



# *The Future of the Alberta Oil Sands*

**Presentation by**

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**President and C.O.O., Syncrude Canada Ltd.**

**To Alberta Science and Research Authority**

**June 7, 2002**

**Syncrude**

Securing Canada's Energy Future

# Canada's Oil Sands



*... a strategic resource for North America*

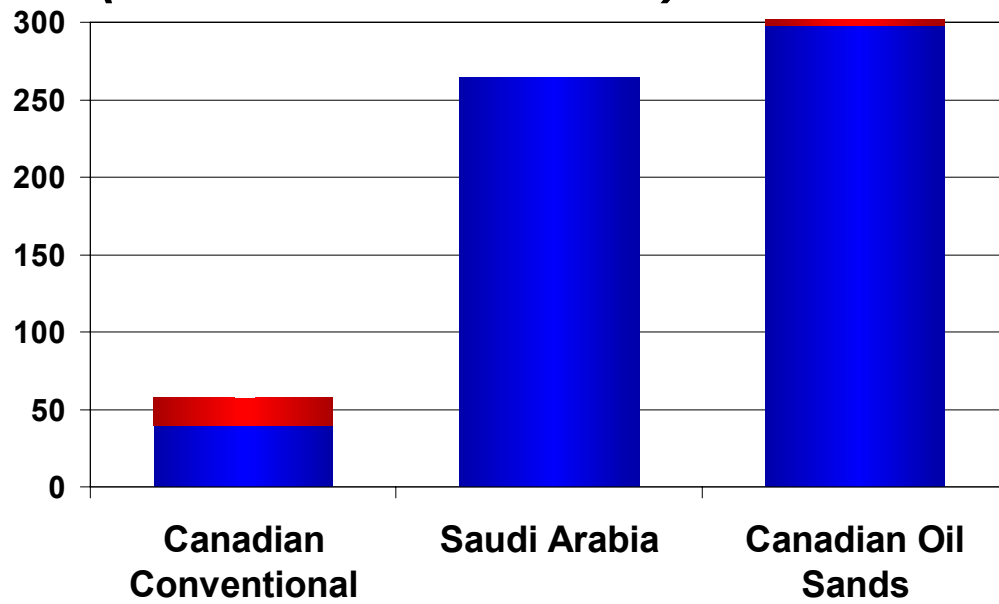
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# World Scale Oil Resource

**Produced**  
**Remaining**

## Comparative Oil Resources (Billions of Barrels)



Source: NEB & BP

Canadian Association  
of Petroleum Producers

**CAPP**  
www.capp.ca

# Oil Sands Projects in 3 Deposits



Syncrude ✕ Albian (Shell) ✕ True North (Koch) ✕ Japan Canada Oil Sands ✕ Exxon Mobil ✕ Pan Canadian ✕ Deer Creek ✕	Suncor ✕ Gulf ✕ PetroCanada ✕ Northstar ✕ CNRL ✕ Opti ✕ SynEnCo ✕
Alberta Energy Cdn Natural Resources (CNRL)	

Shell
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Imperial Oil Alberta Energy Cdn Natural Resources Petrovera Black Rock	Koch Murphy Suncor Husky Numac
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✕ Mining; Others "InSitu"

- **Current production 580,000 bbls per day.**
- **\$21 billion (Cdn) commercially approved - \$11 billion "in the ground".**
- **\$30 billion additional potential announced - risk evaluations underway.**

Source: AOSD

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# *Oil Sands potential is growing ... Continental energy interest*

