


**Presentation Outline**



**• Introduction to Canada's Oil Sands**

**• CERI's 2004 Oil Sands Industry Outlook**

**• Updated Oil Sands Supply Costs**

- Thermal In Situ Projects
- Mining and Bitumen Extraction
- Mining, Extraction and Upgrading

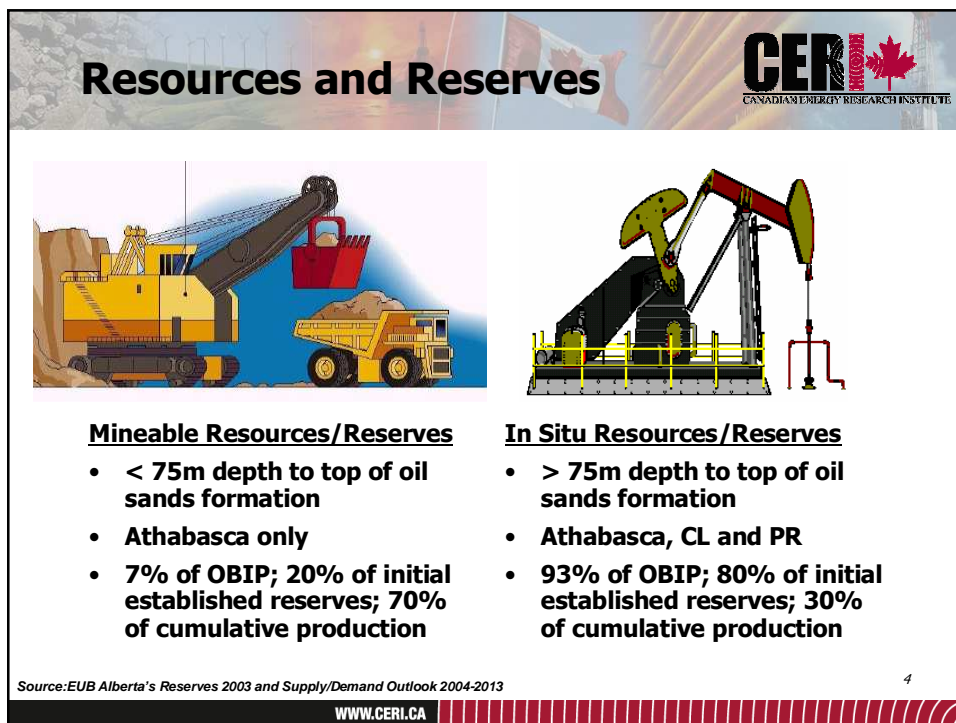
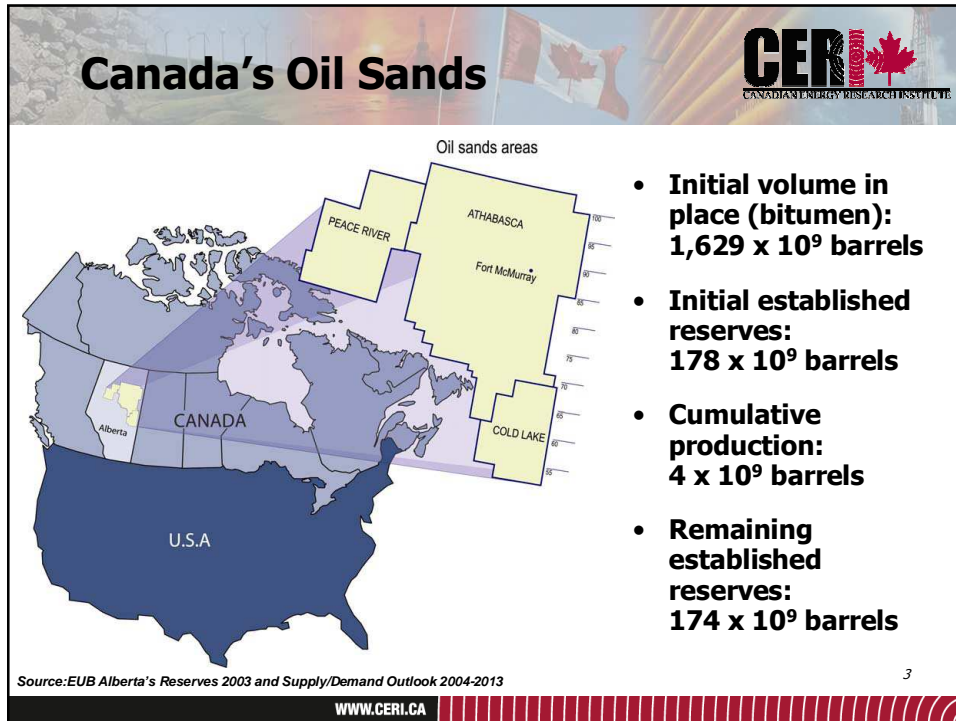
**• Updated Oil Sands Supply Projection**

