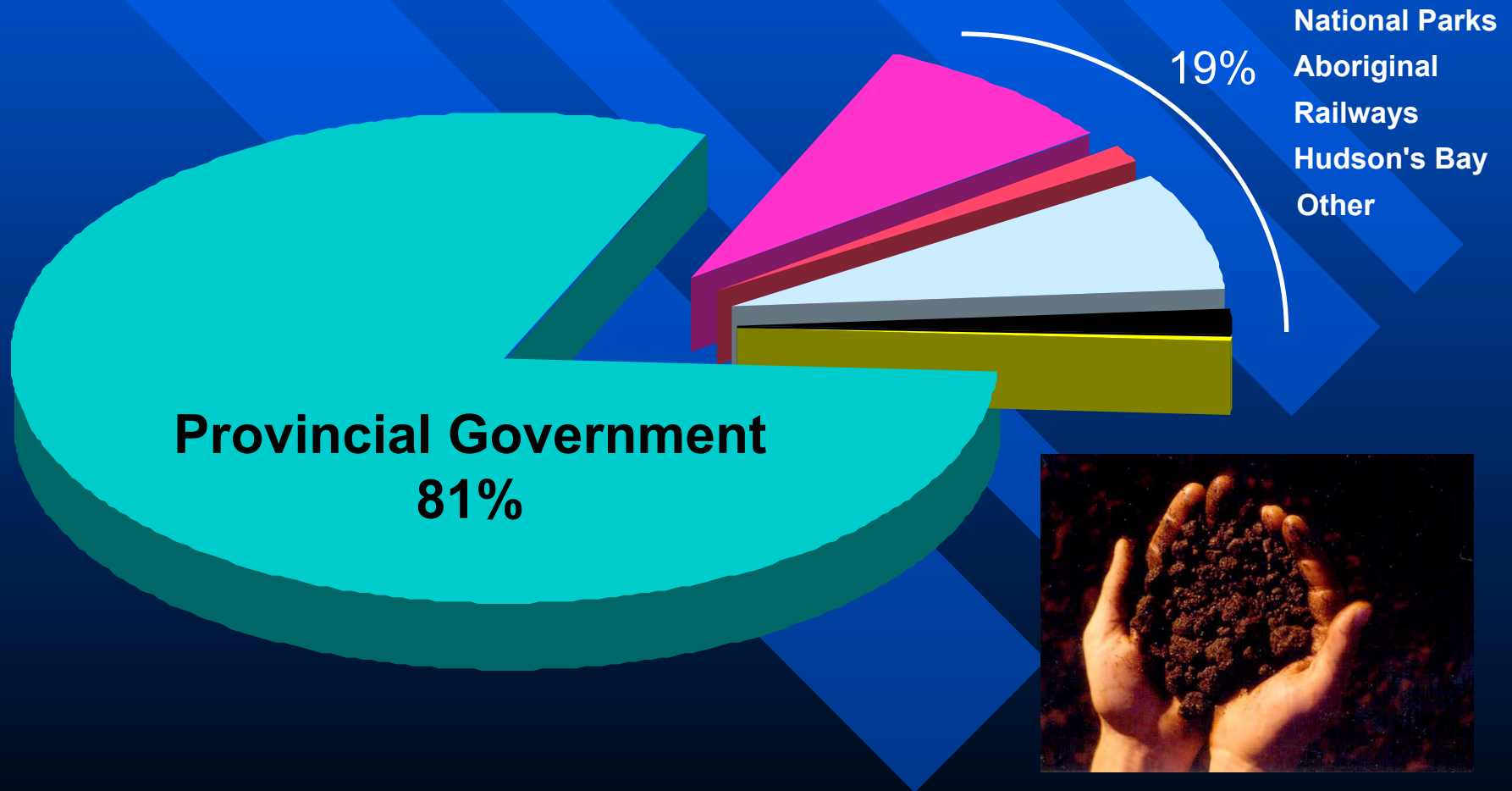


# Forging North American Energy Security Conference

Bob Taylor  
Assistant Deputy Minister  
Alberta Department of Energy

# Alberta's Mineral Ownership



# 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 in place
    - 315 billion barrels ultimate potential\*
    - 178 billion barrels initial established
- \*having regard for geological prospects, anticipated technology and economic conditions.

