Alberta's Industrial Heartland Oilsands 101 Update

Edmonton, Alberta
June 23, 2007

Alberta's Industrial Heartland

Strathcona County
ECONOMIC DEVELOPMENT & TOURISM

Agenda

1. Where is Strathcona County located?
2. What are the oil sands?
3. How do you convert bitumen into synthetic crude oil ?
4. What are the opportunities for companies/individuals to prospect in Alberta for business ?
5. Summary – Call to action

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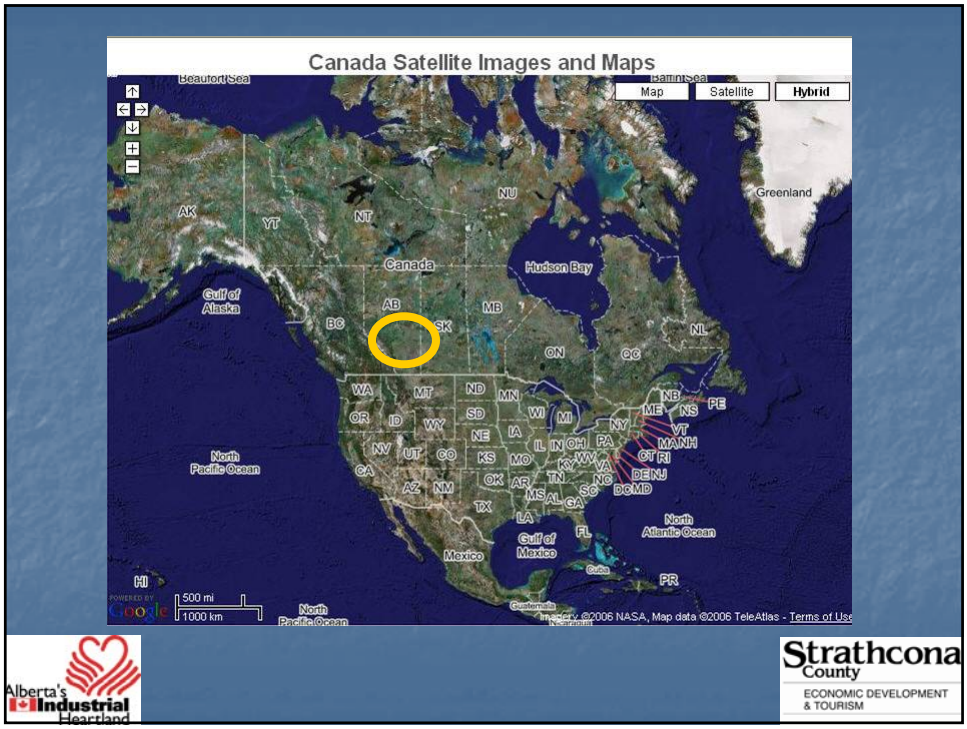
Canada Satellite Images and Maps
Map
Satellite
Hybrid
Beaufort Sea
Baffin Sea
Greenland
AK
YT
NT
NU
Canada
Hudson Bay
Gulf of Alaska
BC
AB
SK
MB
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QC
NL
NB
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North Pacific Ocean
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Yellowknife
Canada
Whitehorse
Strathcona County
Alberta, Canada
Edmonton
Calgary
Regina
Winnipeg
Vancouver
Victoria
Seattle
Portland
PACIFIC OCEAN
Minneapolis
Ottawa
Toronto
Montreal
Quebec City
St. John's
Charlottetown
Halifax
Detroit
Chicago
United States of America
Salt Lake City
New York
Philadelphia
Washington D.C.
San Francisco
Los Angeles
San Diego
El Paso
Dallas
Houston
Miami
ATLANTIC OCEAN
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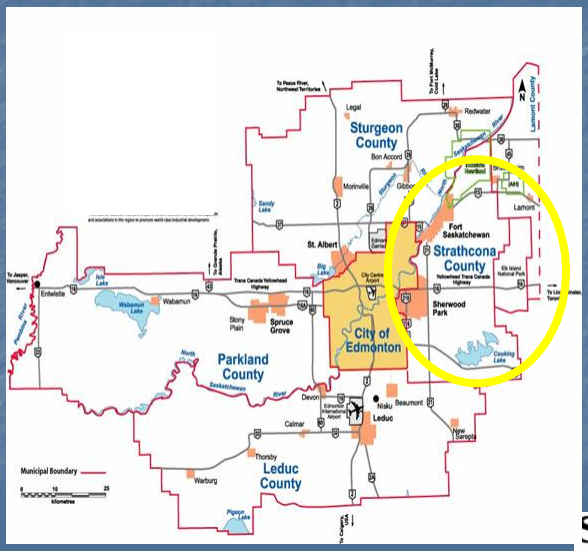
Metro Edmonton Location



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What Are Oil Sands?

- Heavy oil sands are formed by infiltration of petroleum into porous sand near the Earth's surface.
- Oil sands are crude oil deposits that are substantially heavier (more viscous) than other crude oils

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What is the Composition of Oil Sands?

- Oil sands are a mixture of sand, bitumen and water
- Each grain of oil sand has three layers: an envelope of water surrounding a grain of sand, with bitumen surrounding the water to form the outer layer

How is Oil Separated From the Sand and Water?

- Ore preparation
  - Ore dumped into crusher reduced in size to less then 2" particles
- Extraction process
  - Air added to slurry, bitumen attaches to the air bubbles. Froth is processed through a stripper directing the bitumen to storage vessels
  - Solvent added to separate remaining solids, water and asphaltenes
  - This process yields clean diluted bitumen at appropriate viscosity to be transported by pipeline

What is Bitumen?

- Bitumen is a liquid-solid material, such as tar, asphalt, or heavy oil.
- This heavier crude oil has lost much of its lighter fraction of its original petroleum due to volatilization or oxidation.

Why are Oil Sands so Special?

- Oil sands are of interest to the energy industry because they are a potentially huge source of petroleum.
- Upgrading of the oil sands into lighter crude oil can be used commercially.

What is an Upgrader?

- An Upgrader processes the bitumen into vacuum gas oil and light synthetic crude oil
- There are generally two types of upgraders: hydro conversion process and traditional coking process
- Hydro conversion process breaks down the heavy bitumen into smaller molecules by adding hydrogen in presence of a catalyst, heat and pressure
- Sulphur and nitrogen are removed

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Alberta Oil Sands Deposits

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The Oil Sands Resources

- 174 billion barrels of proven reserves with an ultimate potential of over 300 billion barrels
- Over 400 years of supply available at current production rates
- Production based on current mining and *in-situ* techniques
- Marketed to Canadian and US refineries (primarily Midwest US)

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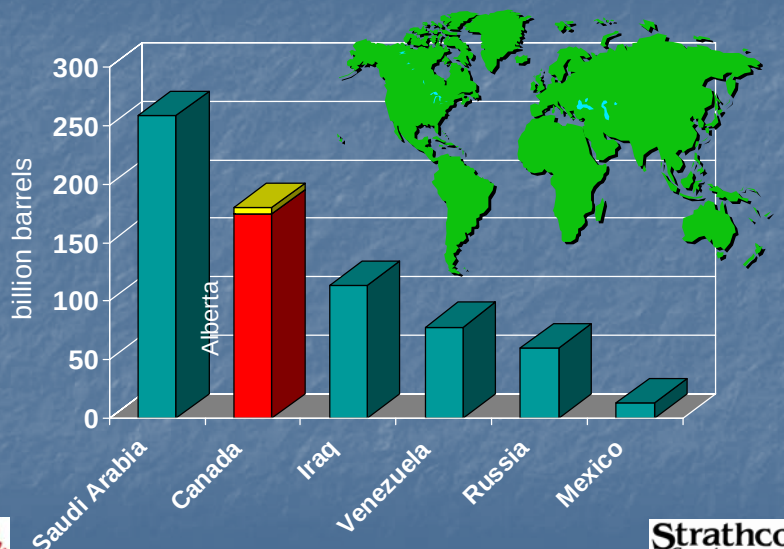
Proven World Reserves



