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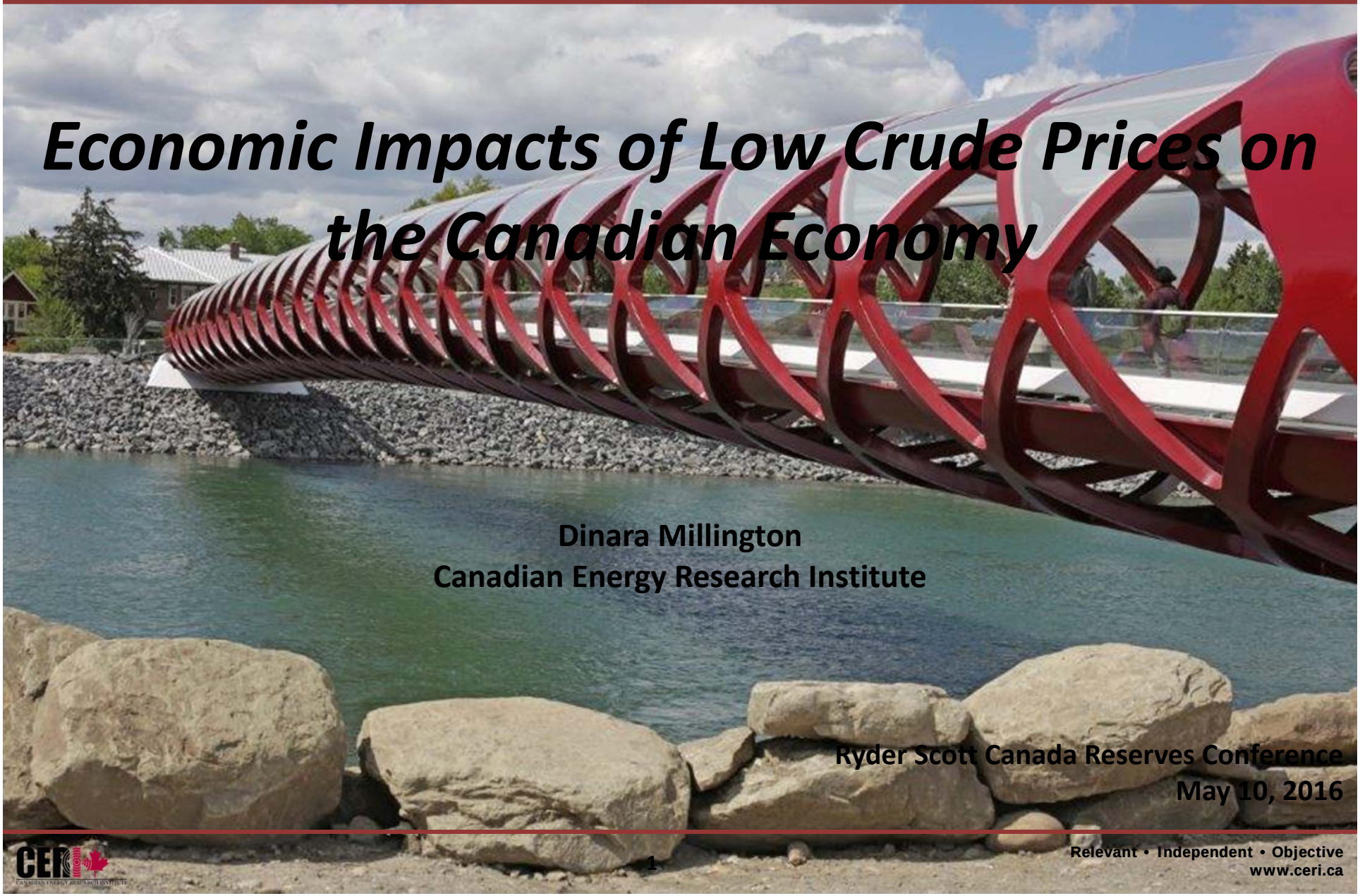

Economic Impacts of Low Crude Prices on the Canadian Economy

Dinara Millington
Canadian Energy Research Institute

Ryder Scott Canada Reserves Conference
May 10, 2016

Canadian Energy Research Institute

Founded in 1975, the Canadian Energy Research Institute (CERI) is an independent, non-profit research institute specializing in the analysis of energy economics and related environmental policy issues in the energy production, transportation, and consumption sectors.

Our mission is to provide **relevant, independent, and objective economic research** of energy and environmental issues to benefit business, government, academia and the public.

Our core supporters include the Canadian Government (Natural Resources Canada), the Government of Alberta (Alberta Energy), and the Canadian Association of Petroleum Producers (CAPP), Chemistry Industry Association of Canada (CIAC), Alberta's Industrial Heartland Association (AIHA), and the University of Calgary. In-kind support is also provided by the Alberta Energy Regulator (AER) and Petroleum Services Association of Canada (PSAC).