# 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

# 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

# Alberta's Royalty Structure

## (cont'd)

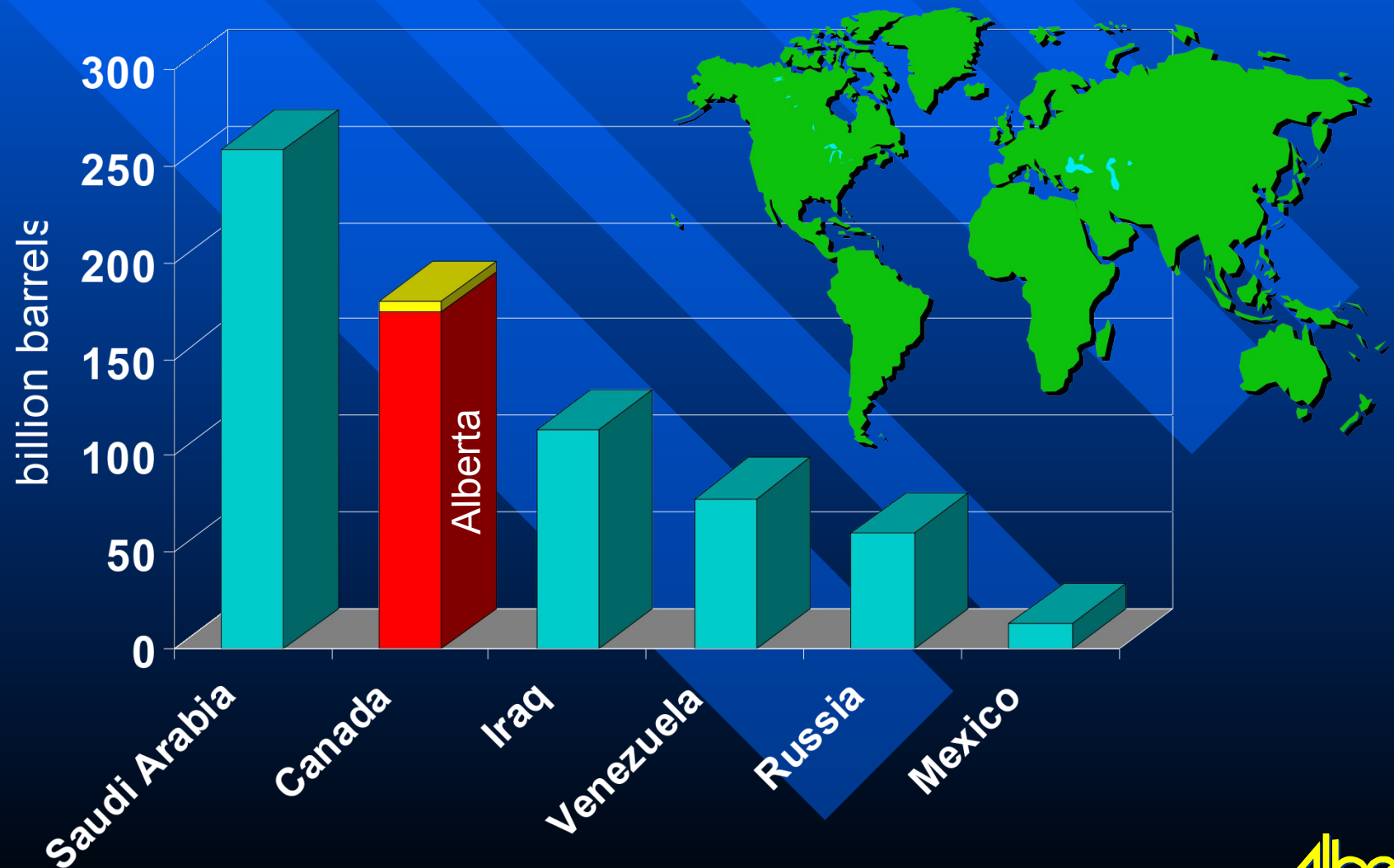
### ■ Land Sales

- 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

# Proven World Crude Oil Reserves



Sources: Oil and Gas Journal – Dec 2002, AEUB

# Alberta Oil Sands Deposits

Alberta contains 100% of  
Canada's oil sands supply

## Reserves (2002)

(Billion Barrels)