Sources: Oil and Gas Journal – Dec 2002, AEUB

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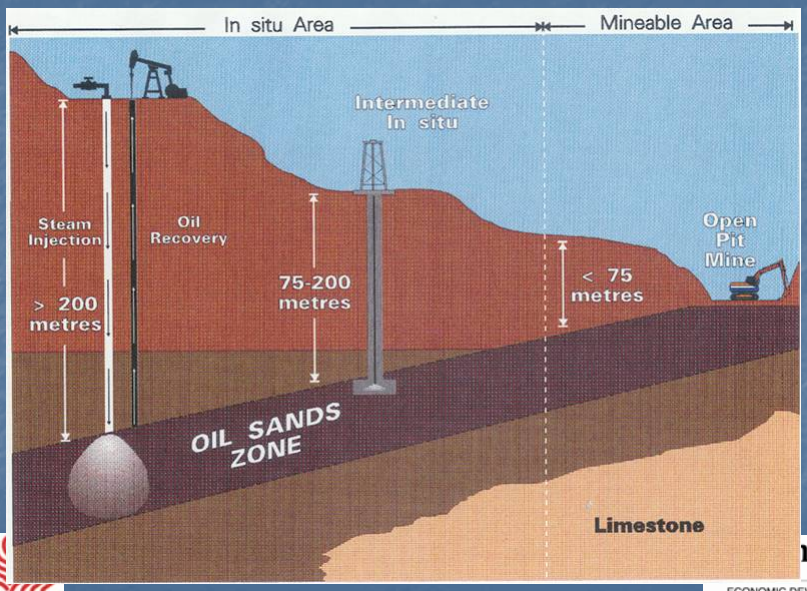
The Nature of the Oil Sands Resources



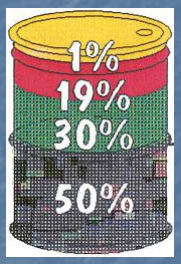
Technology Trends

- In Situ
  - Cyclic Steam Stimulation (CSS)
  - Steam Assisted Gravity Drainage (SAGD)
  - Vapor Extraction (VAPEX)
  - Toe–to-Heel Air Injection (THAI)
  - Thermal Solvent
  - Hybrid (Steam-Solvent) Process
- Surface Mining
  - Truck and shovel
  - Hydro-transport
- Upgrading & Value-Added Products
  - Synergies with existing facilities

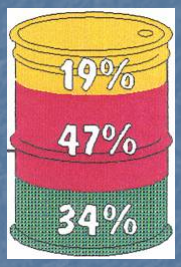
The Oil Sands Barrel

Naphtha
Diesel
Gas Oil

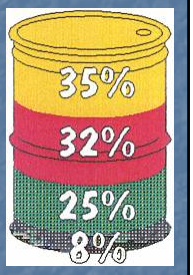
Pitch



BITUMEN



SYNTHETIC CRUDE OIL



LIGHT CRUDE

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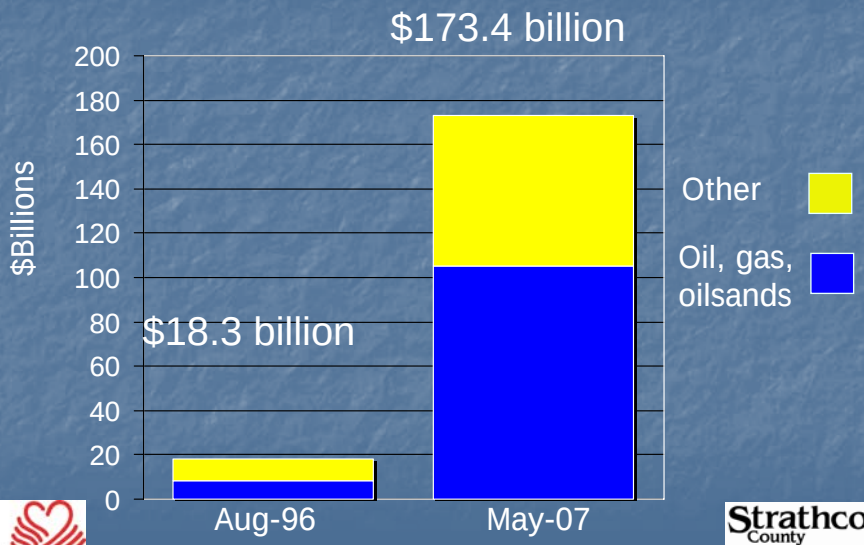
Alberta's Major Projects



Source: Alberta Economic Development

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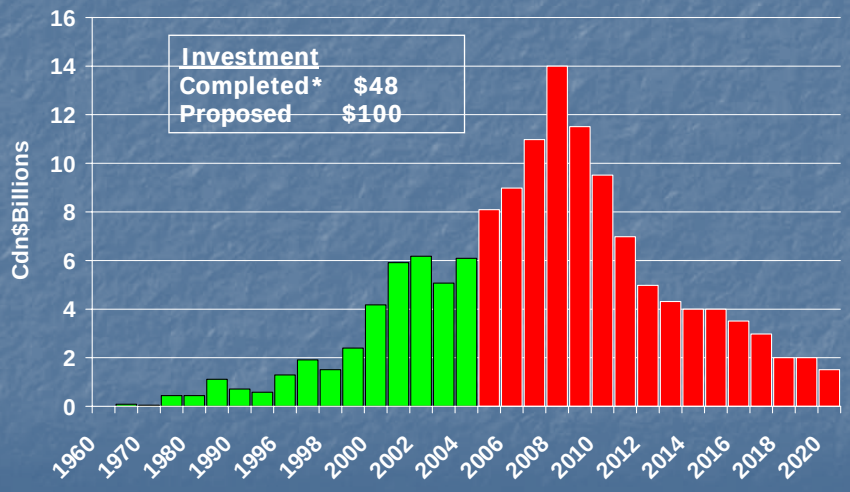
Investment in Alberta's Oil Sands



Alberta's Industrial Heartland Association

A partnership of four municipalities encompassing 120 sq. miles of land planned to accommodate industrial purposes in concert with adjacent users

Cooperative Protocol Signed May 27, 1998

- City of Fort Saskatchewan
- Strathcona County
- Sturgeon County
- Lamont County

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Mandate & Mission

"To plan for future operation and development that serves the interests of the community while meeting the needs of industry."

"Recognized as a global leader in processing, manufacturing and eco-industrial development dedicated to ensuring benefits to citizens, industry and government."