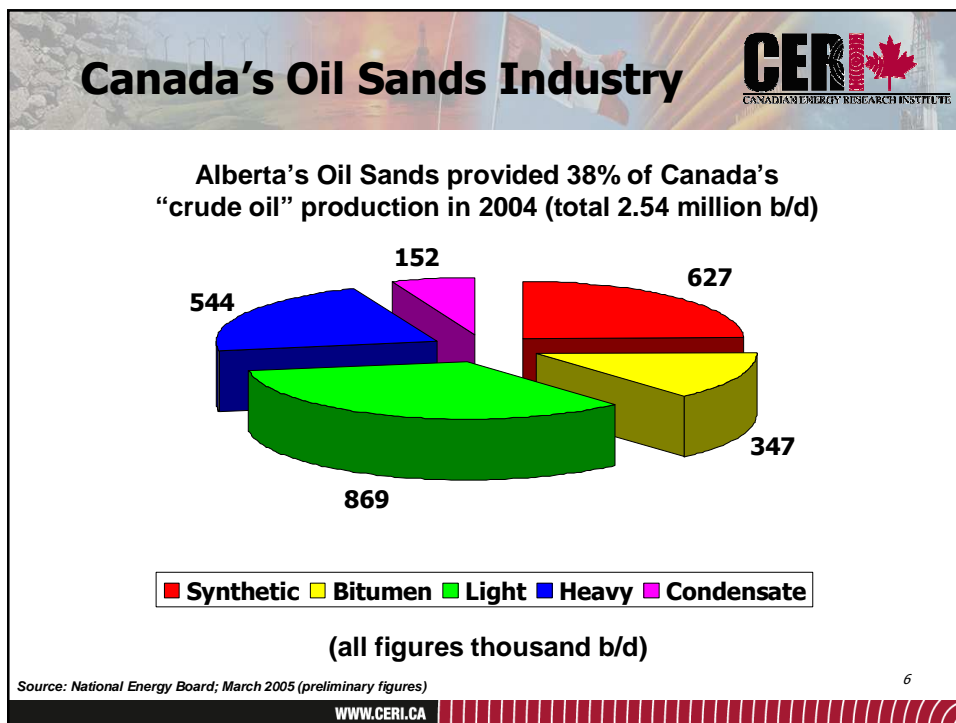
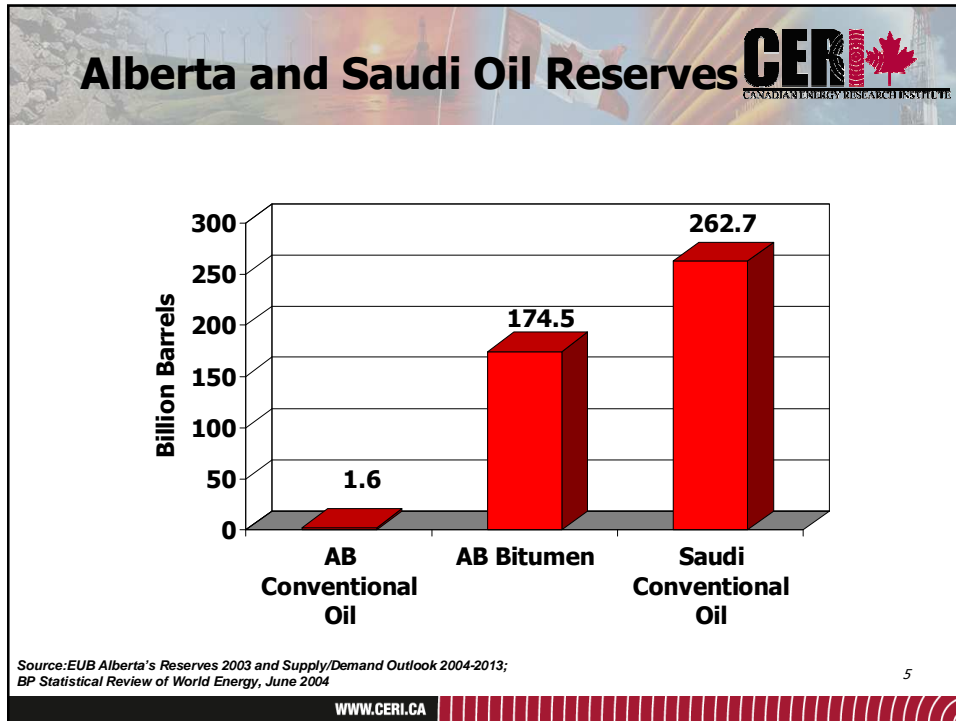
- Potential Production
- Expected Case

