



Stop Sending Canadian Jobs Down the Pipeline!

Time to Think Like Owners.
Time to Upgrade our Future.

Upgrading and refining Alberta's oil sands before it leaves the province is profitable and can be done responsibly.

The Alberta Federation of Labour (AFL), together with Unifor, a union representing many workers in the oil sands, has commissioned a detailed analysis on what it would take to keep good oil sands jobs in Alberta.

The economic and engineering case for upgrading and refining

In 2006, the Alberta government commissioned an expert report on the viability of upgrading and refining in Alberta.

The AFL has hired its own top-flight energy consultant to update that report for 2013. The conclusion of both the

2006 government report and the AFL's current report are the same: an integrated upgrader/refinery complex would be highly profitable in Alberta.

Former Alberta Premier Peter Lougheed memorably said that when it comes to our energy resources, we need to think like owners. Owners don't give away jobs or profits. He also said that when it comes to the oil sands, the real long-term jobs and profits are in upgrading and refining. What our report shows is that Lougheed was right all along.

It's time for our policy makers to re-learn the lessons of Lougheed and start thinking like owners!

74% OF ALBERTANS WANT GOOD OIL SANDS JOBS TO STAY IN ALBERTA

Jobs

If Keystone XL is built, 4,800 direct upgrading/refinery jobs will go to the United States while Canadians will get 35 permanent jobs.

Keystone XL will result in at least 18,000 indirect jobs from the economic spinoffs of the upgrading and refining activity. Those thousands of jobs will go the US Gulf Coast rather than staying in Canada.

If Northern Gateway is built, Canadians will get 228 permanent jobs while 26,000 upgrading, refining, and spinoff jobs will be shipped to China.

Upgrading and refining jobs are good jobs

Average weekly earnings for people working in refineries kept growing during the recession, while many other workers saw their wages fall.

A worker in a refinery earns two thirds more than the average Canadian worker.

Manufacturing job losses

Canadians need value-added manufacturing jobs from the oil sands.

For every oil industry job created in the last decade, we've lost 30 manufacturing jobs.



WHAT WE NEED TO DO TODAY TO THINK LIKE OWNERS

Government of Alberta

In order to maximize profits, jobs, and economic spinoffs, the Government of Alberta can act as an aggregator of bitumen.

The Government of Alberta already does this — through the Petroleum Marketing Commission Act. The province collects bitumen instead of royalties from oil sands producers — guaranteeing upgraders/refineries access to feedstock.

The Province could take an ownership stake in the plant to further maximize its profitability for Albertans.

Government of Canada

The Government of Canada should amend the National Energy Board Act to ensure resources are not shipped out of Canada prior to processing.

Energy transportation networks should be planned according to a National Energy Strategy for Canada — a strategy that puts a top priority on long-term job creation.

The United States has a ban on crude oil exports. The Americans make sure good jobs stay in America. Canada should be no different.



Based on three different sensitivity scenarios for export markets, the project remains profitable.

- ▶ Scenario 1: fuel and petrochemicals products into Canada;
- ▶ Scenario 2: fuel products into USA and petrochemicals in Alberta; and
- ▶ Scenario 3: fuel and petrochemicals products into Asia.

The results of these scenarios, set out in Table 2 below, show that although it is less profitable than the Base Case, the Project economics remain attractive.

Scenario	\$80/bbl		\$100/bbl		\$120/bbl	
	NPV (\$ billion)	IRR	NPV (\$ billion)	IRR	NPV (\$ billion)	IRR
Base Case	12.1	19.0%	17.5	22.6%	22.8	25.6%
Scenario 1	7.8	15.9%	12.6	19.3%	17.1	22.2%
Scenario 2	8.3	16.2%	12.8	19.4%	17.0	22.2%
Scenario 3	7.8	15.9%	12.5	19.2%	16.8	22.0%