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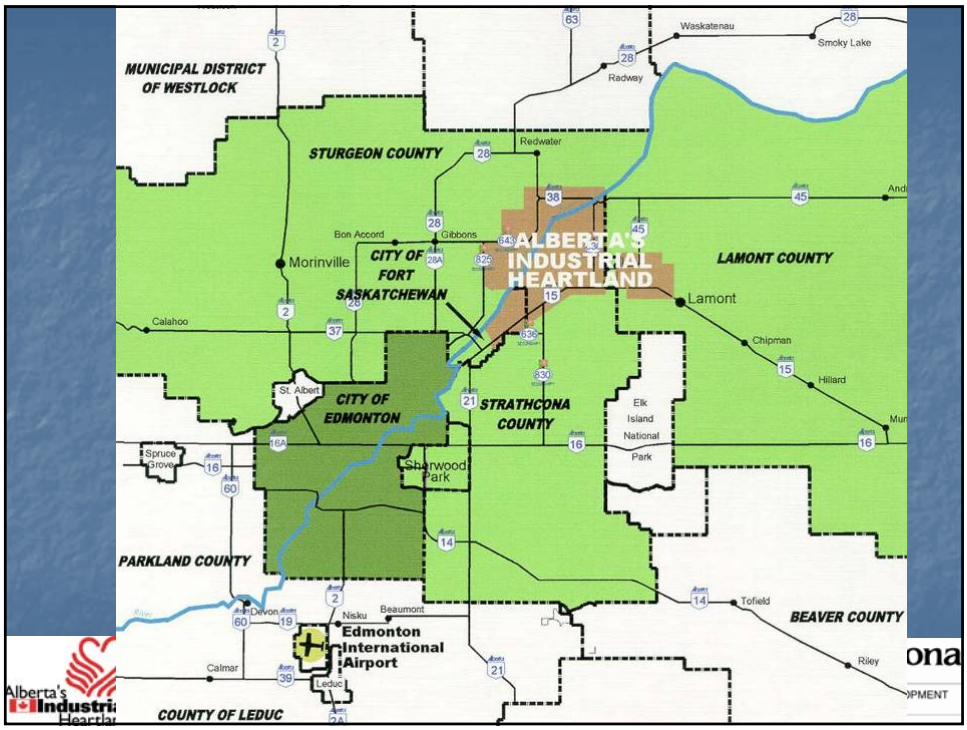

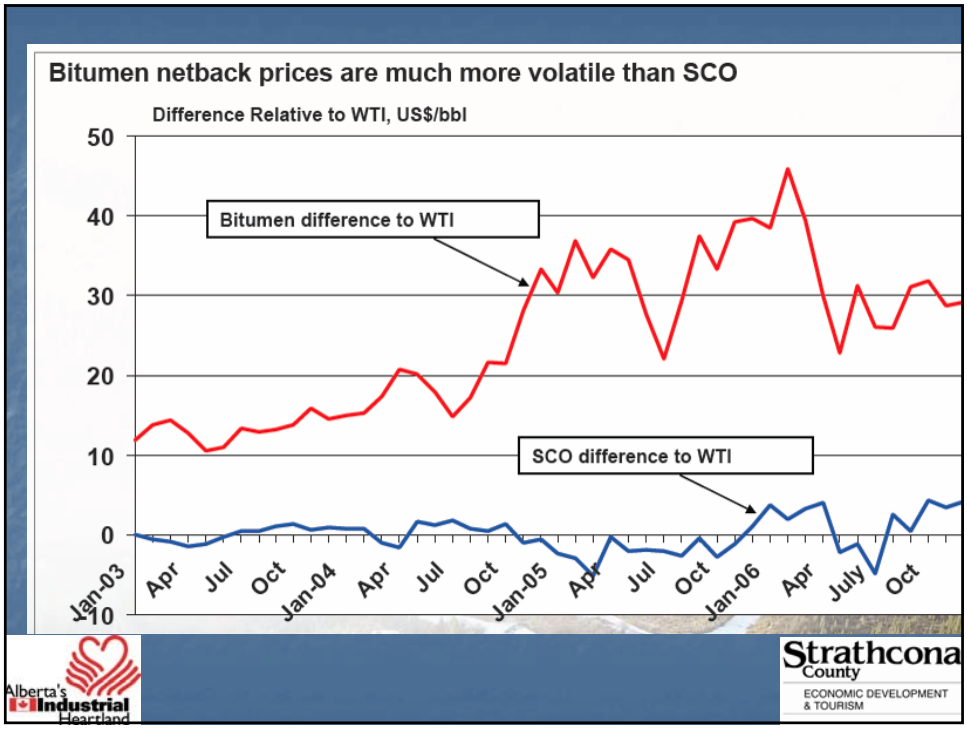

The Hydrocarbon Upgrading Task Force Vision for 2020

Alberta has achieved a competitive hydrocarbon industry that expands the market for Alberta's bitumen resource and produces higher-value products in Alberta.

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AIH AREA ANNOUNCED PIPELINE DEVELOPMENTS

PROJECT	SPONSOR	INVESTMENT
Access Pipeline	Devon Energy/ Meg Energy	$200+ Million
Corridor Pipeline	Terasen Pipelines (Kinder Morgan)	$600 Million
Waupisoo Pipeline	Enbridge Pipelines	Unknown
Gateway Pipeline	Enbridge Pipelines	$3 Billion
Stonefell Terminal	Enbridge Pipelines	Unknown
Heartland Terminal	Terasen Pipelines (Kinder Morgan)	$200 Million

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AIH AREA OIL SANDS RELATED ANNOUNCED DEVELOPMENTS

PROJECT	SPONSOR	INVESTMENT
Refinery Conversion Project	Petro-Canada	$1.6 Billion
Heartland Upgrader	BA Energy	$1 Billion
Petro Canada Upgrader Project	Petro-Canada, Tech,	$5.0 Billion
Scotford Upgrader Expansion	Shell, Chevron, Western	$12.8 Billion Mine and Upgrader
Northwest Upgrader	North West Upgrading Inc.	$1.3 Billion
Heartland Offgas Project	Aux Sable	$35 Million 2007 $100 Million (2012)
Northern Lights Upgrader	Synenco Energy	$3 Billion
2-phase hydrogen production plants.	Air Products	$230 Million

AIH AREA OIL SANDS RELATED ANNOUNCED DEVELOPMENTS cont'd

PROJECT	SPONSOR	INVESTMENT
Spent Catalyst Recovery Facility	Gulf Chemicals	
Sulphur forming and pastille storage facility	HAZCO Environmental	$30 M
Heartland Offgas Project	Aux Sable	$35 Million 2007 $100 Million (2012)
Truck and rail terminalling facility.	Petrogas	Unknown
Oil and Gas Logistics Centre	CN	$50 M
Rail off-loading and terminalling services for condensate	Provident Energy/EnCana	$50 M

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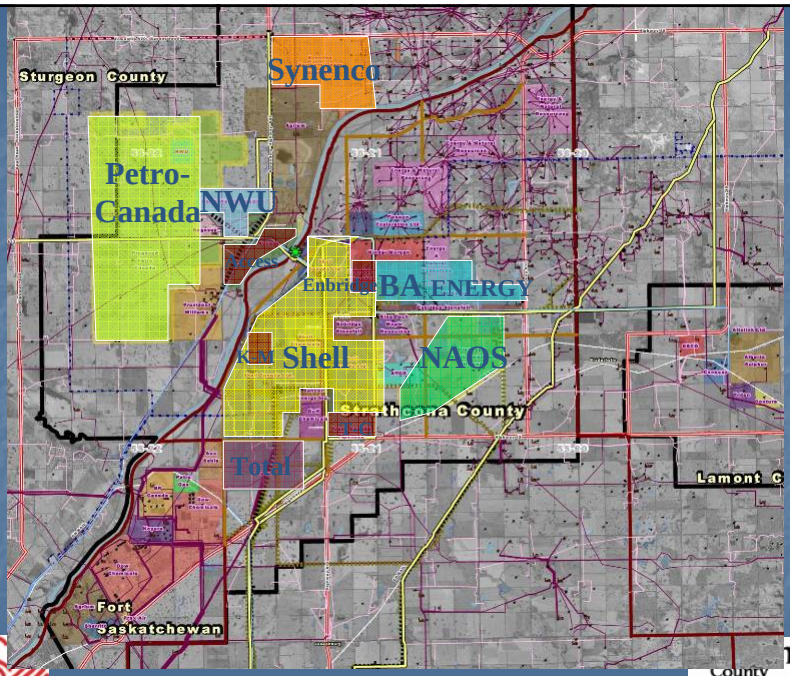