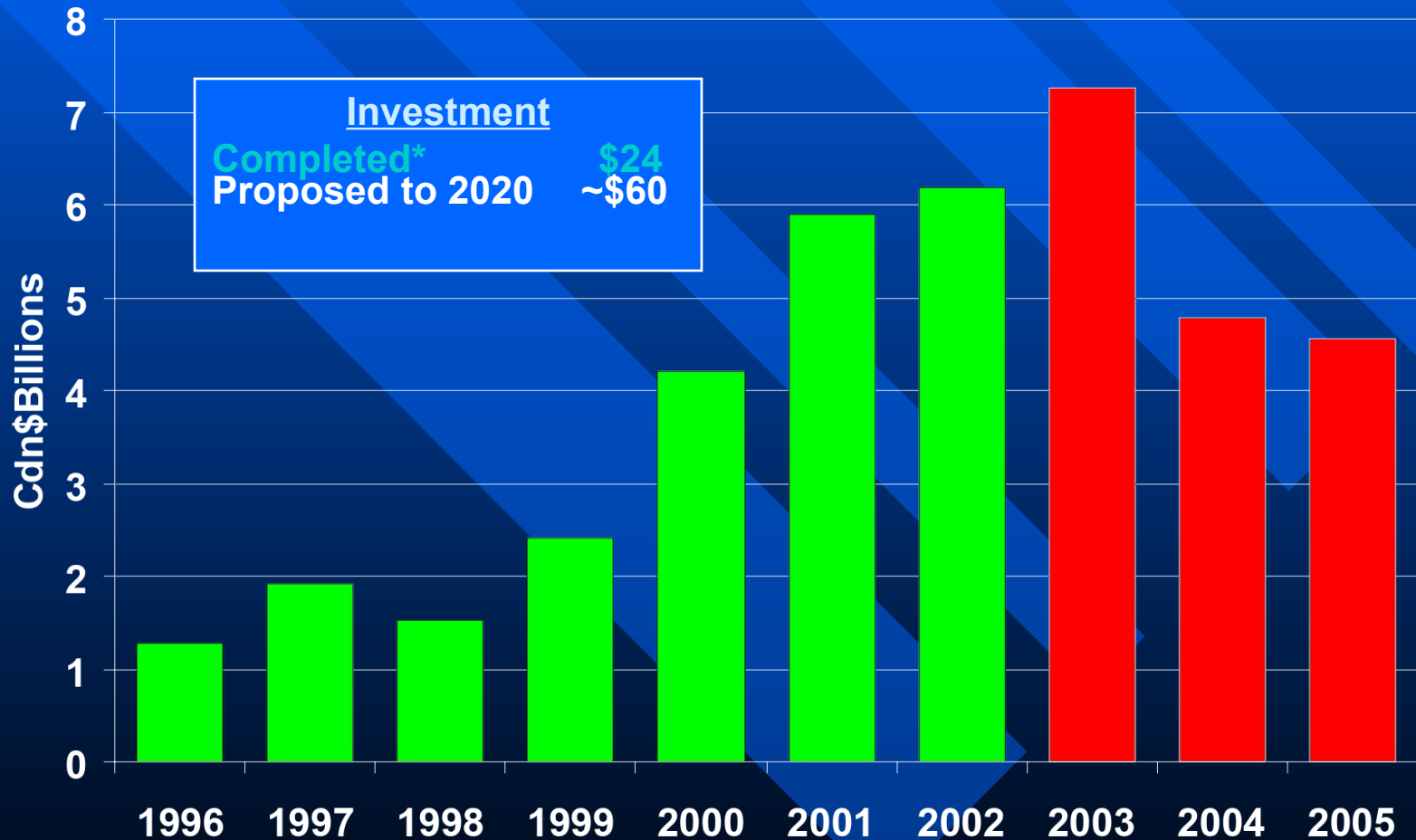
	<u>Oil Sands</u>	<u>Conv.</u>
<i>In Place</i>	1,631	62
<i>Rem. Ult. Pot.</i>	311	5

