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## Oil Sands Supply and Investment Outlook

### China-Canada Energy Cooperation Conference

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November 26, 2004

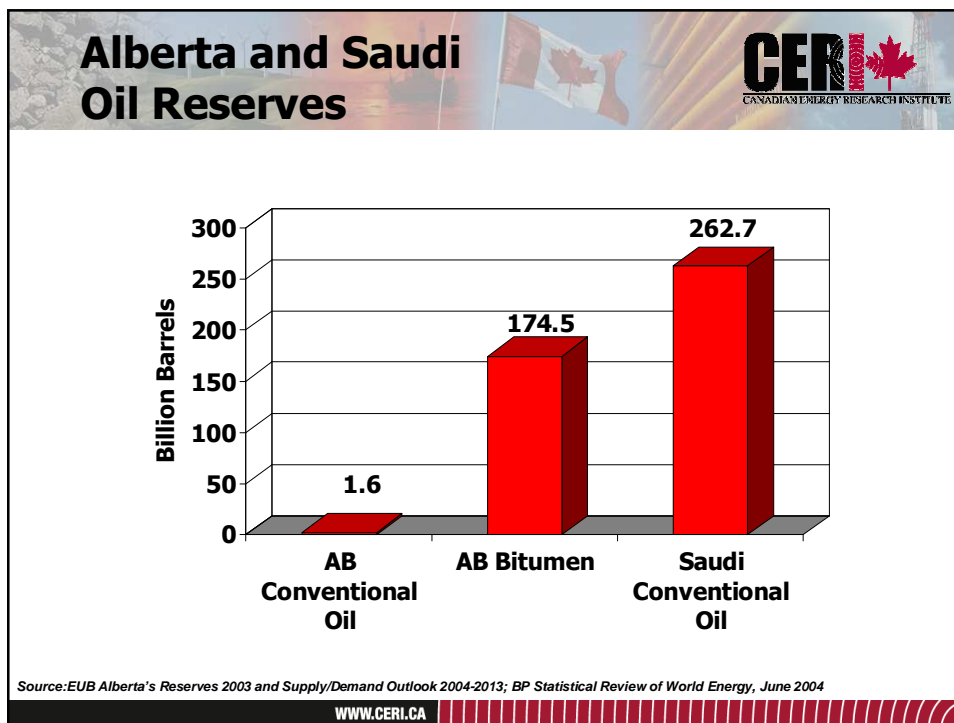
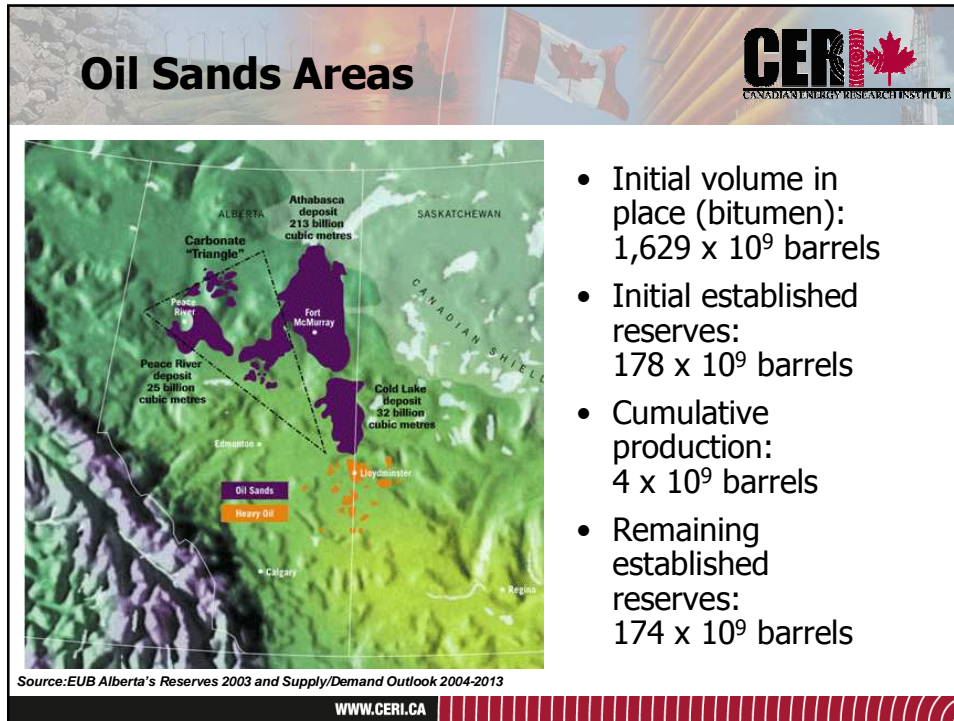
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## Presentation Outline




