

Canadian Outlook: Oilsands, Diluent and the Future

**The Petrochemical Feedstock of the Americas (PFAA)
Barton Creek Resort
November 14, 2008**

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Outline

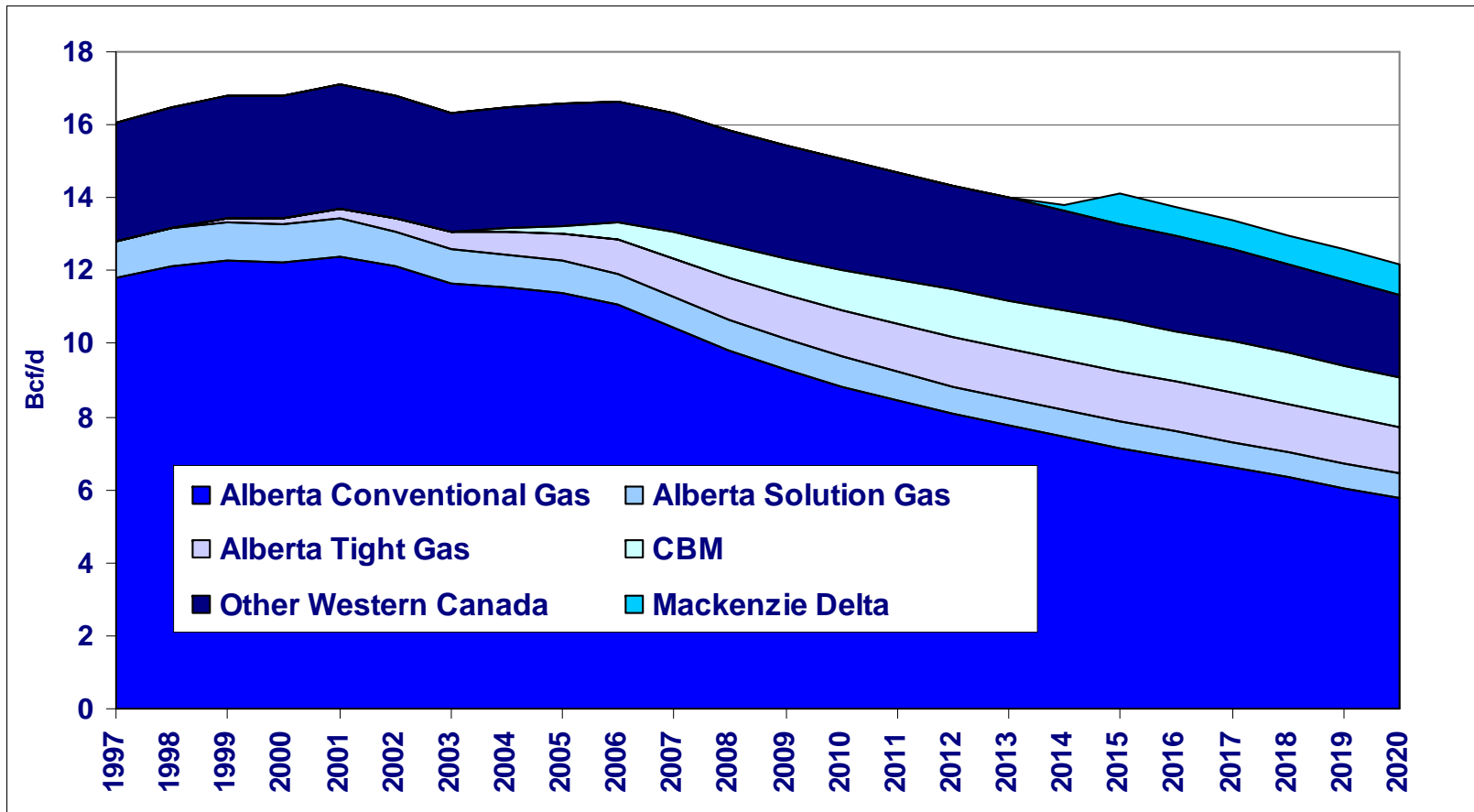
- **Canadian Olefins Feedstock Overview**
- **Industry Environment**
- **Midstream Opportunities**
- **Aux Sable: Past, Present and Future**
- **ASC Key Initiatives and Projects**
- **Risks/Challenges**
- **Conclusions**

Canadian Olefins Feedstock Overview

	Alberta	Ontario	Quebec	Rest of Canada
C ₂ = capacity (b#/yr)	8.5	2.2	0.7	0.0
C ₂ = Growth since 1990	+270%	+30%	+10%	n/a
<u>Current Feedstocks</u>				
C ₂	PRIMARY	y	n/a	n/a
C ₃ /nC ₄	C ₃ capable	Y	Y	n/a
Naphtha/C ₅ ⁺	n/a	YY	YY	n/a
Off gases	n/a	y	y?	n/a
<u>Future Feedstocks</u>				
C ₂ from nat gas	WCB/Arctic	low	none	??
Upgrader offgases	potential	low	low	??