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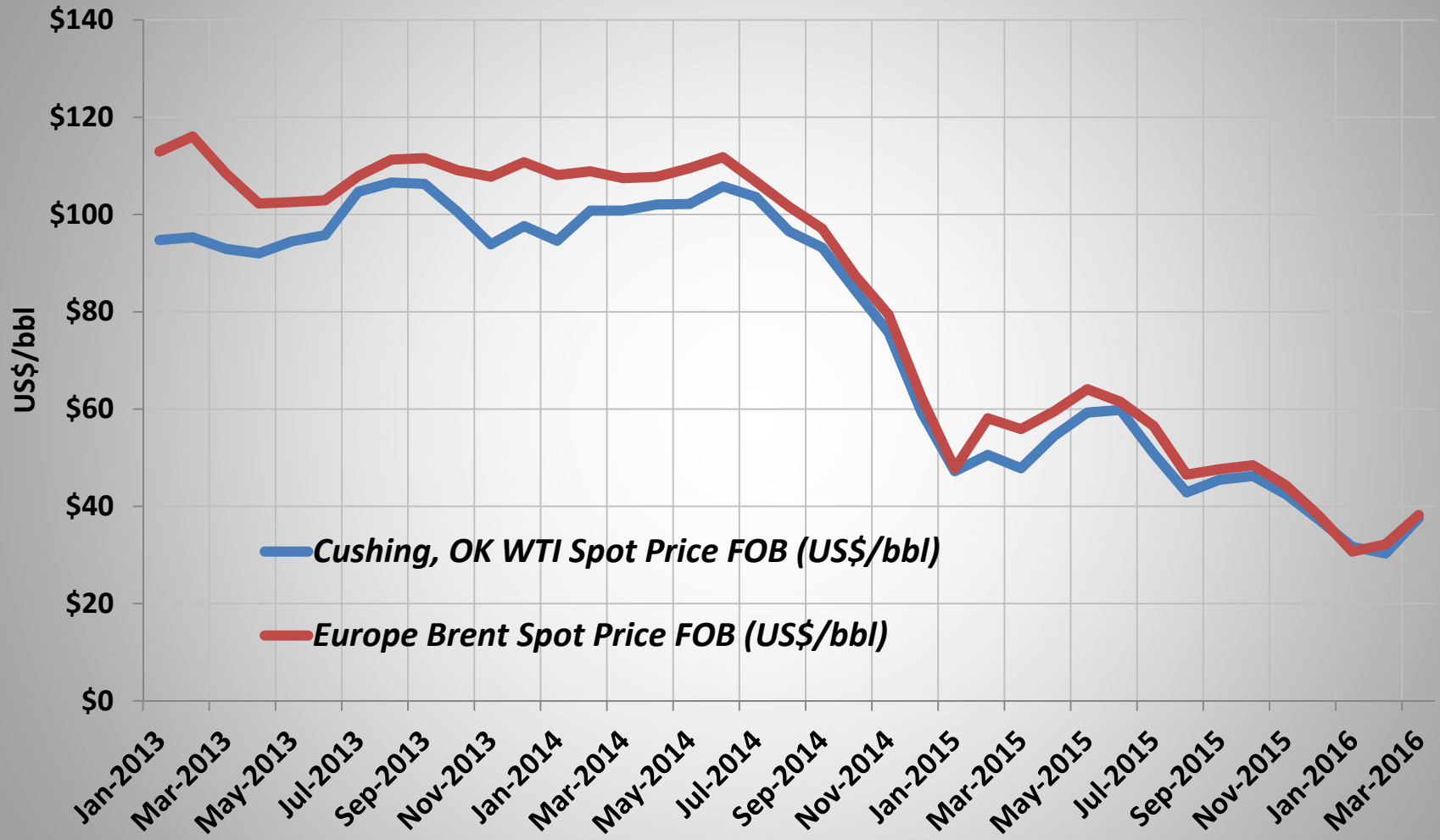
Agenda

CERI's Study 156: "Low Crude Oil Prices and Their Impact on the Canadian Economy":

- Background
- Modelling Methodology
- Assumptions
- Results on National Level
- Results for Selected Provinces
- Conclusions

Background: Crude Oil Prices (Jan'13 – Mar'16)



Source: EIA

Modelling Methodology: I/O Model

CERI's *Canada Multi-Regional Input/Output Model (UCMRIO 3.0):*

- Addresses the way economic circumstances in one part of an economy can ripple through the rest of it;
- Determines an approximate impact on various economic variables due to the introduction to the economy of a particular set of expenditures or 'shocks';
- Models any activity that leads to increased production capacity in an economy:
  - the construction or development of the capacity, and
  - the operation of the capacity to generate outputs.

Modelling Methodology: Scenarios

Reference Case

- *Investment:*
  - Reference Case Capital Investment in oil sands
- *Operations:*
  - Oil Sands Revenues (Reference Case price and production)