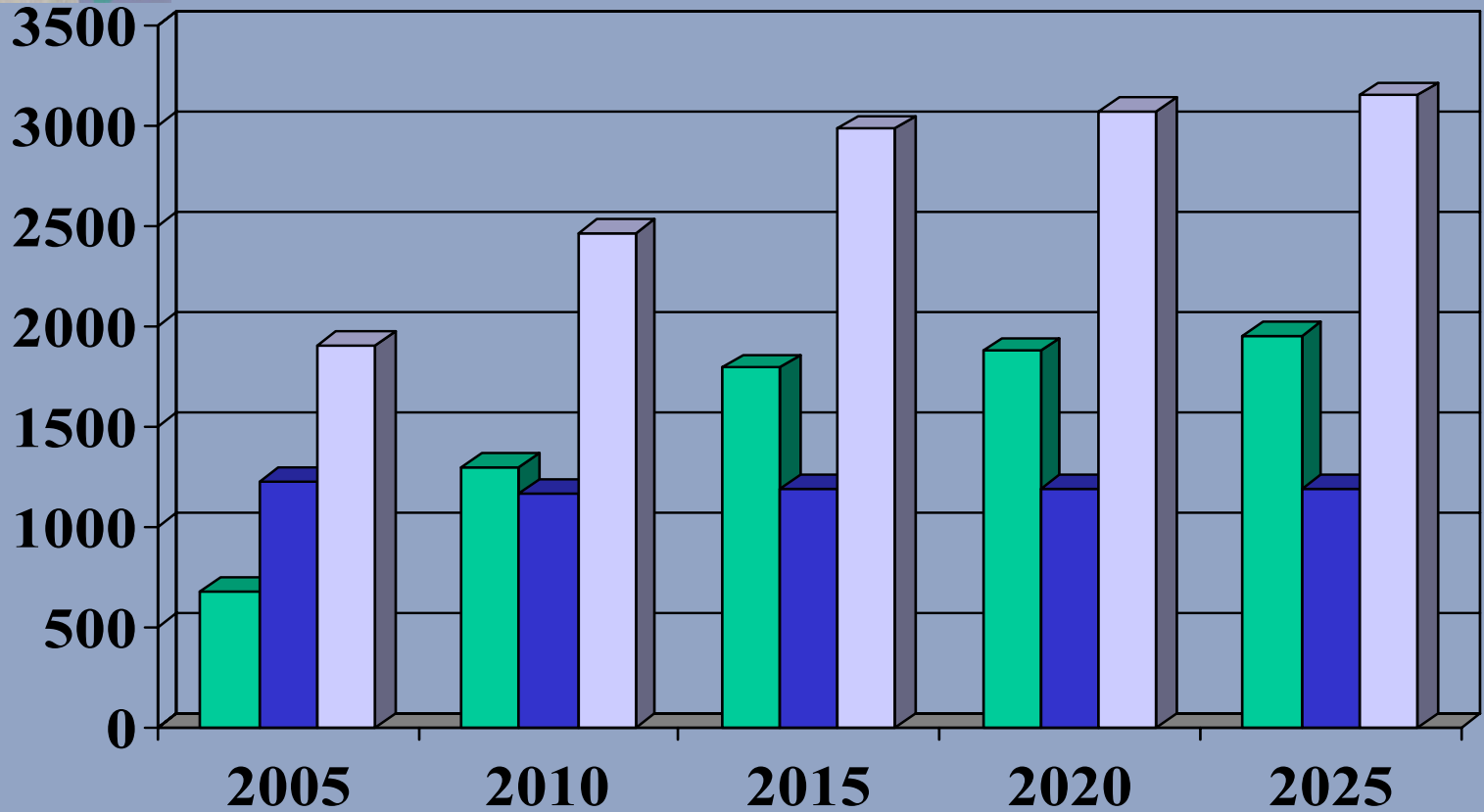
	<u>Jan. 2001</u>	<u>Jan. 2002</u>
<b>Projects Announced</b>	<b>\$51 billion</b>	<b>\$86 billion</b>
• Completed since 1996	\$11 billion	\$17 billion
• Under construction	\$10 billion	\$ 7 billion
• At Risk/Under Evaluation	\$30 billion	\$62 billion
• Forecast (business risk)	<u>\$17 billion</u>	<u>\$25 billion</u>
<b>Total Forecast:</b>	<b>\$38 billion</b>	<b>\$49 billion</b>
<b>Government Revenue (30 yrs)</b>	<b>\$250 billion</b>	<b>\$325 billion</b>
<b>Jobs</b>	<b>70,000/yr</b>	<b>90,000/yr</b>
	<b>2 million total</b>	<b>2.6 million</b>
<b>Crude Oil (per day)</b>	<b>1.9M Bbls</b>	<b>2.5 M Bbls</b>

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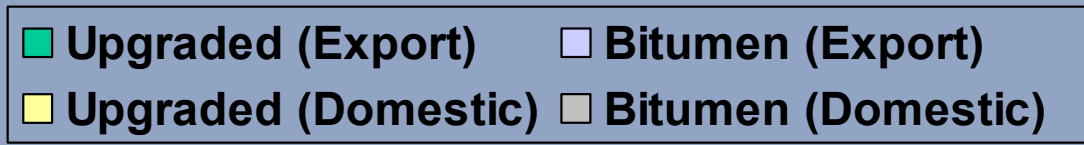
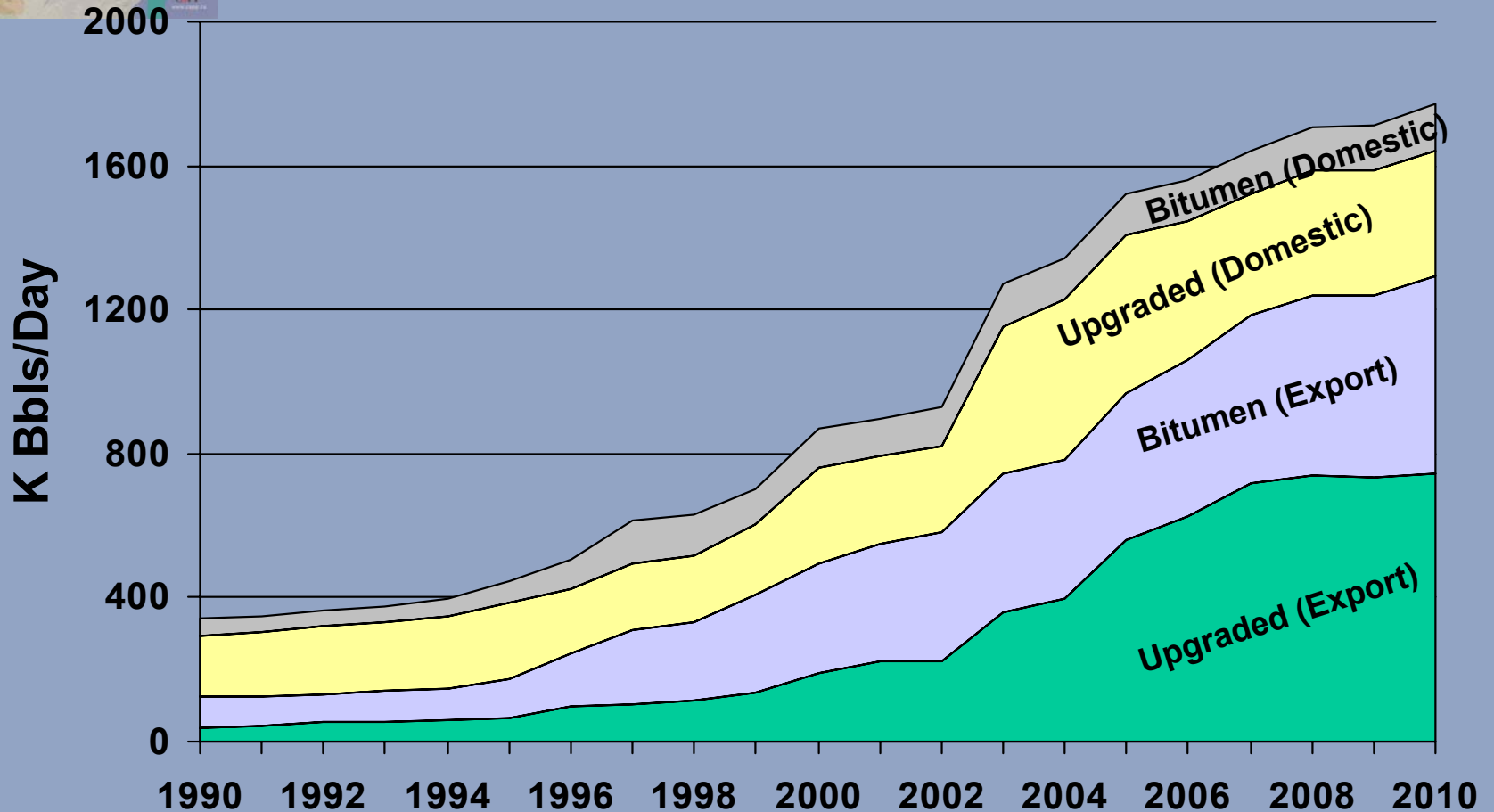


