Pollution Probe

Challenges in Securing Societal Acceptance for the TRANSPORTATION OF HYDROGEN FOR EXPORT FROM ALBERTA

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Acknowledgements

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Members of the Advisory Council include:

- Ian La Couvée (Concentric Public Affairs)
- Stewart Muir (Resource Works)
- Dr. Mark Szabo (author of Fight Different)

Pollution Probe

Pollution Probe is a national, not-for-profit, charitable organization established in 1969 that exists to improve the health and well-being of Canadians by advancing policy that achieves positive, tangible environmental change. Pollution Probe has a proven track record of working in successful partnership with industry and government to develop practical solutions for shared environmental challenges.

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1 Scope

Alberta Innovates has provided funding to Pollution Probe to evaluate the potential level of societal acceptance for various transportation options for exporting hydrogen from the Province of Alberta. This paper will assess known issues, potential reactions, and likely challenges associated with hydrogen carriers and transportation methodologies, and the challenges in addressing them, particularly through traditional processes of engagement. It will consider the transportation of hydrogen from the point of production in Alberta to the time the hydrogen (or derivative) is delivered to market (in the case of the USA) or clears Canadian waters (in the case of exports to Asia). It is recognized that hydrogen is also proposed to be produced for export in northern British Columbia and, while this will be referenced and many of the same issues will obviously be encountered, hydrogen exports from British Columbia are outside of the scope of this report.

This report is a companion piece to Pollution Probe's *Alberta Hydrogen Export to Asian Markets: Common Understanding of Risks*, which lays out the technical challenges associated with the production and transport of ammonia, the most likely hydrogen carrier. It begins by characterizing the nature of the challenge and examines how this will test traditional approaches to engagement. It then examines the geographic, demographic and environmental realities associated with getting products from Alberta to tidewater. The bulk of the paper addresses the nature of risk presented by the export of hydrogen and identifies how that will be manifested in ways that could challenge the assumptions and approaches of the hydrogen value chain. It concludes with a series of questions that could seed a workshop discussion among entities in the hydrogen value chain with engagement experts and external participants who can provide community and Indigenous perspectives on the issues. Such a workshop would bring greater clarity to the issues and may identify areas for further investigation and potential paths forward.

2 Alberta's hydrogen export ambitions

One of the policy pillars of Alberta's Hydrogen Roadmap is that Alberta could become a global supplier of clean hydrogen. Alberta sees growth opportunities based on exporting clean hydrogen carriers. The transformational future envisioned in the roadmap, which is where this report will focus, sees Alberta having a framework and plan in place, developed with other provincial governments and the federal government, to export one million tonnes of hydrogen carriers to global markets, mostly in Asia, by 2030. According to Pollution Probe's companion report, one million tonnes of ammonia, the most likely hydrogen carrier, would require a full train of 70 cars crossing British Columbia every two days.

The recent progress report of the BC Energy and Resources Round Table (BCERT) states that "The governments of Canada and British Columbia, alongside the Government of Alberta, are exploring the feasibility of transporting and exporting hydrogen and its derivatives, including ammonia, to international markets. A Deputy Minister-level committee on ammonia was established to enhance collaboration with supporting working groups." The BCERT plans on "Leveraging the trilateral governance established between British Columbia, Alberta, and Canada on the transportation and export of hydrogen and its derivatives to further advance the maintenance and development of world-class environmental protection measures and safety standards, and to help support the inclusion and participation of First Nations and local communities in the future growth of the hydrogen sector in British Columbia."

