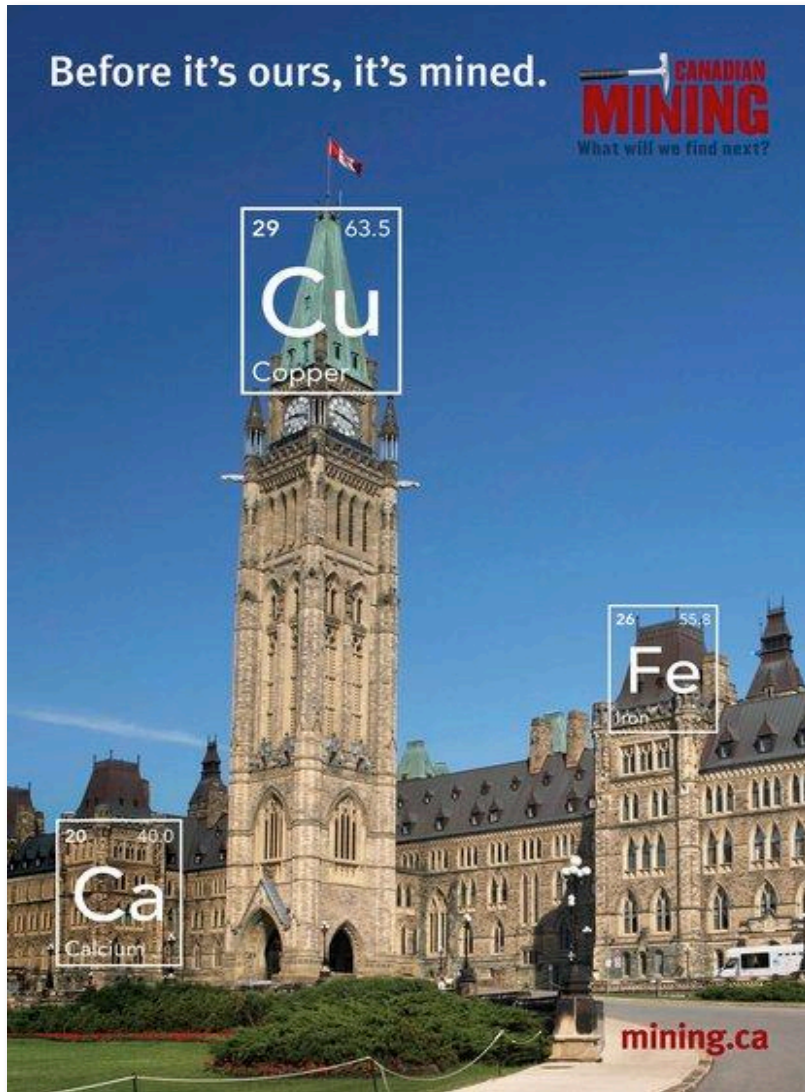


Arctic Opportunities and Challenges: A MAC Perspective

April 2, 2019

Nunavut Mining Symposium



MAC is the national voice of the mining industry in Canada

- Advocacy – to advance the business of mining.
- TSM initiative – stewardship and social license.
- 40+ members in iron ore, gold, diamonds, oil sands, met-coal, base metals, and uranium
- 50+ members in engineering, environment, and finance.
- Members engaged in exploration, mining, smelting, semi-fabrication, and supply.

