

MEGAPROJECTS OUTLOOK – CANADA

February 2017

Projects covered by this analysis include major private industrial investments (i.e.: resource extraction, pipelines, manufacturing sector) announced or under construction in Canada as of December 2016 and valued at \$1 billion or more. Qualified projects have a specific location, a set value and timetable, and are at the construction or pre-construction stage.

FRAGILITY INDICATOR

This indicator represents the value of projects classified as fragile or projects for which public information suggests that the project as initially announced could be reduced, delayed by more than one year, or even abandoned.

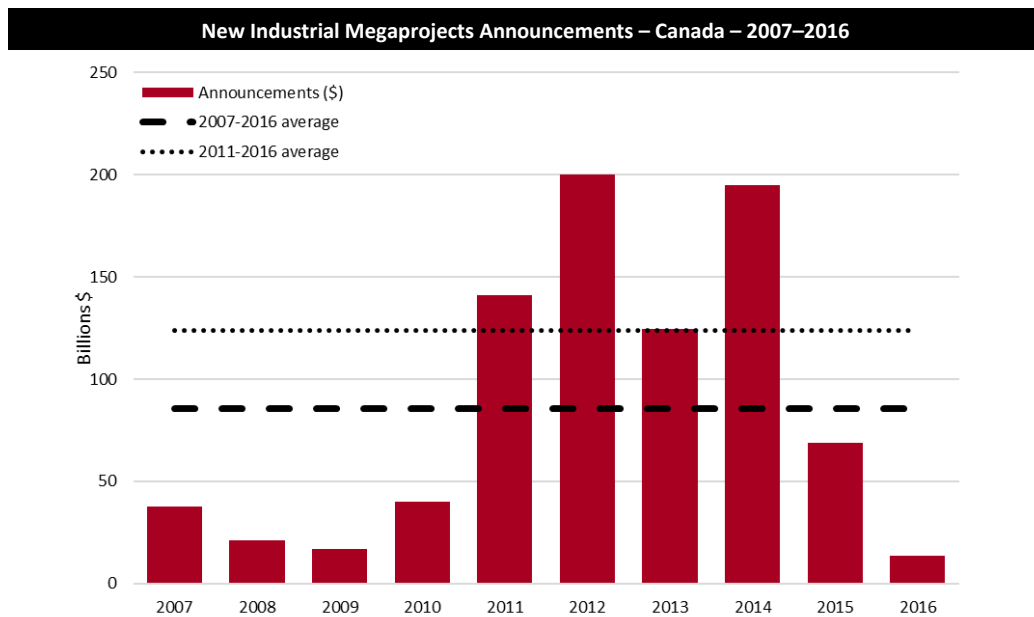
NEARLY \$500 BILLION... on the wrong track

Nearly three out of four ongoing industrial megaprojects in Canada are at risk of being abandoned

- ? Oil - Will technology save the day for the oil sands?**
Although \$151 billion of megaprojects are fragile, the industry seems to have more leeway than expected in terms of controlling and reducing production costs. You may not have heard the last from Canadian oil.
- ↘ Natural gas - Canada's hopes of becoming a major exporter evaporate**
\$225 billion of natural gas projects have been or are in the process of being abandoned. Some relatively minor projects remain active.
- ↘ Mining - End of world-class projects**
More than 80% of announced projects—\$91 billion—are at risk.