**• Conclusions**


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## CERI's March 2004 Oil Sands Industry 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
- **SCO and non-upgraded crude bitumen production is expected to reach 2.2 million b/d by 2017**



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## What has changed?



**For Better:**  Light Oil Prices

**For Worse:**  H/L Differentials       Natural Gas Prices

 Exchange Rate       Project Costs

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## Supply Cost



- **Supply Cost is the constant dollar price needed to recover all capital expenditures, operating costs, royalties and taxes and earn a specified return on investment**
- **For the CERl study, supply costs are calculated:**
  - In constant 2004 dollars
  - using a discount rate of 10%/a (real) - equivalent to a discount rate of 12%/a (nominal) based on an inflation rate of 2%/a
  - For hypothetical standalone projects
    - No flow-through of taxable losses
    - No expansion uplifts

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Source: CERl Study No. 108

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## Supply Cost Assumptions




<u>Economic Assumptions</u>	<u>2004 Study</u>	<u>2005 Study</u>
Exchange Rate (US\$/C\$)	0.75	0.80
<u>Energy Costs</u>		
NYMEX Natural Gas (US\$/MMBtu)	\$4.25	\$6.00
NYMEX - AECO Basis (US\$/MMBtu)	\$0.50	\$0.60
Plant Gate Natural Gas (C\$/GJ)	\$4.74	\$6.40
Plant Gate Electricity (C\$/MWh)	\$40.00	\$50.00
<u>Differentials (US\$/b)</u>		
MSW at Edmonton – Dilbit at Hardisty	\$7.00	\$10.00
MSW – SCO at Edmonton	\$1.00	\$0.00
WTI at Cushing – MSW at Edmonton	\$0.81	\$1.00
Condensate Premium over MSW at Edmonton	5%	5%

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## Capital and Operating Costs



<u>Initial Capital (C\$/b/d)</u>	<u>2004 Study</u>	<u>2005 Study</u>
CHOPS	\$4,700	\$4,750
Cold Lake CSS	\$19,100	\$23,700
Athabasca SAGD	\$12,100	\$15,000
Athabasca M&E	\$18,000	\$17,800
Athabasca ME&U	\$36,000	\$45,600

