ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE
AN UNPRECEDENTED INVESTMENT OPPORTUNITY

October 2007
“The Alberta Government will develop policy to ensure that the raw bitumen from our oil sands is processed right here in Alberta.”

Premier Stelmach
OBJECTIVES

- Alberta’s hydrocarbon resources will be the foundation for a series of world class chemical clusters.
- A chemical cluster further diversifies the economy while adding value to resources.
- Bitumen is a very complex feedstock, and processing provides many co-product, by-product and new feedstock opportunities.
- Upgrading activity planned for Alberta’s Industrial Heartland makes Greater Edmonton the ideal location.
- Existing chemical operations will integrate well with a new cluster.
- Creating the environment for Alberta have one of the most competitive chemical clusters in North America.
## WHAT ARE THE BENEFITS?

<table>
<thead>
<tr>
<th>Industry</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enhance Supply Chains</td>
<td>• Stewardship of the province’s resources</td>
</tr>
<tr>
<td>• Access New Markets</td>
<td>• Increase Economic Wealth in the Province</td>
</tr>
<tr>
<td>• Creation of Integration Synergies</td>
<td>• Stable, High Paying Jobs</td>
</tr>
<tr>
<td>• Increase Competitiveness</td>
<td>• Increase Global Competitiveness</td>
</tr>
<tr>
<td>• Improve Common Infrastructure and Skill Sets</td>
<td>• Creation of New Diversified Industries for Sustained Growth</td>
</tr>
<tr>
<td>• Environmental Management</td>
<td>• Environmental Management</td>
</tr>
</tbody>
</table>

**ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY**
INTEGRATION OPPORTUNITY

From bitumen production to value added processing

Fuel Products
- Diesel
- Kerosene
- Gasoline
- Fuel Oil

Petrochemicals
- Ethylene
- Propylene
- Butadiene
- SynGas
- Hydrogen
- Naphtha

Fertilizers
- Ammonia
- Ammonium Sulphate
- Elemental Sulphur
- Urea

REFINING ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY
AN INTEGRATED LAND MANAGEMENT OUTLOOK

Photo: Marl, Germany

ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY
GREATER EDMONTON REGION
The Preferred Downstream Processing Location

ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY
## ANNOUNCED UPGRAADING PROJECTS

<table>
<thead>
<tr>
<th>Existing Projects</th>
<th>Volume (bpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suncor</td>
<td>260,000</td>
</tr>
<tr>
<td>Syncrude</td>
<td>350,000</td>
</tr>
<tr>
<td>Husky-Lloydminster</td>
<td>59,000</td>
</tr>
<tr>
<td>AOSP</td>
<td>158,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Expansions</th>
<th>Volume (bpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suncor</td>
<td>287,000</td>
</tr>
<tr>
<td>Syncrude</td>
<td>160,000</td>
</tr>
<tr>
<td>Husky-Lloydminster</td>
<td>65,600</td>
</tr>
<tr>
<td>AOSP</td>
<td>397,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Projects</th>
<th>Volume (bpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nexen/OPTI-Long Lake</td>
<td>173,000</td>
</tr>
<tr>
<td>CNRL-Horizon</td>
<td>232,000</td>
</tr>
<tr>
<td>Synenco-Northern Lights</td>
<td>100,000</td>
</tr>
<tr>
<td>BA Energy-Heartland</td>
<td>260,000</td>
</tr>
<tr>
<td>PetroCanada/UTS-Fort Hills</td>
<td>240,000</td>
</tr>
<tr>
<td>PetroCanada</td>
<td>85,000</td>
</tr>
<tr>
<td>Northwest Upgrading</td>
<td>150,000</td>
</tr>
<tr>
<td>Total SA</td>
<td>85,000</td>
</tr>
<tr>
<td>North American</td>
<td>250,000</td>
</tr>
<tr>
<td>Peace River Oil</td>
<td>50,000</td>
</tr>
</tbody>
</table>

**TOTAL UPGRAADING CAPACITY:** 3,361,600 bpd

Source: CAPP, March 2007

**ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE:** AN UNPRECEDENTED INVESTMENT OPPORTUNITY
**GEA UPGRADERS: AN ILLUSTRATIVE VIEW**

- **PetroCanada** 350,000 bpd
- **Agrium (Fertilizer Plant)**
- **Northwest 150,000 bpd**
- **Provident Fractionation Facility**
- **Williams Propylene Splitter**
- **BA Energy 150,000 bpd**
- **Shell 155,000 bpd**
- **Proposed: 700,000 bpd**
- **Total E&P Canada**
  - Phase 1: 130,000 bpd
  - Phase 2: +70,000 bpd
- **StatOil/NAOS 250,000 bpd**
- **Imperial Oil Refinery**
- **BP Canada**
- **Dow Chemical**
- **PV Energy**
- **PetroCanada Refinery**
- **Keyera Energy**
- **Dow Chemical**
- **Shell Chemicals**
- **Shell Refinery**
- **Shell Refinery**
- **Sturgeon County**
- **Strathcona County**
- **Lamont County**

**Majority of investments are not operationally integrated**

**ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY**

- **Petrochemical and Processing Plant**
- **Refinery**
- **Existing Upgrader**
- **Proposed Upgrader**
- **Natural Gas Processing**
CLUSTERS AROUND THE WORLD
What can we learn from the experts?

- Antwerp, Belgium
- Chemelot, Netherlands
- ChemSite, Germany
- Rotterdam, Netherlands
- Jurong Island, Singapore
- Wilton, U.K.

How do we stack up?
Kline's benchmarking analysis

ADDING VALUE TO ALBERTA'S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY
KEY FINDINGS FROM CLUSTER VISITS

- Leadership and vision is key
- Infrastructure is vital
- Site management structure is critical
- Collaboration, integration is crucial
- Focus on advantages and strengths
- Supportive government/regulatory structure
- Stimulation, incentive, kick-start
- Access to downstream markets
- Environmental management

ADDING VALUE TO ALBERTA’S ENERGY ADVANTAGE: AN UNPRECEDENTED INVESTMENT OPPORTUNITY
ALBERTA IS READY

- Oil sands are ranked as the second largest crude oil supply globally
- Strong and developing infrastructure accesses the growing North American and offshore markets
- International companies are already active in Alberta’s oil sands and bring their expertise to the province
- Rising energy costs and increased environmental awareness emphasizes the need for integrated processes to remain competitive
- Governments are committed to value-added in Alberta and working with industry to turn our vision into a prosperous reality
- Along with a hydrocarbon upgrading economy, the opportunity exists to enhance our supply chains and create a supporting manufacturing hub for industrial development
NEXT STEPS

- Stage 1 – Finalize initial Cluster Study
- Stage 2 - Work towards the implementation – deliver the business case to relevant firms domestically and internationally
- Continue to work with stakeholders on a regional plan for land management and linear corridor development in the Greater Edmonton and Industrial Heartland region
- Look at ways to enhance value-added developments in the province and encourage downstream investment to strengthen the overall economy of the province
- Develop strong government policies that work towards resolving the challenges to oil sands development
CHEMICAL CLUSTER STUDY

FRED DU PLESSIS – KLINE AND COMPANY

- Senior Vice President, Europe – Kline and Company
- Over 25 years of experience in international chemicals and life science industries
- President of European Chemical Marketing and Strategy Association (ECMSA) and Treasurer of the European Chemical Site Promotion Platform (ECSPP)
- Involved in both the Antwerp-Rotterdam-Rhine-Ruhr and Tarragona chemical industry supply chain think tank working groups.

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