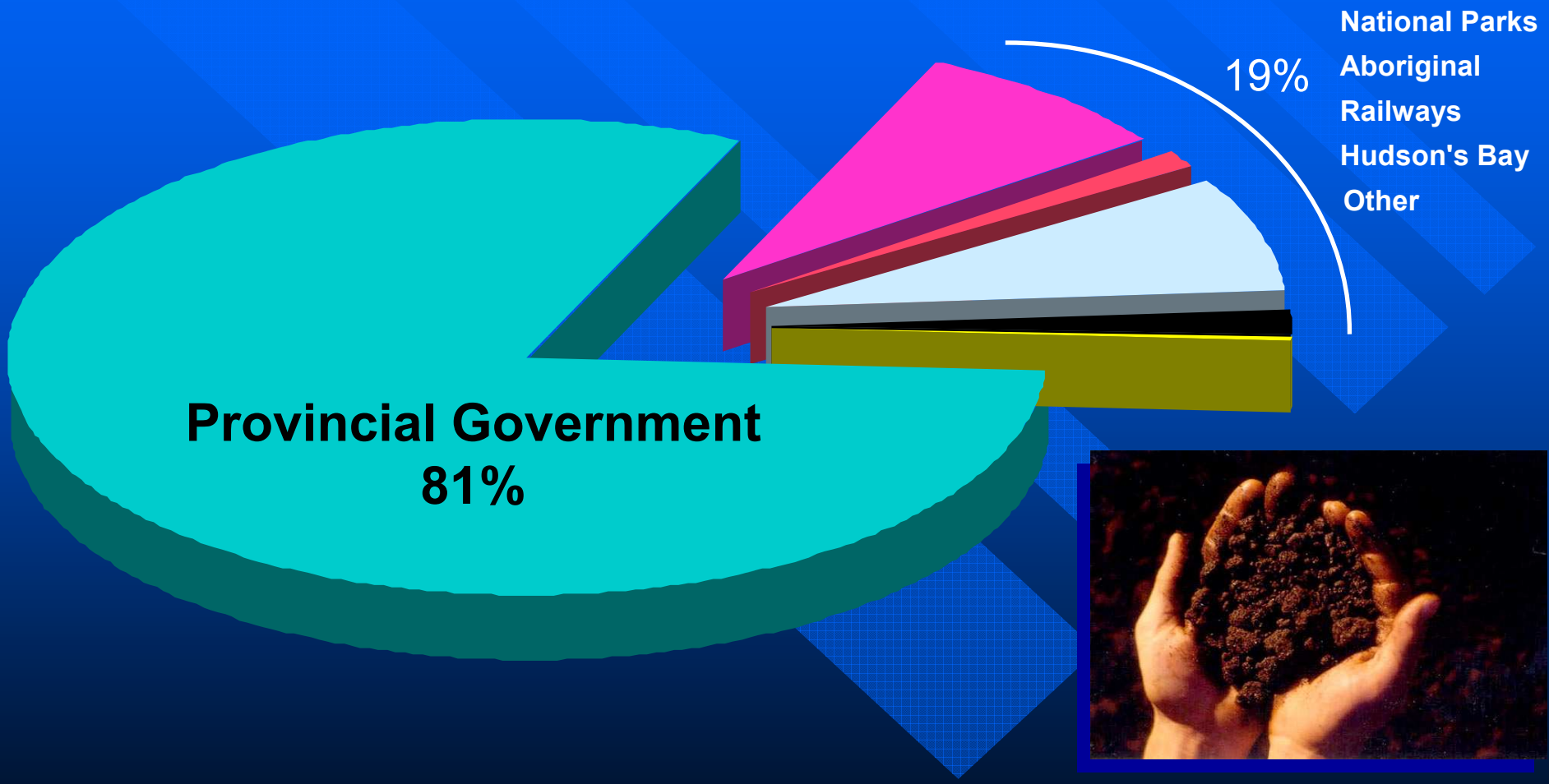
Forging North American Energy Security Conference

Bob Taylor
Assistant Deputy Minister
Alberta Department of Energy

Alberta's Mineral Ownership



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Alberta Facts

- **66% of crude oil production and 80% of natural gas production in Canada is from Alberta**
  - Cdn crude: ~30% from the oil sands

- **Alberta oil sands reserves hold:**
  - 1.6 trillion barrels of bitumen inplace
  - 315 billion barrels ultimate potential*
  - 178 billion barrels initial established

*having regard for geological prospects, anticipated technology and economic conditions.

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Alberta's Petroleum Royalty Structure

- Conventional Oil and Gas
  - royalty applies to individual wells
  - features include:
    - » well productivity (for oil)
    - » vintage and quality
      - Old, New, Third Tier – Light and Heavy
    - » processing cost allowance (for gas)
    - » small company incentive
    - » special features for special circumstances
      - EOR, low productivity, deep gas, horizontal re-entry
- Continuous Monitoring of System
  - modifications as appropriate to remain competitive

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Alberta's Royalty Structure
(cont'd)

- **Oil sands royalty is project based**
  - **1% of gross revenue until payout**
  - **25% of net revenue after payout**
  - **return allowance at Gov't of Canada long-term bond rate**
  - **Bitumen royalty option**
- **Objectives**
  - Crown and Industry share the risk
  - Encourage investment and development activity
  - Improve project economics
  - Shorter pay-out period
  - Level playing field

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Alberta's Royalty Structure
(cont'd)

- Land Sales
  - parcels requested to be posted
  - auction every 2 weeks, with 8 week notice of parcels included
  - sealed tender bidding
  - rights go to highest bidder
- Bids are made with full knowledge of royalty structure
  - bid captures remaining economic rent