Source: EUB





# Investment in Alberta's Oil Sands

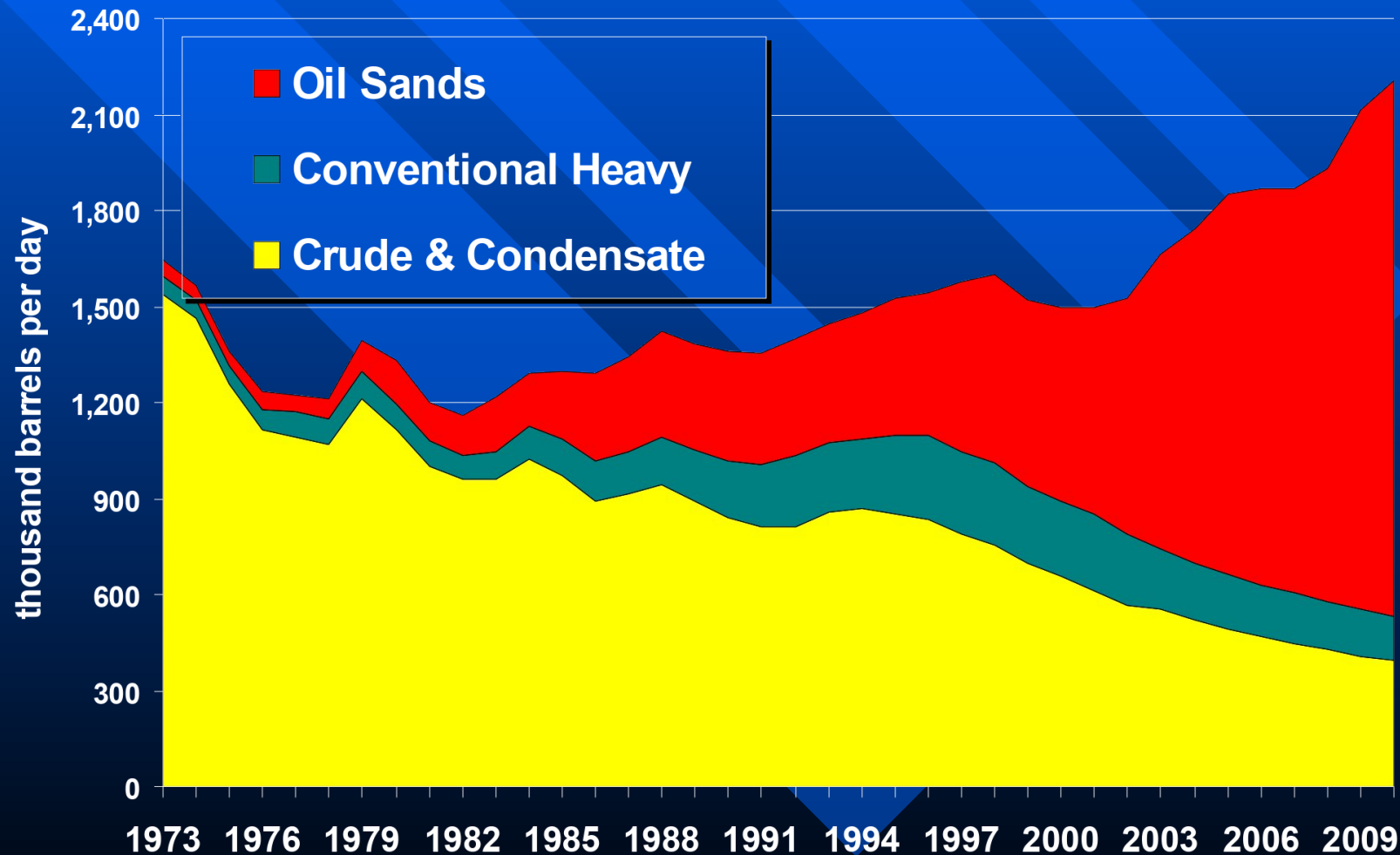


Projections include strategic and sustaining capital.