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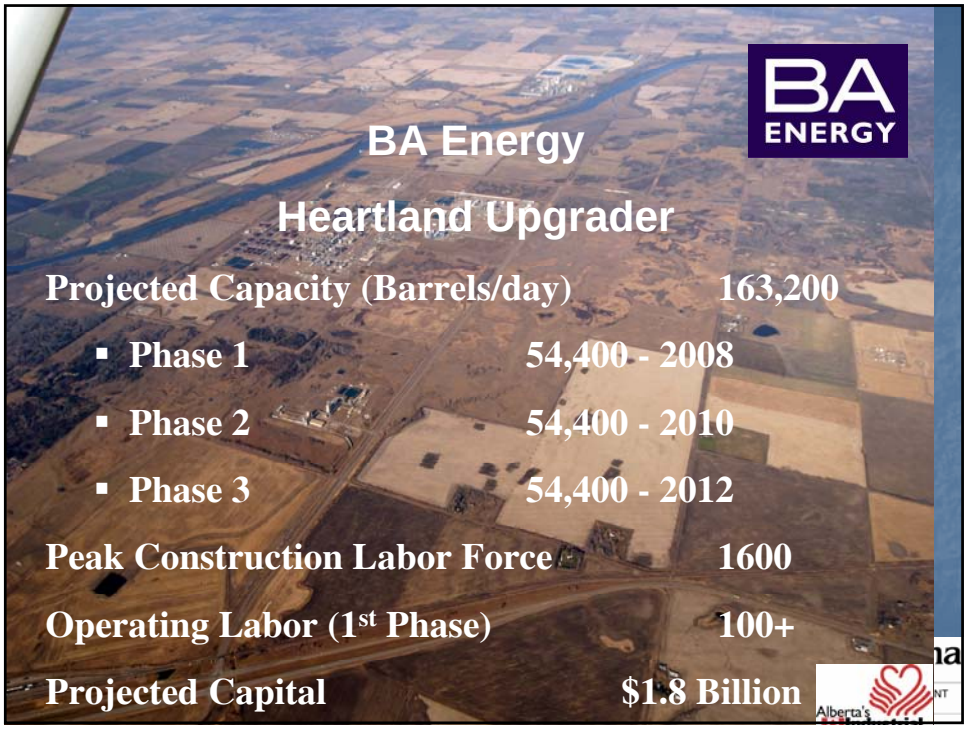
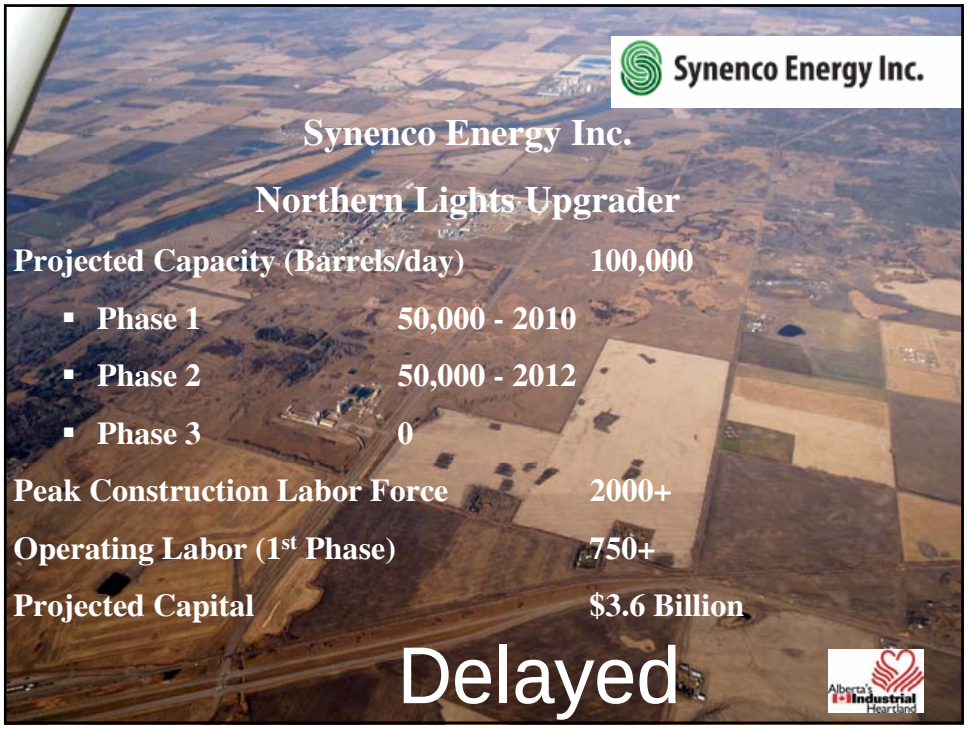

BA ENERGY
BA Energy
Heartland Upgrader
Projected Capacity (Barrels/day) 163,200
Phase 1 54,400 - 2008
Phase 2 54,400 - 2010
Phase 3 54,400 - 2012
Peak Construction Labor Force 1600
Operating Labor (1st Phase) 100+
Projected Capital $1.8 Billion

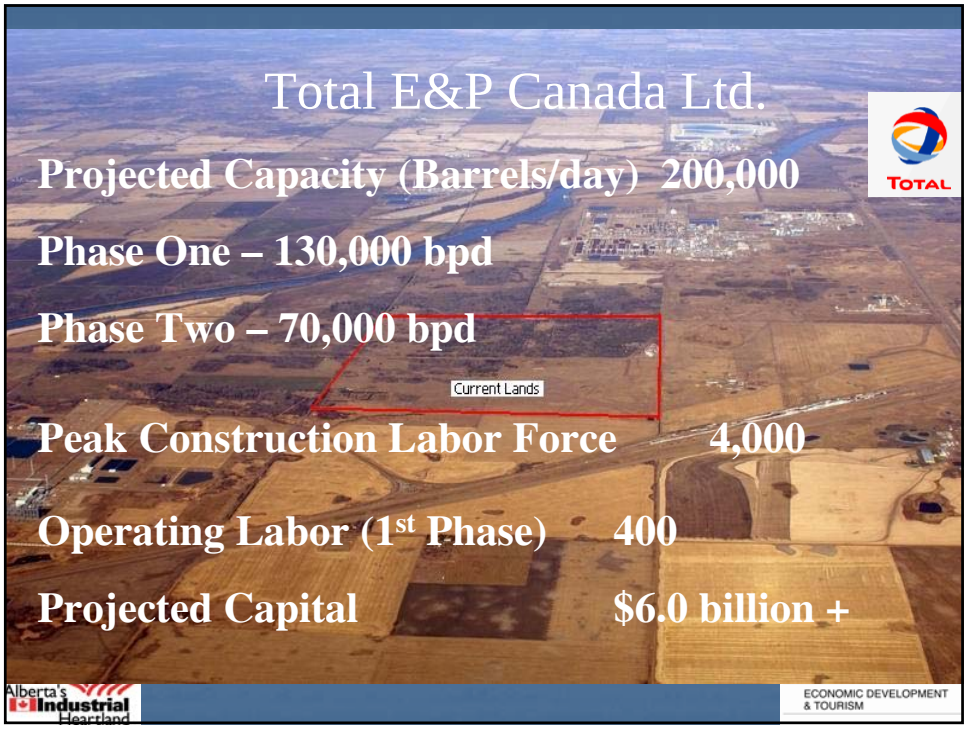

North West Upgrading
North West Upgrading
Projected Capacity (Barrels/day) 150,000
Phase 1 50,000 - 2010
Phase 2 50,000 - 2013
Phase 3 50,000 - 2016
Peak Construction Labor Force 2000
Operating Labor (1st Phase) 200+
Projected Capital $2.5 Billion