Low Case

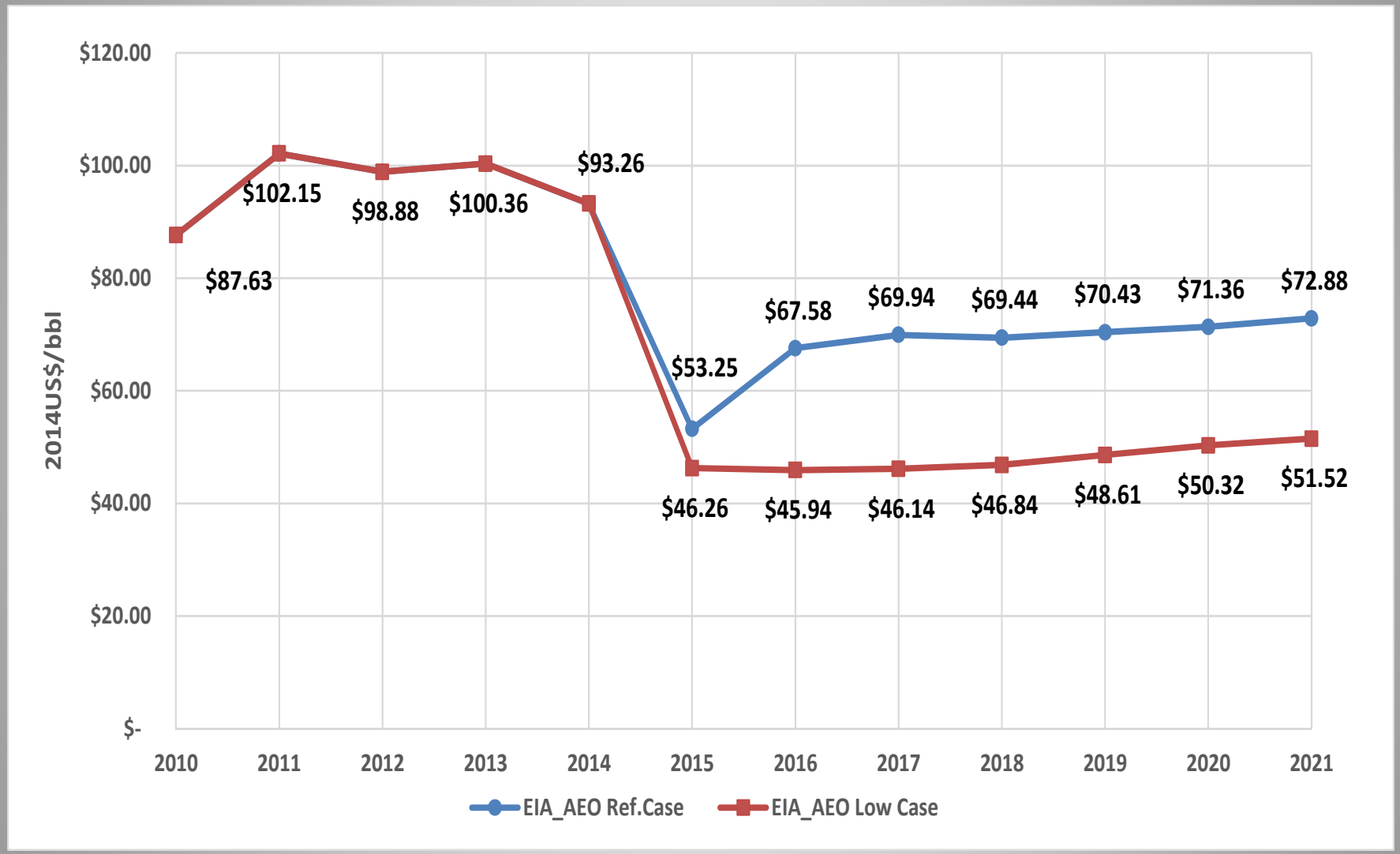
- *Investment:*
  - Low Case Capital Investment in oil sands
- *Operations:*
  - Oil Sands Revenues (Low Case price and production)
  - Change in non-energy exports*

*Incremental change in non-energy exports as a result of a low exchange rate will only transpire on the operations side of the aforementioned economic sectors. In other words, no capital investment assumption is made to build production capacity in those five economic sectors in the 7-year time period.

Assumptions for Two Scenarios

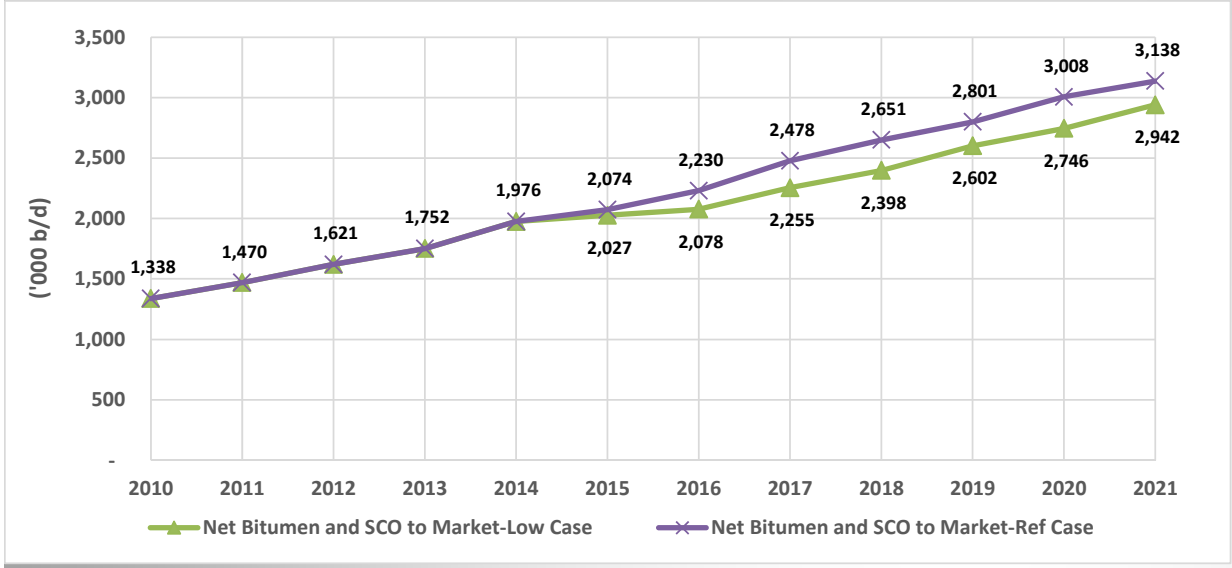
Parameter	Unit of Measurement	Reference Case	Low Case
Time Frame	Years	7	7
First Year of Forecast	Year	2015	2015
US/CDN exchange rate	US$/CDN$	0.85	0.75
WTI price	2014 $/bbl	$53.25(2015)-$72.88(2021)	$46.26(2015)-$51.52(2021)
Oil Sands Production	MMBPD	2.1(2015)-3.1(2021)	2.0(2015)-2.9(2021)
Capital Investment	CDN Mln $/year (avg)	19,575.64	13,702.95
Change in Non-Energy Exports	CDN Mln $(7-yr avg)	No Change	7,557.60