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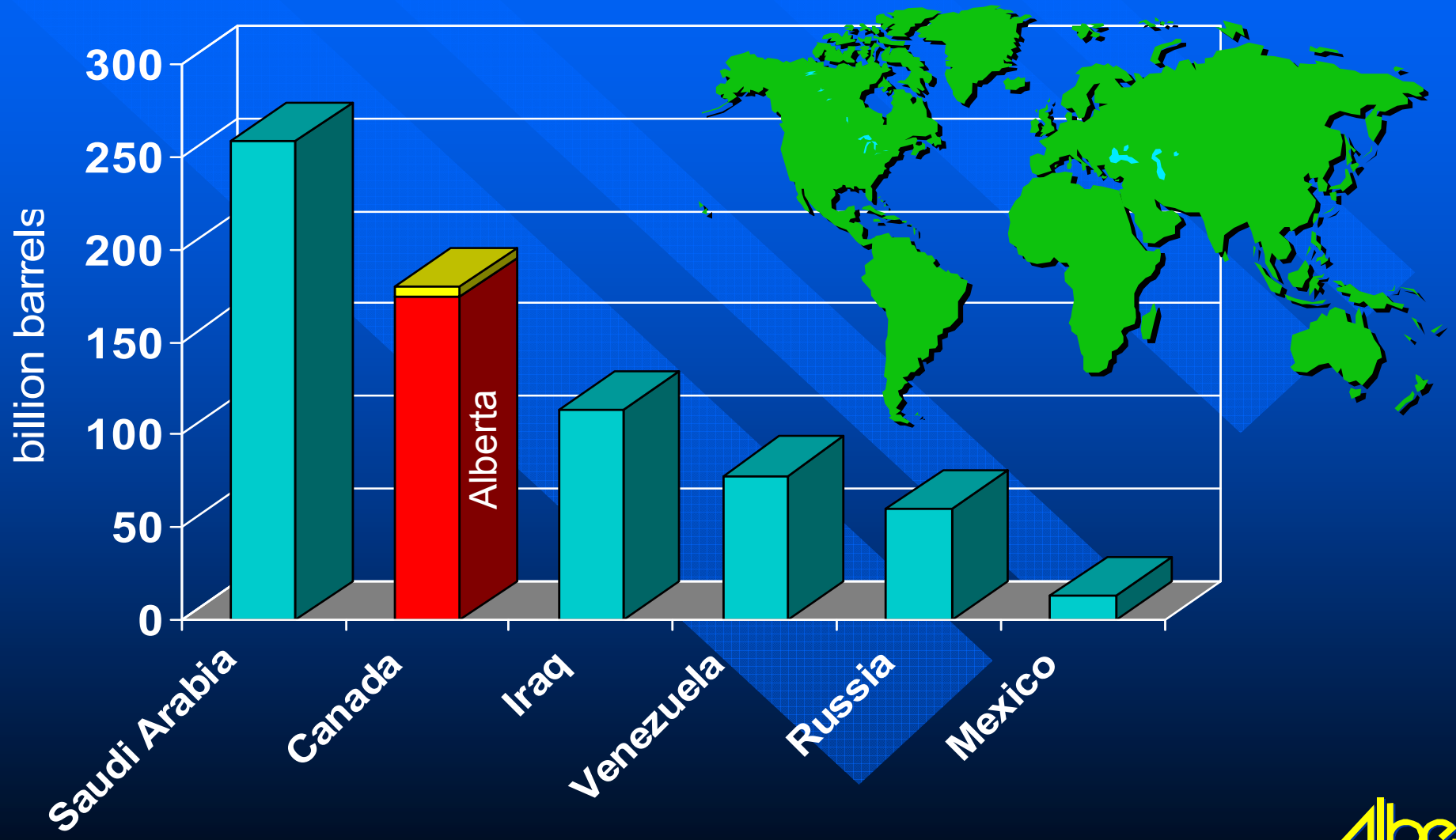
Proven World Crude Oil Reserves



Sources: Oil and Gas Journal – Dec 2002, AEUB

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Alberta Oil Sands Deposits

Alberta contains 100% of Canada's oil sands supply

Reserves (2002)

(Billion Barrels)