# Revenues to Federal Government – Existing & New Oil Sands Projects - 2001 Survey



■ Corporate Tax (Existing & New Projects)      ■ Personal Income Tax (Existing & New Projects)  
□ Total Federal Direct Tax & Total Personal

# Oil Sands Production Domestic and Export Volumes



# *Oil Sands—Mineable Deposits*



- 20% of 300 billion barrel resource
- current production of 320,000 b/d
- upgraded to light sweet crude
  - Syncrude
  - Suncor
  - Albian(Shell) 2002

**Shovel Loads 380 T Truck**



**Extraction Primary Separation Vessel**



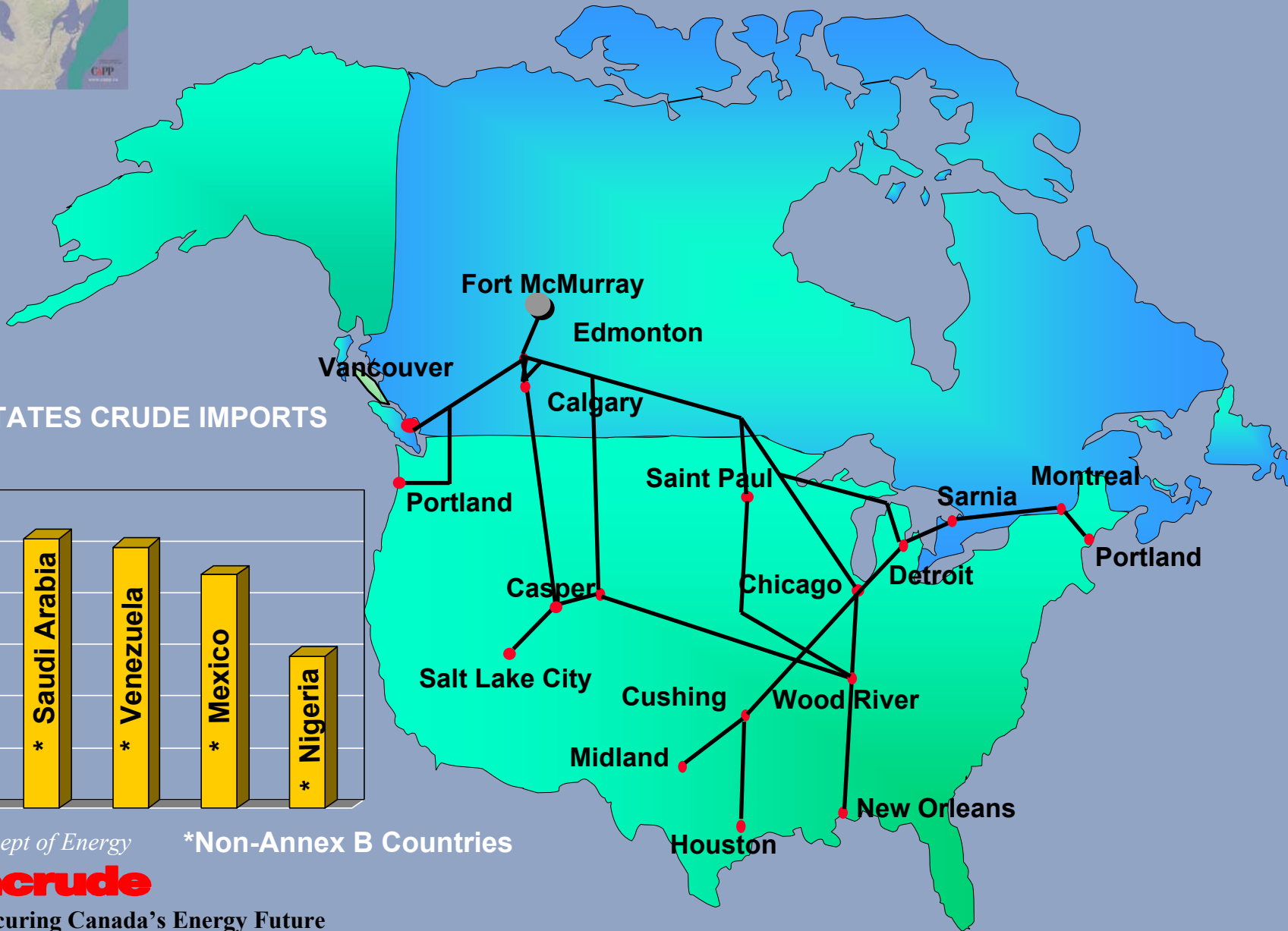