\*Completed – 1996 to 2002

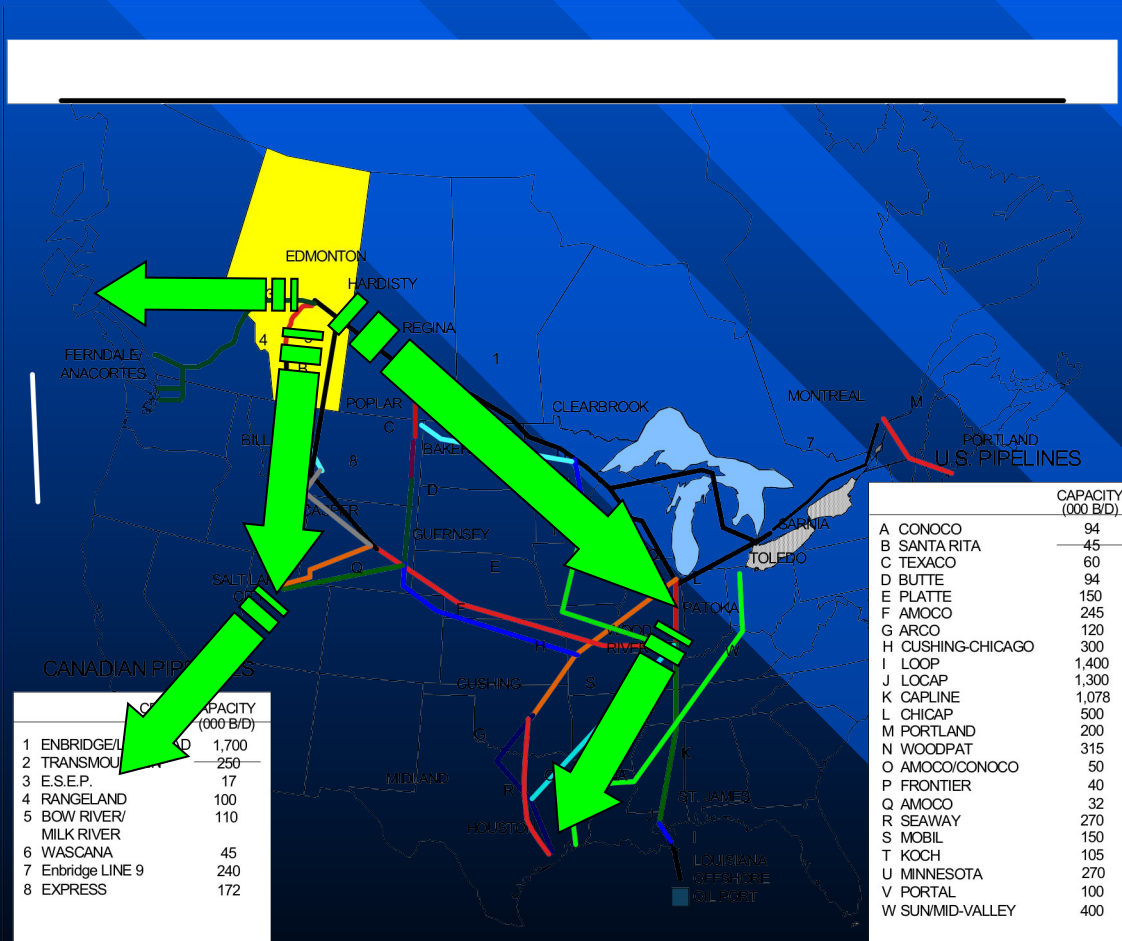
Source: CAPP, ADOE

# Alberta Liquid Petroleum Production (1973 - 2010)



Source: EUB/ADOE

# 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

# 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 Processing

- Synergies with existing facilities