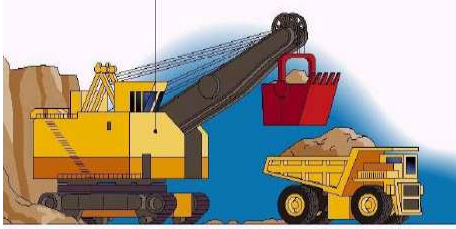
- Oil Sands Overview
  - Reserves
  - Current production
- Outlook
  - Economics
  - Supply projections
  - Capital spending expectations
- Energy Needs
- Conclusions

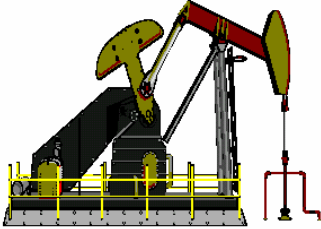
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## Resources and Reserves







Mineable Resources/Reserves

- < 75m depth to top of oil sands formation
- Athabasca only
- 7% of OBIP; 20% of initial established reserves; 70% of cumulative production


In Situ Resources/Reserves

- > 75m depth to top of oil sands formation
- Athabasca, CL and PR
- 93% of OBIP; 80% of initial established reserves; 30% of cumulative production

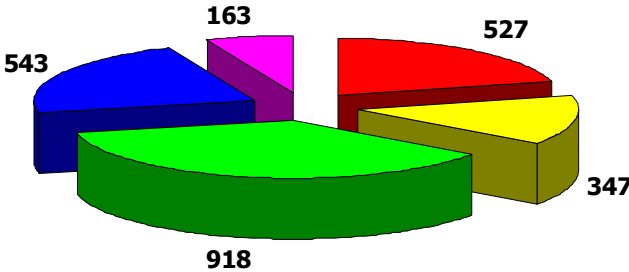
Source: EUB Alberta's Reserves 2003 and Supply/Demand Outlook 2004-2013

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## Canada's Oil Sands Industry