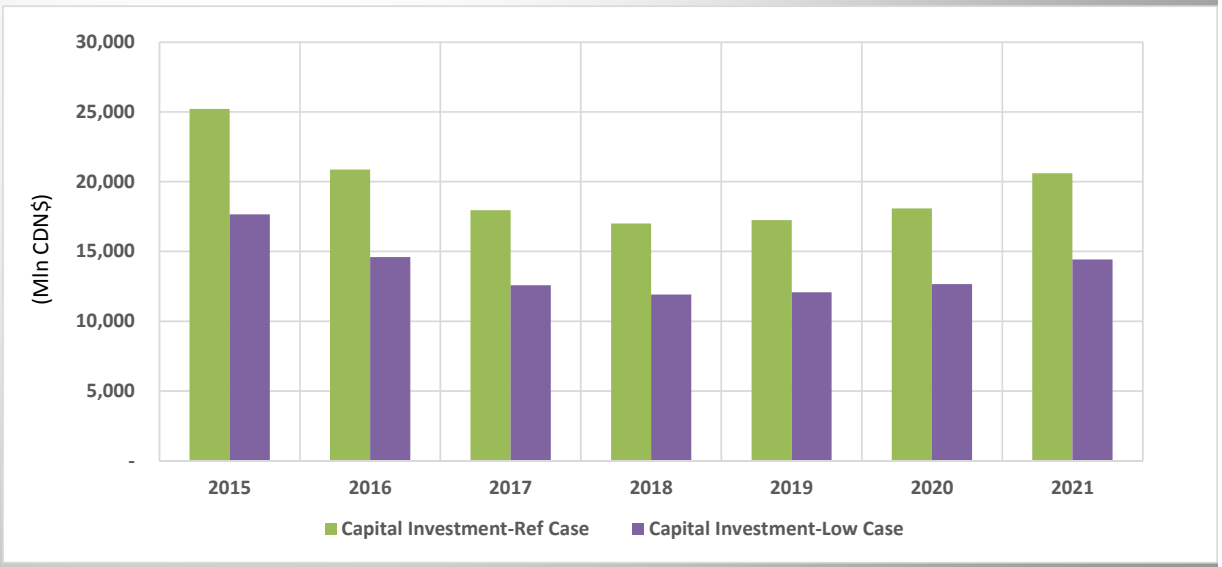
Assumptions for Two Scenarios: Oil Prices