# 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



# Technology Development

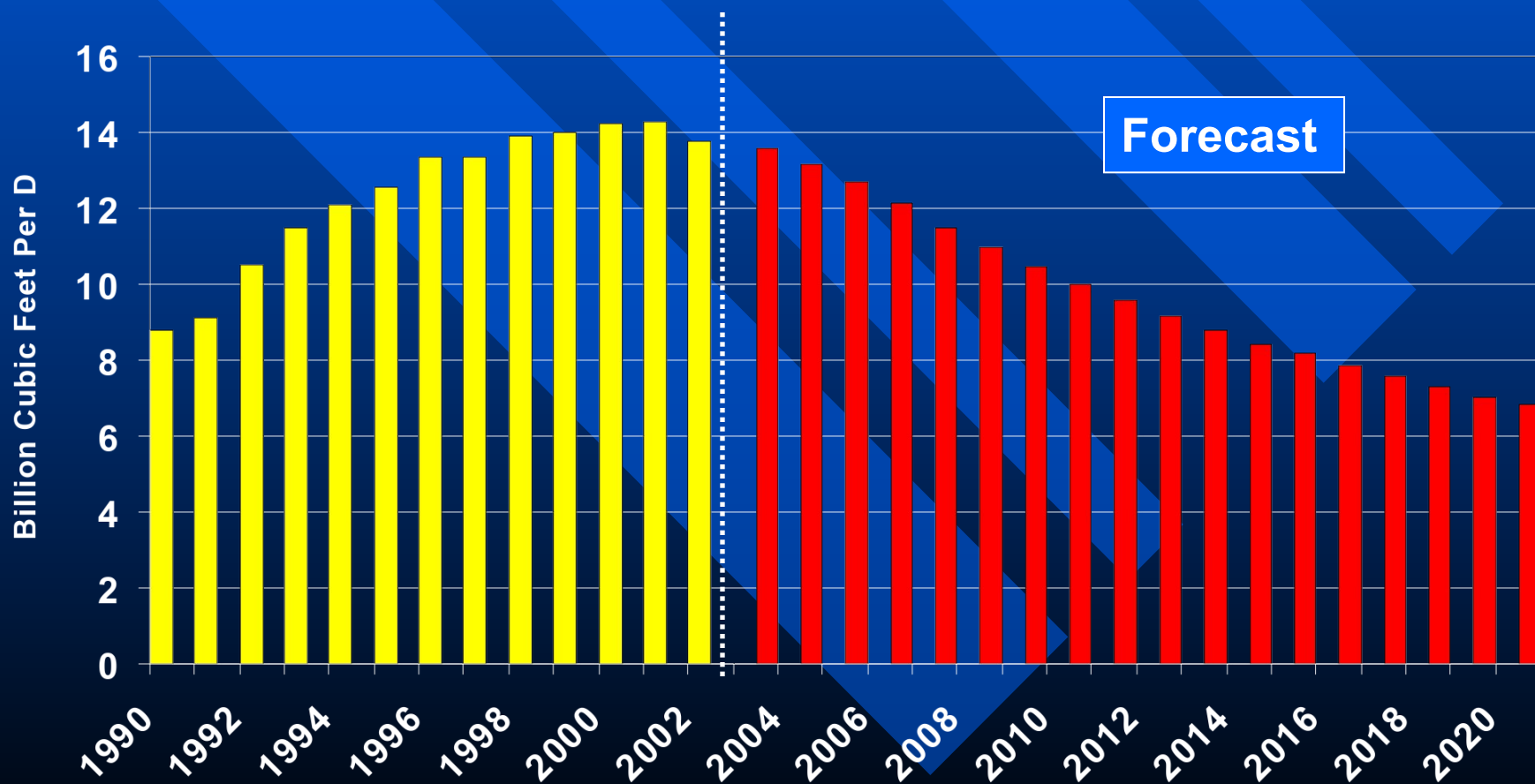
*Removing “limits to growth”!*

- 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

# 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**

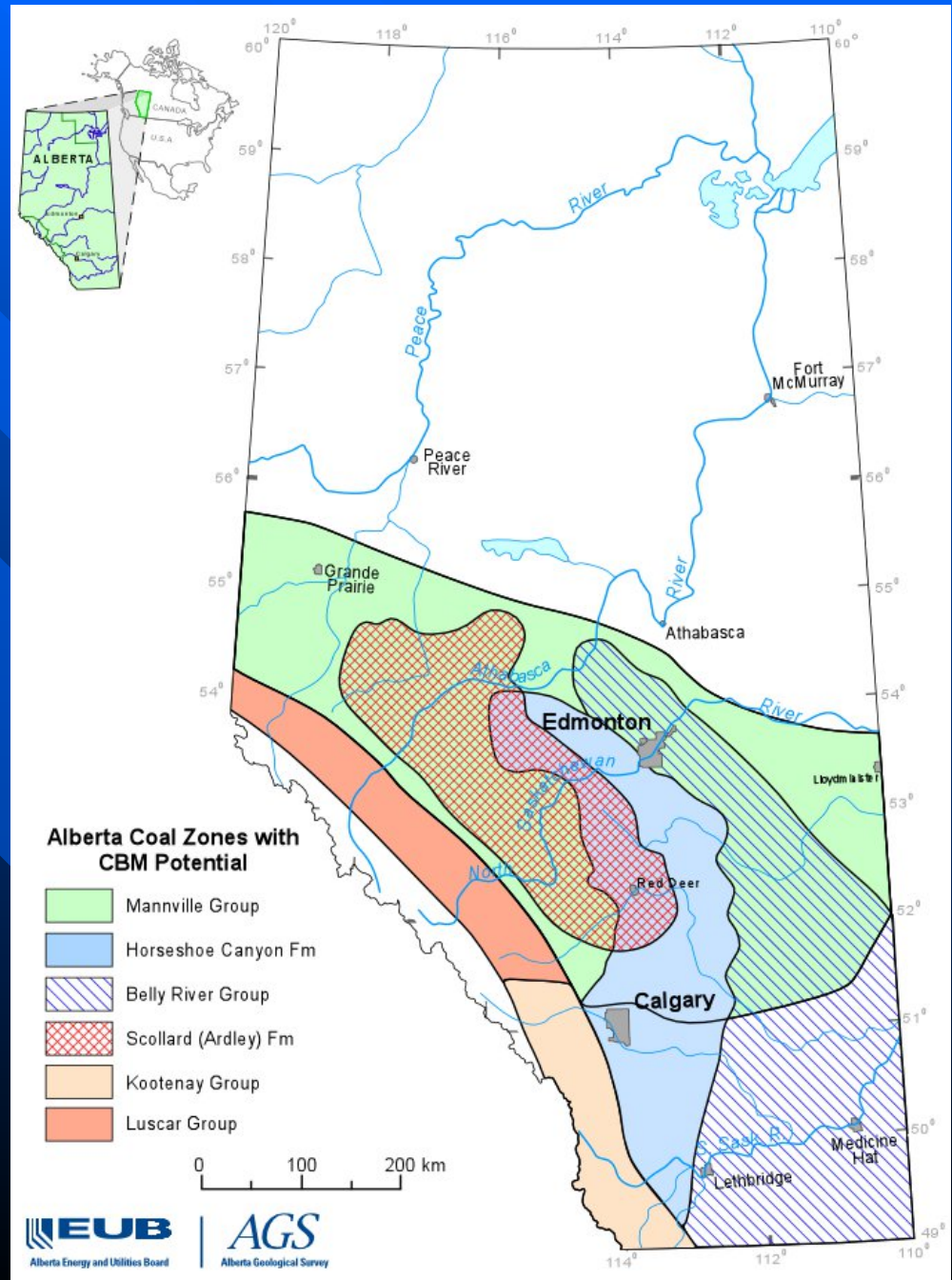
# Forecast Alberta Conventional Natural Gas Production



