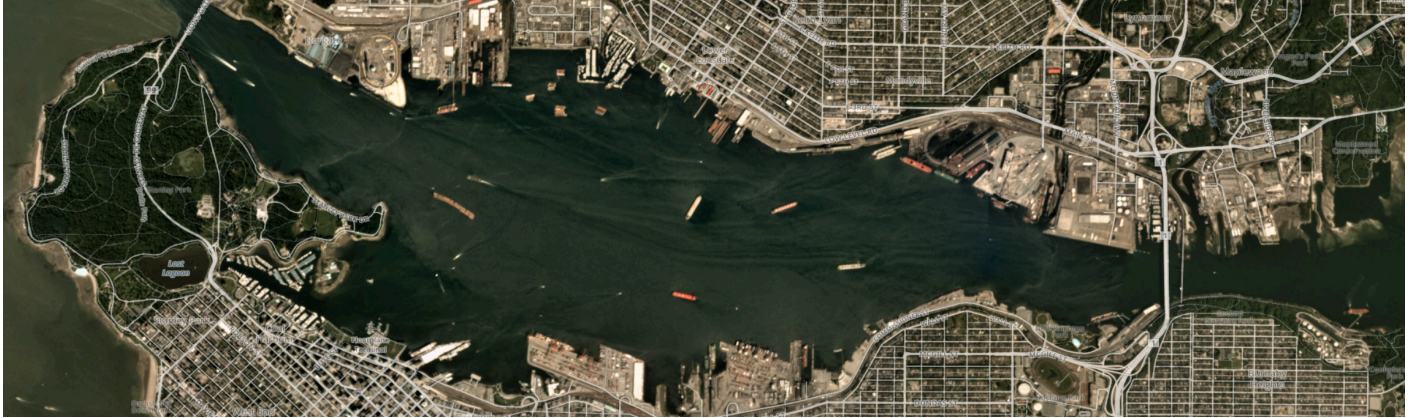


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EXAMINING THE EVIDENCE

*Can we be confident that a responsible
oil shipping industry is in place
at the Port of Vancouver?*

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JUNE 12, 2019

2018 shipping numbers reveal Asia's sudden interest in our oil



MARINE TRAFFIC

If you spotted any of the following ships passing under the Ironworkers Memorial Bridge in 2018, you were seeing actual loaded bitumen tankers:

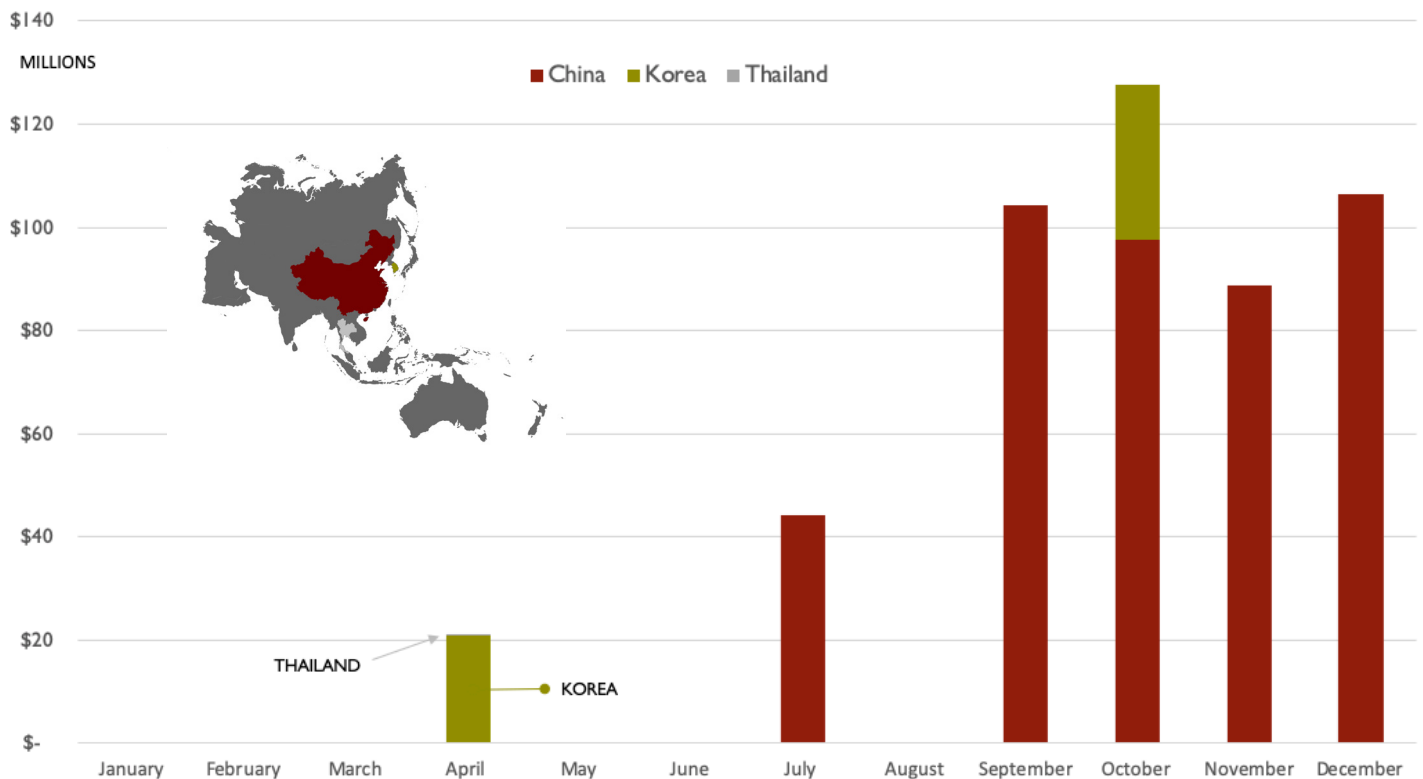
- Serene Sea
- Ambelon
- Nordtulip

These journeys establish that Alberta oil is (a) valued and (b) possesses a proven safety record.

In 2018, the Port of Vancouver saw probably about 10 bitumen shiploads to Asian countries.

The value of these cargoes: \$441 million, supporting workers in Canada's most innovative and trade-surplus-creating industry.

Bitumen shipments from Vancouver to Asia soared in 2018

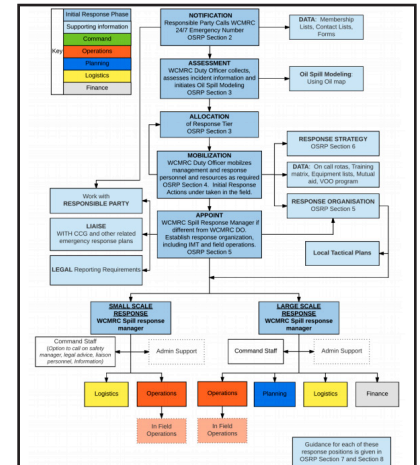


Source: Statistics Canada, International Accounts and Trade Division, table CRO0175167