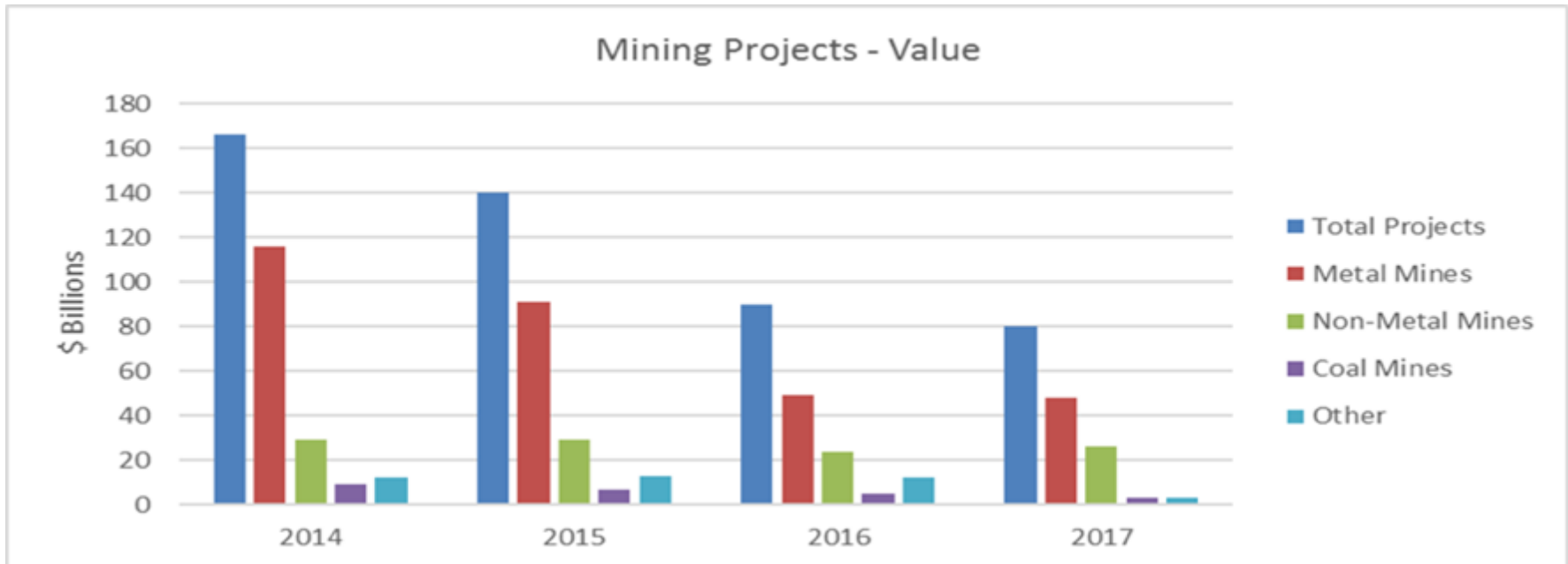
Mining in Canada's Arctic

- Largest private sector driver in Canada's Arctic, employing approximately 8,500 people (1 in every 6 jobs), or 8% of the total territorial population.
- Direct GDP contributions in the Yukon, the Northwest Territories and Nunavut are 13%, 30% and 21%, respectively, as of 2016.
- In recent years across Canada's Arctic, mining companies have, or have committed to invest, more than \$9 billion.
- As the largest private sector employer of Indigenous Canadians, generating significant employment, business and other social and economic benefits, the mining industry is leading Indigenous reconciliation in Canada's Arctic.
- **While contribution is great, the potential is even greater given the right policy and investment environment.**



Competitiveness Needs to be Strengthened

- ◆ **Evidence that Canada's competitiveness could be strengthened:**
 - ◆ The value of total projects planned and under construction from 2018 to 2028 has reduced by 55% since 2014, from \$160 billion to \$72 billion.
 - ◆ In 2017, capital spending in the Canadian mining industry accounted for 4.4% of Canada's total at \$11.7 billion, down 0.5% year-over-year.
 - ◆ This amount is down 16% from 2016 and marks the fifth consecutive year that capital spending has fallen.
 - ◆ Only four new mining projects were submitted for federal EA review in 2018.
 - ◆ Over the last five years, Canada has lost more ground than it's gained in the commodities for which it is a top-five global producer.
 - ◆ Australia's mining supply sector surpassed Canada's in recent years.



Context:

- Recent years have seen Nunavut capture investment more expediently than in the past but its a mixed experience

Highlights

- Several projects currently under construction over the next 10 years
- These project represent \$2 billion in investment
- All three projects are gold projects

Trends

- Exploration expenditure in Nunavut has dropped y/o/y since 2015, from a recent high of \$215 million to \$144 million intended in 2019 – a drop of 33%
- Capital investment in mining has increased y/o/y since 2016, from \$344 million to \$968.5 million in 2018 – an increase of 182%



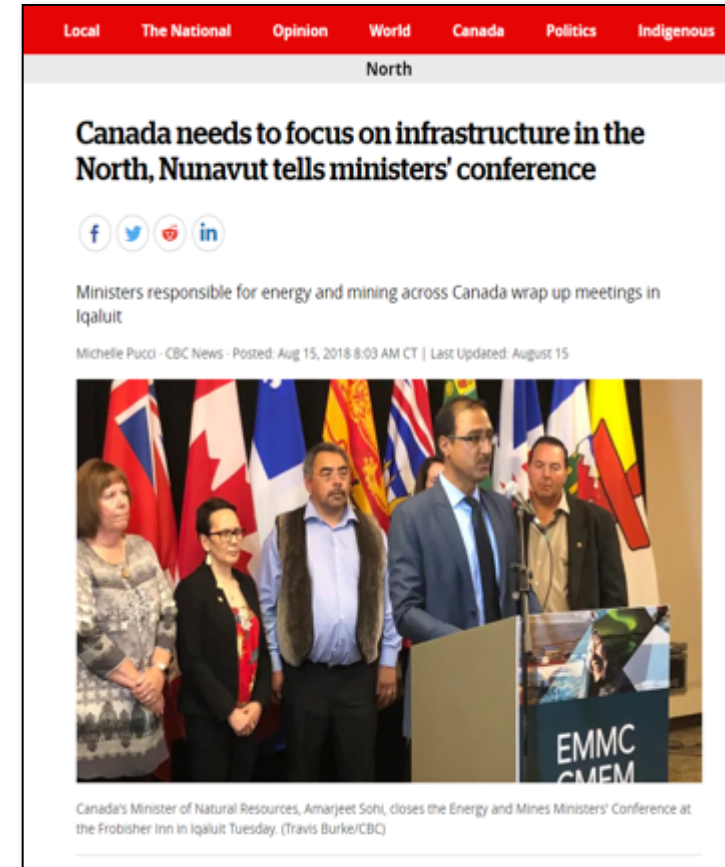
Status	2015		2016		2017		2018	
	#	\$B	#	\$B	#	\$B	#	\$B
Planned	4	\$4	3	\$2	2	\$0.8	2	\$0.8
Under Construction	0	\$0	0	\$0	1	\$1.2	1	\$1.2
Total	4	\$4	3	\$2	3	\$2	3	\$2