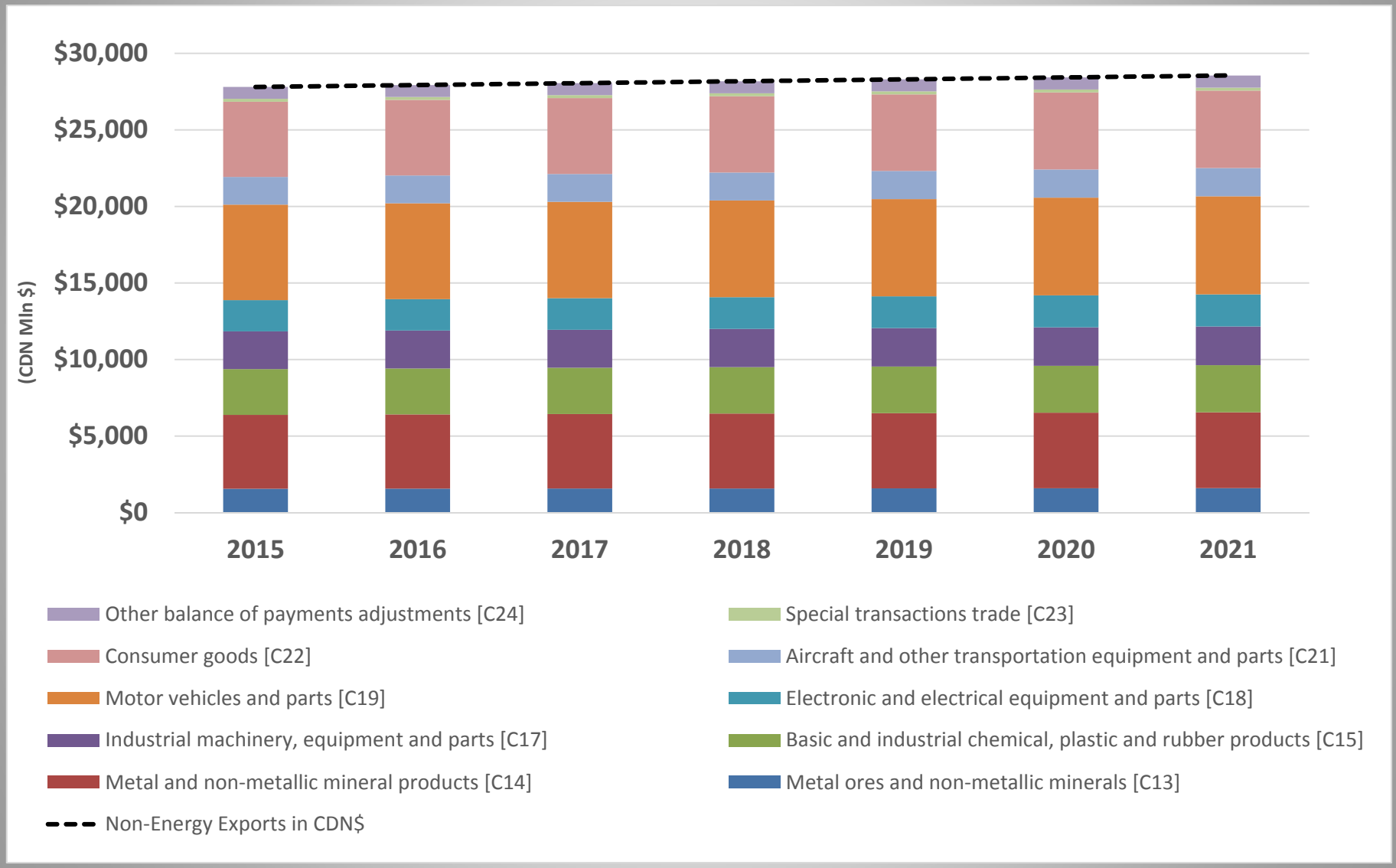
Source: EIA

Assumptions for Two Scenarios: Oil Sands Production and Capital Investment





Assumptions for Two Scenarios: Non-Energy Exports

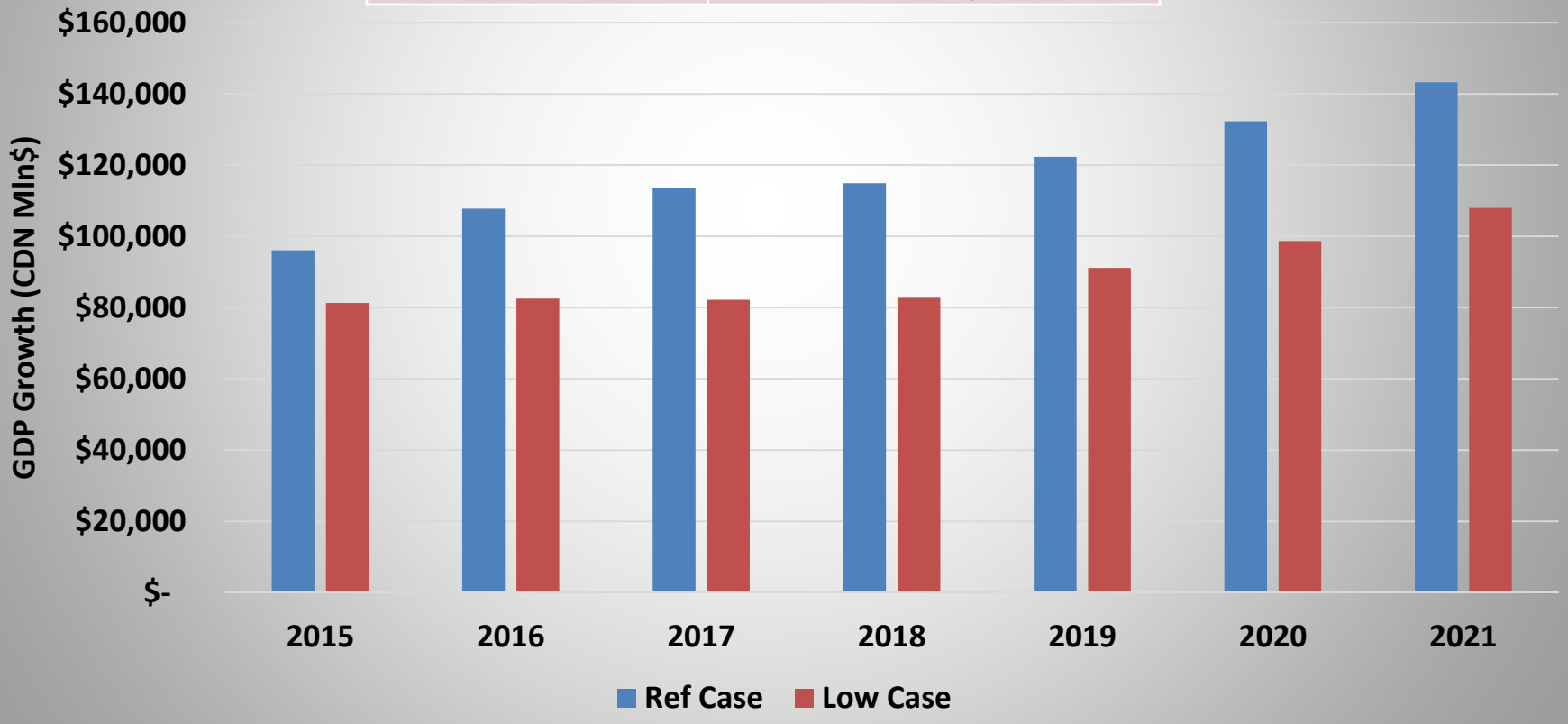


Summary of Results: Total Impacts on Canadian Economy (Cumulative 2015-2021)

