

MEGAPROJECTS OUTLOOK – CANADA

February 2016

Projects include major private industrial investments (i.e.: resource extraction, pipelines, manufacturing sector), announced or under construction in Canada as of December 2015 and valued at \$1 billion or more. Qualified projects have a precise location, a set value and timetable, and are at the construction or pre-construction stage.

FRAGILITY INDICATOR

Represents the value of projects classified as "Fragile", i.e. projects for which public information suggests that the project as initially announced could be reduced, delayed by more than one year or even abandoned.

\$715 BILLION... Mostly at risk

Total value of industrial megaprojects in Canada... and their fragility

Oil

➔ **Natural selection: some companies could disappear, and a wave of asset transfers is looming.**

Nearly two-thirds of projects are associated with unsustainable production costs.

Natural gas

➔ **A game of musical chairs threatens many LNG terminal projects on the West Coast.**

\$284B in ongoing projects, including \$219B for LNG terminals in British Columbia. The number of precarious projects has more than tripled since 2014.

Mining

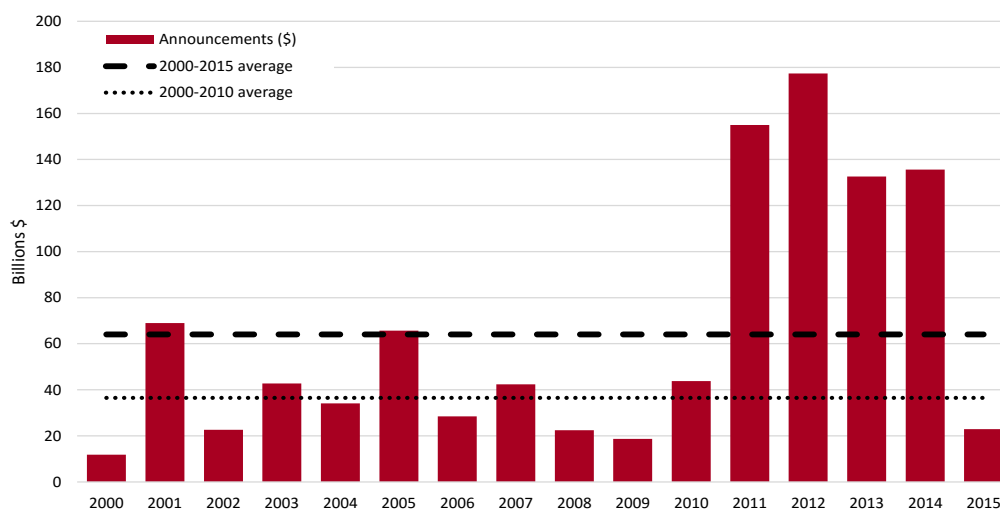
➔ **The end of megaprojects has been confirmed, but production continues.**

From \$129B in ongoing projects in 2014 to \$116B in 2015, with a fragility rate of nearly 60%.

End of the Great Era of Industrial Megaprojects

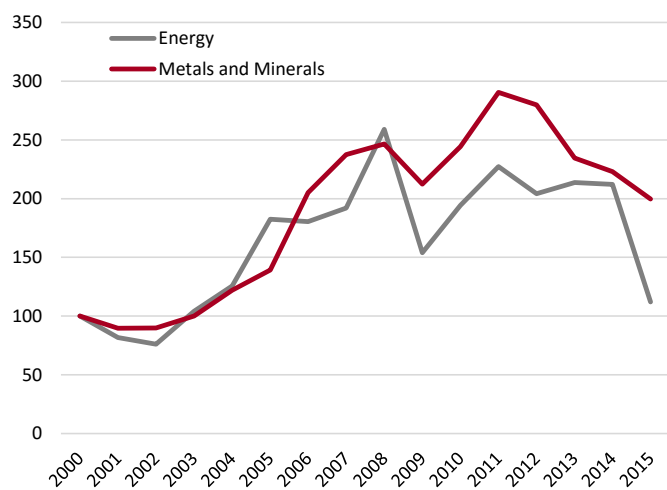
The contribution of new projects to the number of ongoing megaprojects is comparable to the Great Recession 2008-2009 period. With less than \$25 billion in new megaprojects announced in 2015 (though the average since 2011 has been \$150 billion), new investors' paralysis is obvious. In addition, 59% of ongoing projects have seen their scope reduced or their schedule delayed or re-assessed (fragile projects: see definition on the left). Yet the number of active megaprojects remains high in absolute terms.

New Industrial Megaprojects Announcements – Canada – 2000-2015



Source: E&B DATA, CAPEX-online, 2016.

Commodity Price Index - Base 100 = 2000 - 2000-2015



Source: Bank of Canada - Commodity price index (BCPI) in US\$.