Petro-Canada
Sturgeon Fort Hills Upgrader
Projected Capacity (Barrels/day) 400,000
Phase 1 170,000 - 2011
Phase 2 200,000 - 2015
Phase 3 (as above)
Peak Construction Labor Force 6,000
Operating Labor (1st Phase) 500+
Projected Capital $6.0 Billion


Shell Canada Limited
Scotford Upgrader
Projected Capacity (Barrels/day) 290,000 (700,000)
Phase 1 155,000 - 2006
Phase 2 45,000 - 2008
Phase 3 90,000 - 2009
Peak Construction Labor Force 6000
Operating Labor (1st Phase) 175+
Projected Capital $12.8 Billion


Synenco Energy Inc.
Synenco Energy Inc.
Northern Lights Upgrader
Projected Capacity (Barrels/day) 100,000
Phase 1 50,000 - 2010
Phase 2 50,000 - 2012
Phase 3 0
Peak Construction Labor Force 2000+
Operating Labor (1st Phase) 750+
Projected Capital $3.6 Billion
Delayed
Alberta's Industrial Heartland


North American Oil Sands
NORTH AMERICAN OIL SANDS CORPORATION
STATOIL
Projected Capacity (Barrels/day) 250,000
Phase 1 70,000 - 2011
Phase 2 180,000 -2014
Peak Const Labor Force 2000-3000
Operating Labor (1st Phase) 300+
Projected Capital $4.0 Billion


Total E&P Canada Ltd.
Projected Capacity (Barrels/day) 200,000
Phase One – 130,000 bpd
Phase Two – 70,000 bpd
Current Lands
Peak Construction Labor Force 4,000
Operating Labor (1st Phase) 400
Projected Capital $6.0 billion +
TOTAL
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AIH Upgrader Summary
Total Projected Capacity (b/d) 1,463,000
Total Peak Construction Labor 2010-2012 20,100
Total 2012 $23 Billion

AIH Upgrader Summary

Company/Years	BPD	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BA Energy	163,200			54,400		54,400		54,400			
North West Upgrading	150,000					50,000		50,000			50,000
Petro-Canada	400,000						170,000				*230,000
Shell Scotford	290,000	*155,000		45,000	90,000			!!!			!!!
Synenco - Delayed	100,000					50,000		50,000			
North American Oil Sands	250,000						70,000				160,000
Total E & P –	200,000								130,000		200,00050,000

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OIL SANDS

Shell Canada's Project (AOSP)

Muskeg River Mine

Corridor Pipeline

Scotford Refinery

Scotford Upgrader

Strathcona

Shell Canada Limited

Growth

- Full-time operational positions nearly doubled to about 675 employees
- Approximately 100 long-term contractor positions created
- Reduced SO2 emissions despite a possible 90% increase in production

Strathcona

Shell Canada Limited

Growth

- $12.8-billion estimated cost for Phase One of the Muskeg River Mine and Upgrader Expansions
- About 60% of investment remains in Canada

Shell Canada Limited

Amount of Material Used in an Upgrader:

- Amount of cable - 2,375 km or nearly the distance from Vancouver to Toronto
- Amount of concrete - poured 62,500 m3 or amount used to pour a sidewalk from Edmonton to Ft. McMurray
- Amount of steel - 30,300 mt or enough to build railroad track from Toronto to Ottawa
- Number of piles 16,000 driven 20 meters into the ground

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Economic Impact

- $3 billion in taxes and royalties in the next 30 years
- Almost $300 million spent in Canada in 2004; $262 million spent within Alberta; $52 million spent within a 70 km radius of the Upgrader

Strathcona

Shell Canada Limited

Pipeline Project Update Proposed

Kinder Morgan (Terasen) Corridor Pipeline to Scotford

- Size 42” Capacity 500,000 bpd* to 1.3 million bpd * from existing 24” line.

Enbridge Waupisoo Pipeline

- Size 30” line capacity, 380 km. long 350,000 bpd* to 600,00 bpd*

Access Pipeline

- Size 30” line capacity

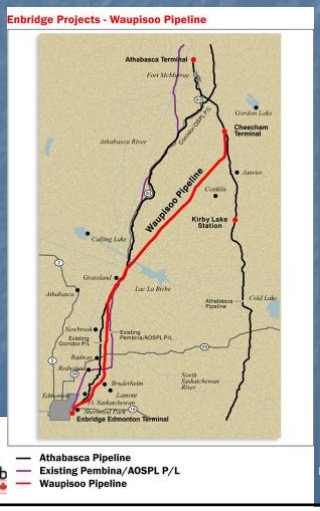
Gateway Pipeline

- From Metro Edmonton to Kitimat B.C. via 36” pipeline with capacity of 400,000 bpd* and a 24” condensate line

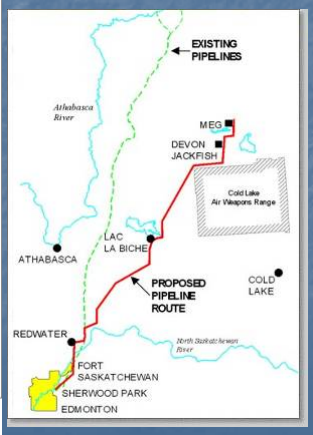
*Barrels per Day

Pipeline Locations

Kinder Morgan



Access Pipeline



Corridor Pipeline

ECONOMIC DEVELOPMENT & TOURISM

Economic Impacts of Oil Sands

<u>"Central Scenario" Findings</u>:

- Investment of just over $100 billion to 2020
- Increase in GDP of $885 billion
  - $789 billion in Canada; $96 billion in other countries
- Approximately 6.6 million person years of employment generated
  - 5.4 million in Canada; 1.1 million in other countries
- Total government revenue of $123 billion
  - Federal - $51 billion (41%)
  - Alberta - $44 billion (35%)
  - Others - $29 billion (24%)

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Massive opportunity

Capital Construction

- Assumption 100,000 bpd upgrader ~ $2 Billion CDN
- Equipment represents 70% of total cost = $1.400 Billion CDN

Pressure vessels, industrial furnaces, cooling towers/heat exchangers	**43% of $1.4 Billion $600 million CDN**
Instrumentation & control systems	**12% ~ $168 million CDN**
Pumps & gas compressors	**6% ~ $84 million CDN**
Engines	**2% ~ $28 million CDN**
Steel Pipe & Tube	**1% ~ $14 million CDN**
Valves	**1% ~ $14 million CDN**

