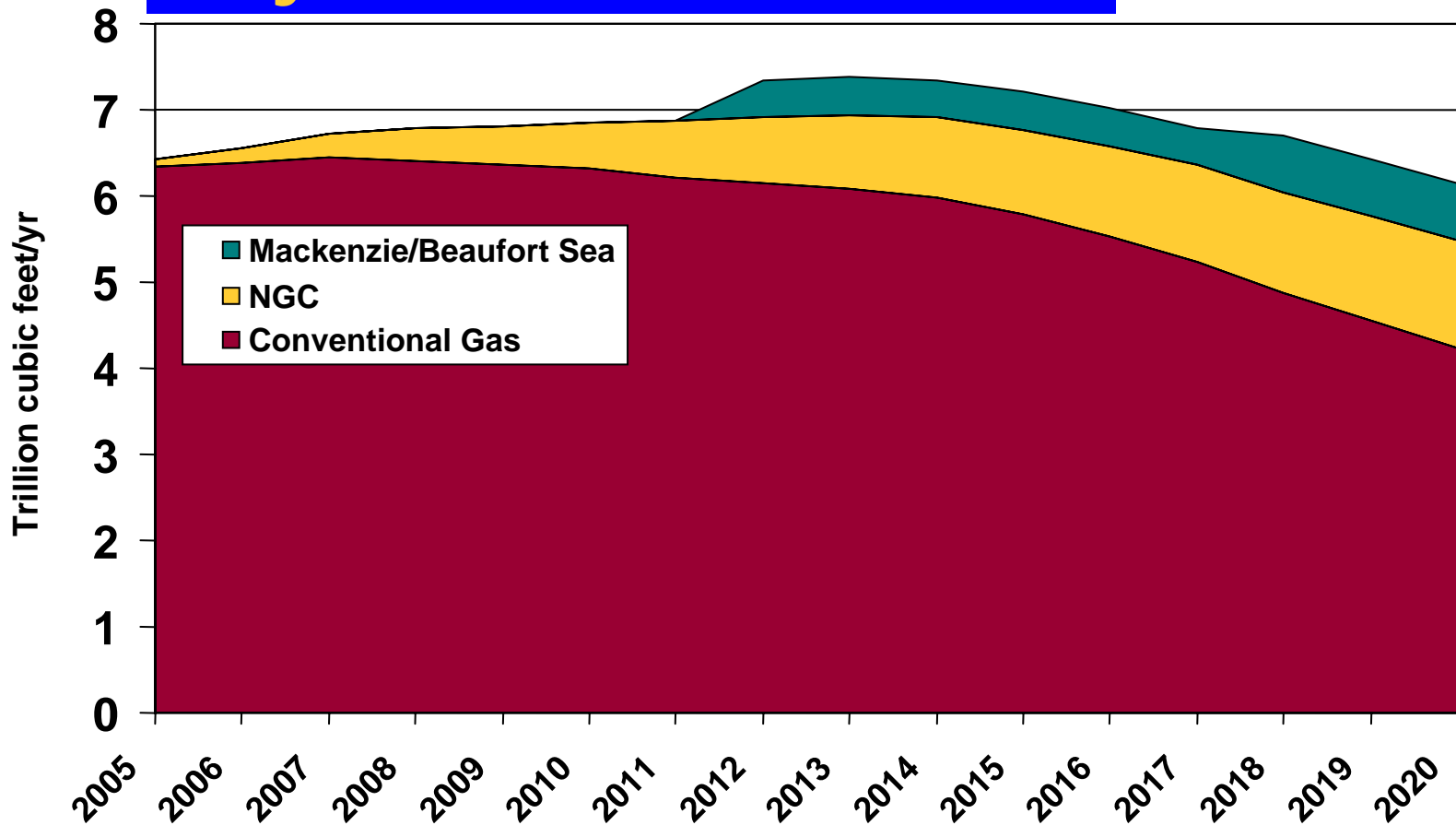
To Meet Alberta's Gas Demand these 2 efforts are critical