Findings: In-Province Upgrading: Economics of a Green Field Oil Sands Refinery

The technical aspects of the plant

- ▶ The plant would use bitumen feedstock. Bitumen is a poor quality feedstock that yields coke, so convert those to syngas through partial oxidation.
- ▶ The plant would generate hydrogen for use elsewhere in the complex and facilitate ammonia production
- ▶ The complex would use a combination of catalytic and thermal cracking, together with partial oxidation, to generate transportation fuels (Gasoline, Jet Fuel, Diesel) and feedstock for petrochemical production.
- ▶ Petrochemicals produced would be propylene, benzene, toluene, and xylene.
- ▶ What do we make with these petrochemicals?
 - Polypro: tents, carpet, artificial hearts, credit cards, airplane wings, bungee cords, horse bridles
 - Benzene: used as a building block for plastics, resins, and nylon and synthetic fibers, some types of lubricants, rubbers, dyes, detergents, drugs, and pesticides.
 - Toluene and xylene: paints and thinners, nail polish, lacquer, printing processes, glue and adhesives, rubber and plastic cement

Profits

Based on existing capital costs, the project is profitable regardless of the price of oil.

West Texas Intermediate Price per Barrel	Net Present Value @ 8.9% real	Internal Rate of Return
\$80	\$12.1 billion	19.0%
\$100	\$17.5 billion	22.6%
\$120	\$22.8 billion	25.6%

Excerpt from the Study

“Given its inland location and the potential transportation costs required for alternative markets, it appears that the plant is best suited to supply local areas, should there be sufficient demand.”

“However, based on the current supply / demand outlook for Canada and the US, both markets are unlikely to be in deficit. Table 2 above shows that Scenario 3, which looks at supplying product into the Asian market, still shows reasonable returns under all the crude pricing scenarios, despite the logistics involved.”

Conclusion

“Our analysis of the economics of an in-province upgrading refinery and petrochemical complex in Alberta suggests that it is likely to be profitable and generate favourable economic returns. So much so, in fact, that it would meet many of the criteria necessary to attract investment from the private sector. There are several factors that work in the project’s favour, including:

- ▶ Mr. Netzer’s configuration uses partial oxidation to eliminate heavy residues and reduce the amount of hydro-processing of fuel products derived from oil sands;
- ▶ The market value of oil sands at Hardesty is quite low; return diluent streams are valued at higher naphtha-related alternate value; and
- ▶ The complex would have the capability to maximize margins by selling into a variety of end-user markets (i.e. Alberta, Canada, the US and Asia), as necessary to optimize profitability.”



About the CEG Report

The Government of Alberta has been looking at potential upgrading projects for a number of years in order to try and add value to the hydrocarbon resources prevalent in the region. These studies have been administered under the mandate of the Hydrocarbon Upgrading Task Force (“HUTF”), a joint government and industry initiative to develop business cases and promote opportunities for new refining and petrochemical investment in Alberta. The HUTF was established in February 2004.

In 2006, the Government of Alberta, under the HUTF, retained David Netzer, Consulting Chemical Engineer, to develop a conceptual design for an integrated bitumen upgrading, refining and petrochemical complex in Alberta, “Alberta Bitumen Processing Integration Study” by David Netzer, Consulting Chemical Engineer and Associates, March 2006 (the “2006 Study”). This study built on previous reviews with the aim of assessing whether an integrated complex transforming bitumen into a variety of high value products is technically feasible.

Up until early 2013, the Government of Alberta had not made any further assessments of the concept.

In March 2013, the Alberta Federation of Labour (“AFL”) approached Edward Osterwald (now a Partner with CEG Europe in London) to assess the potential economics of such an “in-province upgrading, refining, and associated value-added petrochemical complex” using the configuration set out in the 2006 Study. The request followed publication of Mr. Osterwald’s appraisal of a proposed green field oil sands refinery on the West Coast of Canada at Kitimat, on behalf of the Government of British Columbia (“Review of the Proposed Kitimat Refinery Project”). That report was published on 14 March 2013, at which time Mr. Osterwald was a Managing Director with Navigant Consulting.

The objective of the current study for AFL is to examine the potential economics of in-province upgrading of oil sands produced within Alberta and whether such a project that should be looked at in more detail.

Learn More and Take Action

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