**Upgrading Fluid Coker**



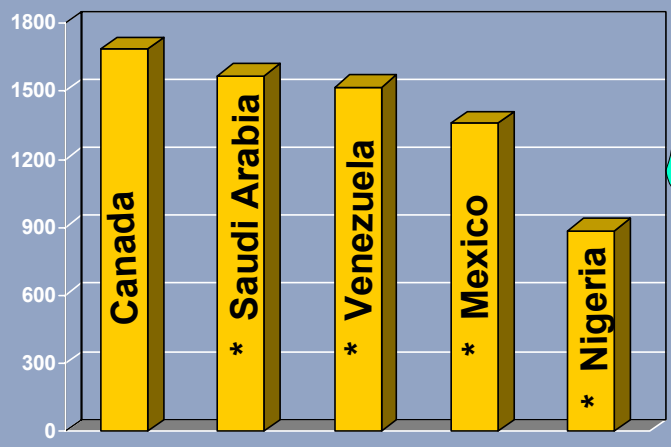
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*Most of the production increase is for U.S. markets and competes against countries outside the OECD*



**UNITED STATES CRUDE IMPORTS**

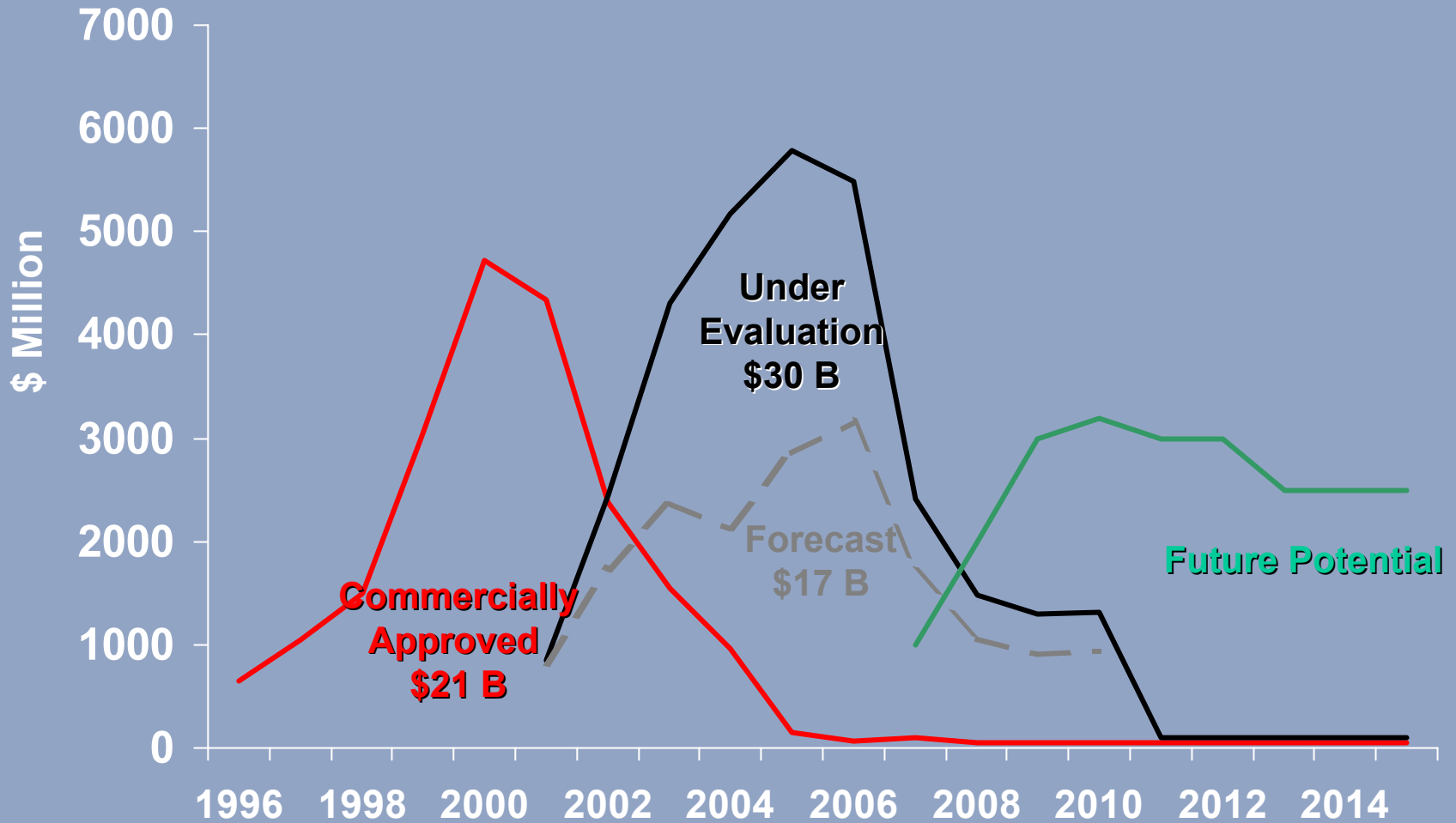


Source: US Dept of Energy \*Non-Annex B Countries



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# Capital Investment Profile - Current Oil Sands Industry Forecast