	Oil Sands	Conv.
In Place	1,631	62
Rem. Ult. Pot.	311	5

Source: EUB

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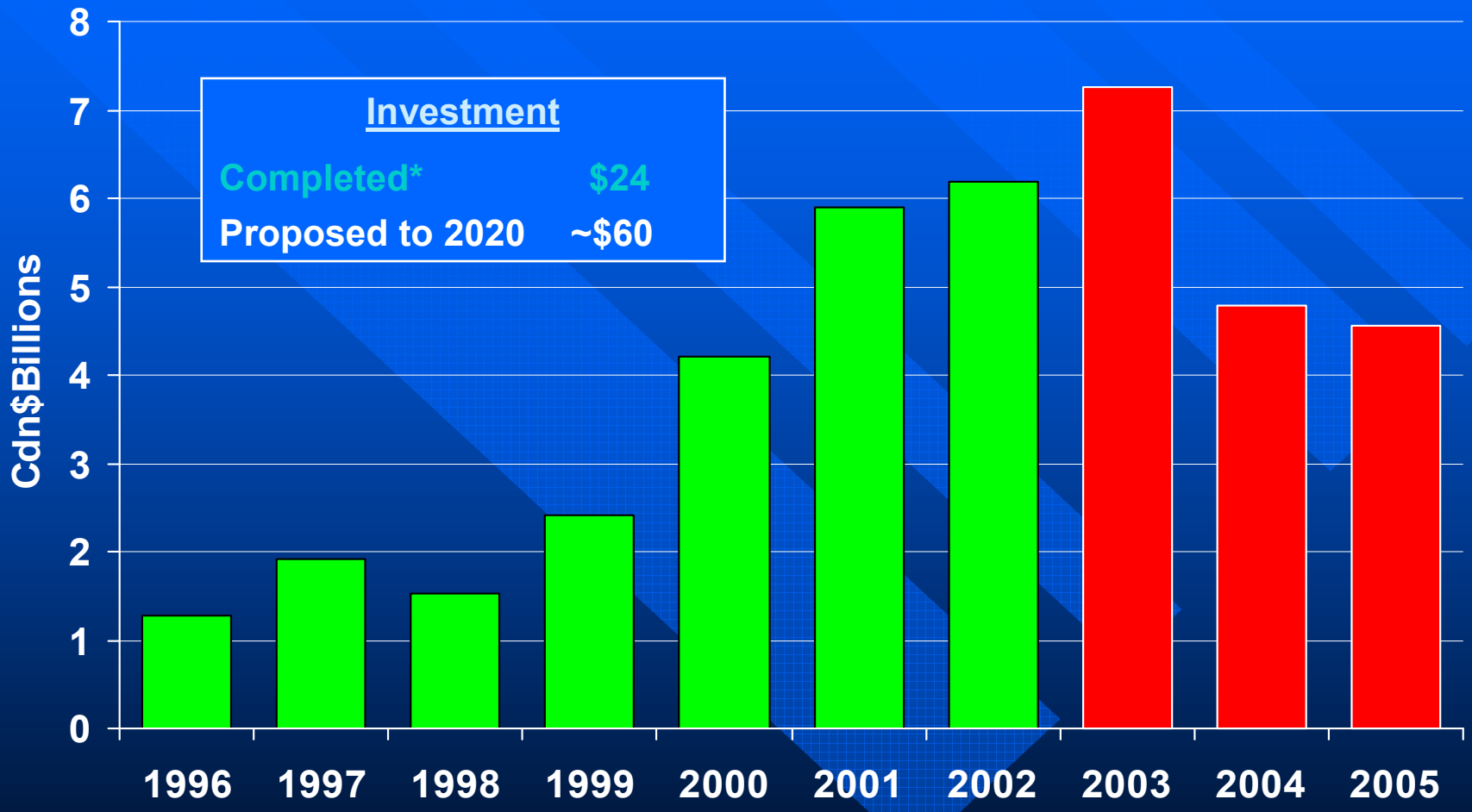
Investment in Alberta's Oil Sands



Projections include strategic and sustaining capital.

*Completed – 1996 to 2002

Source: CAPP, ADOE

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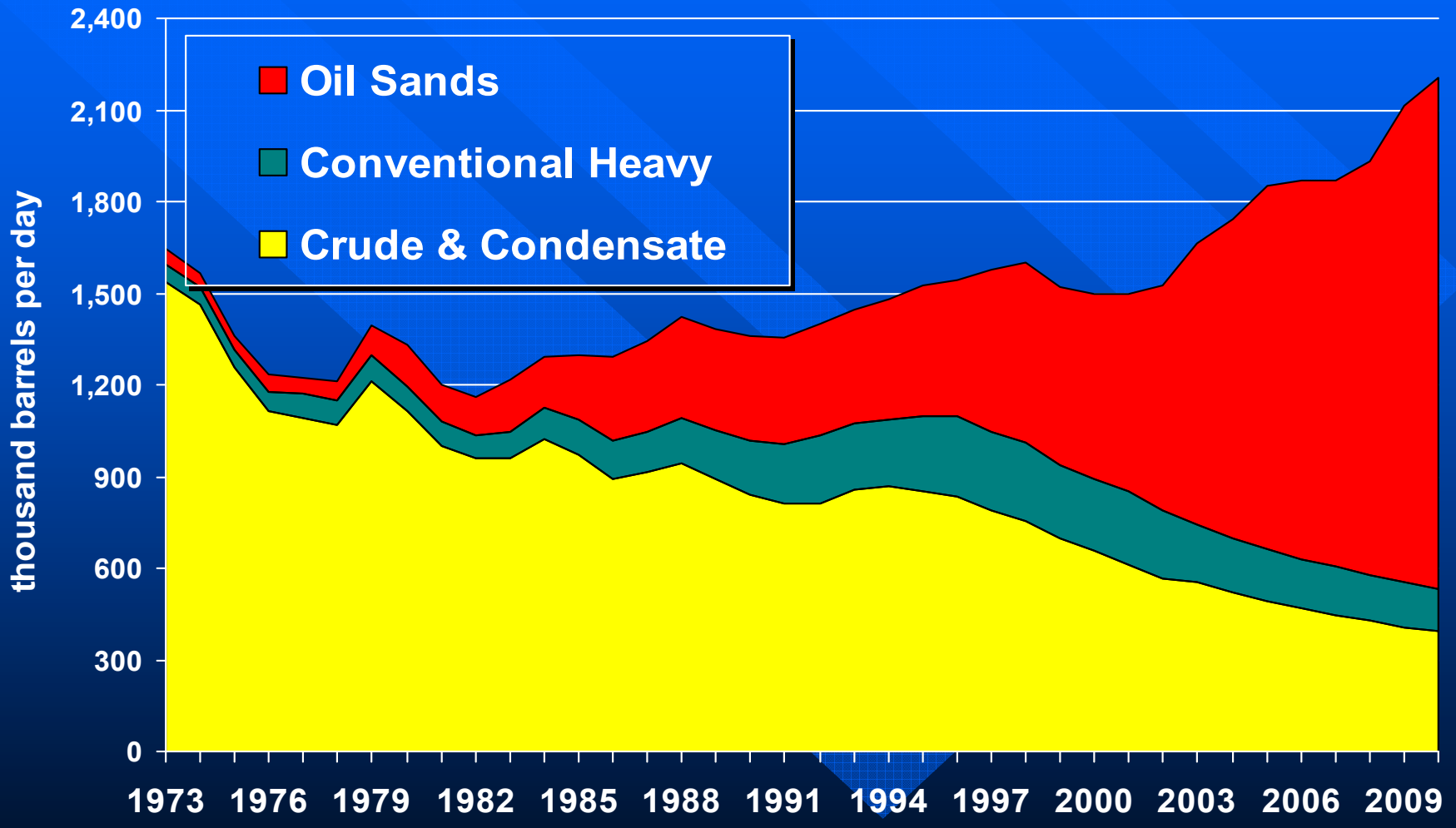
Alberta Liquid Petroleum Production