Shipping safety at heart of public concerns about oil spill risk

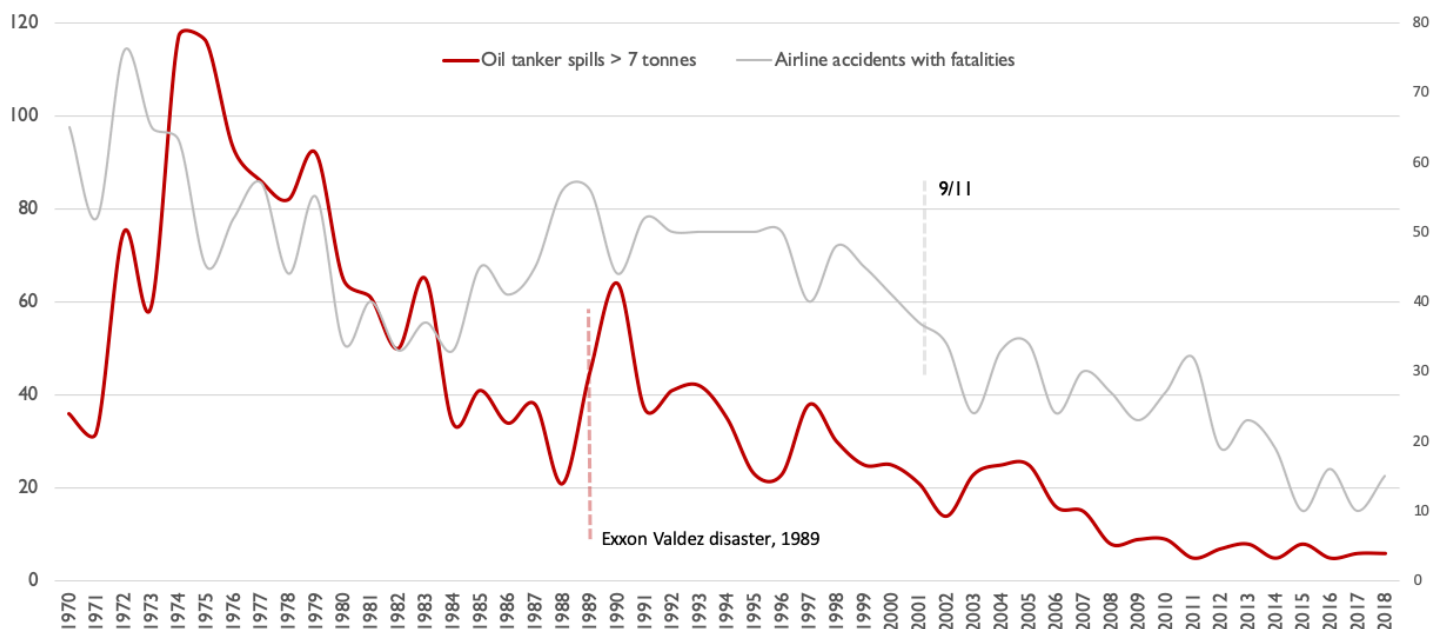
The Trans Mountain Expansion project will have a number of impacts on shipping in the Salish Sea region. Some notable facts:

- From 60 oil tankers a year leaving Burnaby today, with the pipeline expansion in place there will be up to 408. As a percentage of the large ships in the region, oil tankers will rise from today's 1.1% of the total to 6.6%.
- The idea that there will be “seven times the spill risk” from the expansion, although often stated, isn't found in any reputable source.
- The National Energy Board accepted that the likelihood of an oil spill of 8,250 m3 or more in 50 years for the region is 8.4 per cent, the likelihood of a large oil spill of 16,500 m3 in 50 years for the entire regional study area is 1.7 per cent and the likelihood of an oil spill of any size in Vancouver Harbour from a project-related vessel is once in 19,286 years or 0.3 per cent in 50 years.
- A number of alarmist spill scenarios submitted to the NEB received wide media coverage. In both the original review and again upon reconsideration, all of them were deemed to be without merit or inapplicable.
- Bitumen, or dilbit, is often characterized as a distinct and hazardous commodity. In fact, continuing research is showing that it's simply a type of crude oil, with very similar characteristics to other oils.
- The 1989 Exxon Valdez incident in Alaska was a safety wakeup call for the global oil tanker industry. Following the tragedy, deep reforms led to a dramatic fall in the number of accidents, even as the amount of product shipped grew.