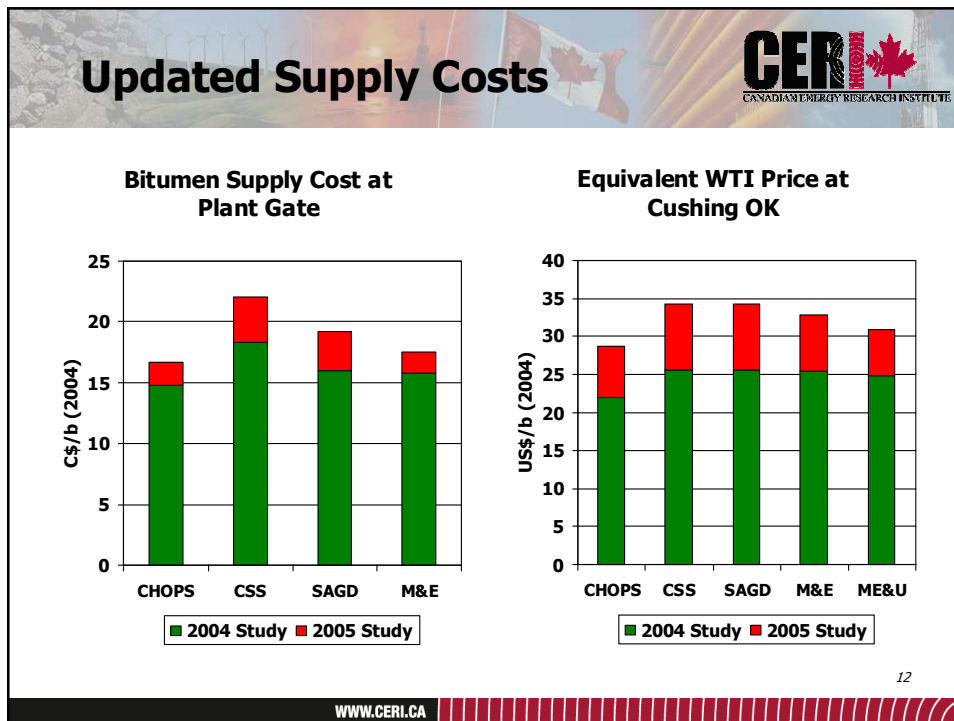
  

<u>Unit Operating Costs (C\$/b)*</u>	<u>2004 Study</u>	<u>2005 Study</u>
CHOPS	\$7.85	\$8.50
Cold Lake CSS	\$7.63	\$9.47
Athabasca SAGD	\$7.90	\$9.79
Athabasca M&E	\$6.23	\$8.47
Athabasca ME&U	\$12.95	\$15.36

\* Including Energy and Abandonment Costs

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<b>Mining Projects</b>		
<b>(kb/d)</b>	<b>2005</b>	<b>2015*</b>
<b>Athabasca</b>		
Suncor (SCO)	225	260
Syncrude (SCO)	250	550
AOSP (Bitumen)	155	575
CNRL Horizon (SCO)	-	230
Petro-Canada/UTS (Bitumen)	-	200
Imperial/Exxon (Bitumen)	-	200
Synenco (SCO)	-	100
Deer Creek (Bitumen)	-	100
<b>Totals</b>	<b>630</b>	<b>2,215</b>