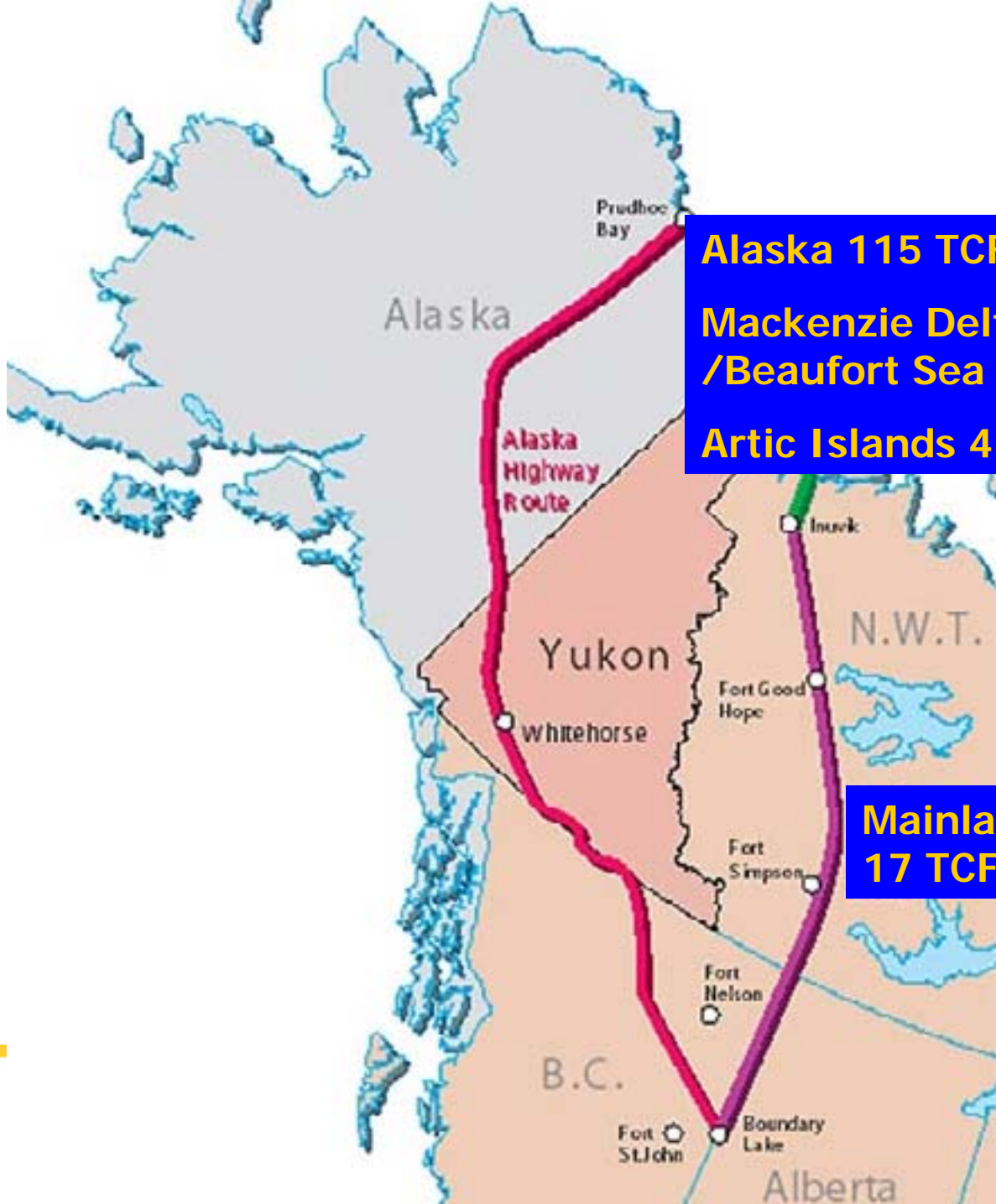


CoalBed Methane or Natural Gas from Coal Wells



Gas Sources For the Next 14 years





Alaska 115 TCF

Mackenzie Delta /Beaufort Sea 61 TCF

Arctic Islands 45 TCF

Mainland NWT 17 TCF

2007 SUMMARY

- **Commodity Prices down**
- **Capital Investment Down**
- **Drilling and Rig Activity Down**
- **Global Steel Materials rising but beginning to moderate**
- **Labour still tight – especially for oil sands**
- **Drilling costs starting to moderate**
- **Oil Sands Investment up by \$1.5 Billion**
- **Catching up on Public infrastructure**



Next Presentation...