(1973 - 2010)



Source: EUB/ADOE

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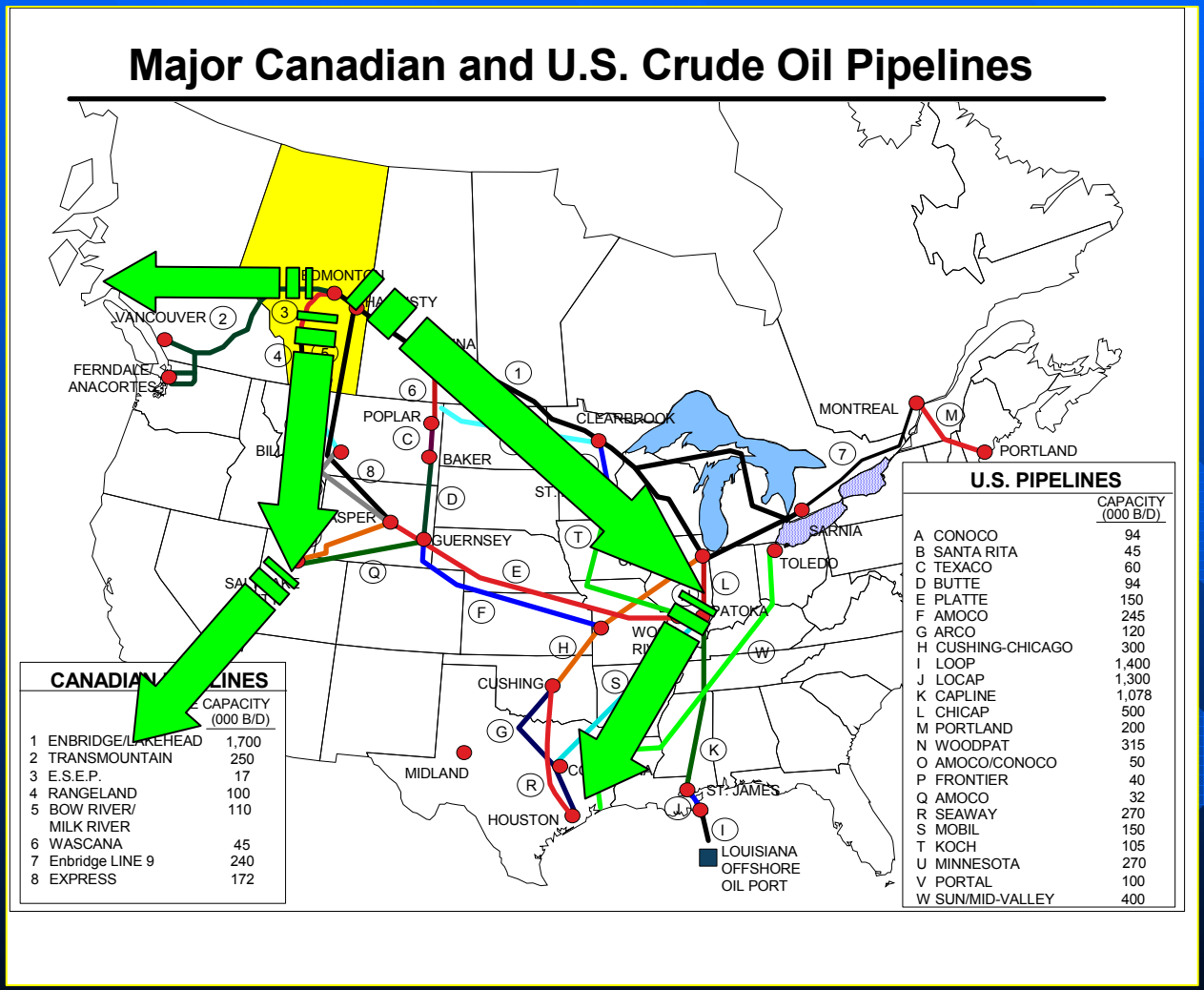
Continental Markets for Alberta Crude



Alberta Deliveries

- 1.61 million bpd
- 63% to US
- 25% in Alberta
- 12% to Rest of
  - Canada

Proposed Expanded Capacity

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Technology Trends

- **In Situ**
  - Cyclic Steam Stimulation (CSS)
  - Steam Assisted Gravity Drainage (SAGD)
  - Vapor Extraction (VAPEX)
- **Surface Mining**
  - Truck and shovel
  - Hydro-transport
- **Upgrading & Value-Added Products**
  - Synergies with existing facilities

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Opportunities to Improve Profitability

- **Reduce Costs**
  - Reduce energy intensity
  - Improve project management
  - Develop labour capacity

- **Increase Revenues**
  - Improve oil quality and meet customer needs
  - Cogeneration power exports
  - Open new markets (pipeline & port access)
  - Value-added products

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Technology Development

Removing "limits to growth"!