Notes:

Energy Products: Crude oil, natural gas and coal.

Metals and minerals: Potash, aluminum, gold, nickel, iron, copper, silver, zinc, lead.

OIL

The power struggle between OPEC and producers in non-member countries continues, and we haven't heard the last from the latter. In Canada, though the situation is fairly bleak (63% of projects are fragile), oil extraction megaprojects have a surprising resilience, and official abandonments are rare. Investment programs are of course reduced and capex programs reallocated to lowest-cost projects. Although price levels hinder progress for most projects on which construction has yet to begin, these price levels are still not low enough to bring ongoing projects to a complete halt. Timelines are delayed, mostly pending a recovery in prices—and political unblocking of pipeline projects. With a lifespan exceeding 30 years in the majority of cases, oil extraction megaprojects span several economic cycles, and financial calculations include periods of low prices. The question is, then, how long can one produce at a loss? Production costs can vary by a factor of three, or even more (*in situ* processing projects being at an advantage), and high cost producers will be the first to desist. If low prices are to continue, a wave of asset transfers of assets is inevitable.

NATURAL GAS

Despite price pressure, over 40% of natural gas projects appear to be moving forward. The justification of North American export terminals, however, is less obvious. The price differential between North America and Europe remained stable in 2015, with comparable relative declines (from US \$3 to US \$2 per MMBtu and US \$9 to US \$6 respectively). Although the International Energy Agency predicts a decline in Asian demand¹ (notably due to resumption of the nuclear program in Japan), for now prices remain significantly higher (US \$9 in Japan) than in North America. On the West Coast of Canada, it's a game of musical chairs, and competition between projects is increasing. It is unlikely the vast majority of export terminals megaprojects will be commissioned before 2020, while some megaprojects outside Canada for the same markets have a head start. With seven megaprojects already under construction, Australia will have the largest liquefaction capacity in the world as of 2017. Not all of the nearly 20 Canadian LNG terminal projects underway for the Asia-Pacific market will be required, and when the music finally stops, there will be more losers than winners. LNG terminal projects on the East Coast of Canada face less competition and might therefore be more successful.

MINING

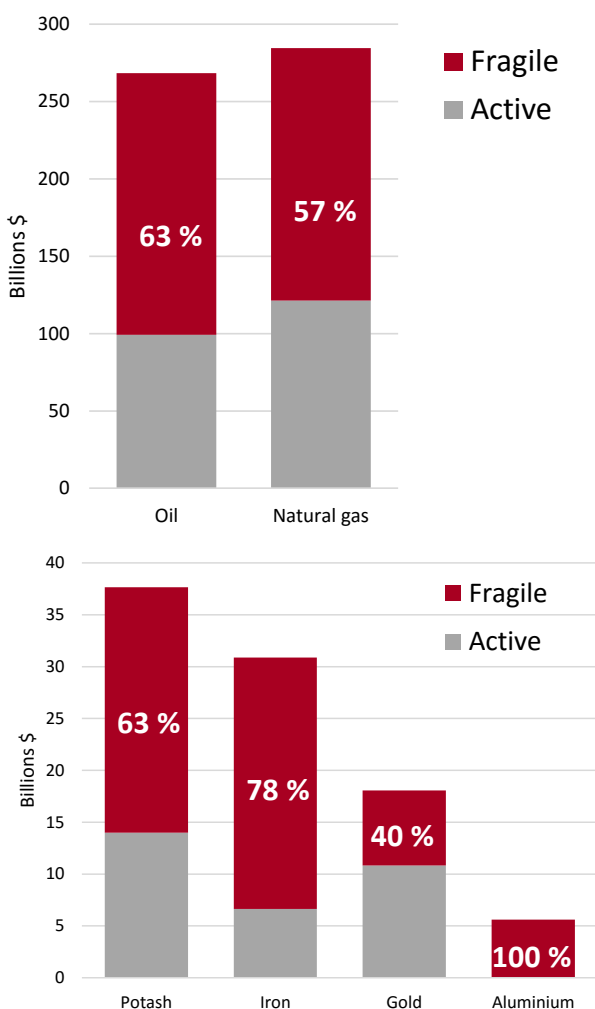
The sharp drop in ore prices dates back to 2011-2012, and hardly any new megaprojects have been announced in this sector since 2013. In a context of continually falling prices, there is no sign of a recovery of major investment projects. Before drawing gloomy conclusions, it should be noted that the value of Canadian exports for certain ores (e.g., potash, copper, gold) reached or maintained historically high levels in 2015 and capital expenditures for smaller projects do proceed. Despite the price drop since 2012, price levels in 2015 remained at least twice as high as the average for the previous decade², and are still high enough overall to ensure at least marginally profitable production.