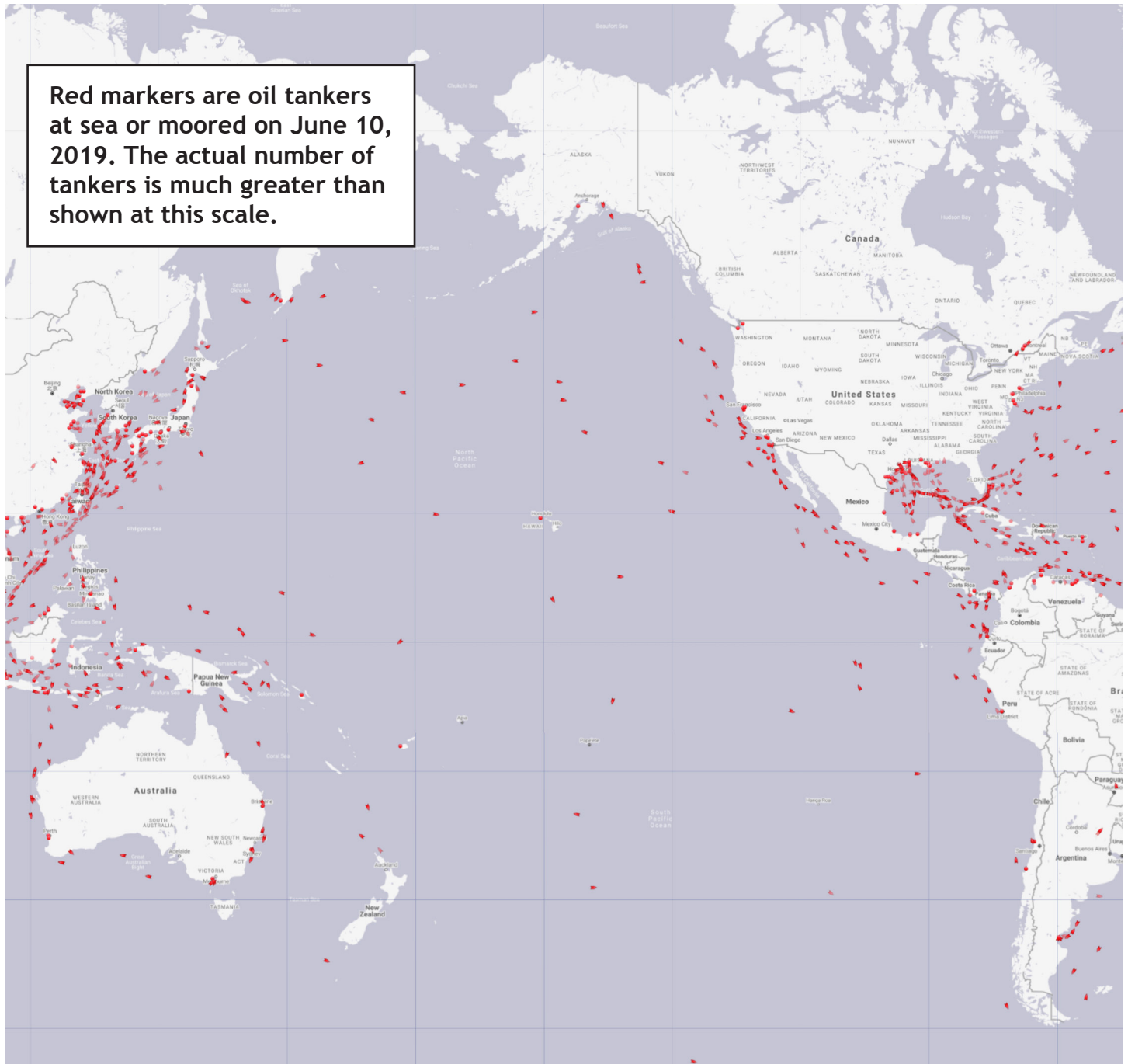
This chart shows the Response Procedure Tree in place for spills in Metro Vancouver. Source: Western Canada Marine Response Corporation, Oil Response Plan Part A, issued September 2017, revised January 2018.