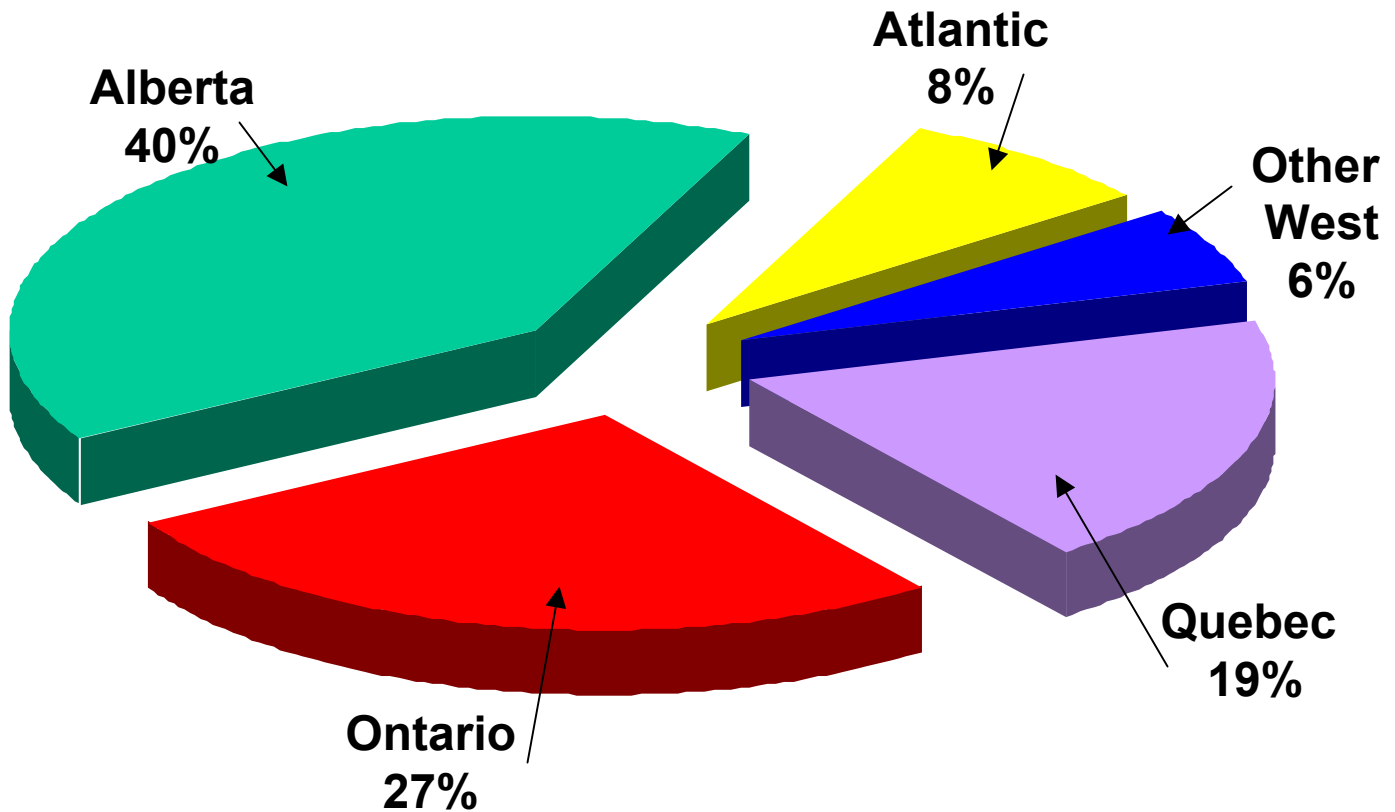


Source: AOSD - May/01

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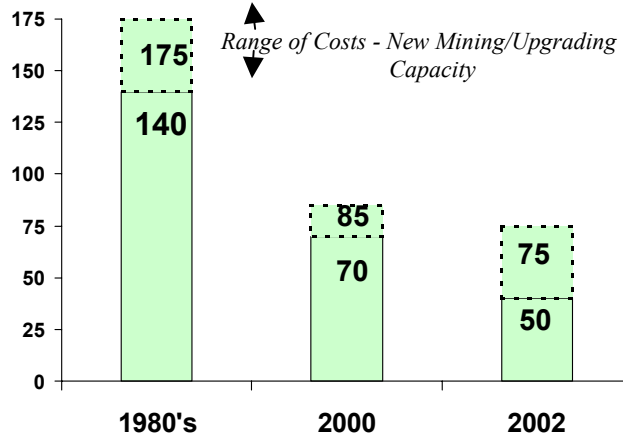
# Oil Sands: 60% of income effect outside Alberta



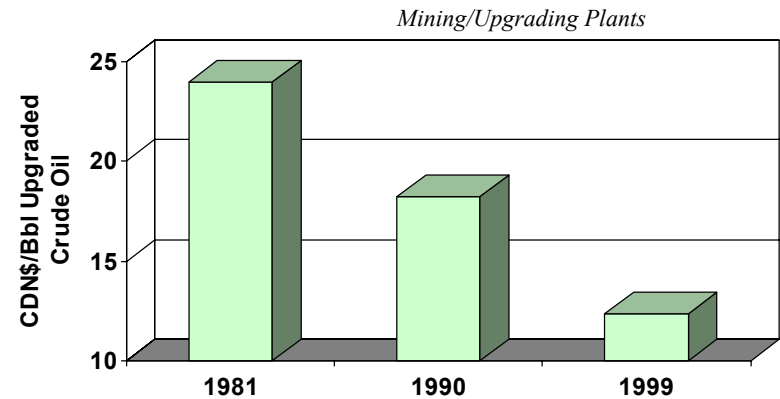
Source: NOSTF Report (1995)