Alberta's Oil Sands provided 35% of Canada's "crude oil" production in 2003




Category	Value
Synthetic	543
Bitumen	163
Light	918
Heavy	527
Condensate	347

■ Synthetic ■ Bitumen ■ Light ■ Heavy ■ Condensate

Source: National Energy Board

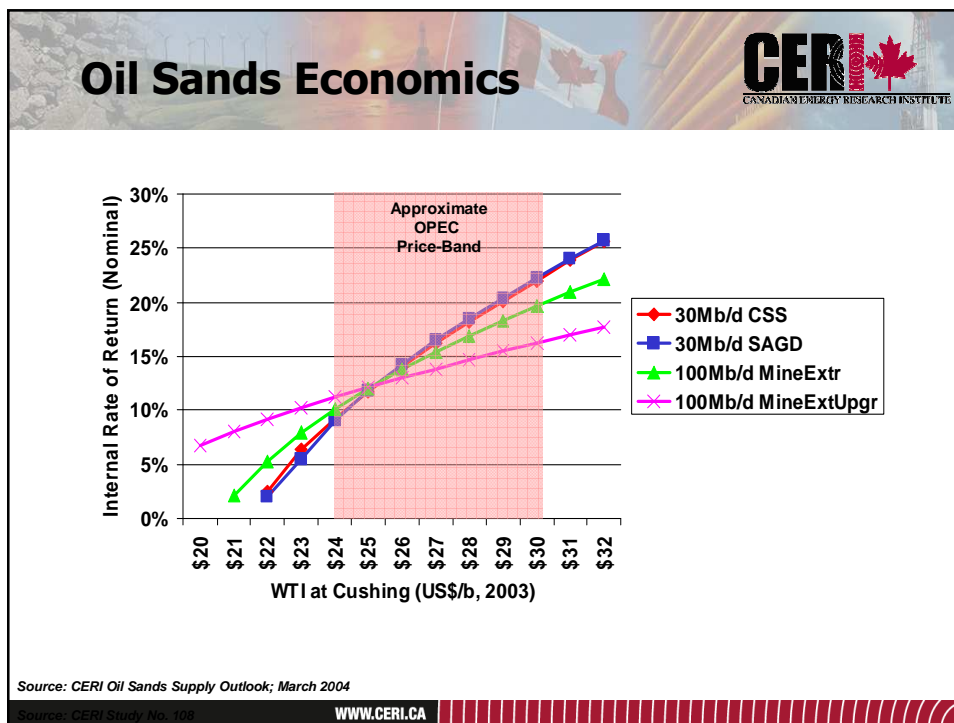
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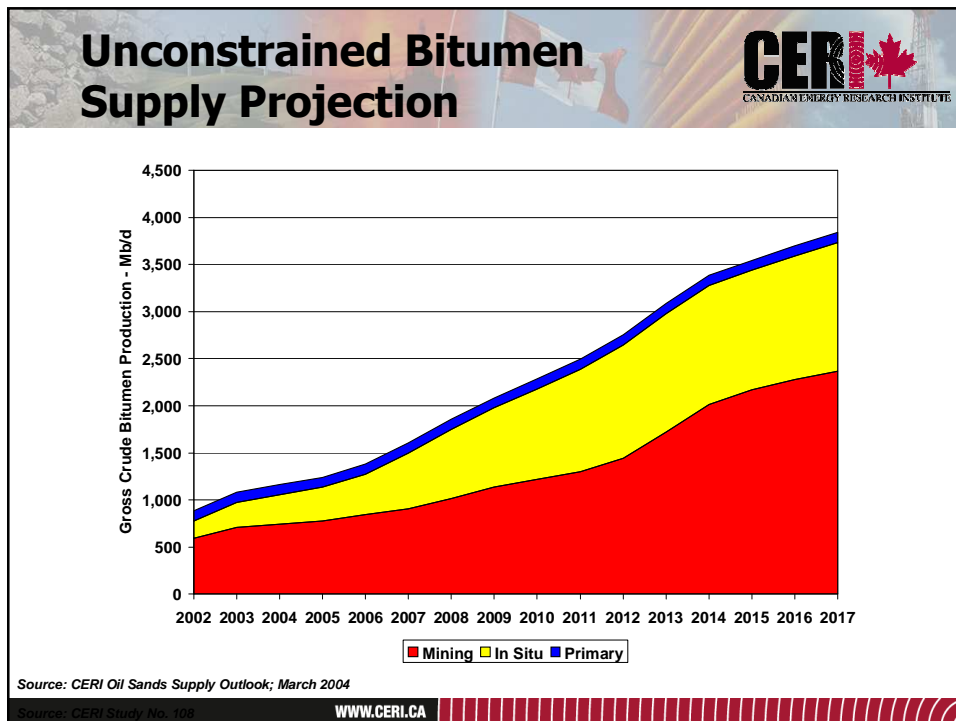
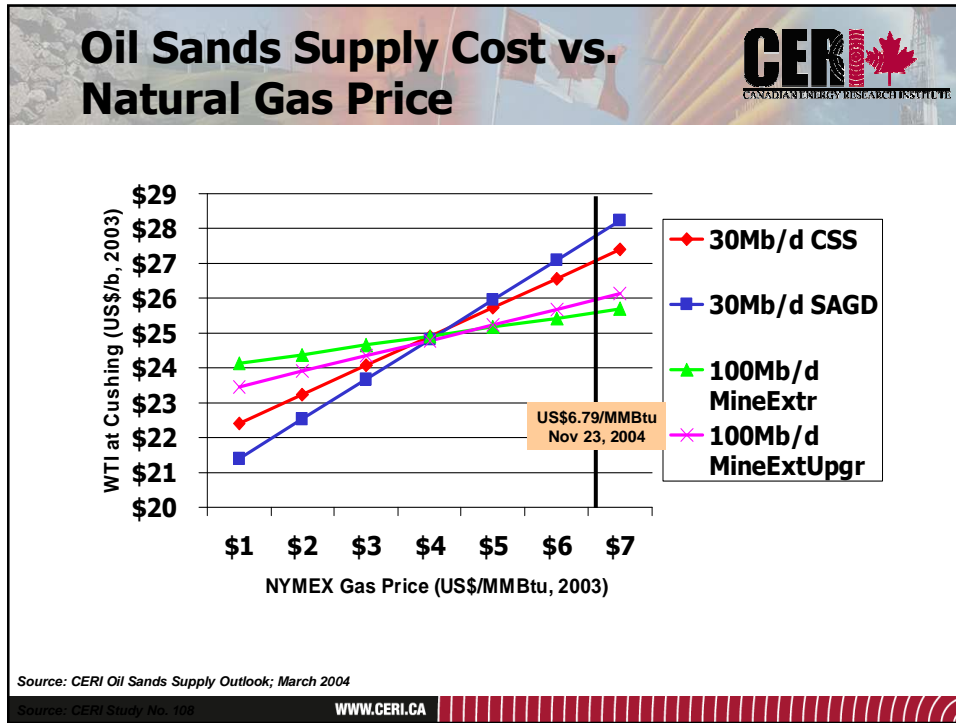
## CERI's Oil Sands Supply Outlook