Arctic Policy Context

- Canada's Arctic often lost when pan-Canadian policy has been developed and implemented in the past.
 - In some cases, this has resulted in sub-optimal policy outcomes for the region.
- Current developments are an opportunity to change that:
 - Canada Minerals and Metals Plan
 - Arctic Policy Framework
 - CANNOR's Toward a Pan-Territorial Growth Strategy
- The above developments present an opportunity to modernize the old “one-size-fits-all” approach to policy, and create a positive institutional legacy that recognizes and incorporates regional considerations.
 - MAC supports the government's objective of creating a macroeconomic development plan for Canada's Arctic – strong coordination, collaboration and prioritization is critical for success.
 - MAC recommends that a unified implementation plan for Canada's Arctic be developed to ensure the efforts of all parties can be leveraged and coordinated optimally to maximize success
- **Key Issues: Infrastructure; training; carbon; transportation**
- Addressing these issues is critical to address climate change, reconciliation and broader social and economic development priorities in the region

Arctic Infrastructure Deficit

- Canada's Arctic is the most expensive jurisdiction for mineral development in Canada, and arguably the world:
 - To develop a base or precious metal mine in Canada's Arctic is 2-2.5 times more expensive than the same mine in Canada's south.
 - 70% of this cost differential is attributed to the infrastructure deficit.
- The extremely limited reach of trade enabling and energy infrastructure means mines absorb construction costs, are off-grid, and are dependent on diesel with very few exceptions.
- A consequence of these heightened costs is that many projects are not economically viable despite best efforts, while those that are viable operate on thin margins or have yet to recuperate their initial capital cost.
- A recent amalgamation of projects for the NPMO by CANNOR has identified 20 territorial mineral projects whose capex exceed \$13.3 billion. However, 13 of them don't have access to an all-season road.



Mining as a Reconciliation Enabler

- The territories host the highest per-capita demographic of Indigenous peoples of any sub-national jurisdiction in Canada.
- Strengthening Arctic people and communities means advancing Indigenous economic reconciliation.
- The mining industry is ideally positioned to be leveraged as a vehicle by government to help close these gaps in quality of life.
- Enhancing training programs most important means of maximizing Inuit participation in current mining benefits/opportunities
 - **Current public training programs/allocations are insufficient and do not align with existing industry needs**
 - **Governments should match company funding on training programs proven for success**

INDIGENOUS TRADITIONAL KNOWLEDGE

...IS TRANSFORMING HOW WE MINE.

At Dominion Diamond's Ekati mine in the Northwest Territories, a group of Elders from across the North advises on how to continuously improve the integration of Traditional Knowledge into the mine's operations.

By embedding Traditional Knowledge into our business, Canada's mining industry is working alongside our communities to preserve the environment for future generations.

Learn more at: mining.ca/reconciliation-in-action

◆ Agnico Eagle Meadowbank Mine – Nunavut

- ◆ Baker Lake – 1600 km NW of Winnipeg
- ◆ Off grid, requiring investment to build diesel gen-set + tank farm,
- ◆ No economically viable alternative energy sources
- ◆ 69ML of fuel transported 3400 km at a cost of approx: \$0.12 per litre
- ◆ AEM assumed total cost (>\$200m) of 200km road development to connect Baker Lake to mines.
- ◆ The fuel must be transported by truck from Baker Lake to Meadowbank Mine on a 110 km road at a cost of \$0.04 per liter.
- ◆ **Total Transportation costs per litre of fuel is approx: \$0.16**



Meadowbank Mine



**Floating Port Tank Farm
110km Road**



3400km Marine Supply Chain



◆ How does this compare to the proposed carbon price?