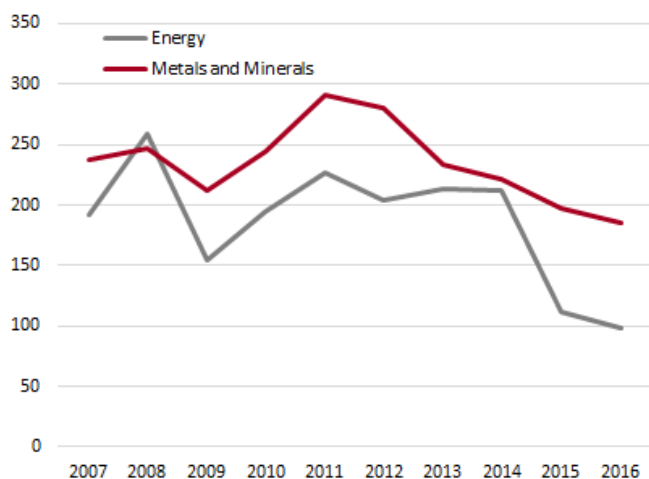
The case of the deflating bubble

Despite indications to the contrary, the collapse did not occur. Few ongoing projects have actually stopped, and recently completed projects are in production. Completely abandoned projects remain few and far between and are found mainly in the oil and gas sector. However, the value of announced new projects hit a 10-year low in 2016, and the fragility index is at an all-time high since this measure was introduced in 2013.



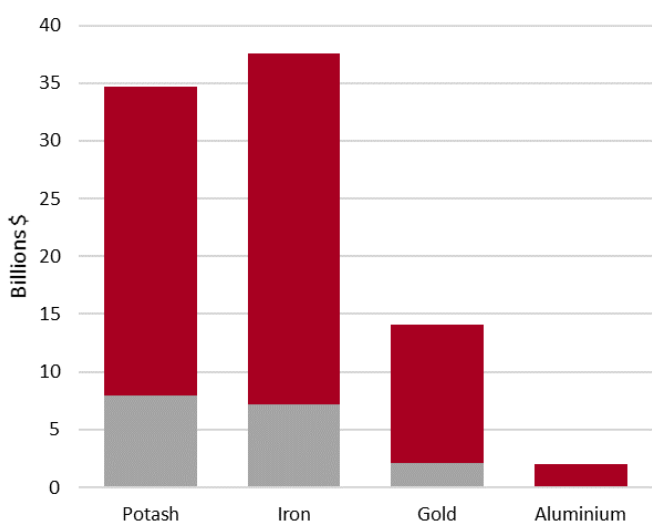
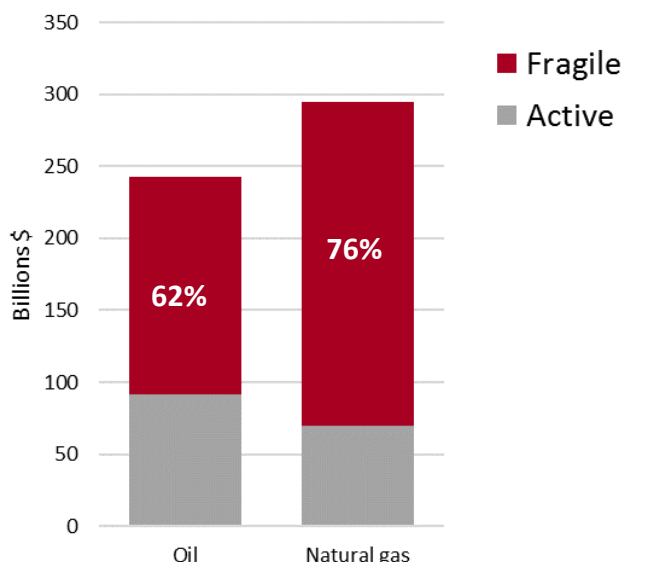
Source: E&B DATA, CAPEX-online, 2017.

Commodity Price Index - Base 100 = 2000 — 2007–2016



Source: Bank of Canada - Commodity price index (BCPI) in US\$.
 Notes:
 Energy products: Crude oil, natural gas, and coal.
 Metals and minerals: Potash, aluminium, gold, nickel, iron, copper, silver, zinc, lead.

Fragility of Ongoing Projects – By Product – 2016



Source: E&B DATA, CAPEX-online, 2017.