- Oil Sands Supply Outlook
  - Potential Supply and Costs of Crude Bitumen and Synthetic Crude Oil in Canada, 2003 - 2017
- CERI Study No. 108
- Released March 3, 2004

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## Oil Sands Expenditures



Initial Capital (C\$ 2003)

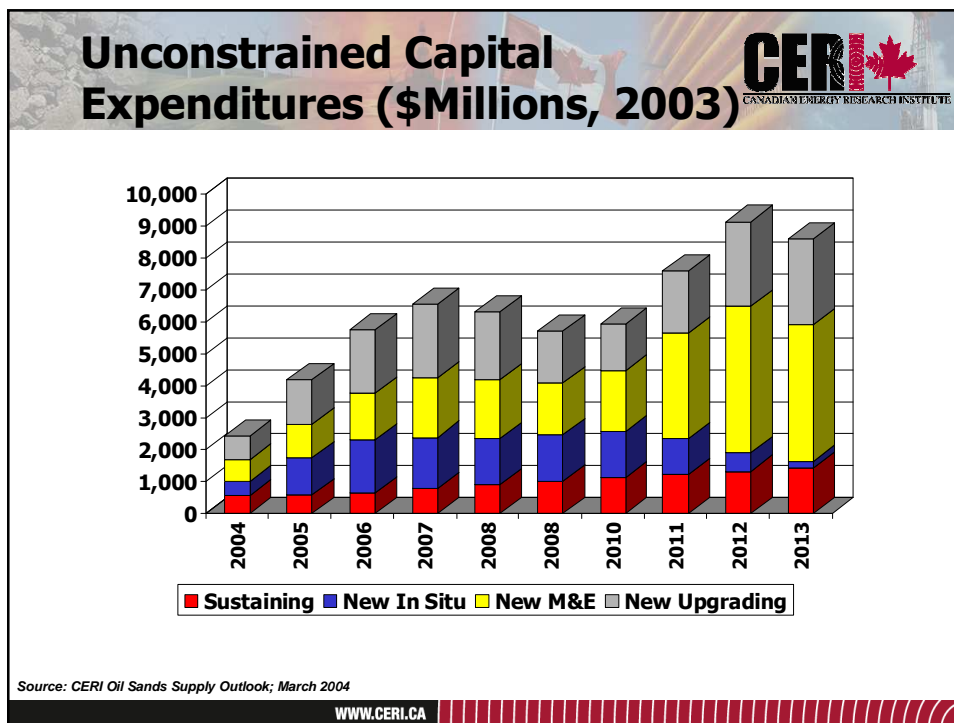
- Athabasca SAGD \$12,100 per b/d
- Cold lake CSS \$19,100 per b/d
- Athabasca Mining & Extraction \$18,000 per b/d
- Athabasca Mining, Extraction & Upgrading \$36,000 per b/d