Source - CCPA

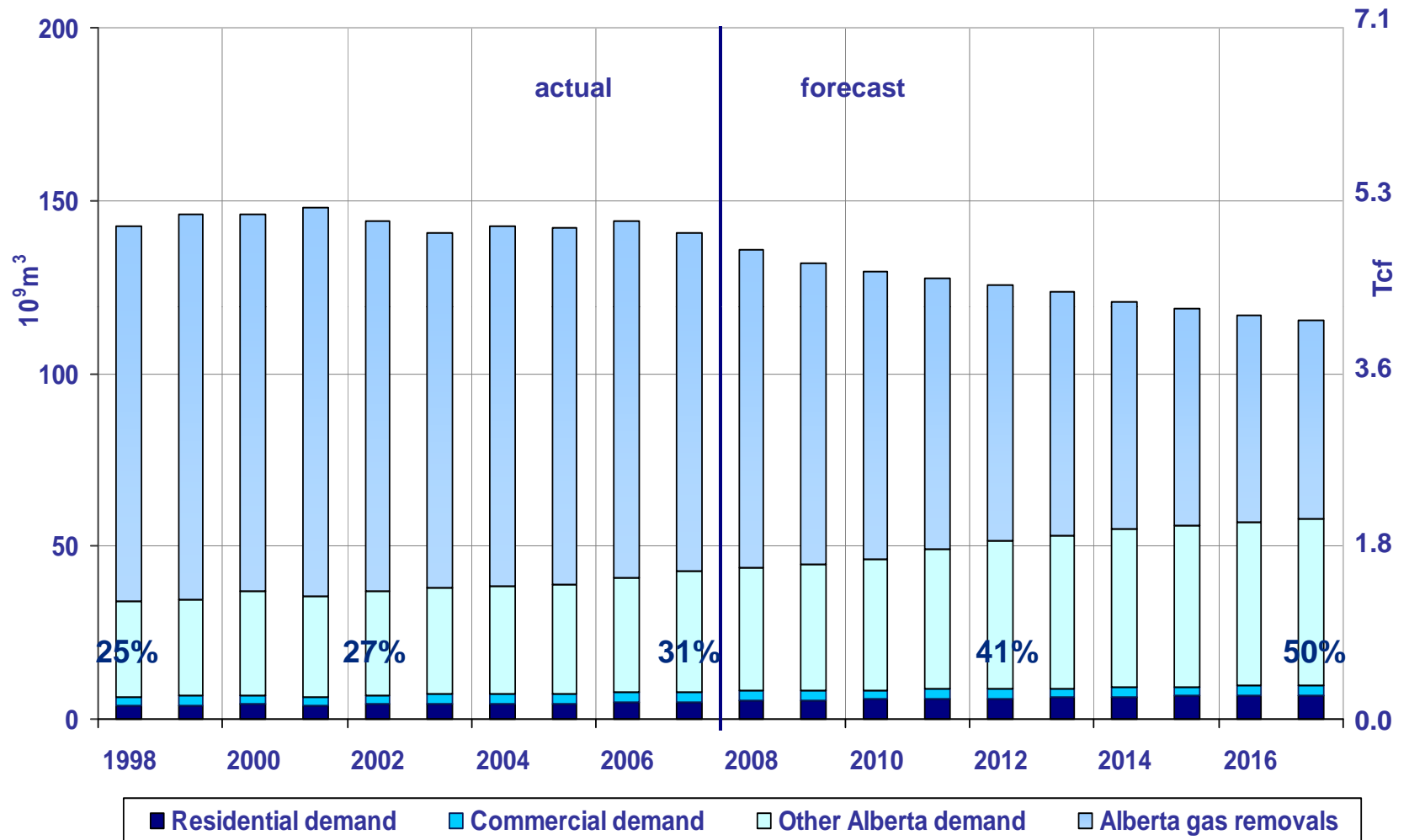
Western Canada and Mackenzie Delta Gas Supply