- Viable alternatives to natural gas
- Manage water demands within supply
- Reduce capital costs
- Reduce land disturbance / reclamation costs
- Reduce GHG intensity
- Match product quality with customer demand

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Market Development

- Maintain strong share of current markets plus access new markets
- Infrastructure development
- Additional local upgrading capacity
- Alternative Products – i.e.: hydrogen
- Value-added opportunities in Alberta

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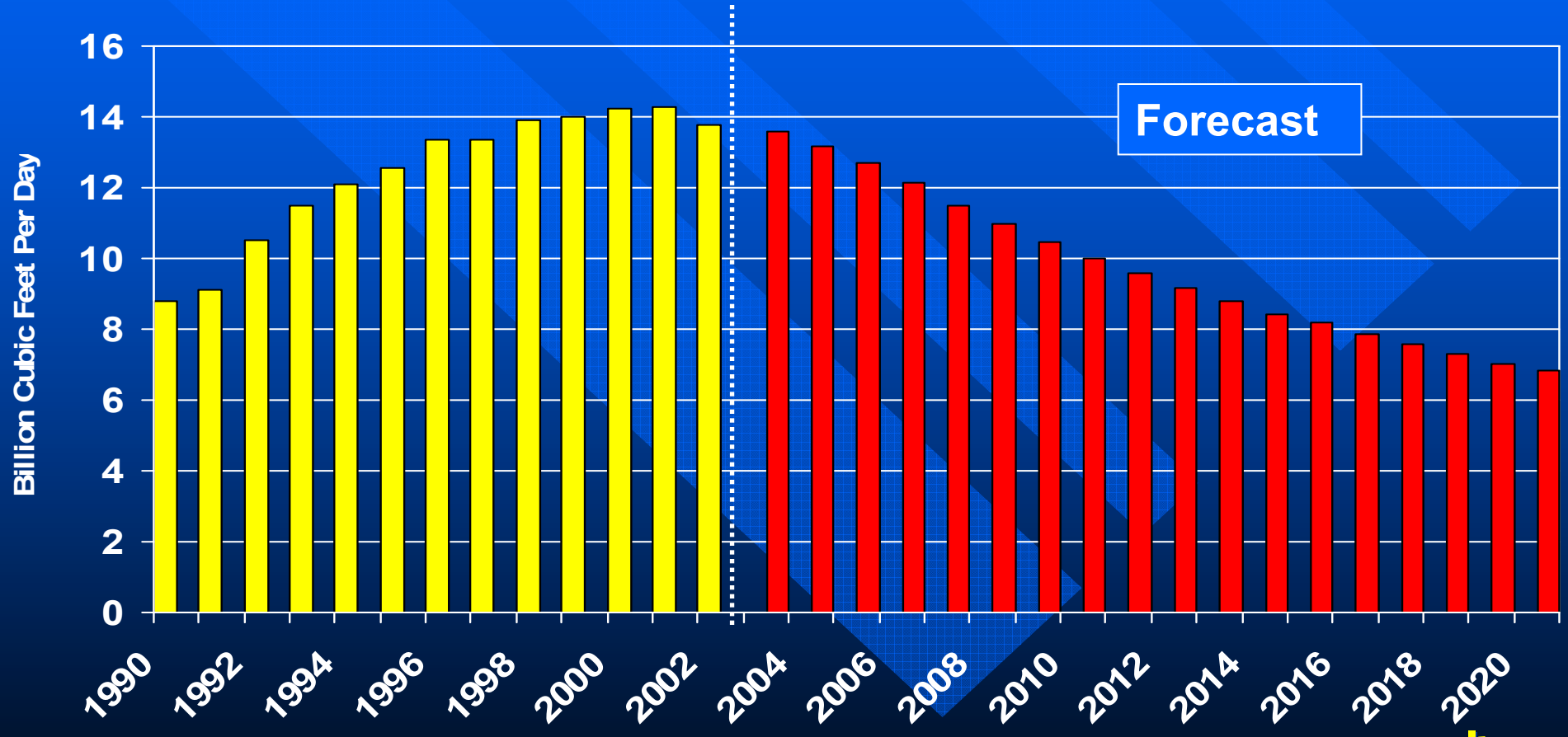
Forecast Alberta Conventional Natural Gas Production