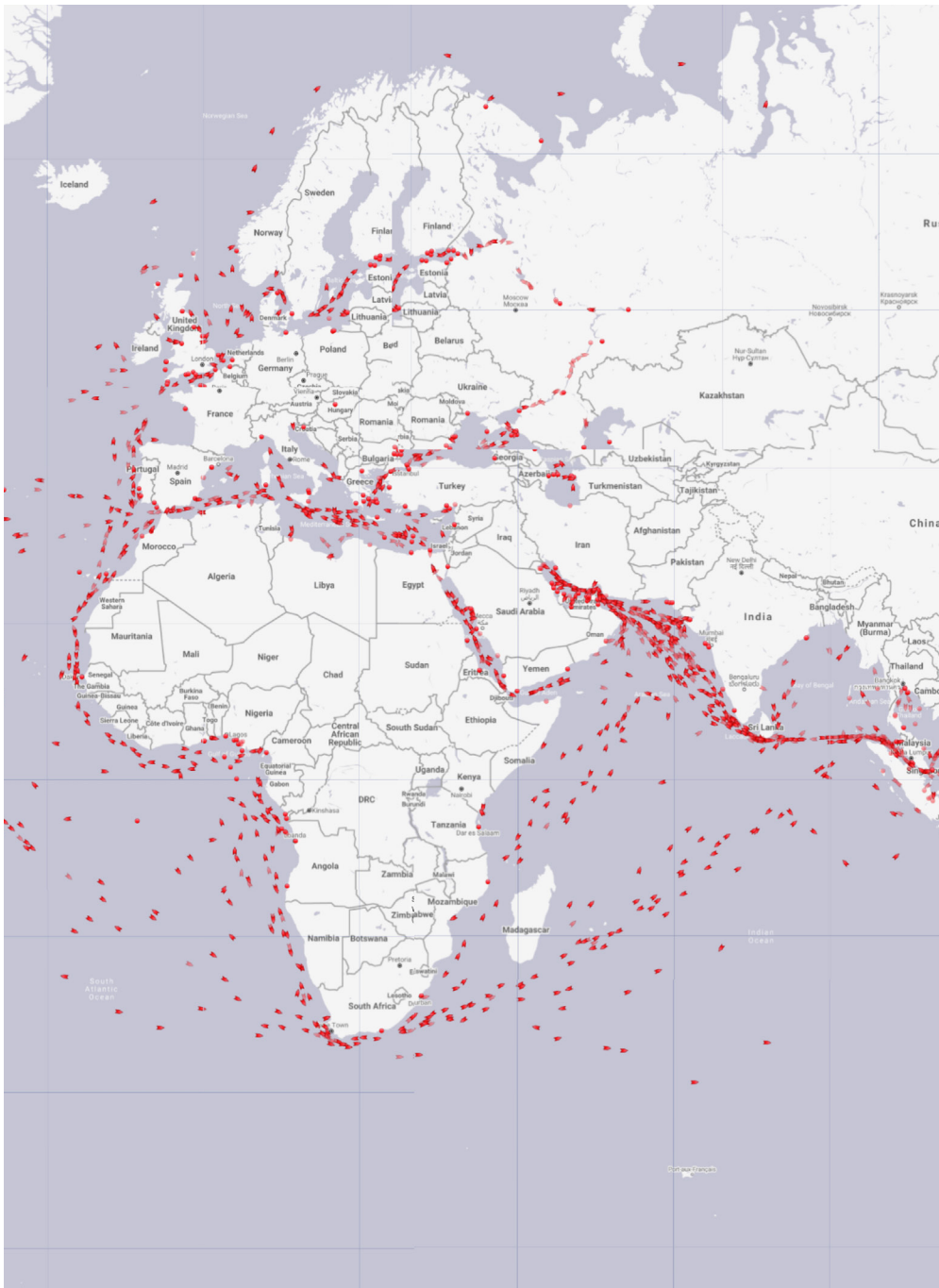
Drive to safety: Oil tankers and aviation display similar trends



Sources: ITOPF, Flight Safety Foundation

A Global Perspective: Trade and The Economy





Economic power is shifting from west to east, changing global trade flows.

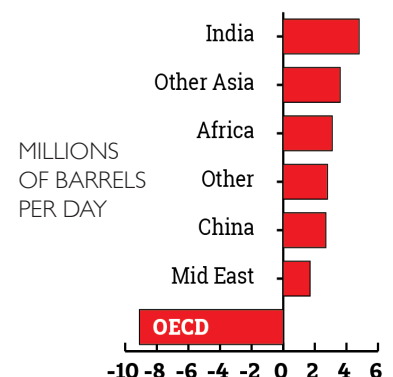
Trade between emerging economies has doubled as a share of global trade. Trade relationships have become more complex and fragmented – with Asia quickly becoming the world's largest trade region.