OIL

Despite the slowdown in oil sands projects, investments in this sector have been fruitful in recent years, and heavy oil production peaked in 2016. The downturn in prices has stopped and the outlook is encouraging for some investors who reactivated projects in 2016 or whose projects will resume construction shortly (e.g. CNRL–Kirby North project, Cenovus–Christina Lake Phase G). The continuation of these projects and the increased profitability of some of the largest investors (e.g. Suncor, CNRL, Teck Resources, Husky Energy) between 2015 and 2016 indicate stronger resilience than anticipated. Reasons include a favourable exchange rate (78% of production is exported to the United States), low gas prices (an input for the steam-assisted gravity drainage process), and technological breakthroughs aimed at reducing extraction costs. Some companies are reducing their costs, especially for new *in situ* operations, notably through modifications to steam-assisted extraction processes (e.g. solvent or surfactant additives, electromagnetic steam substitution). With respect to transportation, approval of the Trans Mountain Project and the likely revival of Keystone XL will relieve and comfort Canadian investors following the rejected Northern Gateway project. In this context, the Energy East project is less of a priority.

NATURAL GAS

The enthusiasm of the last few years has disappeared. In February 2016, American producers began to export LNG overseas from Louisiana's Cheniere (Sabine Pass) terminal ahead of Canadian projects, none of which had even reached the construction stage. In addition, the price difference between the North American and Asian markets, which strongly supported North American export of LNG, collapsed in 2015 and showed virtually no improvement in 2016. For the time being, a single LNG terminal project (Bearhead LNG–Nova Scotia) holds all the necessary approvals. Located on the East Coast, it will export US shale gas and only requires a 62-km pipeline, while Western gas pipelines (e.g. Chevron Canada Resources–Pacific Trail Pipeline, Nova Gas Transmission–Pacific Northwest Gas Looping, Spectra Energy–Westcoast Connector Gas Transmission), which are still awaiting the final investment decisions for the related LNG terminals, have to cross thousands of kilometres and almost as many obstacles (e.g. First Nations territories, local opposition, costs, climate plans). The window of opportunity closed rapidly and it is difficult to foresee it reopening before the next decade. In the meantime, megaprojects in the gas sector will be confined to transportation projects designed to expand the network in producing provinces and optimize interconnections with adjacent US states.

MINING

Global overcapacity in most commodities in the metals and minerals sector, as well as increased economic and geopolitical uncertainty, has strongly curbed optimism for almost all Canadian resources, including copper, diamonds, iron, gold, lead-zinc, nickel, uranium, and aluminium. In total, \$91 billion in announced projects have become increasingly less likely in the short to medium term. Other projects, already underway, are centred on more specialized products (e.g. some ferroalloys) or on more limited geographic markets. For the most part, the “world class” projects have been shelved.

Canada's dream of becoming a global resource superpower has faded as other countries have outpaced it. Unlike some countries that are rushing to develop new capacities, Canada has not established massive overcapacity in its industries. With the demise of its global aspirations, Canada's destiny has once again become continental. Will Canadian investors be able to assert the strategic importance of the Canadian resource industry within the North American economy for the new US administration?

TABLES AND NOTES

Ongoing Megaprojects - Status

Status	Dec. 16		Dec. 15	
	Value (\$M)	Breakdown of value	Value (\$M)	Breakdown of value
Active	193 679	29%	267 372	39%
Fragile	485 754	71%	418 251	61%
Total	679 433	100%	685 624	100%

New Megaprojects Announcements

Sector	Country of Origin			
	Canada (\$M)	Other (\$M)	Total (\$M)	Breakdown of value
Oil & Gas	7 760	2 355	10 116	91%
Mining	0	0	0	0%
Others	1 000	0	1 000	9%
Total	8 760	2 355	11 116	100%

Megaprojects - Status Updates

Development Stage of Megaprojects	Value (\$M)
Previously ongoing (December 2015)	685 624
New in 2016	83 181
Reactivated in 2016	0
Abandoned in 2016	70 350
Completed in 2016	19 021
Total ongoing	679 433

Note: Totals may not equal the sum of the components due to rounding.

MEGAPROJECTS

Megaprojects are projects with a total value of \$1 billion or more. Selected projects have a specific location, a set value and timetable, and are at the construction or pre-construction stage.