Source: EUB

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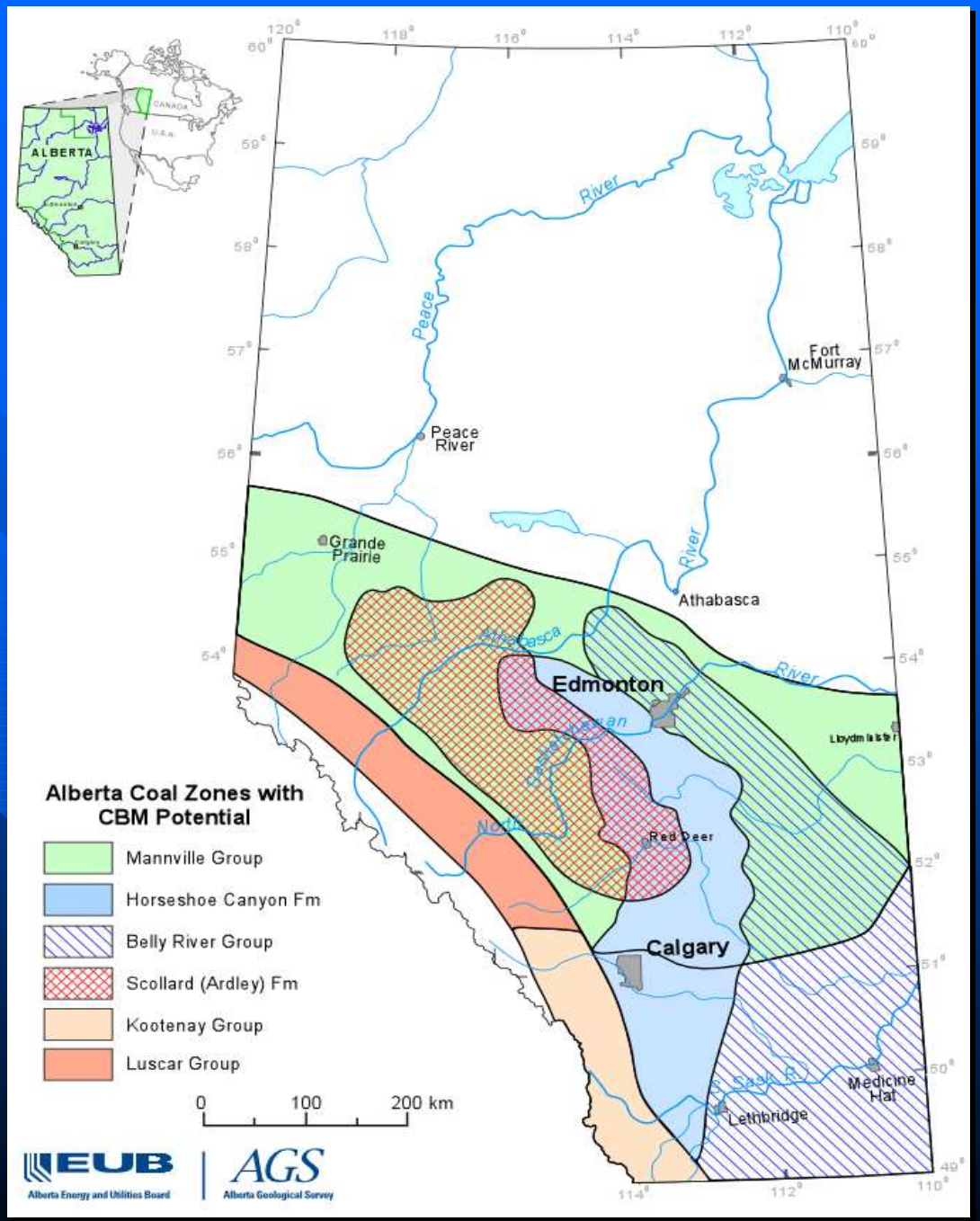
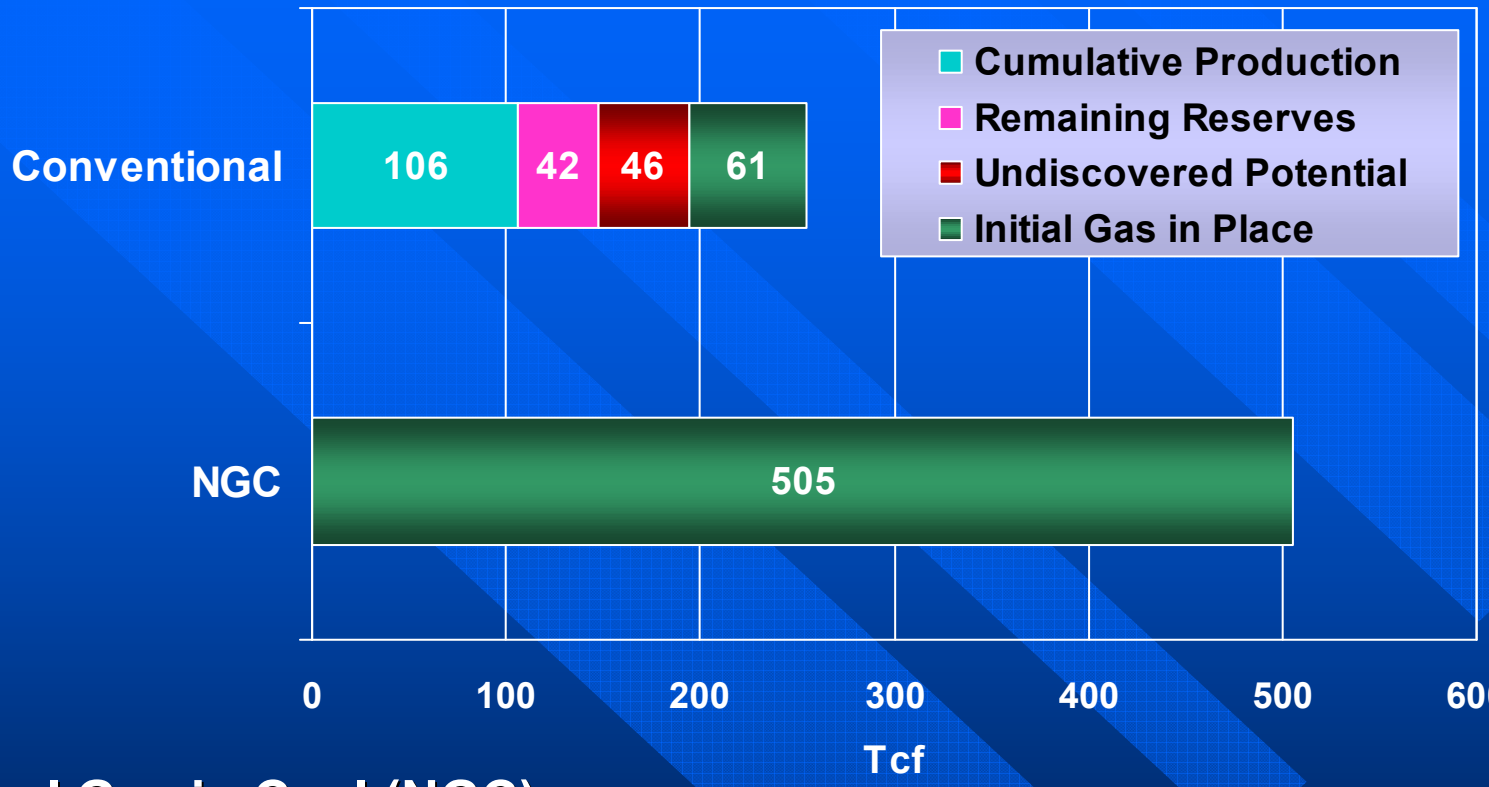
Gas Prone Coalbeds in Alberta