The Barton Report urged Canada to position itself as a global trading hub by strengthening links to large and fast-growing Asian economies and investing in trade infrastructure.

Whether we are up for the challenge depends in very large part on whether we have confidence in ourselves, as Canadians, and the trust required to embark on growth in trading capacity.

At all levels, the Trans Mountain pipeline expansion is a test of our readiness for the future.

Change in daily use of oil, 2017 to 2040



Sources: BP Outlook 2019

The oil sands are getting better over time at managing CO₂

The world needs to quickly reduce the negative effects of our hydrocarbon usage. This includes minimizing emissions, capturing carbon, using fuel more efficiently, and switching to other energy sources like renewables, nuclear and hydro.

The Canadian oil sands are doing their part in reducing environmental harms, most prominently in the following five ways, said IHS Markit in a 2018 report entitled “Greenhouse gas intensity of oil sands production: Today and in the future.”

1. Fuel switching. Oil sands producers are looking at conversion of existing coke-fired boilers to natural gas or introducing cogeneration capacity, which could reduce coke combustion.

2. Cogeneration. For the most part, oil sands mining operations are electrically balanced—neither major importers nor exporters of electricity from the grid. To meet demand, they use a combination of boilers and cogeneration units.

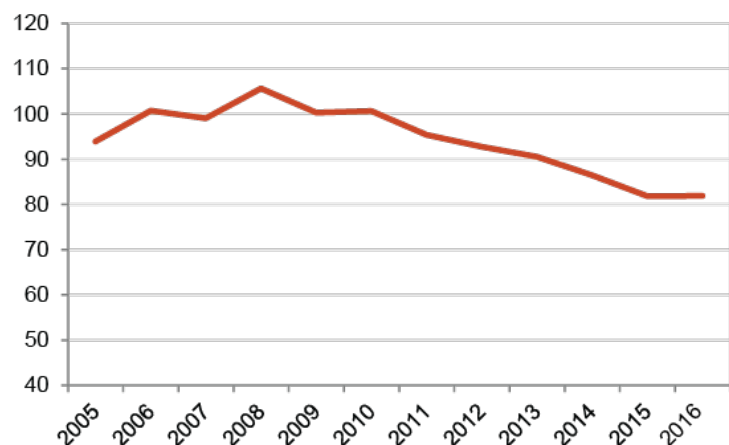
3. Mobile mining fleets. Oil sands mining operations have large fleets of heavy equipment, which run on diesel. (One mine studied had well over 150 trucks and shovels of various sizes.) LNG offers promise as a lower-carbon green option.

4. CCS. Carbon capture and storage is a way to cut emissions from the combustion of fossil fuels. Currently, there is one oil sands mine with an integrated capture unit, while another site injects CO₂ into tailings. This is a field of growing promise.

5. Process efficiency. Separating bitumen from sand, clay, and water in mining operations requires large volumes of warm water. This requires a lot of energy. Gains are being seen in overall efficiency, and through the use of solvents.

Canadian oil sands GHG emissions intensity

kgCO₂e/bbl of SCO and bitumen



Source: IHS Markit, 2018

Canada's oil & gas extraction and pipeline sector is:

8.2x

larger than Canada's auto and parts manufacturing sector (\$132 billion versus \$16 billion).

2.6x

the size of the residential construction industry in Canada (\$132 billion versus \$50.7 billion).

4.0x

larger than our telecommunications sector (\$132 billion versus \$33.4 billion).

1.7x

larger than the entire transportation sector, including air, rail, water, trucking, and related warehousing (\$132 billion versus \$77.6 billion).

3.3x

larger than the combined agriculture, forestry, and fishing industry (\$132 billion versus \$40 billion).