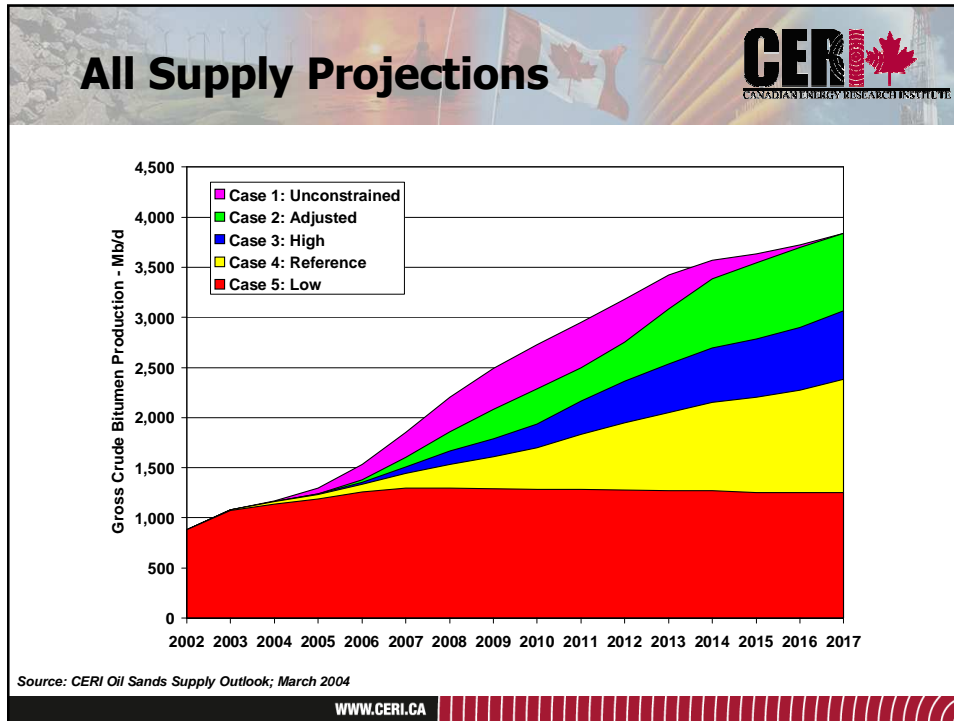
Operating Costs (C\$ 2003)\*

- Athabasca SAGD \$7.90 per barrel
- Cold lake CSS \$7.63 per barrel
- Athabasca Mining & Extraction \$6.23 per barrel
- Athabasca Mining, Extraction & Upgrading \$12.95 per barrel