Distribution of rock formations containing coal zones with CBM potential



Alberta NGC Resource Estimates



Natural Gas in Coal (NGC)

- NGC total resource estimate is greater than 500 Tcf
- Unclear how much will be economically recoverable
- NGC development is still in its infancy in Alberta with slightly over 1000 wells being drilled, of which 400 have had production

Source: EUB

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Societal Pressures

- Climate Change and other Emissions
- Water Management
- Landscape Management
- Aboriginal Opportunities
- Sustainable Communities

The "permit to operate" is closely aligned with responsible stewardship

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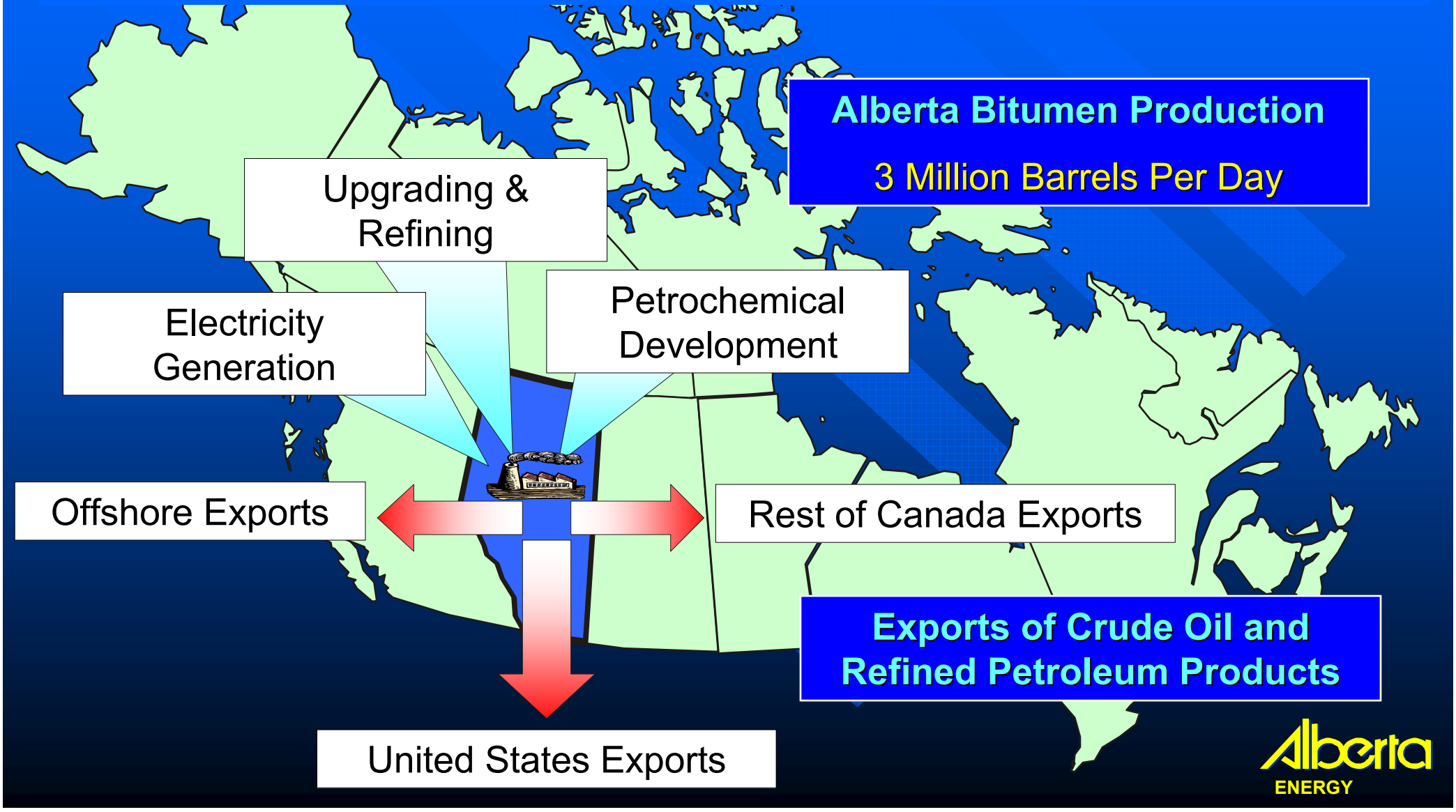
Alberta: A Superior Hub