# Productivity Improvements from Innovation

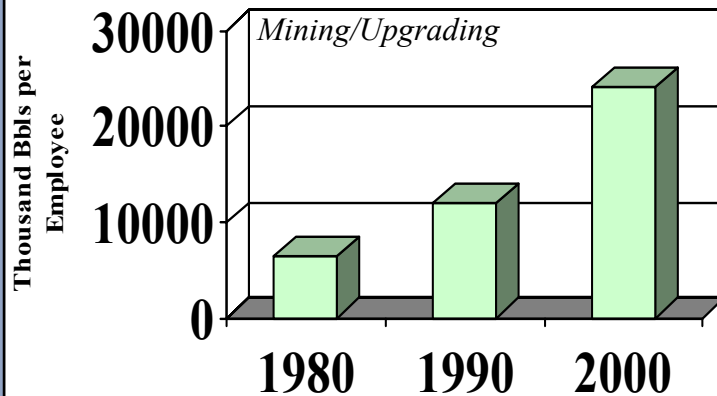
**Capital costs reduced 50-60%**



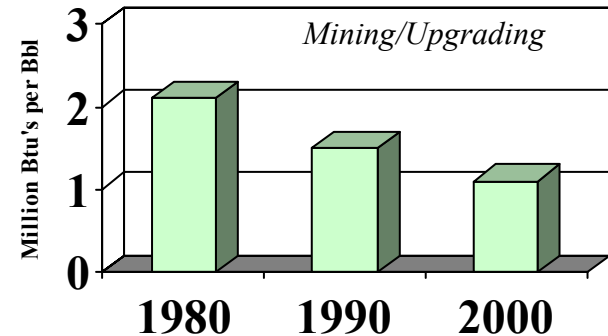
**Cash Operating Costs reduced 50%**



**Labor productivity increased 100% every decade**



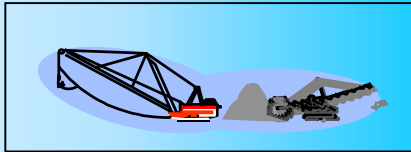
**Energy efficiency improved 45%**



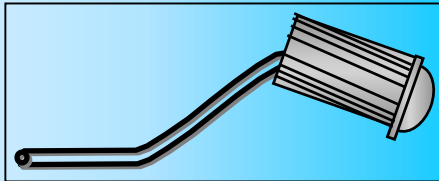
Source: Oil Sands Developers - Dec/99 Update

# Oil Sands: \$100 M/Yr R&D - Innovation & Efficiency

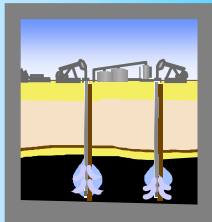
## OLD



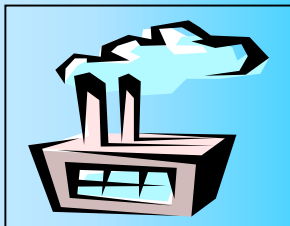
Dragline & Bucketwheel



Conveyor & Tumblers (80°C)



Vertical Wells

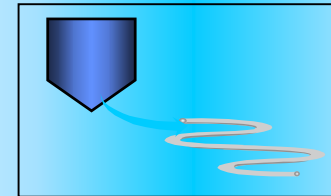


Coal fired  
Power Plant

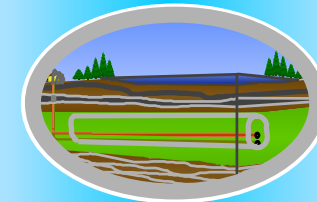
## NEW



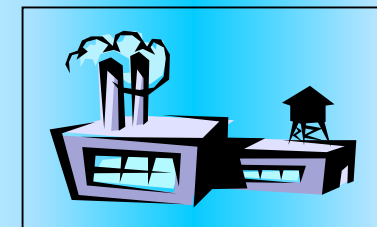
Truck & Shovel



Low Energy Extraction  
25 - 50° C  
Hydrotransport



SAGD Horizontal Wells



Co-Gen Power Plants

*Energy  
Efficiency*



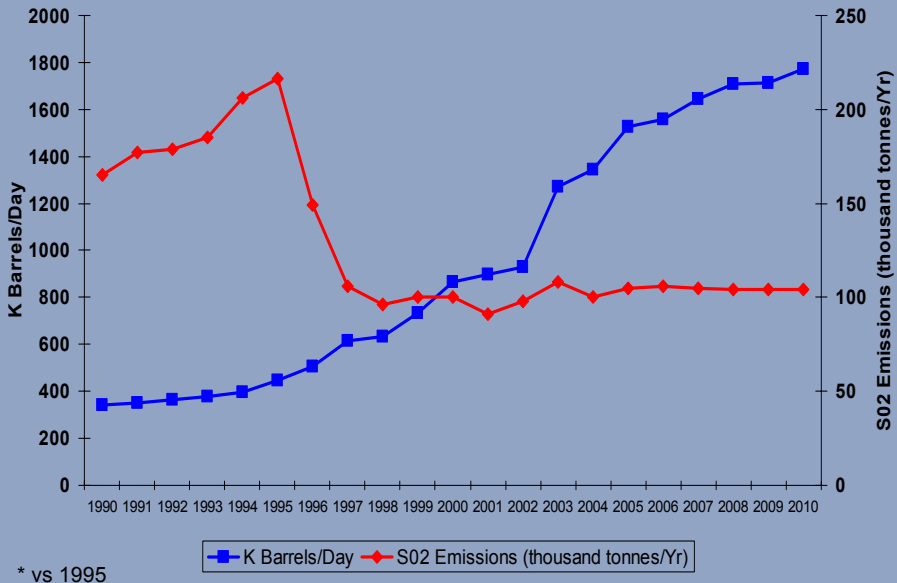
*45% Reduction  
in CO<sub>2</sub> per  
barrel*