\* Natural gas C\$4.74/GJ, Electricity C\$40/MWh

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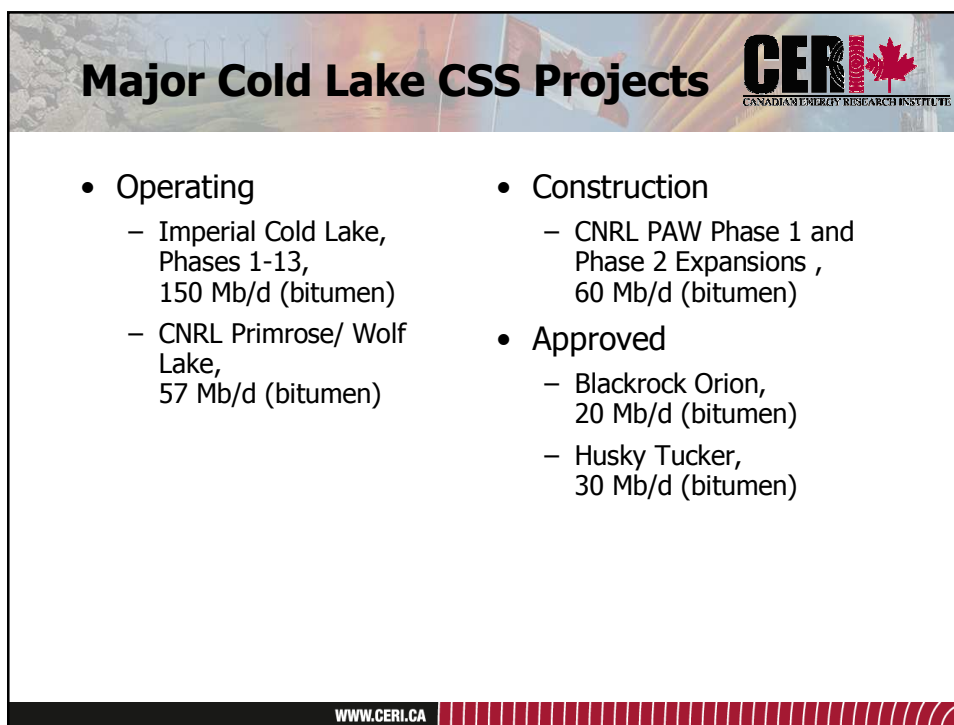
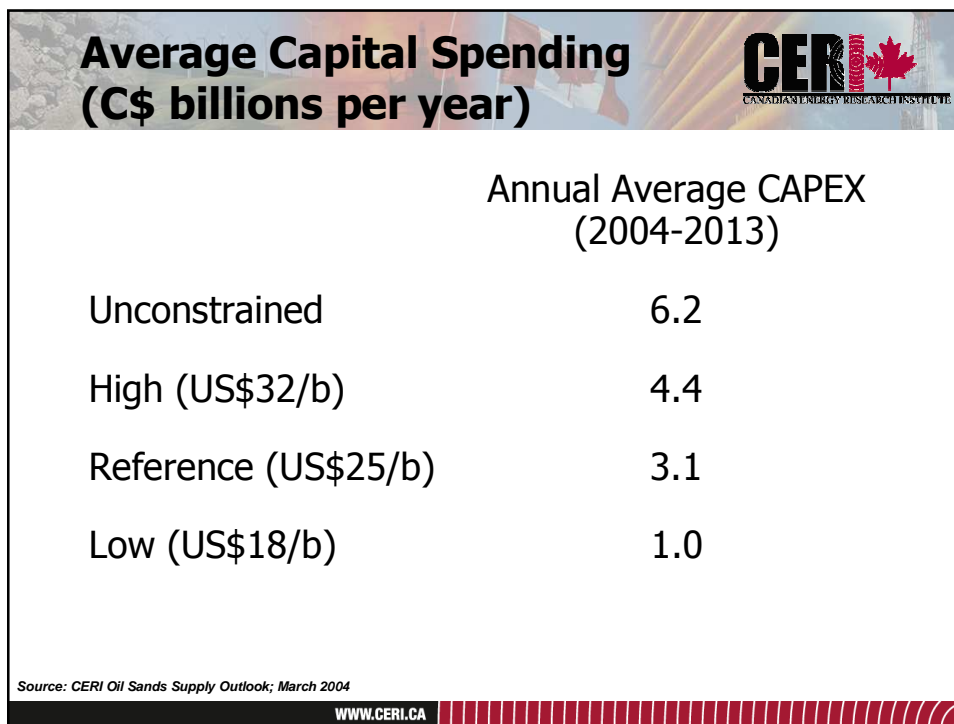
### Supply Outlook in 2017 (million b/d)

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CANADIAN ENERGY RESEARCH INSTITUTE

	SCO	Bitumen	Total
Unconstrained	2.0	1.5	3.5
High (US\$32/b)	1.6	1.2	2.8
Reference (US\$25/b)	1.3	0.9	2.2
Low (US\$18/b)	0.8	0.3	1.1

Source: CERI Oil Sands Supply Outlook; March 2004

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## Major Athabasca SAGD Projects