WCSB Gas Reaches North American Markets

- Geographical positioning of Alberta coupled with existing infrastructure allows for greater access to all North American gas supplies
- Most new supply will enter North American demand areas through the Alberta Hub

Alberta's Oil Sands in 2020

World Scale Hub for Energy and Refined Products



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Alberta Counter-Terrorism Crisis Management Plan

The Plan delivers four key results:

- Capacity to determine “Level of Threat” for Alberta
- Identification of Alberta Critical Infrastructure by “level of criticality”
- Facilitated “Response Plans” by level of threat
- Emergency Notification System (ENS) to enable partners to implement a predetermined “response plan” by level of threat and facility criticality

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Security Activities

A. Preliminary Actions ■ Site Information ■ Vulnerability Assessment ■ Business impact	**B. Outer Perimeter - Security** ■ Grounds ■ Perimeter Barrier ■ Lighting ■ Security Force
C. Inner Perimeter - Security ■ Structures ■ Commodities ■ Equipment ■ Operations ■ Security	**D. Access Controls** ■ Employees/contractors ■ Visitors/Customers/Deliveries ■ Vehicles/Parking ■ Shipping/Receiving ■ Security
E. Information Technology ■ Computerization ■ Other	**F. Plans, Policies & Procedures** ■ Security policy ■ Communications ■ Intelligence ■ Emergency Plans ■ Specific Terrorism ■ Training

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Critical Infrastructure Security Measures

Threat level / Facility Ranking	IMMINENT	HIGH	MEDIUM	LOW	NO THREAT
HIGH	5	5	4	3	3
MEDIUM	4	4	3	2	1
LOW	4	3	2	1	1

Security Requirements Defined by levels 1 -5

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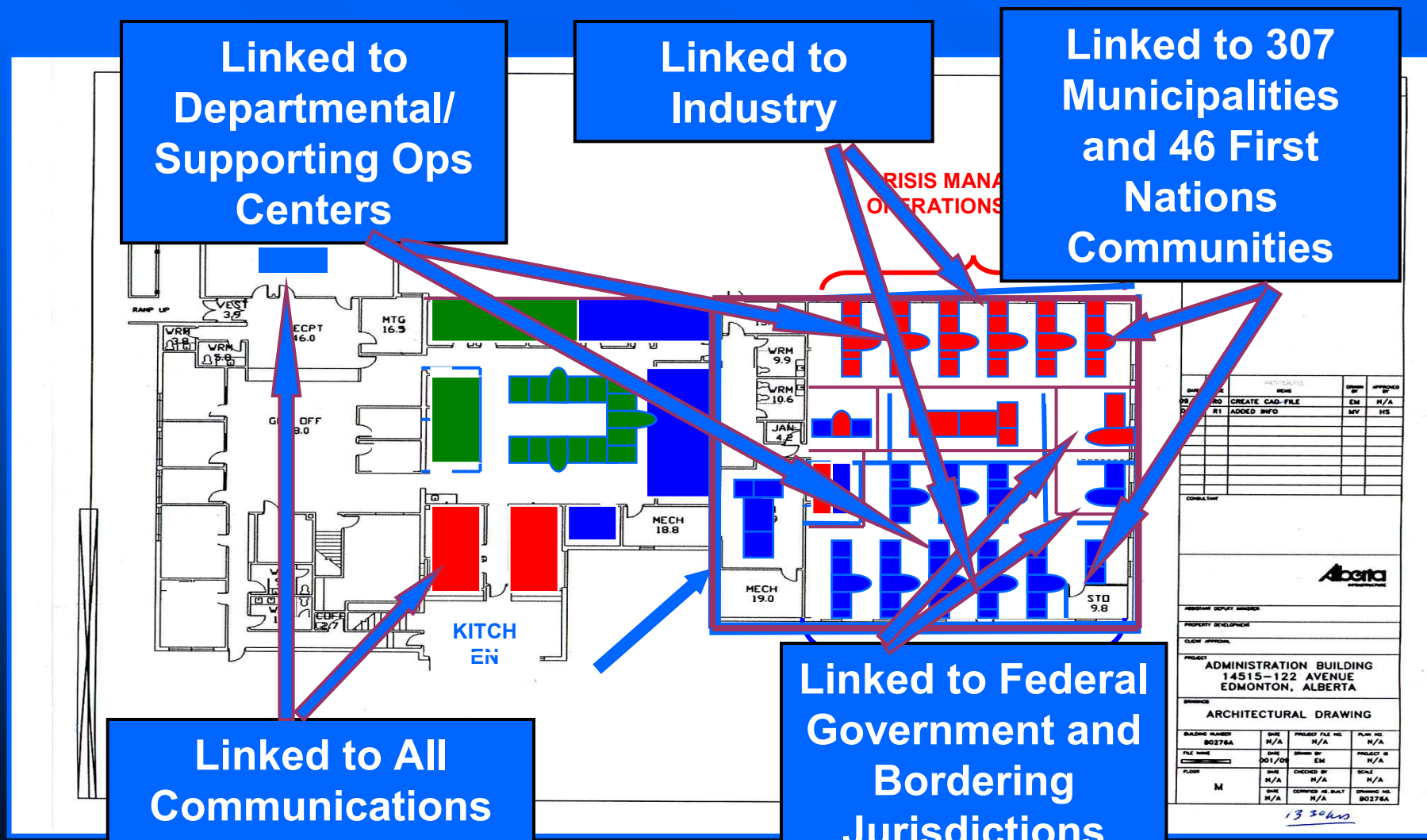
EMA Operations Centres



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