*(2008 vs 1990 technology)*

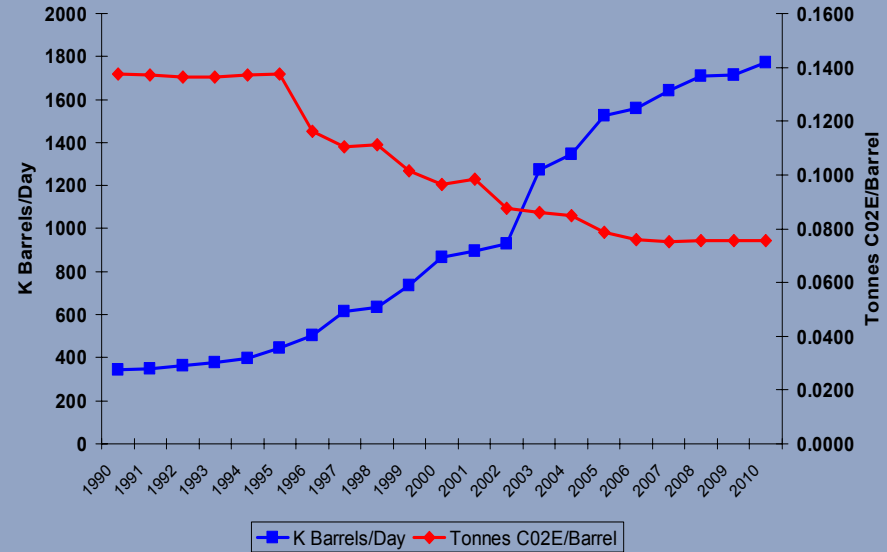
# Environment—Continuous Improvement Focus



*Oil Production increases 500% ... total annual emissions of sulphur dioxide reduced 50%\**



*45% reduction in CO2E emissions per barrel due to new technology investment ...2%/year improvement*



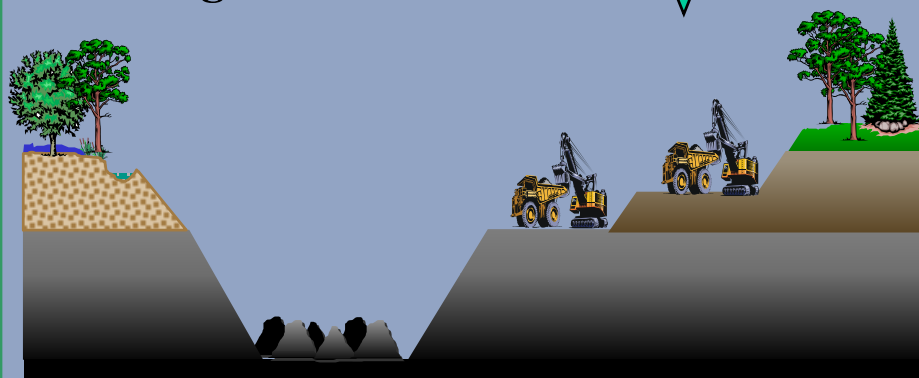
Source: Oil Sands Developers - Dec/99 Update



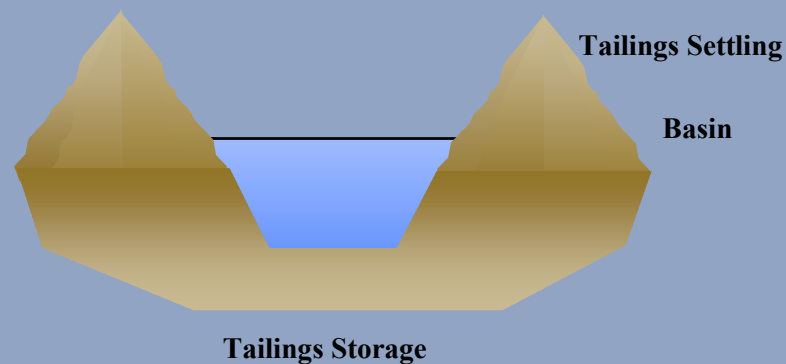
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# Environment: Improved tailings management and earlier reclamation

Mining Land Disturbance ↓ 25%



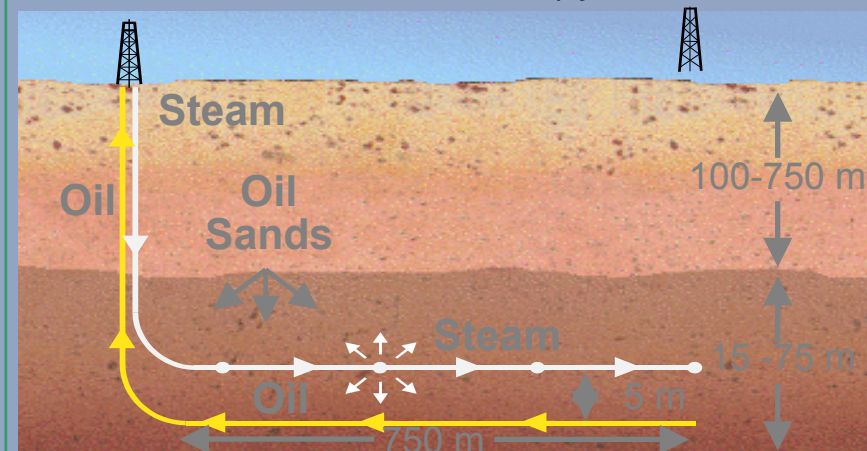
Mining/Extraction Tailings/Recycle Ponds ↓ 75%