\* Based on regulatory applications, disclosures and company announcements

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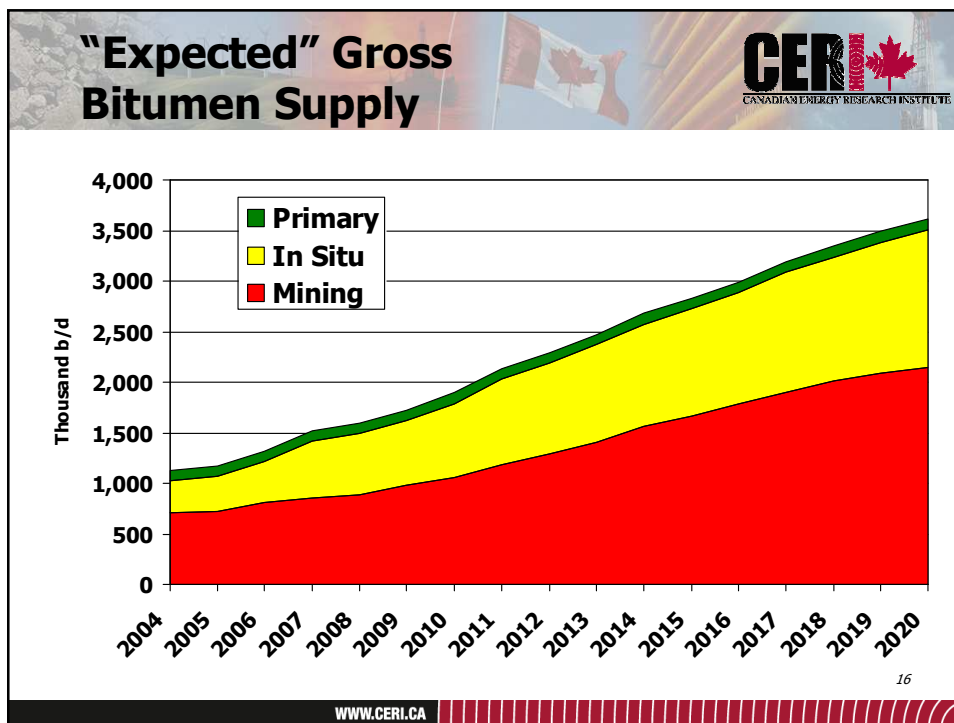
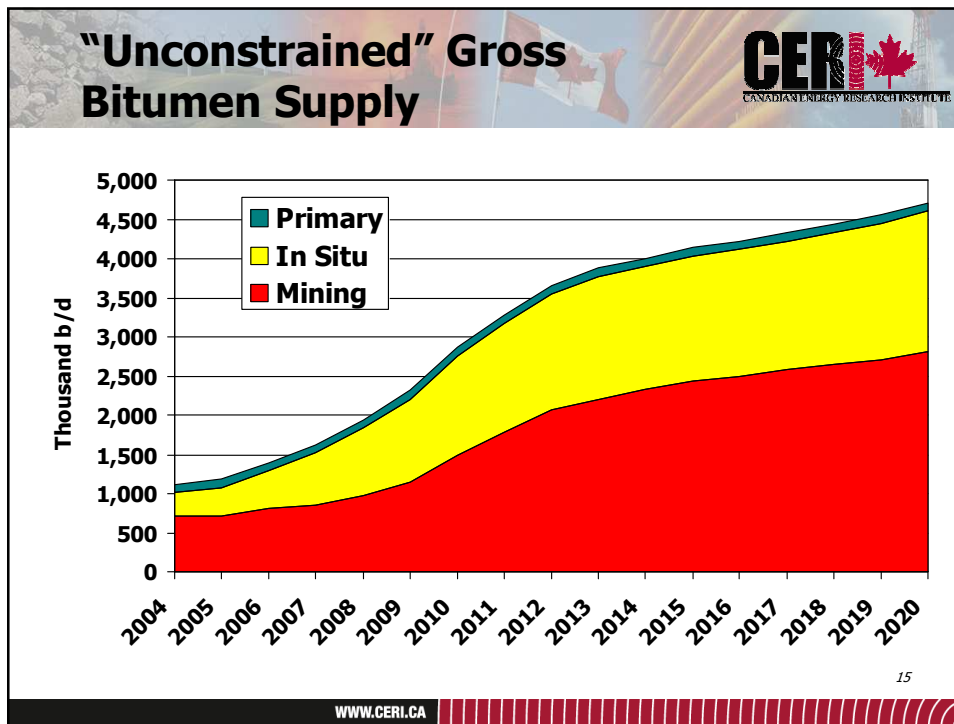
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<b>100+ kb/d In Situ Projects</b>		
<b>(kb/d bitumen)</b>	<b>2005</b>	<b>2015*</b>
<b>Athabasca</b>		
EnCana Foster Creek	33	130
Suncor Firebag	33	375
Nexen Long Lake	3	140
ConocoPhillips Surmont	-	100
Husky Sunrise	-	200
<b>Cold Lake</b>		
Imperial Cold Lake	140	170
CNRL Primrose & Wolf Lake	56	115
<b>Total</b>	<b>265</b>	<b>1,230</b>