2015-2021	Unit of Measure	Ref.Case	Low Case	Low vs. Ref. Case	% Change
GDP Growth	Mln CDN$	830,336	626,887	($203,449)	-24.5%
Compensation	Mln CDN$	384,578	297,680	($86,898)	-22.6%
Employment	Thousand person-years	4,109	3,298	(811)	-19.7%
Federal Taxes	Mln CDN$	95,063	71,307	($23,756)	-25.0%
Provincial Taxes	Mln CDN$	58,543	45,457	($13,087)	-22.4%

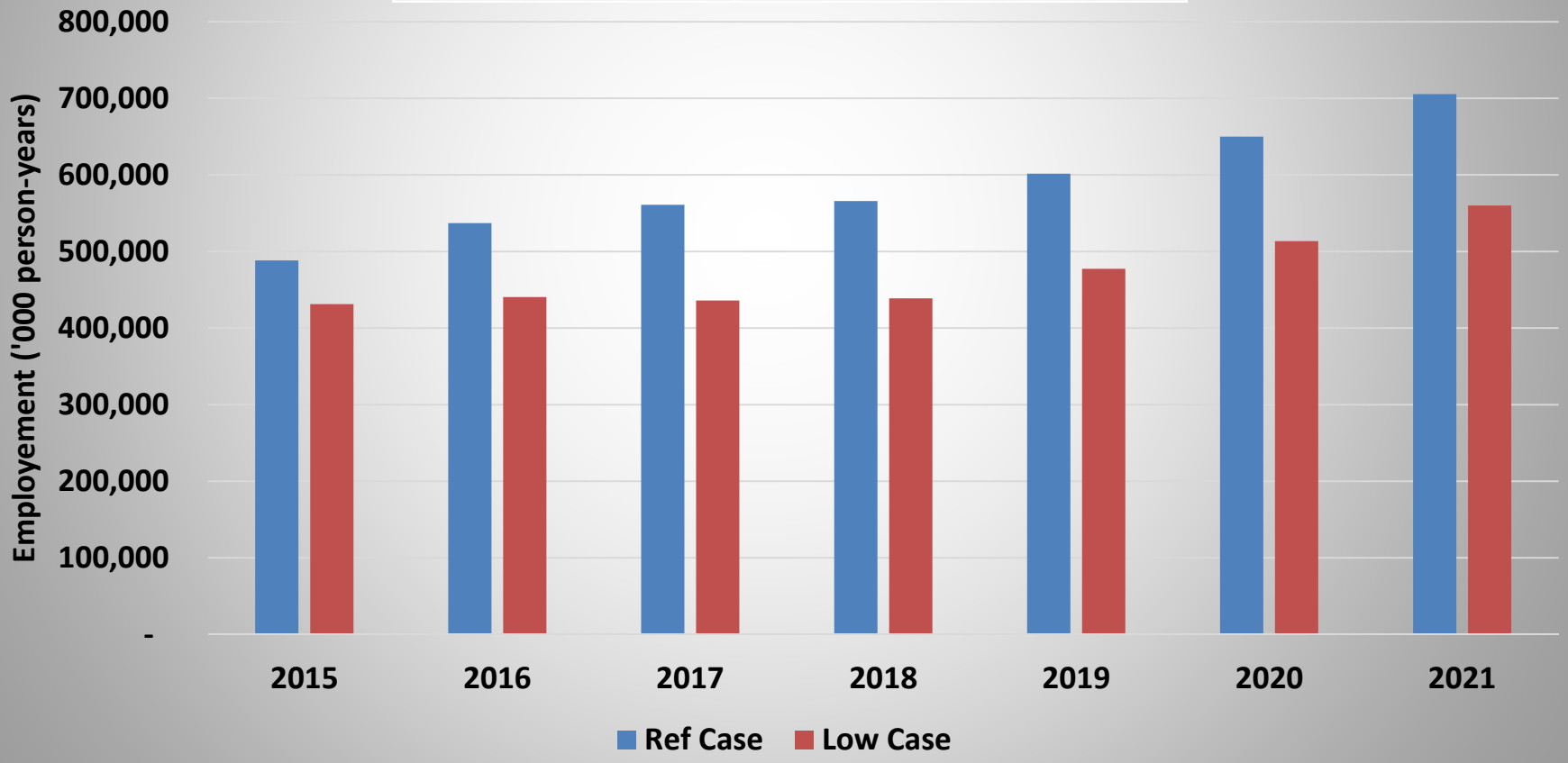
Total Annual Impacts: Canadian GDP