- Operating
  - EnCana Christina Lake, 10 Mb/d (bitumen)
  - EnCana Foster Creek, 30 Mb/d (bitumen)
  - JACOS Hangingstone, 10 Mb/d (bitumen)
  - Petro-Canada Mackay River, 30 Mb/d (bitumen)
  - Suncor Firebag Phase 1, 35 Mb/d (bitumen)
- Construction
  - Suncor Firebag Phase 2, 35 Mb/d (bitumen)
  - OPTI/Nexen Long Lake, 70 Mb/d (bitumen)
  - ConocoPhillips Surmont Phase 1, 25 Mb/d (bitumen)
- Approved
  - Suncor Firebag Phases 3-4, 70 Mb/d (bitumen)
  - ConocoPhillips Surmont Phases 1-3, 75 Mb/d (bitumen)
  - Petro-Canada Meadow Creek, 80 Mb/d (bitumen)

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## Mining Projects



- Operating
  - Suncor - 225 Mb/d (SCO)
  - Syncrude - 260 Mb/d (SCO)
  - AOSP (Muskeg River) - 155 Mb/d (bitumen)
- Under Construction
  - Syncrude Stage 3 - 110 Mb/d (SCO)
- Approved
  - True North (Fort Hills) - 190 Mb/d (bitumen)
  - CNRL (Horizon) - 233 Mb/d (SCO)
  - AOSP (Jackpine) - 200 Mb/d (bitumen)
- Others are in various stages of the regulatory process

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## Canadian Upgraders



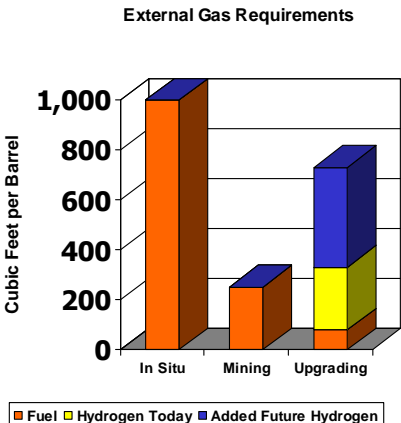
- Integrated Upgraders
  - Suncor
  - Syncrude
  - AOSP (Scotford)
- Standalone Upgraders
  - Husky (Lloydminster)
  - Federated Co-op (Regina)
- Standalone Upgrader Proposals
  - BA Energy (Strathcona)
  - Northwest Upgrading (Strathcona)

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## Oil Sands External Natural Gas Requirements