~ $16 Billion of Equipment Requirement

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Massive opportunity

Operating Maintenance

- Existing upgraders (Provincial) = 4 (all expanding)
- Announced new projects = 8

Heartland Upgraders

- $23+ Billion new development plus existing
- Assume ongoing maintenance and repair ~ 2% annually

~$460 million per year

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Challenges

- Pace of development
  - Socio-economic impacts on communities
  - Skilled labour requirements
  - Integrated land management
- Economic viability
  - Operating costs – energy intensive industry
  - Energy input costs
- Funding for technological developments
- Environmental management
- Infrastructure and market access
- Competition with other jurisdictions

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Creation of New Energy Sources

- Ethonal uses as much energy input as it produces 100%
- Coal to liquids uses 60% energy inputs as it produces
- Gas to liquids uses 45% energy inputs as it produces
- Oilsands use 25% energy inputs as it produces

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CERI Report on Oil Sands Investment

"in CERI's relatively conservative base case scenario, investment of approximately $100 billion directly generates oil production worth about $570 billion—and in the process creates GDP increases of $885 billion, 6.6 million person years employment, and $123 billion of government revenues".

He also adds, *"these benefits are spread wide and far—Ontario, Quebec, other provinces, municipalities, and the various levels of government in Canada, as well as to other countries—and across many sectors of the economy".*

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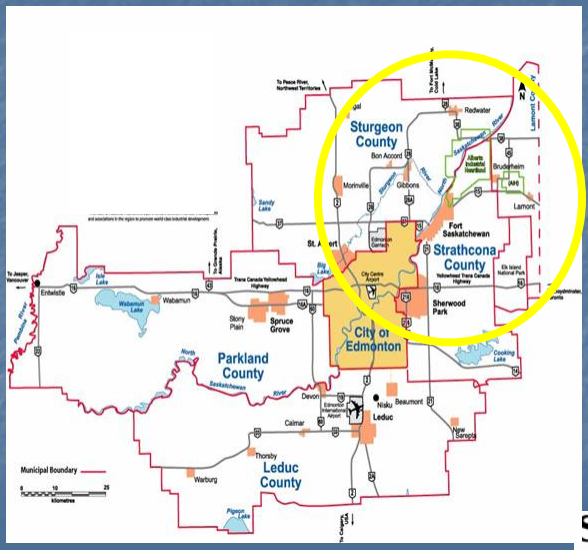
Metro Edmonton Location