Case	2015-2021 Annual Average
	(CDN$Mln)
Ref. Case	$ 118,619
Low Case	$ 89,555



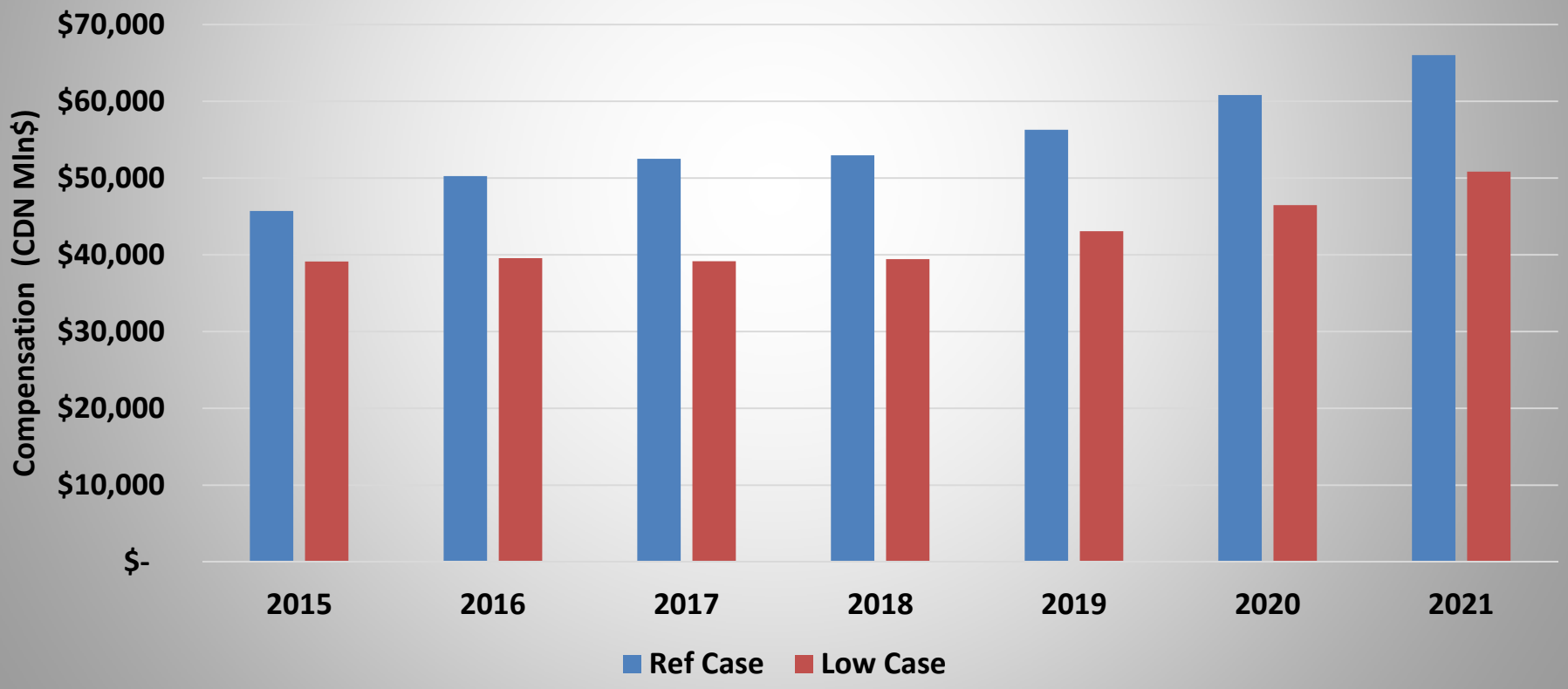
Total Annual Impacts: Employment

Case	Employment (2015-2021 Avg)
	(Jobs/yr)
Ref. Case	587,006
Low Case	471,118

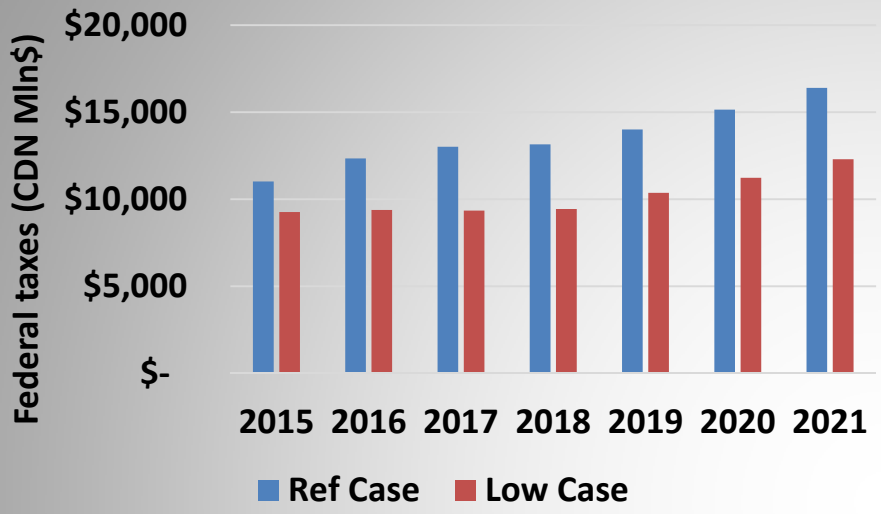


Total Annual Impacts: Compensation

Case	Compensation (2015-2021 Avg)
	(CDN$Mln)
Ref. Case	$ 54,940
Low Case	$ 42,526