Mining Land Reclaimed Earlier



In-Situ Land Disturbance Reduced 35%



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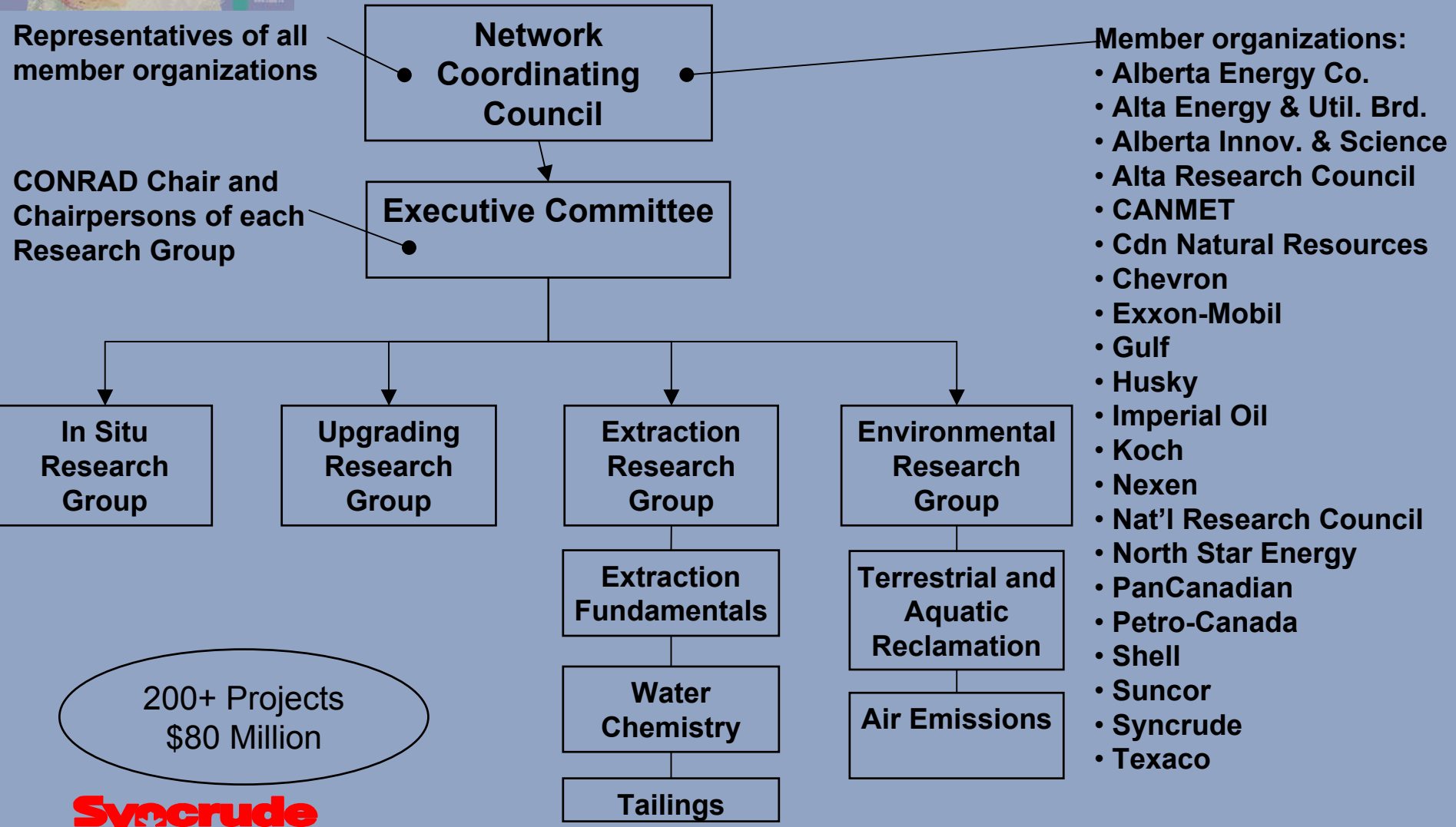
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# *Technology & Environmental Advancement*

- Oil Sands R&D - \$100 million per year
- Current R&D Focus Areas:
  - Improved Mining Equipment
  - Low energy extraction
  - Reduced thermal inputs
  - Process/upgrading improvements
  - Automated control systems
  - Recovery of waste heat
  - Reclamation technologies
  - Alternative energy technologies



# Collaborative R&D: CONRAD - Canadian Oilsand Network for Research and Development



200+ Projects  
\$80 Million

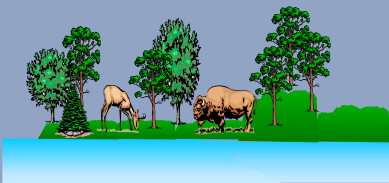
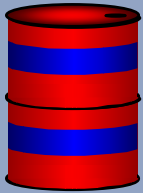


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# *Oilsands Development Risks ...*



# *Oil Sands: A strategic resource for North America*



- **An increasing source of North American crude oil**
  - Huge, known reserves
  - Reliable, secure, expanding supply
  - Potential for additional phases of growth over the longer term
- **An economic North American source of crude oil**
  - Competitive full cycle costs
  - Technological improvements
  - Investment in R & D - high tech
- **Responsible and sustainable resource development**
  - Environmental assessments and performance
  - Energy conservation programs / R&D
  - Aboriginal employment and contracts
  - Community infrastructure and social responsibility

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