DEVELOPMENT STAGES

New megaprojects are projects that were publicly announced in 2016. Reactivated projects were previously abandoned, but have been relaunched. Ongoing projects were already ongoing as of December 31, 2015. Abandoned megaprojects have been either announced as or presumed abandoned in 2016. Completed megaprojects have been completed since January 2016. Ongoing megaprojects include both new and already ongoing projects that have not yet been completed. Adjustments to project values (e.g. cost overruns) as of December 2016 have been taken into account for ongoing projects (announced in previous years).

MEGAPROJECT SECTORS

The mining sector includes extraction activities (metallic and non-metallic ore) and processing, such as iron-ore pelletizing and aluminum smelting. The oil and gas sector includes extraction, processing (i.e. upgrading, refining), and transportation activities for oil and natural gas, which includes pipelines and liquefied natural gas terminals. All other manufacturing sectors are included in "Other."

Ongoing Megaprojects by Sector

Sector	December 2016			December 2015		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Mining	115 375	17%	78%	114 475	17%	61%
Oil & Gas	552 148	81%	70%	560 939	82%	61%
Oil	242 978	36%	62%	268 828	39%	64%
Natural Gas	294 654	43%	76%	277 595	40%	58%
Other Oil & Gas	14 515	2%	77%	14 515	2%	56%
Other	11 910	2%	62%	10 210	1%	72%
Total	679 433	100%	71%	685 624	100%	61%

Ongoing Megaprojects by Region of Destination

Region	Dec. 16			Dec. 15		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Western Canada	570 949	84%	75%	581 849	85%	63%
Central Canada	60 985	9%	76%	58 980	9%	74%
Atlantic Canada	37 425	6%	13%	34 720	5%	19%
Northern Canada	10 075	1%	79%	10 075	1%	36%
Total	679 433	100%	71%	685 624	100%	61%

Ongoing Megaprojects by Region of Origin

Region	Dec. 16			Dec. 15		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Canada	397 076	58%	64%	352 565	51%	61%
United States	115 155	17%	72%	132 250	19%	45%
Asia-Pacific	98 302	14%	83%	98 608	14%	73%
Europe	53 400	8%	100%	86 700	13%	65%
Other	15 500	2%	94%	15 500	2%	94%
Total	679 433	100%	71%	685 624	100%	61%

MEGAPROJECT STATUS

Active projects are under construction or in the process of obtaining government approval and financing, showing no sign of a slowdown. Projects are classified as fragile when available public information suggests that the project as initially announced could be reduced, delayed, or even abandoned for financial reasons (market conditions, access to financing) or regulatory concerns, or because the investor has not provided information about the project for an unusually long period of time. Projects officially on hold are also included in this category.

FRAGILITY INDICATOR

This indicator represents the value of a project classified as fragile at the time of the analysis compared to the total value.

REVISIONS

The February 2017 publication incorporates data revisions due to an improved imputation methodology for missing data.

REGION OF DESTINATION

Western Canada includes British Columbia, Alberta, Saskatchewan, and Manitoba. Northern Canada includes the Yukon, Northwest Territories, and Nunavut. Central Canada includes Ontario and Quebec. The Atlantic region includes Newfoundland and Labrador, New Brunswick, Nova Scotia, and Prince Edward Island.

REGION OF ORIGIN

The Asia-Pacific region includes 57 states—the 55 member states of the UN General Assembly, in addition to Australia and New Zealand. Europe includes all members of the European Union as of December 2016, in addition to Norway and Switzerland. The "Other" category includes South Africa, Brazil, and Russia.

OWNERSHIP

This study covers privately held projects, with the exception of projects announced in Canada by non-Canadian state-owned enterprises.

E&B (Economic and Business) DATA is an independent economic-analysis company specializing in the industrial sector, particularly in heavy industry. Its clients include private investors, industry associations, governments, and trade unions. Data come from CAPEX-online and are based on a continuous review of public announcements concerning private capital investment projects valued at \$1 billion or more in Canada. To purchase or subscribe to CAPEX-online, please email us at info@ebdata.com.

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