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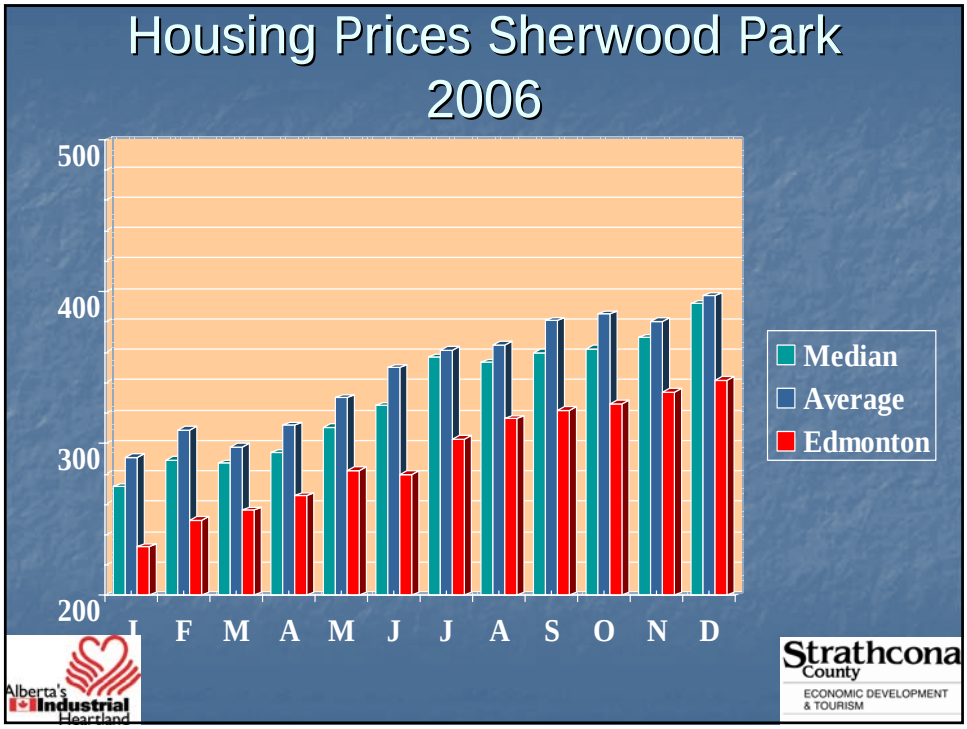
Housing Prices Sherwood Park
2006
500
400
300
200
J F M A M J J A S O N D
Median
Average
Edmonton
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Strathcona County
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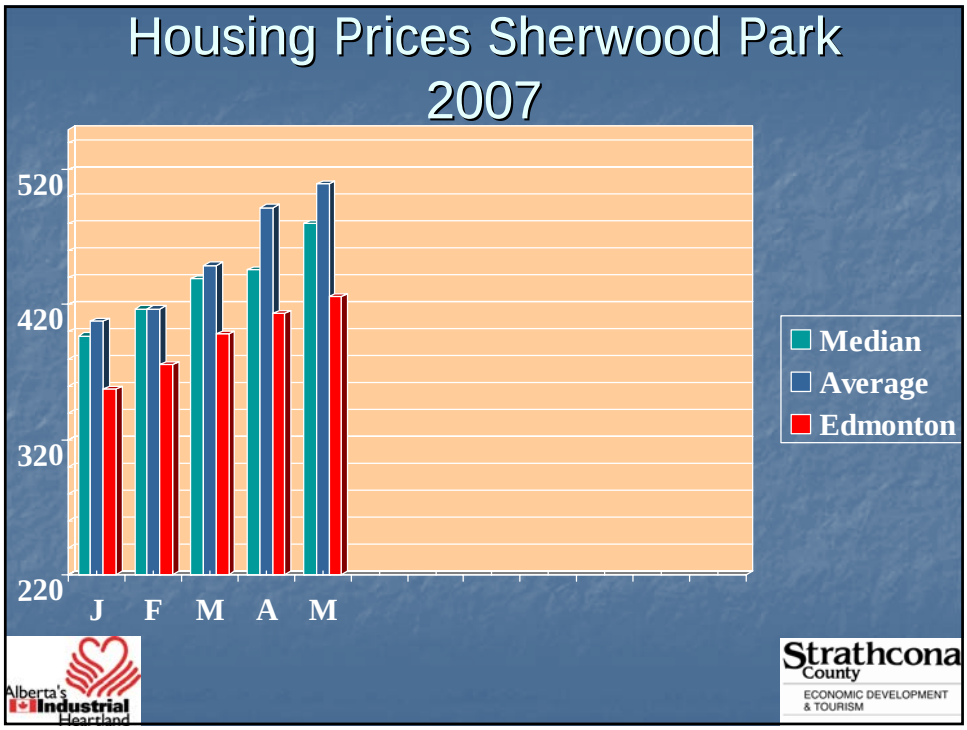
Housing Prices Sherwood Park
2007
520
420
320
220
J F M A M
Median
Average
Edmonton
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Strathcona County
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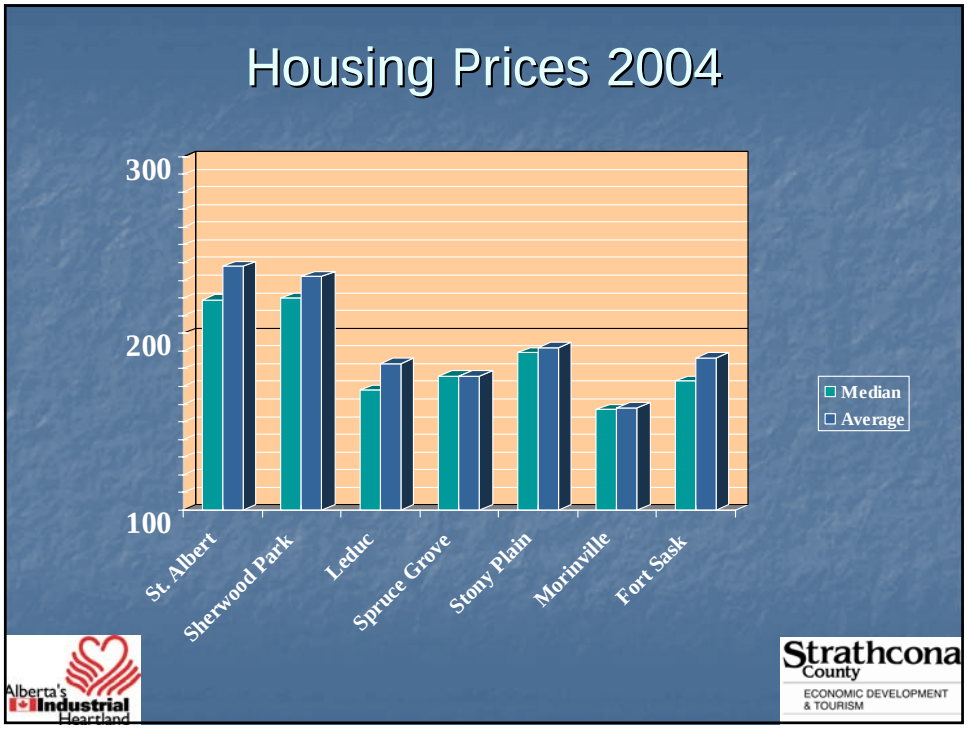
Housing Prices 2004
300
200
100
St. Albert
Sherwood Park
Leduc
Spruce Grove
Stony Plain
Morinville
Fort Sask
Median
Average
Alberta's Industrial Heartland
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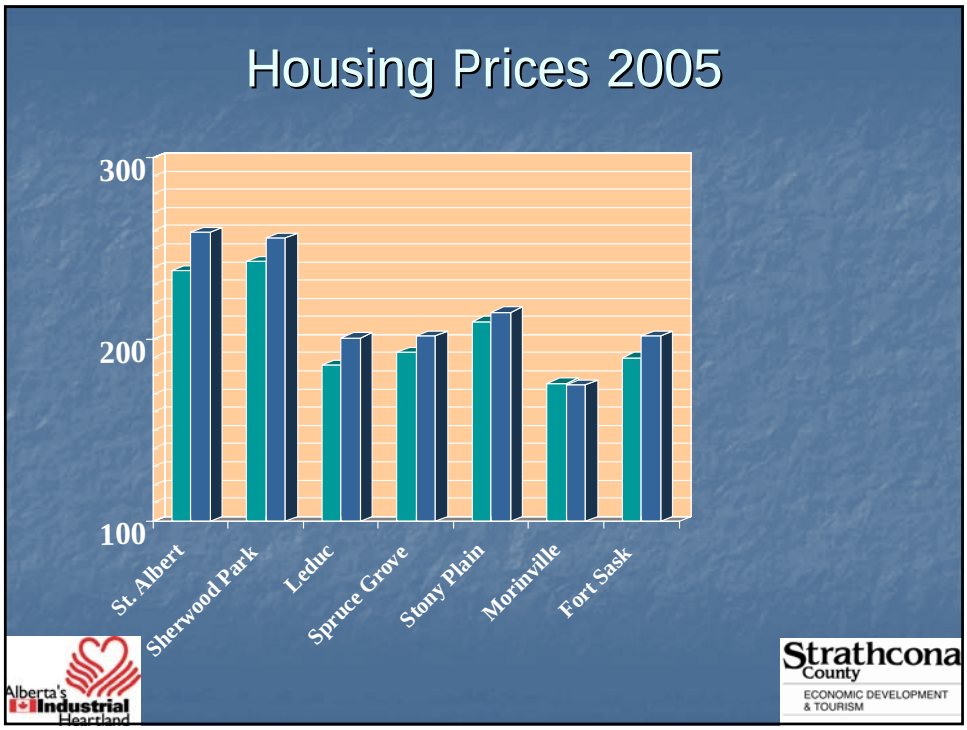
Housing Prices 2005
300
200
100
St. Albert
Sherwood Park
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Fort Sask
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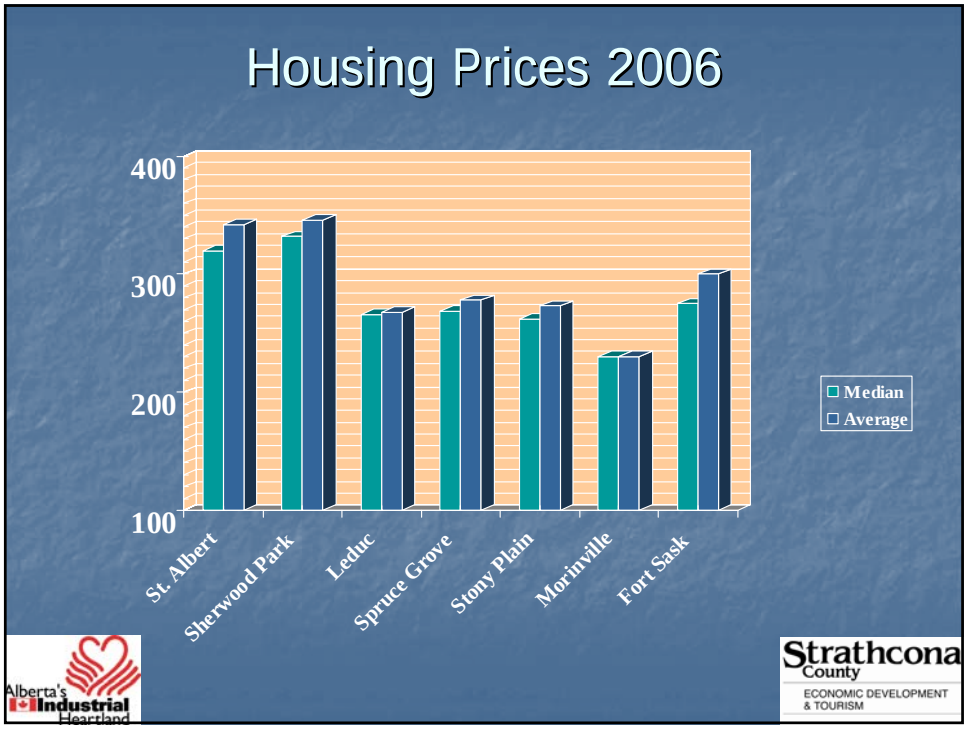
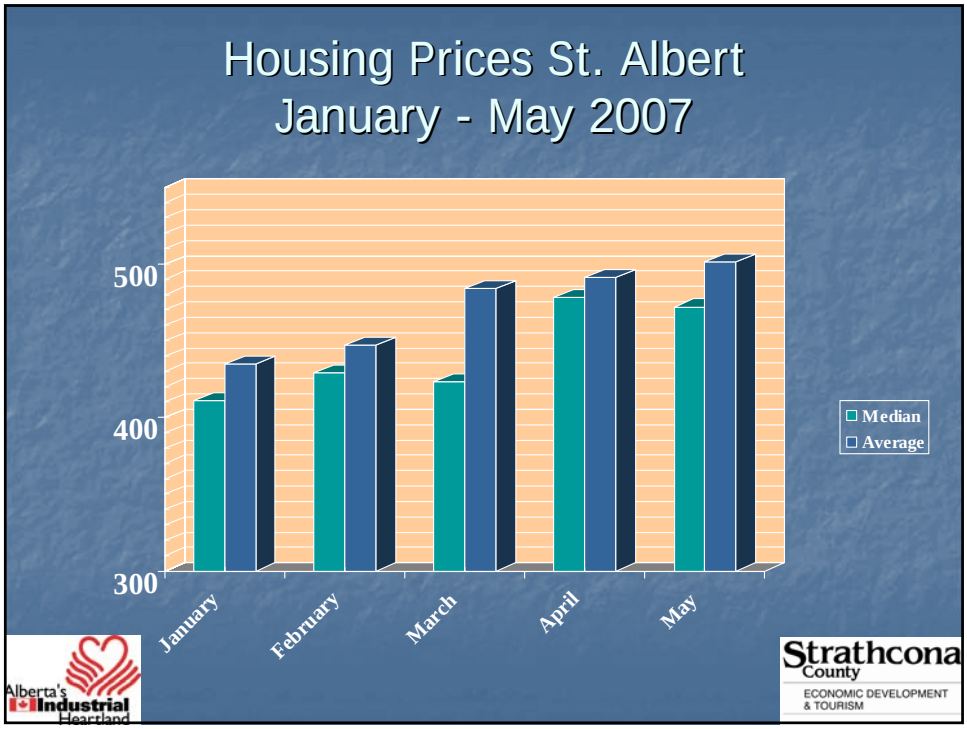
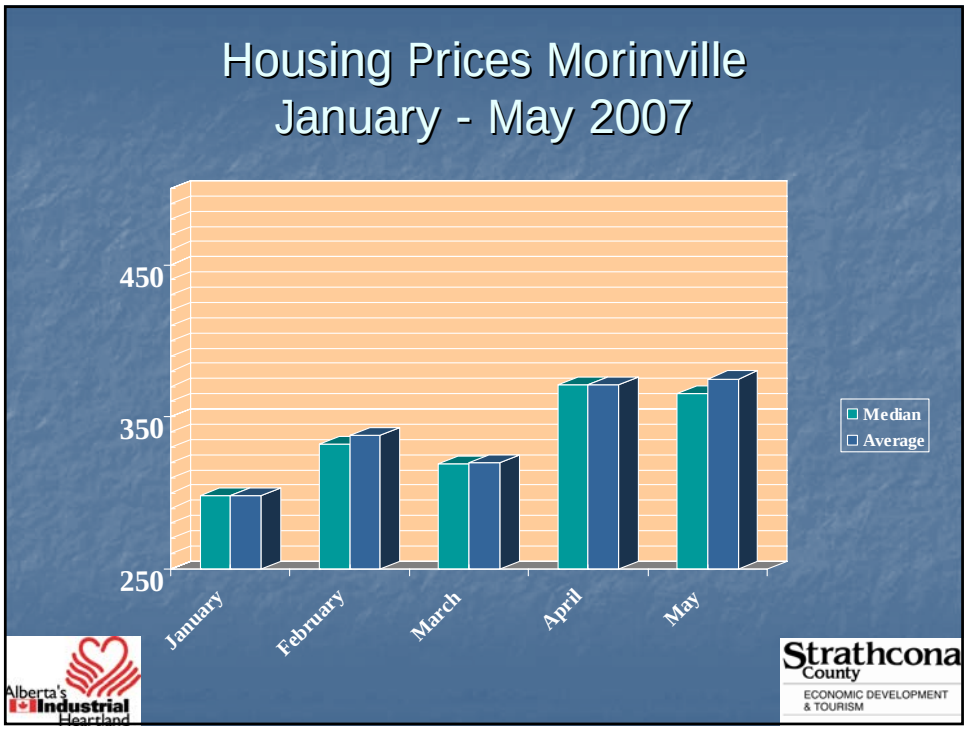
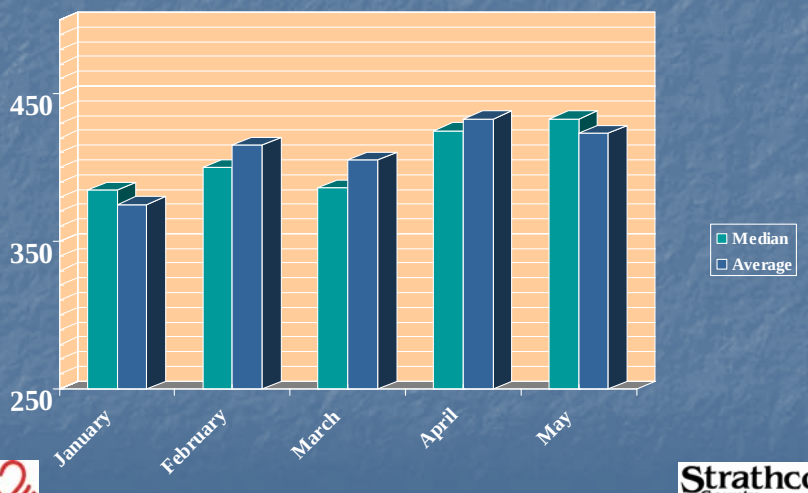