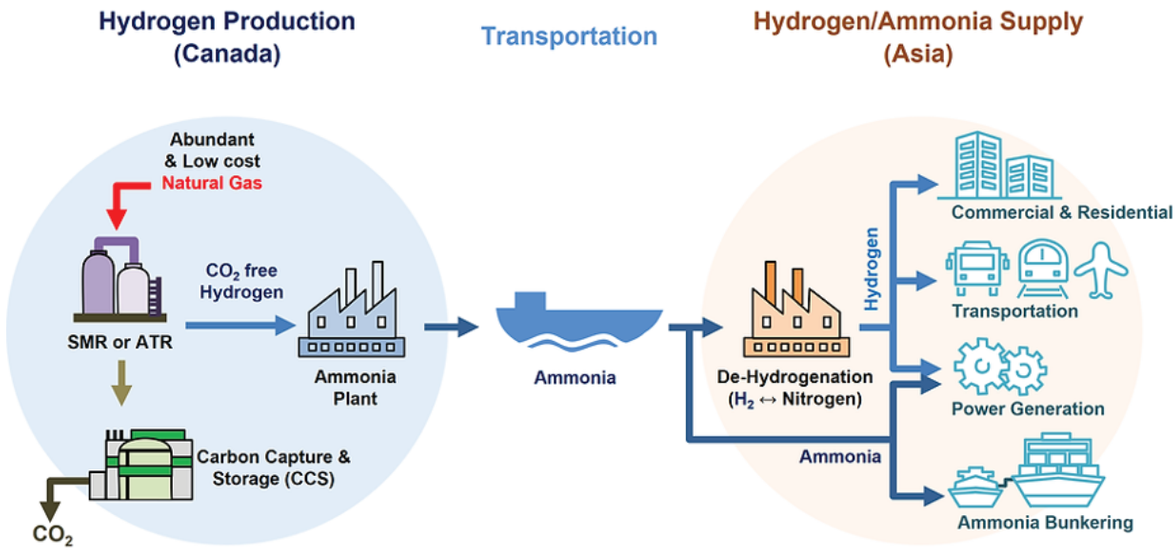
The report Hydrogen as an Alberta Export Opportunity by Emission Reductions Alberta and Alberta Innovates flagged the risks and opportunities for Alberta to get new energy products to tidewater as a major gap that needs exploring. In the short term, Alberta's expects its ambitions to be realized through the transportation of ammonia via rail, leveraging existing rail and port infrastructure, with a potential ammonia pipeline to the Pacific as a longer-term option. According to the Alberta roadmap, "Ammonia-by-rail provides a near-term opportunity to export clean hydrogen to North American markets and ports. However, *ammonia export by rail is limited by rail capacity and public interest*." (emphasis added). That is because ammonia is classified as a toxic, inhalable hazard that can present significant risks to human health, and the environment and its storage and transport are tightly regulated.

At this stage, the communities and First Nations impacted by Alberta's ambitions have not yet been fully engaged, and their reactions are largely unknown. However, it can be assumed that progress will be challenging given the aggressive timeframe, the risks to be addressed, recent history on the proposed export of bitumen through the region, and that little preparatory work has been done to date. Examining public interest in the scaling up of transportation of ammonia, and the associated risks and opportunities, is crucial to the successful development of the industry. To ensure that a hydrogen export industry can be developed as quickly as possible, it is critical that these concerns are addressed.

3 Alberta exports face geographic, demographic and environmental realities

The graphic below from Hydrogen Canada (HC), a developer, shows the challenges in developing a hydrogen export industry. HC's hydrogen production will take place in Edmonton, while ammonia will be shipped to Asia from Prince Rupert. The roughly 1,500 km travel distance between the two cities is excluded from the graphic, but it is the potential environmental impacts and societal acceptance associated with those 1,500 km and out of Canada's 12-mile nautical sea that are critical to the success of Alberta's hydrogen export industry, and, to date, little thought has gone into how to address these challenges. And the public, communities and First Nations along the route are largely unaware of the scale of what is being proposed.