5.6x

the size of Canada's combined forestry, logging, wood product, and paper manufacturing sectors (\$132 billion versus \$23.5 billion in 2018).

Source: Statistics Canada

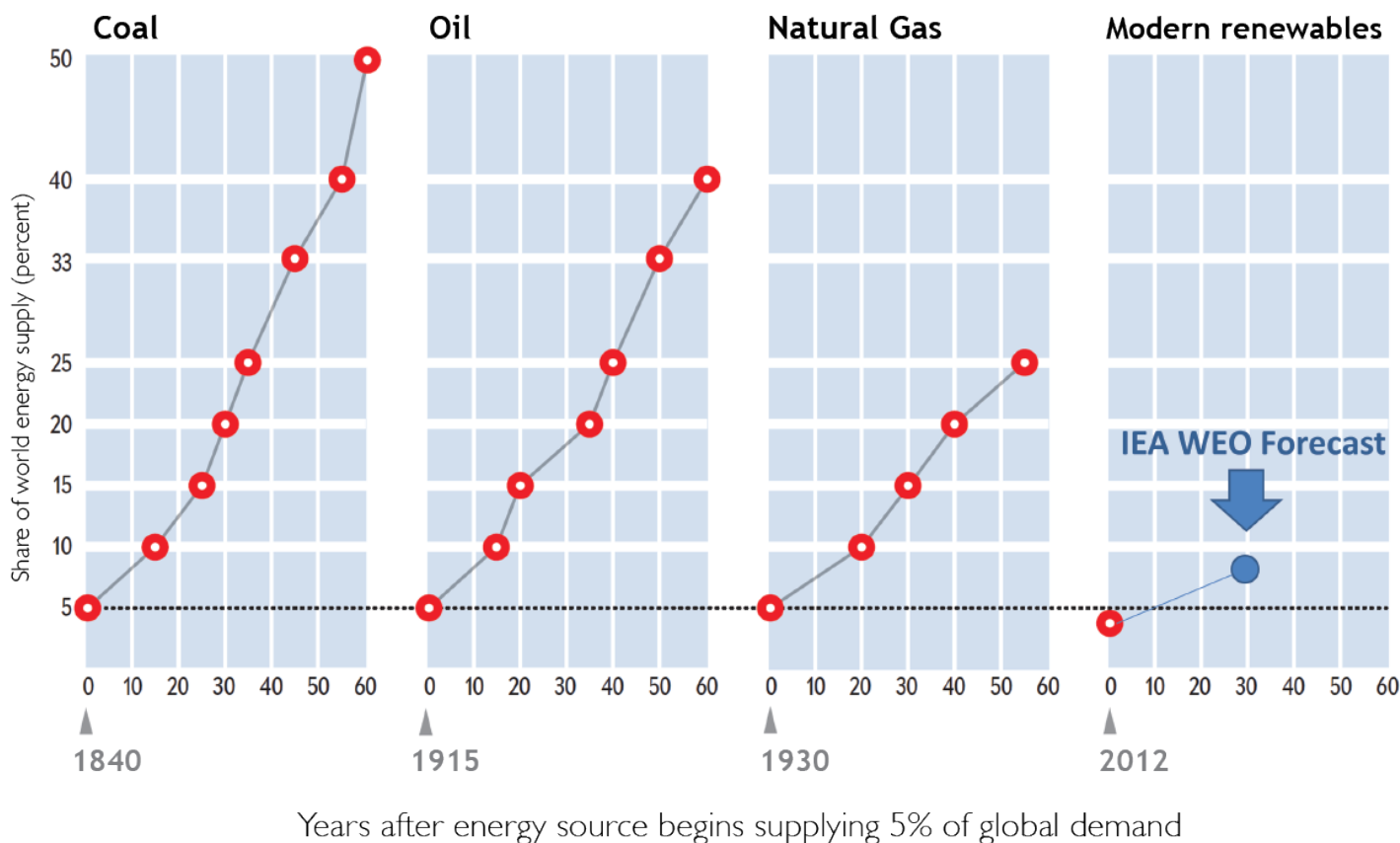
Many years needed to take over the energy world

Each major energy source that has dominated world supply has taken 50-60 years to rise to the top spot. Coal reached 5% of global supply in 1840 and gradually took over from wood, reaching 50% some 60 years later, around 1900. Subsequent transitions to oil and natural gas have followed similar patterns, with rapid growth occurring after they reach 5%. Oil has not yet reached 50% and may never. Natural gas is still partway

along the path and is taking longer to ascend.