James Cleland and Alberta's Metal Fabrication Sector

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Alberta's Metal Fabrication Sector

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Components of the Sector

- Structural Steel Fabrication
- Boilers, Pressure Vessels and Tanks
- Heat Exchangers
- Machine Shops
- Forging



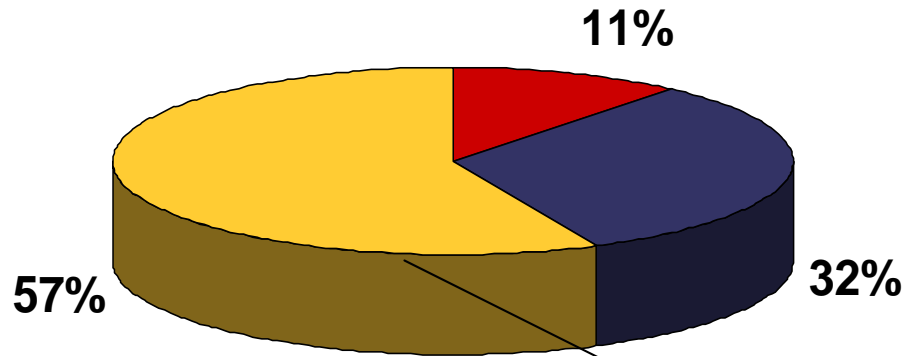
Components of the Sector

- Primary Steel Production
- Modular Fabrication
- Motor Vehicle and Trailer Manufacturing
- Coatings and Heat Treating
- Metal Service Centres



Industry Profile: Sector Breakdown

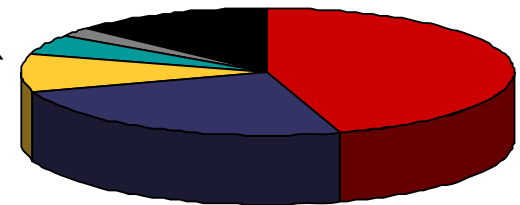
Total \$7.94 Billion



- NAICS 336 Transportation Equipment Mfg.
- NAICS 331 Primary Metals Mfg
- NAICS 332 Fabricated Metals Mfg

Fabricated Metals Breakdown (\$4.57 Billion)

- Structural Steel
- Pressure Vessels
- Machining
- Coatings
- Forging
- Balance



Industry Profile - \$7.94 Billion (2005)

	Number of Companies (2004)
Primary Metals (NAICS 331)	72
Fabricated Metal Products (NAICS 332)	960
Transportation Equipment Mfg (NAICS 336)	176
Metal Service Centres (NAICS 4162)	151

Companies – 1,359

Employees – 30,100

Metal Fabrication	Distribution of Companies by Number of Employees (2004)			
	1-49	50-99	100-499	500+
Number	1156	117	83	3
% of Total	85.0%	8.6%	6.1%	0.2%