- ◆ At \$50/tonne, ECCC estimates the carbon cost at approx: \$0.13 for diesel
- ◆ Total transportation costs per litre of fuel to Meadowbank is approx: \$0.16
- ◆ **Geography, and the accompanying infrastructure deficit, already impose a *de facto* carbon-cost exceeding \$55/tonne**
- ◆ **Options to abate stationary/mobile diesel emissions severely limited for off-grid/pipe connected facilities**

◆ Electricity OBS Price Signal Distorted in Remote Regions ◆

- ◆ Directionally correct, but limited recognition of remoteness with 550t/GWh diesel threshold - balance of electricity emissions a pure cost to business
- ◆ Despite highest costs in the world, only 2 off-grid/pipe mines have deployed renewable technologies, one heavily subsidized
 - ◆ Maximum diesel displace of ~10%
- ◆ GoC exempted remote communities from levy on electricity emissions on basis of remoteness - miners equally remote, only higher emissions, and therefore greater cost-exposure
- ◆ No programs designed to support industry-specific transition off diesel reliance in remote areas
- ◆ Significant uncertainty over how sub-national jurisdictions will spend carbon revenue

Fuel	Unit	2018	2019	2020	2021	2022
		(\$10/tonne)	(\$20/tonne)	(\$30/tonne)	(\$40/tonne)	(\$50/tonne)
Gasoline	\$/L	0.0221	0.0442	0.0663	0.0884	0.1105
Heavy Fuel Oil	\$/L	0.0319	0.0637	0.0956	0.1275	0.1593
Light Fuel Oil	\$/L	0.0268	0.0537	0.0805	0.1073	0.1341
Petroleum Coke	\$/L	0.0384	0.0767	0.1151	0.1535	0.1919
Propane	\$/L	0.0155	0.0310	0.0464	0.0619	0.0774
Marketable Natural Gas	\$/m ³	0.0196	0.0391	0.0587	0.0783	0.0979
Non-marketable Natural Gas	\$/m ³	0.0259	0.0517	0.0776	0.1034	0.1293
High heat value coal	\$/t	22.52	45.03	67.55	90.07	112.58
Low heat value coal	\$/t	17.72	35.45	53.17	70.90	88.62
Combustible Waste	\$/t	19.97	39.95	59.92	79.89	99.87

◆ Additionality: Clean Fuel Standard

- ◆ At 20mt for liquid fuels, Clean Energy Canada models an escalator from \$0.02 to \$0.07/litre of diesel fuel by 2030
- ◆ On Jan 22 '19, NRCan pegged national avg. diesel price at 1.18/litre
 - ◆ +\$0.3 in carbon price (80% shielding under OBPS)
 - ◆ +\$0.07 in CFS by 2030
 - ◆ +\$0.16 remote delivery costs
 - ◆ = \$0.26 per litre (22%) beyond Canadian avg. price
- ◆ **The above doesn't account for remoteness cost increases from heightened marine shipping and trucking costs (carbon pricing and CFS), or aviation costs (CFS)...**

- ◆ The International Maritime Organization is currently assessing a proposed ban on the “carriage or consumption of heavy fuel oil (HFO)” in Arctic Waters
- ◆ Canada is currently undertaking an economic impact assessment on the cost to communities of the proposed HFO Ban
 - ◆ The cost of goods and materials transported by sea will increase (food, housing, equipment, etc.)
 - ◆ The cost of business reliant on marine transportation will increase
- ◆ It is unclear what shape the proposed ban will take, nor whether it will reduce risk to the marine environment
- ◆ Based on MAC’s analysis, the economic risk to mining includes:
 - ◆ Moderate to significant cost increases to shipping (which, while significant, is “low-risk” in these circumstances)
 - ◆ The pool of vessels willing to service the Arctic shrinking dramatically due to the regulatory and logistical burden of complying with the ban. Such an outcome is high risk and could result in shipping companies seeking a “premium” above and beyond the anticipated cost of compliance.
- ◆ Any additional costs in Canada’s Arctic reduce the attractiveness for investment in an already heightened cost-jurisdiction
- ◆ The Mining industry takes its environmental responsibilities very seriously, including best practice operations in the marine environment



◆ Infrastructure

- ◆ Advanced Allocation of >\$770 million under the National Trade Corridor Initiative
- ◆ NTCF Northern Envelope Renewal of \$400 million
- ◆ \$18 million to support planning for the NWT Taltson hydro electricity expansion project
- ◆ The creation of the Universal Broadband Fund leveraging >\$4.5 billion over the next decade to bring high-speed internet to remote communities and businesses

◆ Tax

- ◆ Immediate tax deductibility of certain zero-emission vehicles for businesses
- ◆ Accelerated Investment Incentive increasing miner's ability to write-off three times the eligible cost of newly acquired assets in the year the investment is made
- ◆ 100% immediate write-off for full cost of clean energy equipment
- ◆ 5 year extension of the Mineral Exploration Tax Credit