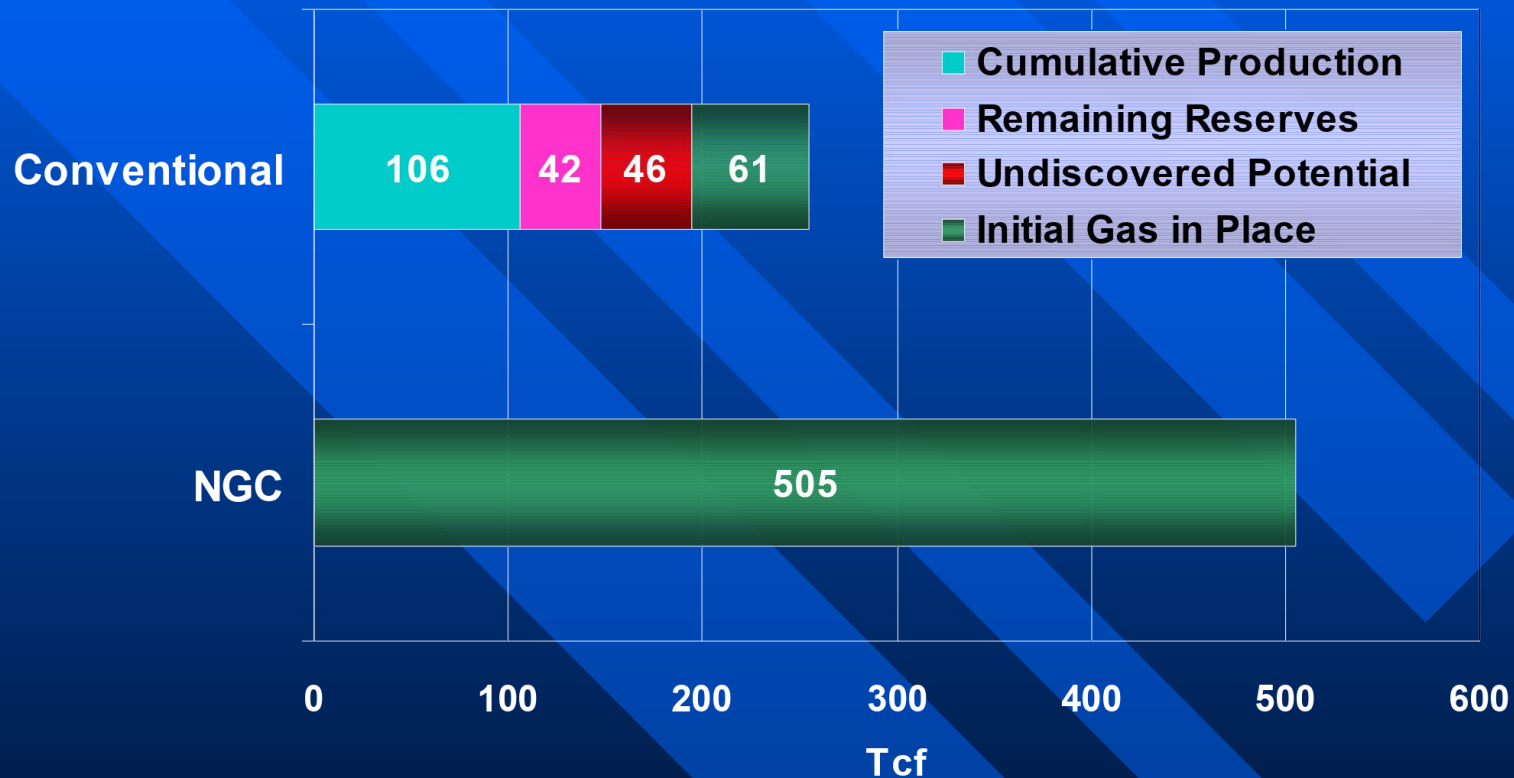


# Gas Prone Coalbeds in Alberta

## 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

# 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**

# Alberta: A Superior Hub

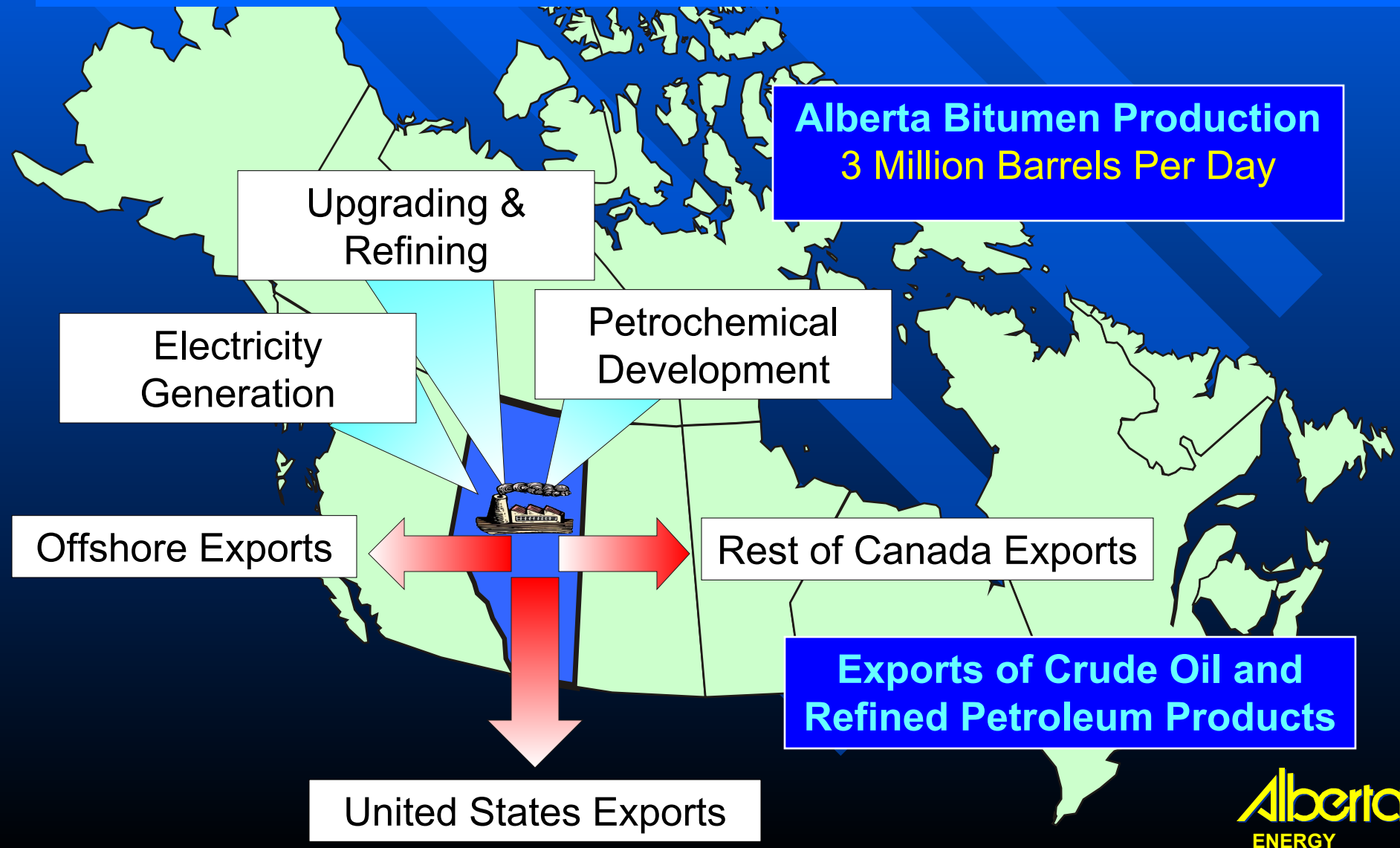
## WCSB Gas Reaches North American Markets