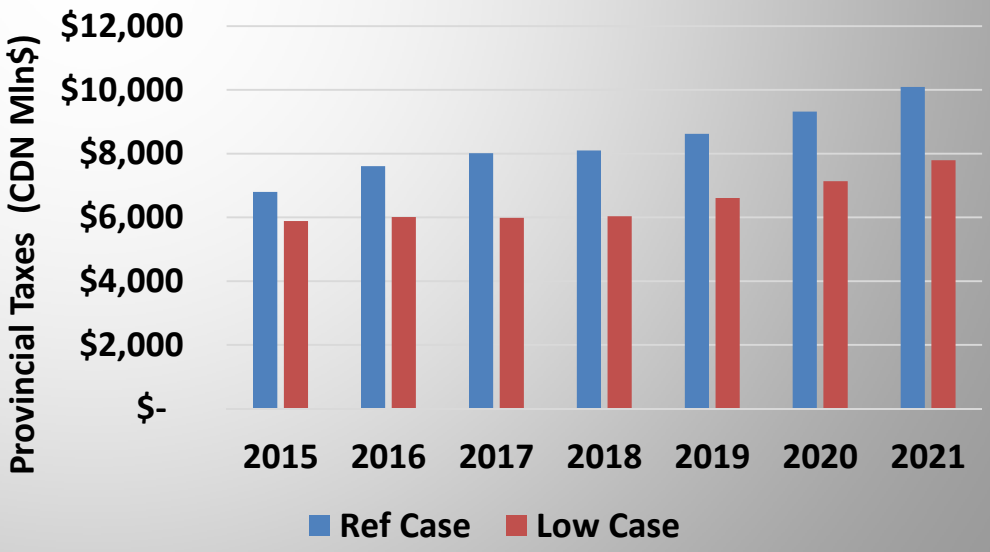


Total Annual Impacts: Federal and Provincial Taxes



Case	2015-2021 Avg (CDN$ Mln)
Ref. Case	$ 13,580
Low Case	$ 10,187

Case	2015-2021 Avg (CDN$ Mln)
Ref. Case	$ 8,363
Low Case	$ 6,494



Provincial Impacts for AB and ON

	Rank	Industry	% Share of GDP	Ref Case	Low Case	% change
AB	1	Oil Sands	39.72%	$ 331,018	$ 227,898	**-31.2%**
AB	2	Household	11.71%	$ 97,582	$ 67,834	**-30.5%**
AB	3	Finance, Insurance, Real Estate and Rental and Leasing	7.89%	$ 65,755	$ 46,115	**-29.9%**
AB	4	Conventional Oil	6.13%	$ 51,080	$ 36,250	**-29.0%**
AB	5	Owner occupied dwellings	5.12%	$ 42,675	$ 29,665	**-30.5%**
ON	1	Finance, Insurance, Real Estate and Rental and Leasing	23.22%	$ 13,491	$ 16,083	**19.2%**
ON	2	Wholesale Trade	11.08%	$ 3,310	$ 7,678	**132.0%**
ON	3	Household (Labour)	10.79%	$ 5,407	$ 7,476	**38.3%**
ON	4	Other Manufacturing	10.16%	$ 5,460	$ 7,037	**28.9%**
ON	5	Transportation & Warehousing	7.87%	$ 2,893	$ 5,455	**88.6%**

Provincial Impacts for BC and NFLD

	Rank	Industry	% Share of GDP	Ref Case	Low Case $ M	% change
BC	1	Finance, Insurance, Real Estate and Rental and Leasing	16.05%	$ 3,232	$ 3,173	-1.8%
BC	2	Household (Labour)	12.58%	$ 2,727	$ 2,486	-8.8%
BC	3	Other Manufacturing	11.26%	$ 2,460	$ 2,226	-9.5%
BC	4	Wholesale Trade	9.24%	$ 1,370	$ 1,828	**33.4%**
BC	5	Transportation and Warehousing	8.59%	$ 1,661	$ 1,699	**2.3%**
NFLD	1	Conventional Oil	26.46%	$ 155	$ 119	-23.2%
NFLD	2	Finance, Insurance, Real Estate and Rental and Leasing	8.30%	$ 45	$ 37	-18.0%
NFLD	3	Transportation and Warehousing	7.60%	$ 42	$ 34	-17.9%
NFLD	4	Household (Labour)	7.35%	$ 41	$ 33	-19.2%
NFLD	5	Other Mining	7.16%	$ 31	$ 32	**3.2%**

Conclusions

- **Low oil prices are influenced by low economic growth in Asia, Europe and North America. They are also influenced by increased oil production efficiency and high amounts of supply. The low oil price environment is expected to continue for several years.**

- **As a net oil exporter, Canada is and will be affected by the lower prices, operating through several channels.**

- **Stronger US growth and a weaker Canadian dollar have boosted non-energy exports. Investment spending and job creation have also begun to pick up in non-energy sectors, although significant slack remains in the labour market.**

- **Overall, Canadian economic growth could contract by an *average of 23 percent* if low oil prices persist over the next seven years.**

In summary, for the duration of the forecasted time horizon (2015-2021), every dollar gain in the annualized price of WTI, would increase national Canadian GDP by $1.7 billion on average.

Thank you!

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