Source: Ziff Energy

Industry Environment

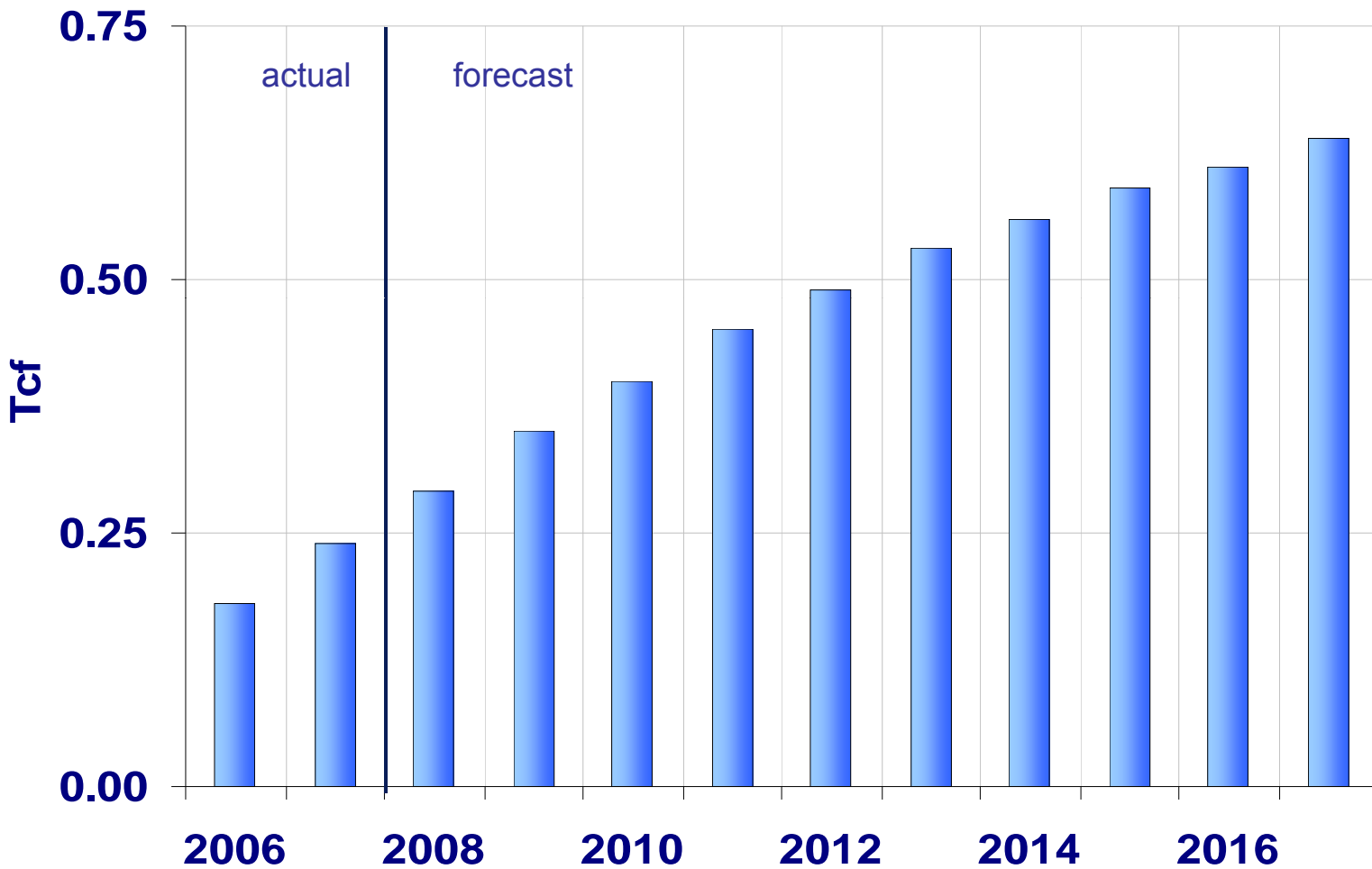
Alberta Natural Gas Supply/Demand



Source: ERCB

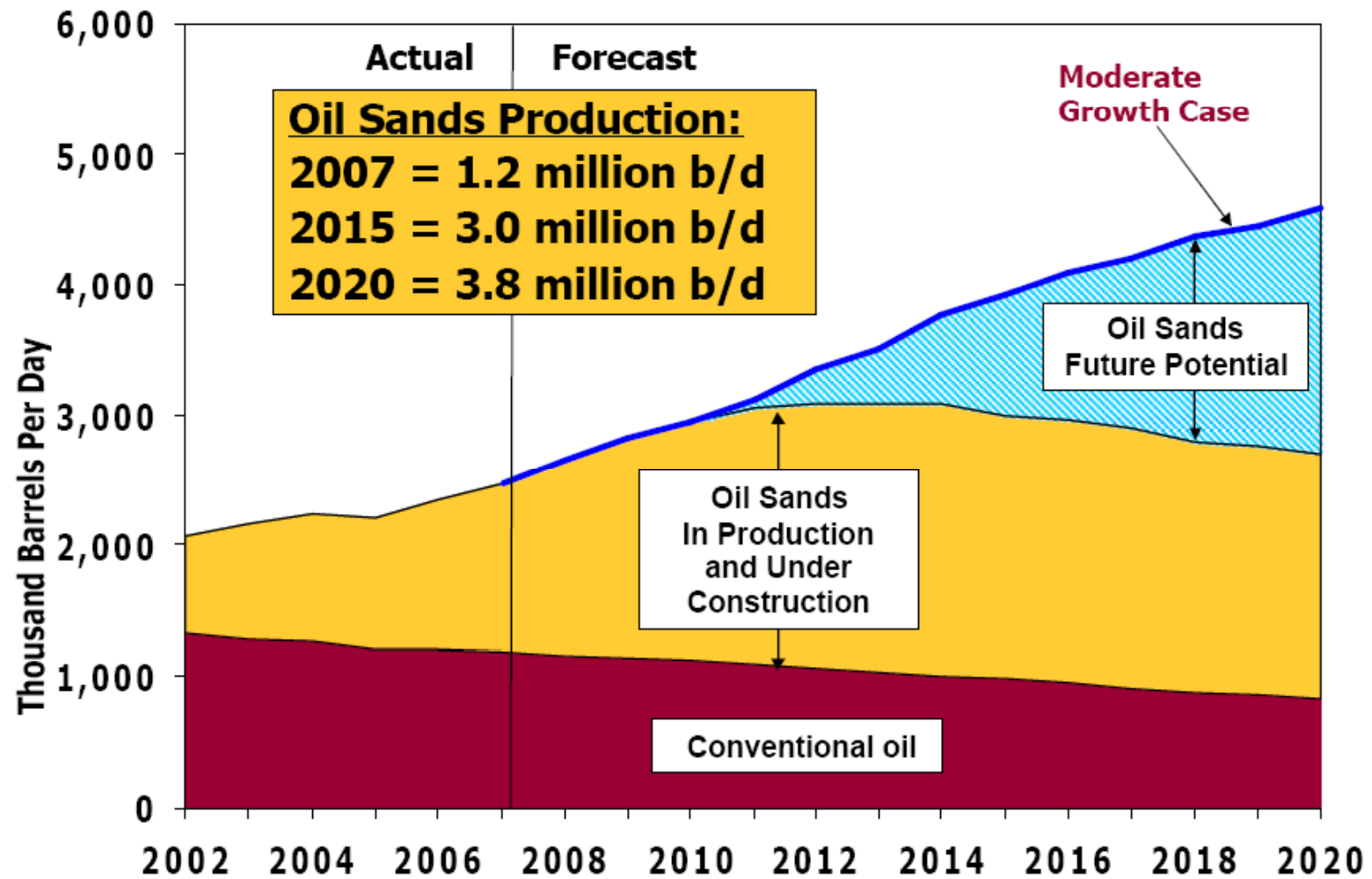
Industry Environment

Alberta Coalbed Methane Supply



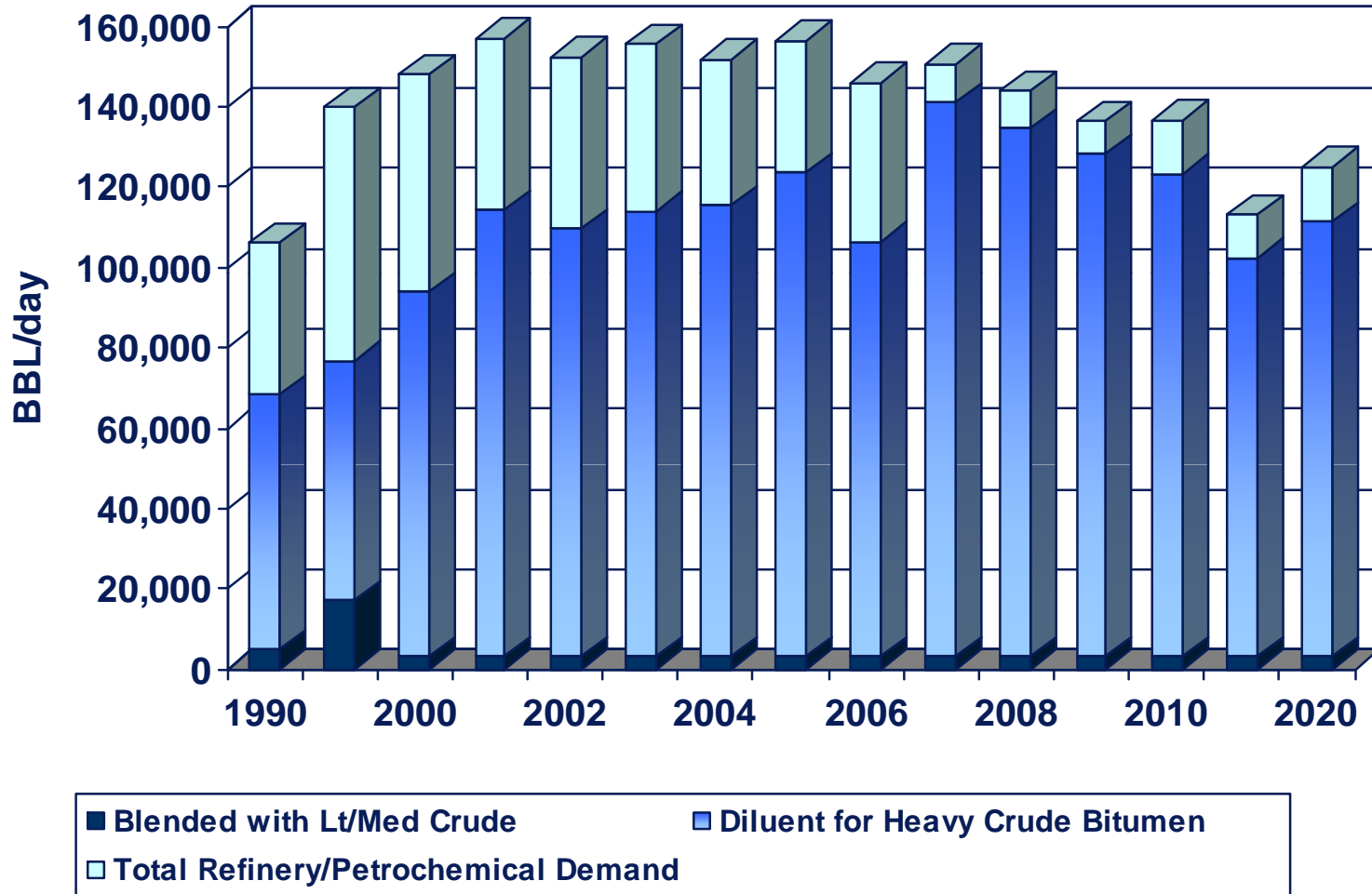
Source: ERCB

Industry Environment: Canadian Crude Oil Supply



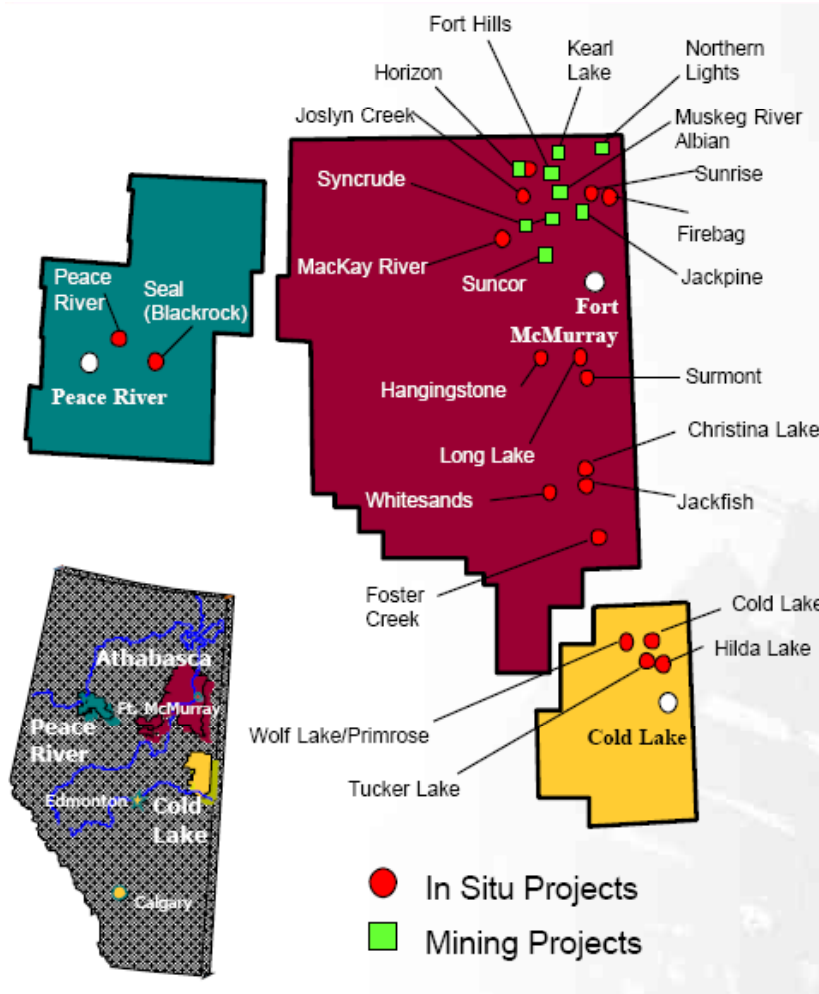
Source: CAPP