Housing Prices 2006
400
300
200
100
St. Albert
Sherwood Park
Leduc
Spruce Grove
Stony Plain
Morinville
Fort Sask
Median
Average
Alberta's Industrial Heartland
Strathcona County
ECONOMIC DEVELOPMENT & TOURISM


Housing Prices Sherwood Park
January - May 2007
500
400
300
January
February
March
April
May
Median
Average
Alberta's Industrial Heartland
Strathcona County
ECONOMIC DEVELOPMENT & TOURISM


Housing Prices St. Albert
January - May 2007
500
400
300
January
February
March
April
May
Median
Average
Alberta's Industrial Heartland
Strathcona County
ECONOMIC DEVELOPMENT & TOURISM


Housing Prices Morinville
January - May 2007
450
350
250
January
February
March
April
May
Median
Average
Alberta's Industrial Heartland
Strathcona County
ECONOMIC DEVELOPMENT & TOURISM

Housing Prices Fort Saskatchewan January - May 2007



Alberta's Industrial Heartland

Strathcona County
ECONOMIC DEVELOPMENT & TOURISM

Call to action:

- Based upon conservative estimates, there will be over 20,000 construction jobs within the next 8-10 years
- Based upon current data, there will be over 3,200 full time jobs after the upgraders are built
- There will be around 800-1000 permanent contractor jobs created around every upgrader
- It is estimated by Alberta EII that there are 4 other jobs created for every full time job created in the oilsands upgraders

Alberta's Industrial Heartland

Strathcona County
ECONOMIC DEVELOPMENT & TOURISM

Copy of Presentation?

Thank you for your attention. I will be providing this presentation to REIN for all interested groups.

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