Global Industry Trends

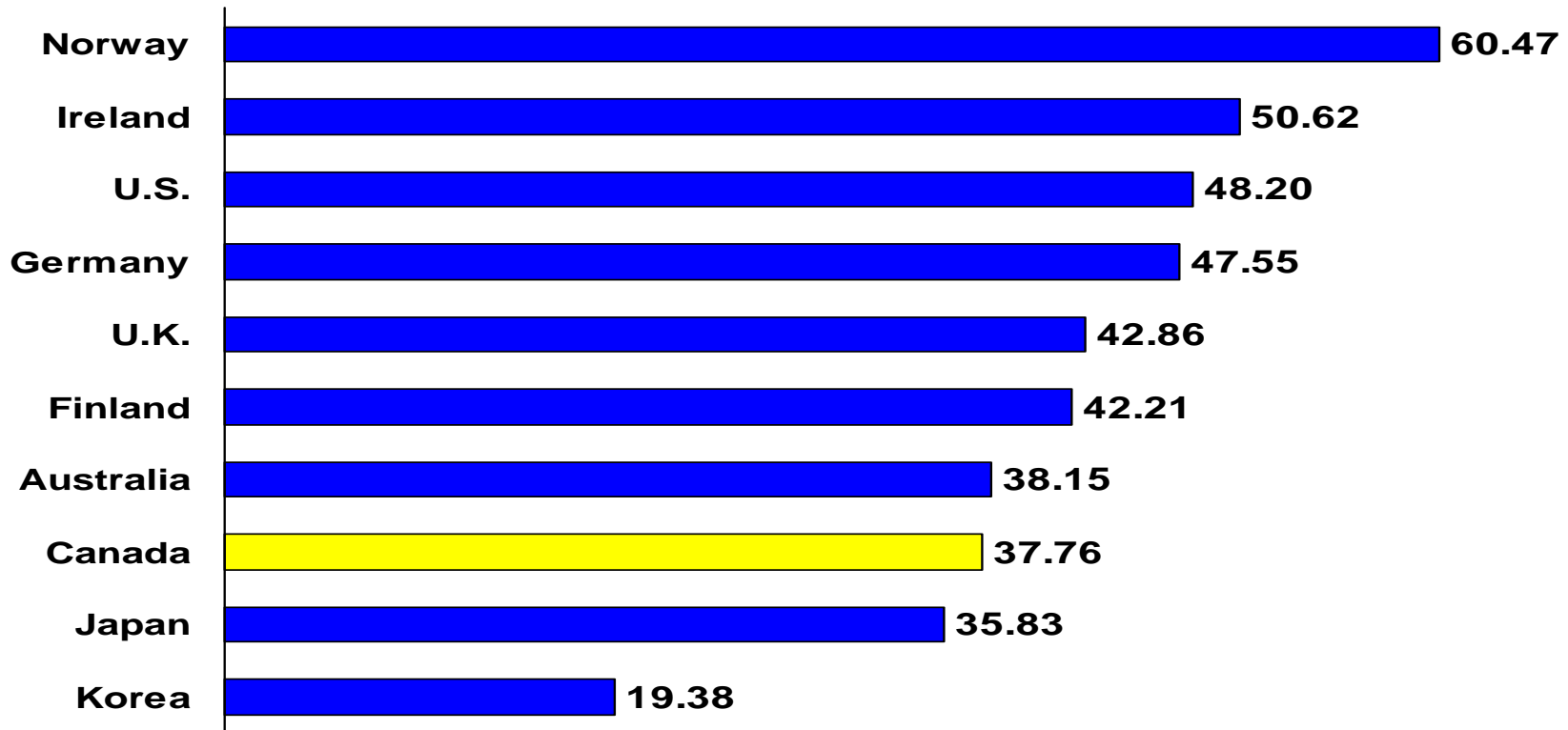
- Shift to China for commodity type production
 - Quality is improving
 - Very low cost labour (\$0.80 - \$1.00 /hr)
 - High rate of technology and automation in new plants
- Extremely high global demand for manufactured goods in oil and gas / petrochemical, as well as construction labour.
 - Over \$1 trillion in capital projects for Middle East
 - Increasing global backlog for Pressure Vessels, Reactors, Heat Exchangers as well as specialty plate and large forgings.
- Increased integration of Global Supply Chains and optimization of manufacturing clusters.

Global Industry Trends

- Global shortage of skilled workers, especially trades and engineers.
 - Fewer and fewer regions to draw from
 - Stiff competition to attract workers to Alberta
- Lot's of R+D into higher productivity equipment
 - Advancements in laser cutting speed over last 5 yrs
 - Higher deposition pulsed wave welding
 - Better sensing and advanced logic used in robotics
- Mergers and Acquisitions increasing with manufacturers