External Gas Requirements

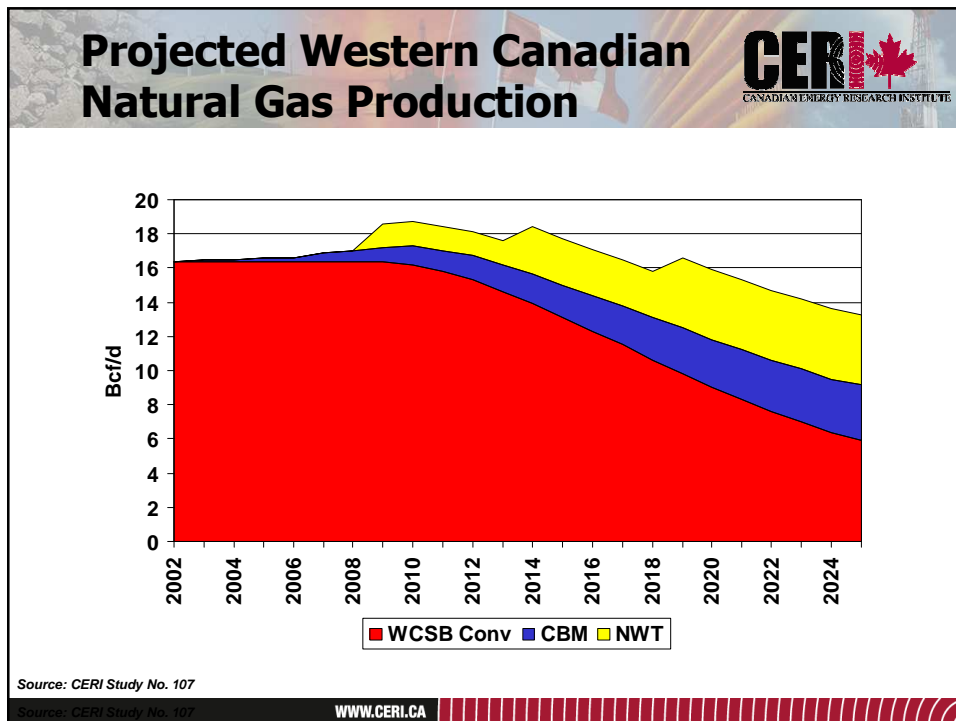
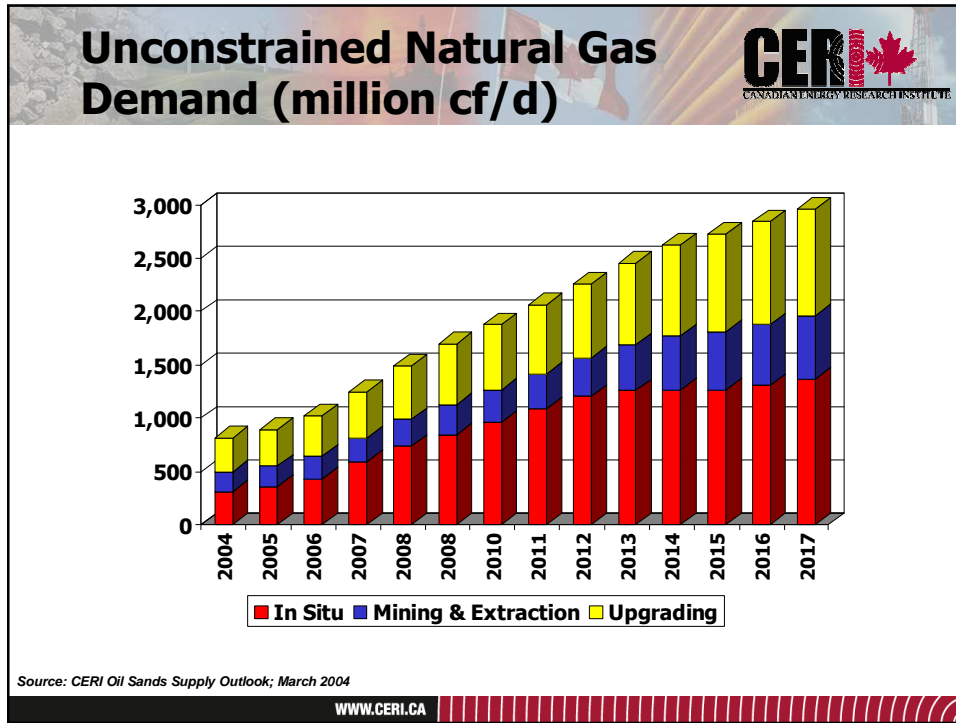


Process	Fuel	Hydrogen Today	Added Future Hydrogen
In Situ	~1000	0	0
Mining	~250	0	0
Upgrading	~100	~250	~450

Source: Oil Sands Technology Roadmap

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- Thermal in situ projects are very large energy consumers – Gas use depends on recovery performance
- Gas use for upgrading is higher for production of higher quality synthetic crude oil



## Implications



- The oil sands industry is competing for supply with other North American natural gas consumers
- Strong demand for North American natural gas and supply shortages will sustain current high natural gas prices
- High prices are providing incentives for:
  - Further industry efficiency improvements
  - Development of new recovery technologies
  - Examination of alternative fuels

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## CERI Oil Sands Supply Outlook - Conclusions



- Alberta's oil sands industry has a very robust future given a reasonable outlook for crude oil prices
  - The industry needs crude oil prices of US\$25/b (2003 real, WTI at Cushing) to recover costs and earn an adequate return on investment
  - The industry faces many challenges that must be overcome for sustained growth
  - Many projects will proceed, others will not

Source: CERI Oil Sands Supply Outlook; March 2004

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