Diluent Demand



Source: Purvin & Gertz

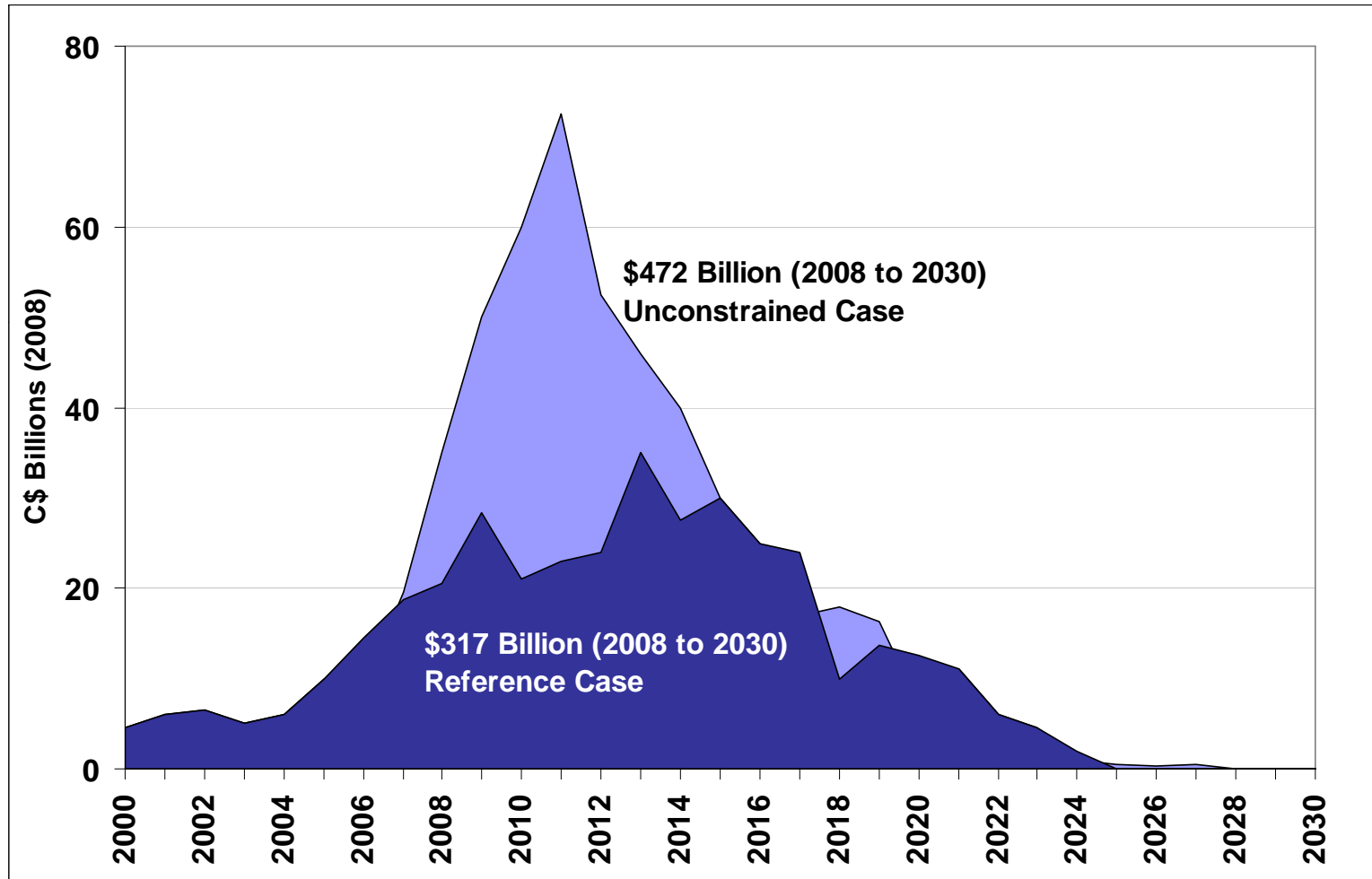
Industry Environment Oil Sands Projects



Athabasca – Mining		Barrels per day	
Operator	Project	Initial	Potential
Albian/Shell	Muskeg/Jackpine	155,000	560,000
Suncor	Base Plant	280,000	550,000
Syncrude	Base Plant	300,000	600,000
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CNRL	Horizon (2008)	135,000	577,000
Imperial	Kearl	100,000	300,000
Petro-Canada	Fort Hills	100,000	190,000
Total E&P	Joslyn Creek Mine	50,000	200,000
Athabasca – In Situ Thermal			
ConocoPhillips	Surmont	25,000	110,000
Encana/Conoco Phillips	Christina/Foster Creek	42,000	400,000
JACOS	Hangingstone (pilot)	10,000	30,000
Suncor	Firebag	68,000	375,000
Total E&P	Joslyn Creek	10,000	40,000
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Devon	Jackfish (2008)	35,000	70,000
Husky/BP	Sunrise	60,000	240,000
OPTI/Nexen	Long Lake (2008)	72,000	288,000
Petro-Canada	MacKay River	22,000	70,000
Cold Lake – In Situ Thermal			
Shell	Hilda Lake (pilot)	600	20,000
CNRL	Primrose	50,000	110,000
Imperial	Cold Lake	150,000	170,000
Husky	Tucker	18,000	40,000
Peace River – In Situ Thermal			
Shell	Peace River	12,000	100,000