- 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



# 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

# Security Activities

<b><u>A. Preliminary Actions</u></b> <ul style="list-style-type: none"><li>• Site Information</li><li>• Vulnerability Assessment</li><li>• Business impact</li></ul>	<b><u>B. Outer Perimeter - Security</u></b> <ul style="list-style-type: none"><li>• Grounds</li><li>• Perimeter Barrier</li><li>• Lighting</li><li>• Security Force</li></ul>
<b><u>C. Inner Perimeter - Security</u></b> <ul style="list-style-type: none"><li>• Structures</li><li>• Commodities</li><li>• Equipment</li><li>• Operations</li><li>• Security</li></ul>	<b><u>D. Access Controls</u></b> <ul style="list-style-type: none"><li>• Employees/contractors</li><li>• Visitors/Customers/Deliveries</li><li>• Vehicles/Parking</li><li>• Shipping/Receiving</li><li>• Security</li></ul>
<b><u>E. Information Technology</u></b> <ul style="list-style-type: none"><li>• Computerization</li><li>• Other</li></ul>	<b><u>F. Plans, Policies &amp; Procedures</u></b> <ul style="list-style-type: none"><li>• Security policy</li><li>• Communications</li><li>• Intelligence</li><li>• Emergency Plans</li><li>• Specific Terrorism</li><li>• Training</li></ul>

# 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**



# EMA Operations Centres

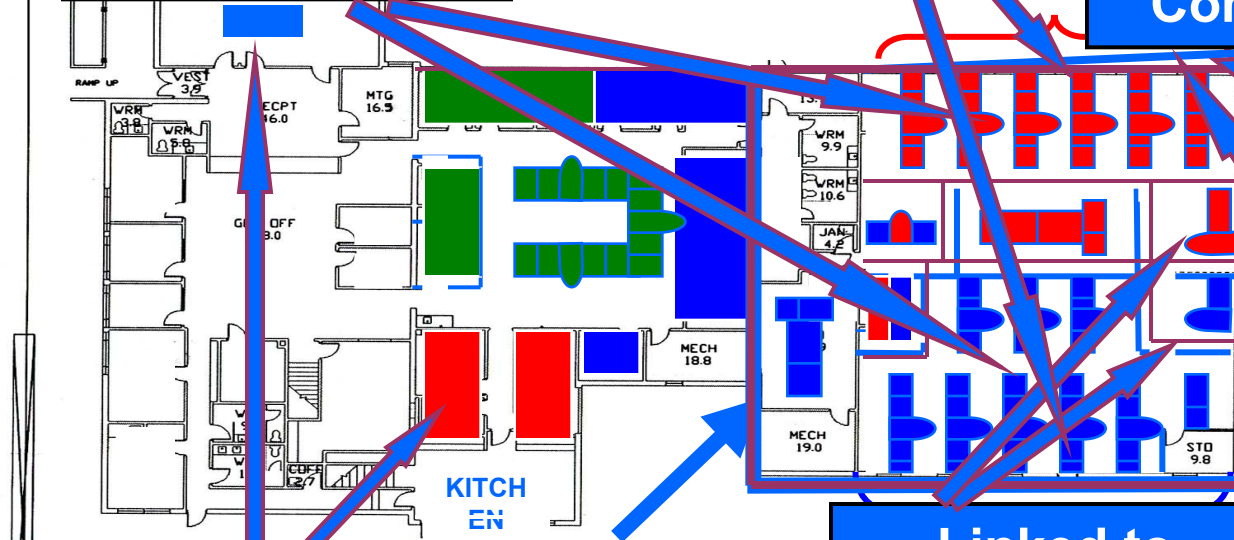


## Linked to Industry

**Linked to 307  
Municipalities  
and 46 First  
Nations  
Communities**

## Linked to All Communications Partners

**Linked to  
Federal  
Government  
and Bordering  
Jurisdictions**

[illegible]

ASSISTANT DEPUTY MINISTER

PROPERTY DEVELOPMENT	
----------------------	--

CUM APPROV

**PROJECT**  
**ADMINISTRATION BUILDING**  
**14515-122 AVENUE**  
**EDMONTON, ALBERTA**

ARCHITECTURAL DRAWING

BUILDING NUMBER 80276A	DATE N/A	PROJECT FILE NO. N/A	PLAN NO. N/A
FILE NAME [REDACTED]	DATE 001/00	DRAWN BY EM	PROJECT ID N/A
FLOOR  M	DATE N/A	CHECKED BY N/A	SCALE N/A
	DATE N/A	CORRECTED BY, BUILD N/A	DRAWING NO. 80276A

13 30 hrs