The fall of the Canadian dollar compared to the US dollar is a factor in the reduced enthusiasm of new investors in the resource sectors. However, investors who had already secured financing and equipment import contracts before the Canadian dollar dropped are better positioned to pursue their projects. For projects completed in recent years, the weak dollar does soften the blow of falling commodity prices. With the current depreciation of the Canadian dollar, Canadian resource industries are not all losers... so far.

¹For the third consecutive year, the growth forecast has been revised downwards. From 2.9% per year (2013-2018) to 2% (2015-2020). International Energy Agency, Medium-Term Gas Market Report 2015.

² Statistics Canada, Table 029-0046.

Fragility of Ongoing Projects - By Product - 2015



Source : E&B DATA. CAPEX-online. 2016.

TABLES AND NOTES

Ongoing Megaprojects - Status

Status	December 2015		December 2014	
	Value (\$M)	Breakdown of value	Value (\$M)	Breakdown of value
Active	294 445	41%	464 948	64%
Fragile	420 971	59%	260 219	36%
Total	715 416	100%	725 168	100%

New Megaprojects Announcements

Sector	Country of Origin			
	Canada (\$M)	Other (\$M)	Total (\$M)	Breakdown of value
Oil & Gas	1 700	4 000	5 700	25%
Mining	0	4 200	4 200	18%
Others	13 000	0	13 000	57%
Total	14 700	8 200	22 900	100%

Megaprojects - Status Updates

Development Stage of Megaprojects	Value (\$M)
Previously ongoing (December 2014)	725 168
New in 2015	22 900
Reactivated in 2015	13 600
Abandoned in 2015	9 070
Completed in 2015	37 181
Total ongoing	715 416

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

MEGAPROJECTS

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

DEVELOPMENT STAGES

"New" megaprojects are those publicly announced in 2015 (may include projects previously abandoned, but being relaunched). "Previously ongoing" projects were ongoing as of December 31st 2014. Megaprojects labeled "abandoned" have been either announced as, or presumed abandoned, in 2015. "Completed" megaprojects have been completed since January 2015. "Ongoing" megaprojects include both new and previously ongoing projects not yet completed. Adjustments to projects' values (e.g., cost overruns) as of December 2015 have been made for projects announced in previous years.

MEGAPROJECT SECTORS

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

Ongoing Megaprojects by Sector

Sector	December 2015			December 2014		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Mining	115 587	16%	59%	129 137	18%	46%
Oil & Gas	568 769	80%	60%	579 971	80%	34%
Oil	268 356	38%	63%	281 497	39%	53%
Natural gas	284 498	40%	57%	282 558	39%	15%
Other Oil & Gas	15 915	2%	51%	15 915	2%	17%
Others	31 060	4%	39%	16 060	2%	40%
Total	715 416	100%	59%	725 168	100%	36%

Ongoing Megaprojects by Region of Destination

Region	December 2015			December 2014		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Western Canada	596 991	83%	61%	615 537	85%	36%
Central Canada	73 630	10%	61%	60 630	8%	40%
Atlantic	34 720	5%	19%	38 925	5%	32%
Northern Canada	10 075	1%	36%	10 075	1%	0%
Total	715 416	100%	59%	725 168	100%	36%

Ongoing Megaprojects by Region of Origin

Region	December 2015			December 2014		
	Value (\$M)	Breakdown of value	Fragility	Value (\$M)	Breakdown of value	Fragility
Canada	385 574	54%	57%	374 099	52%	37%
United-States	130 462	18%	44%	135 227	19%	17%
Asia-Pacific	98 208	14%	74%	98 619	14%	33%
Europe	85 672	12%	65%	98 022	14%	53%
Others	15 500	2%	94%	19 200	3%	81%
Total	715 416	100%	59%	725 168	100%	36%

MEGAPROJECT STATUS

"Active" projects are those under construction or in the process for obtaining government approval and financial structuring, while showing no sign of slow-down. Projects are categorized as "fragile" when available public information suggests that the project as initially announced could be reduced, delayed or even abandoned, due to financial factors (market conditions, financing) or regulatory concerns, or because the investor has remained silent about the project for an abnormally long period of time. Projects officially on hold are also included in this category.

FRAGILITY INDICATOR

Represents the value of a project categorized as fragile at the time of the analysis.

REVISIONS

The February 2016 publication incorporates data revisions due to improved imputation methodology for missing data.

REGION OF DESTINATION

Western Canada includes British Columbia, Alberta, Saskatchewan and Manitoba. Northern Canada includes 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, 55 states as grouped together at the General Assembly of the UN in addition to Australia and New Zealand. Europe includes all members of the European Union as of December 2015, in addition to Norway and Switzerland. The "Others" 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 screening of public announcements concerning private capital investment projects of \$1 billion and over in Canada. For a purchase or a subscription to CAPEX-online, please contact info@ebdata.com.

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