Source: CAPP

Oilsands Investment

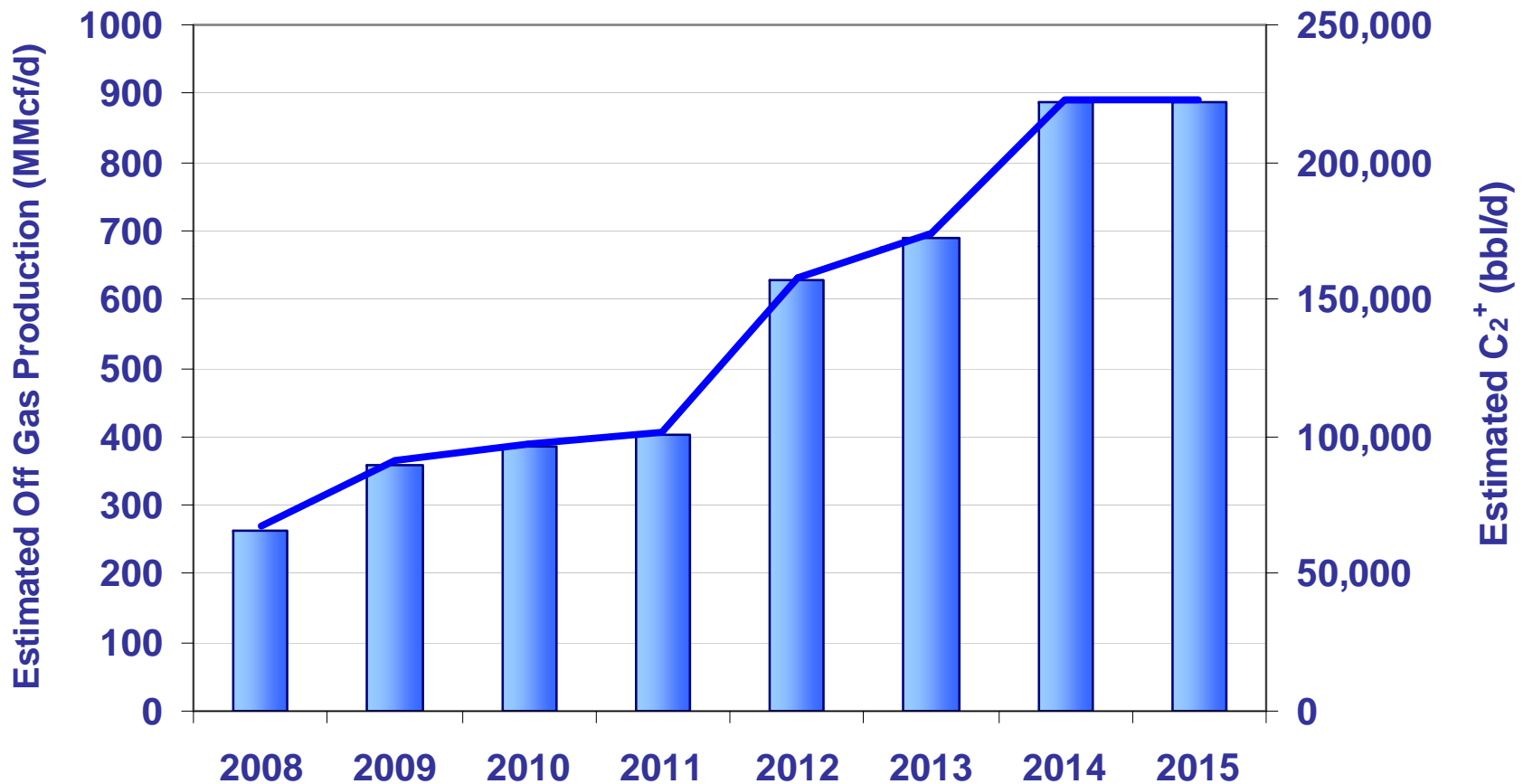


Source: CERI

Future Prospects for Olefin Feedstocks

- Extract more ethane from WCB gas production
 - ◆ Alliance gas (ethane extraction project)
 - ◆ Deeper cuts at straddle plants
 - ◆ Avoid comingling CBM in richer gas streams
- Extract C₂⁺ from Oil Sands Upgrader Off-gases
 - ◆ Fort McMurray area upgraders....extract C₂⁺ from upgrader off-gases and pipeline to Fort Saskatchewan for processing
 - ◆ Fort Saskatchewan area upgraders....extract C₂⁺ from upgrader off-gases and process streams depending on their olefinic content
- C₂⁺ from Mackenzie gas
- C₂⁺ from Alaskan gas
- Aggregate sufficient volumes of propylene in Fort Saskatchewan to support a worldscale polypropylene plant(s)

C₂⁺ Potential from Central Alberta Upgraders



Source: EUB applications and public data

Who Is Aux Sable?