The so-called modern renewable energy sources – wind, solar, geothermal and liquid biofuels – have only hit about 3.4%. Unless there is a disruptive technology or revolutionary policy to speed up change, they, too, may be destined for a long transition.

– Vaclav Smil, *Scientific American*, January 2014



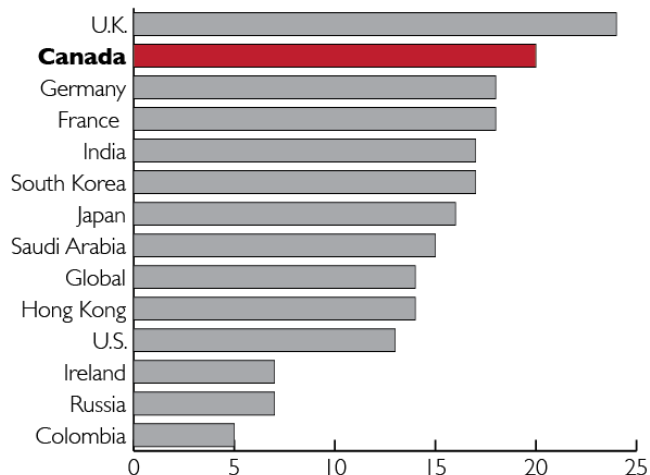
The Trust Gap

The trust gap reflects the difference in trust levels between the mass population and the “informed” public toward business, the media, government, and non-governmental organizations.

In 2019, Edelman’s Trust Barometer showed that Canada ranked behind only the United Kingdom for this type of distrust. The U.K. is currently facing the Brexit crisis.

Canada also has a wide gap between the general population and the informed public on whether they and their families will be better off in five years’ time, with the informed public tending to believe they will be seeing improved economic prospects.

In Canada and the U.S., these trends are accompanied by a low trust in social media and high trust in traditional media.



Source: Edelman 2019 Trust Barometer

Killer whales: an urgent conservation priority



ADOBE STOCK

Protecting the local population of Southern Resident Killer Whales (SRKW) is a broadly shared priority.

Under Trans Mountain's Reconsideration findings from early 2019, noise effects, as well as potential vessel strikes and spills from Trans Mountain-related marine shipping, are to be reduced by measures and monitoring.

Ferries are the largest source of acoustic noise that disturbs SRKWs, and in combination with tugs are responsible for as much as 94% of such noise.

The National Energy Board stated in February 2019 that while "significant adverse environmental effects" will be a small fraction of Trans Mountain's total cumulative effects, and the level of traffic is expected to increase with or without the project, the increase in marine vessels associated with the project would further contribute to cumulative effects that are already jeopardizing the recovery of SRKWs.

After reviewing all the evidence, the NEB concluded it was "confident that a technically and economically feasible mitigation mix can be developed to offset the additional underwater noise and risk of strikes due to project-related vessels."

A Conservation Agreement announced earlier this year encourages large commercial vessels to slow down in key foraging areas for the SRKW to reduce underwater noise that may disrupt their ability to find prey. (Since the Salish Sea is bi-national waters, shared between Canada and the USA, these voluntary measures cannot be imposed on American shipping.)

Sources: National Energy Board - NEB Reconsideration Report - Reconsideration; Chamber of Shipping

There are likely thousands of chemicals to be found in the killer whales of BC, from:

- Municipal effluent outfalls
- Petrochemical facilities
- Sewer overflows
- Pulp and paper mills
- Urban runoff and storm-water drainage
- Agriculture, forestry, and aquaculture
- PCBs, DDT and other chemicals from as far away as Asia