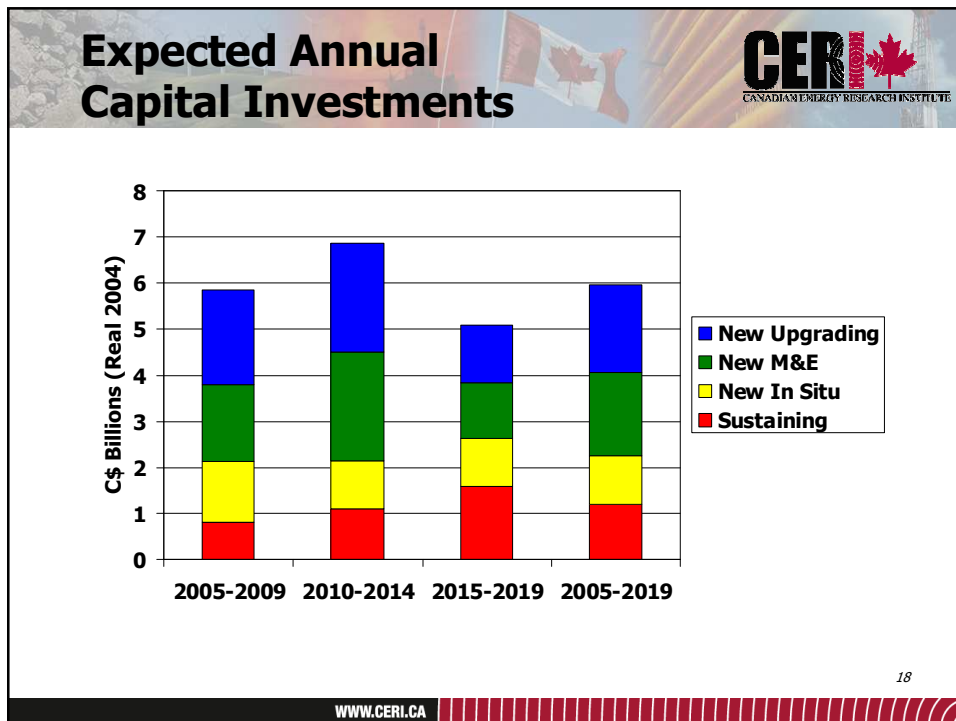
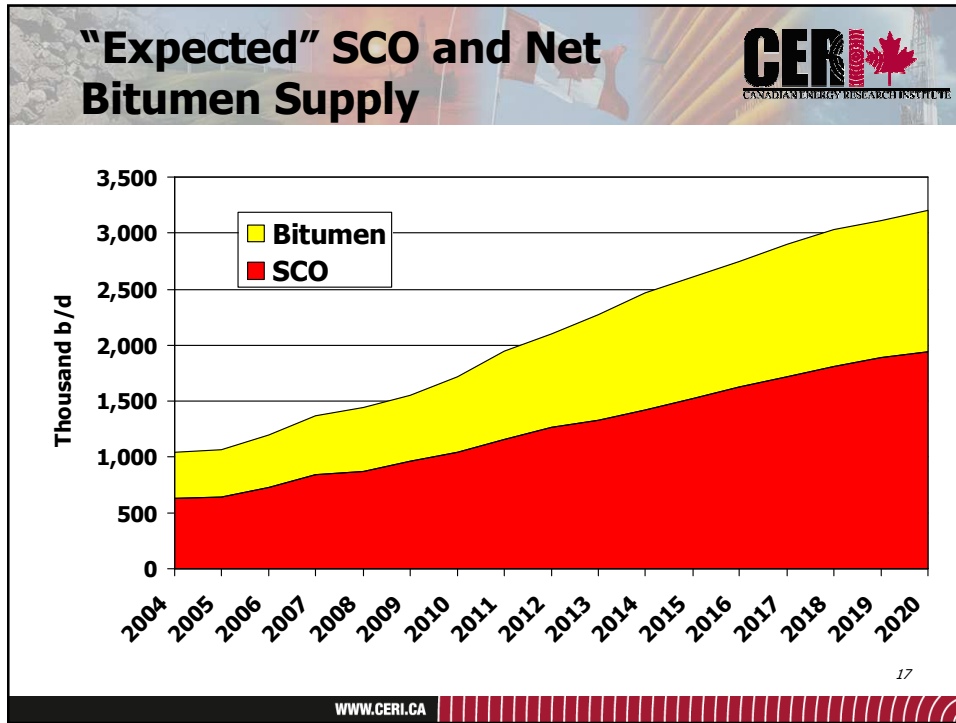
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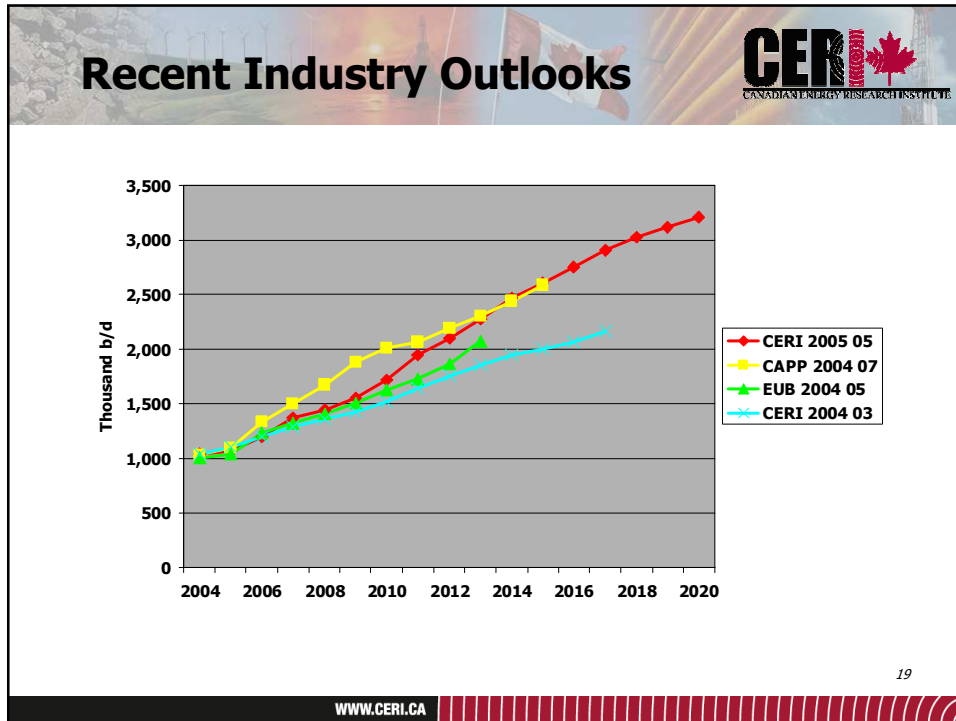
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- ## Conclusions
- **Canada's oil sands are one of the world's largest hydrocarbon accumulations**
  - **The industry is well developed and growing rapidly**
  - **Oil sands projects are economically attractive at about US\$30/b WTI**
  - **Production of synthetic crude oil and unprocessed crude bitumen is expected to reach 2.6 million b/d by 2015 and 3.2 million b/d by 2020**
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## Acknowledgements



- **Canadian Energy Research Institute**
- **CERI's Oil Sands Cogeneration Project Team**
  - **Luke Chan**
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  - **Nicole LeBlanc**
  - **David McColl**

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## Cogeneration Opportunities for Oil Sands Projects



### Objectives:

- **Assess the current status of oil sands development and associated cogeneration development to 2020**
- **Review cogeneration technologies and the costs and benefits associated with the different technologies**
- **Investigate the economic viability of cogeneration within the constraints imposed by economic, market, infrastructure and technological issues**
- **Provide a vision of oil sands and cogeneration development beyond 2020**

### Status:

- **Part I - April 1; Part II - May 16; Part III - July 8; Part IV - September 16, Part V - November 14**

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## The Economic Impact of Alberta's Oil Sands Industry



### Objectives:

- Analyze the impact of oil sands development on Alberta's economy: i.e., GDP, employment, household income and government revenue
- Estimate local and regional impacts
- Assess the impact of this development on the economies of Ontario, Quebec, and the rest of Canada

### Status:

- Final Report - May 27

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**Thank you**

**Questions?**

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