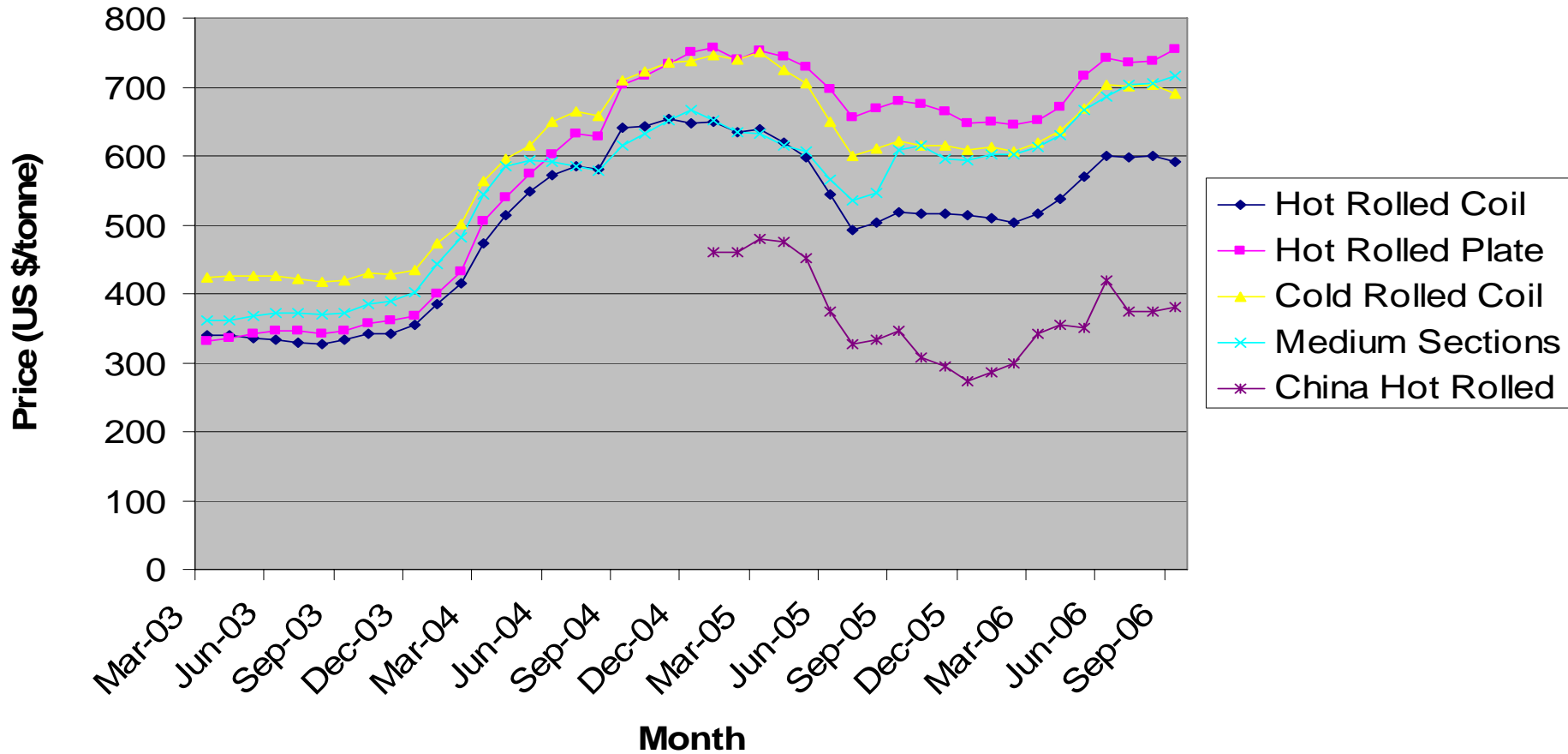
Canada Compared Internationally

- Labour Productivity (GDP per hour at PPP) in 2005, by country



Sources: Groningen Growth and Development Centre / Conference Board

Steel Market Price Trends



Welding Technology Gaps Study

- Study to look at Welding Technology Gaps conducted by Alberta Economic Development and Edmonton Economic Development Corporation completed April '06
- Key Findings
 - *Need for Resource Center to educate Alberta industry on welding technology*
 - *Critical Labour shortages are accelerating fabricators quest for Automation / high productivity weld processes*
 - *Great business opportunities for providers of unique Automation solutions*
 - *Biggest barrier to implementing new weld procedures is acceptance by end users / project owners.*

Additional Study Findings

- 98 % of joins in process facilities are welded joins
- Welding is the single most important fabrication process with the greatest potential for variability of cost / profit
- On average 25% of the cost of major capital goods in Alberta are directly attributed to welding.
- In the next five years, metal products fabrication firms in Alberta will generate \$48 billion in revenues. Approximately \$12 billion will be directly accounted for by welding.
- A 15% - 20% increase in Welding Productivity will save over \$2 Billion in capital equipment costs.

Strategies for Alberta's Metal Industry

- Increase productivity through technology adoption and automation.
 - Welding Automation Initiatives
 - Technology Awareness Missions
 - Lean Manufacturing Assessments
- Create a favorable regulatory environment that encourages investment in new technologies to increase productivity
 - Examine tax policies that encourage investment in new, higher productivity equipment
- Outsourcing supply chain opportunities
 - Partnering opportunities between Alberta fabricators and Eastern Canadian fabricators.

Current Projects for Alberta Industry

- Automated Welding:
 - Joint Industry Project with AB Research Council
 - Possible Automation Consortia c/w Tech Tours
- Lean Manufacturing Assessments
 - Initial assessment to evaluate process improvements
- iCOSMO – Supplier Matching Across Canada
 - CME hosted business matching web portal www.icosmo.ca
- Benchmarking Pilot Program
 - Compare your operational performance to established Global standards.
- Alberta Steel Products Opportunity Study
 - Report to examine Alberta's primary steel needs and current sources for those products



Next Presentation...

John McGinnis and Alberta's Hydrocarbon Upgrading Vision

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