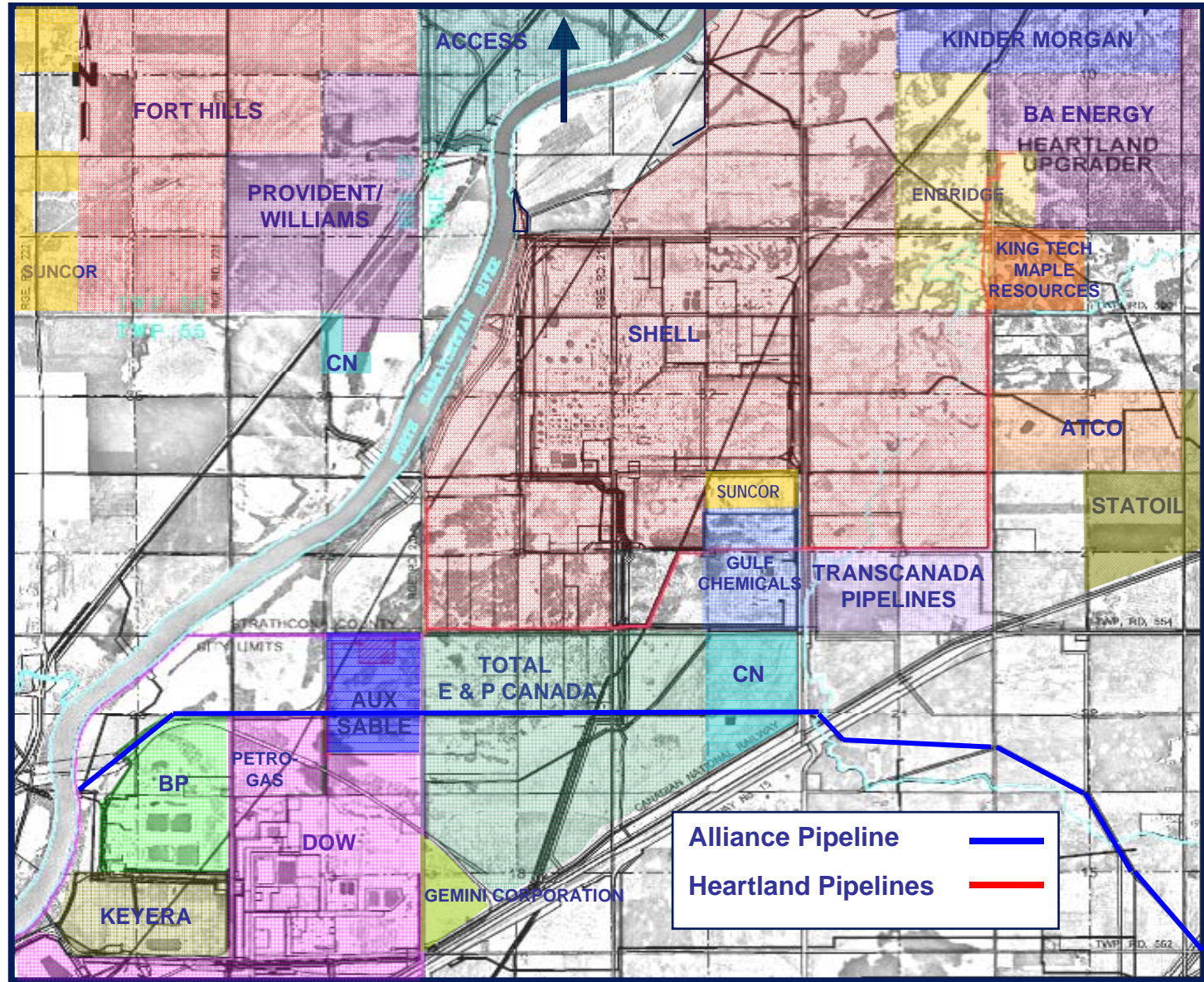
- Aux Sable U.S. owns and operates a 2.1 bcf/d world scale extraction/frac plant at terminus of Alliance Pipeline (Chicago area)
 - ◆ NGL production sold to BP under a long term agreement
- Aux Sable Canada performs supply function for Aux Sable U.S. and is developing a fee-based energy processing infrastructure business primarily in Alberta
 - ◆ First off-gas project for BA Heartland Upgrader is under construction
 - ◆ Evaluating/developing other Fort Saskatchewan projects
 - Off-gas processing/fractionation facilities
 - Fort Saskatchewan ethane extraction
- Aux Sable companies are both private companies and are owned by Enbridge, Fort Chicago, and Williams

Aux Sable U.S. Channahon Plant



ASC Projects

NORTHWEST UPGRADING & SYNENCO (< 2 KM)



Heartland Offgas Project

- Heartland upgrader offgas 15 mmcf/d
 - ◆ 2,200 bbl/d of C₂ (40% ethylene)
 - ◆ 2,000 bbl/d of C₃⁺
- Startup delayed due to delays at BA Upgrader
 - ◆ C₂/C₂⁼ to Dow Chemical
 - ◆ C₃⁺ to local/export markets
- Residue gas returned to BA
- All regulatory approvals received
- Construction commenced in August 2007

Risks/Challenges

- Conventional natural gas supply on the decline
- Intra-Alberta natural gas consumption increasing
- Reduction in natural gas flows past major export points (primary source of ethane)
 - ◆ Cochrane
 - ◆ Empress
- Natural gas quality, from NGL perspective, eroding
 - ◆ Coal bed methane production increasing (high CO₂)
 - ◆ NGL content of natural gas declining
- Cost environment
- Timing of Oil Sands developments
- Access to Capital Markets
- Income Trust taxation changes
- Development of open access Alberta Hub

Conclusions

- Alberta holds the most promise for growth in olefins based petrochemicals
- First priority is to extract ethane from existing gas streams
 - ◆ May see rationalization of some existing extraction plants to secure sufficient gas commitments to underpin deeper cuts
- The primary alternative feedstock with sufficient volume and growth potential is C₂⁺ from upgrader off-gases
 - ◆ The required extraction and processing facilities should be developed to ensure cost effectiveness (e.g. centralized processing sites where possible)
- Financial crisis will impact timing of new supply development
- Alberta is well positioned to capture the potential from northern gas supplies (Mackenzie gas and Alaskan gas) when they are developed