The CN Rail line from Edmonton to Prince Rupert runs roughly the same route as the Yellowhead Highway (Highway 16). Ammonia loaded onto a train in Edmonton heads west around northern Edmonton and then out through the communities of Spruce Grove, Edson, Hinton and Jasper to the Alberta border with BC (around 400 km). It then embarks on a 1,100 km journey across northern BC through Prince George, Vanderhoof, Burns Lake, Houston, Smithers, New Hazelton and Terrace before arriving in Prince Rupert for transfer to a ship to take it to Asia. Along the way, it will pass through at least 19 First Nations reserves and across the treaty claims of 11 First Nations. Between Edmonton and Jasper, the train will pass Wabamun Lake, where 800,000 litres of oil were spilled due to a train derailment in 2005. About 160 km of the route goes through Jasper and Mount Robson National Parks. Near Jasper, the train will begin to follow the path of rivers virtually the entire distance across BC, first the Athabasca and Miette, then the Fraser, Nechako, Bulkley and finally, the Skeena River. These waterways and their fisheries are of invaluable cultural and economic significance to First Nations and are integral to the profound linkages between First Nations and their environment.



Upon leaving Prince Rupert, ships laden with ammonia will need to navigate through the marine territories of First Nations and around three marine conservancies established by the BC government: Ksgaxl/Stephens Island Conservancy, Lax Kwaxl/Dundas And Melville Islands Conservancy, and Nang Xaldangaas Conservancy in Haida Gwaii. The protection of the marine environment in this region is so important to First Nations that the federal government enacted the moratorium on oil tankers along British Columbia's north coast, which prevents crude oil or persistent oil from being transported within a defined Moratorium Area that includes Prince Rupert and the shipping routes that ammonia-fueled ships or ships transporting ammonia would use to reach Japan and South Korea.

In short, to export hydrogen, Alberta needs support from British Columbia, First Nations and communities along the route, and from those who are concerned about protecting the environment and fisheries of the region to be transected. Over the past 15 years, Alberta has faced difficulties in developing projects to get bitumen to tidewater via the Northern Gateway pipeline (canceled) and the Trans Mountain Pipeline expansion (delayed but now operational and more expensive). The lessons of those projects, as well as other initiatives, need to be brought to bear on the transportation of ammonia. Otherwise, transporting hydrogen to tidewater could also become confrontational, leading to delays and missed opportunities.

4 The human element: Challenging traditional approaches

The federal government's recent Hydrogen Strategy for Canada Progress Report states that: "Delaying action on hydrogen awareness will inevitably become a bottleneck in gaining social acceptance. While there have been a large number of reports and studies generated over the past few years, including by the working groups under the Hydrogen Strategy, more efforts need to be made to ensure their conclusions are broadly disseminated. Governments, academia and industry need to actively raise awareness to facilitate public acceptance of low-carbon hydrogen, especially in the areas identified as strategic priorities such as de-risking production, end use and hubs projects." Clearly, there is a lot of work to be done before large-scale transport of hydrogen can take place.

If successful, Alberta will eventually be exporting at least a million tonnes of ammonia, classified as a hazardous material (see companion report), across northern British Columbia annually by 2030. If societal acceptance for the transportation of significant quantities of hazardous materials through communities and the territories of multiple First Nations is required, trust needs to be earned. Those impacted need to have confidence that their concerns have been listened to and addressed and believe that transport can be done safely and with quick and effective responses in the case of an accident. This is much harder to achieve if communities and First Nations are engaged after decisions have been made. It will be extremely difficult if they are surprised or believe the issue is being imposed upon them. In the face of the scale and nature of risks to communities, First Nations and the environment, any financial offerings will be of secondary consideration, assurances of safety will be scrutinized intently, and the historical record of transporting ammonia safely will be largely irrelevant.

This proposed scaling up of the transportation of ammonia is unprecedented. It juxtaposes Canada's commitment to clean energy with its considerable commitments to reconciliation with First Nations and the conservation of biodiversity. Given the challenges and scale, the traditional approach to stakeholder engagement, in which companies develop their risk management and communications strategies, and then governments approve projects and may even help to de-risk issues before engaging with those impacted, is not likely to be effective. Much can go wrong, and this report presents numerous examples of where other projects have encountered significant problems and unanticipated challenges on issues that they thought they understood. Given the stakes, a creative, proactive and inclusive approach to addressing First Nations, communities, and public concerns regarding the transportation of large quantities of ammonia is required.

When managing large-scale initiatives where the public is involved and empowered to influence outcomes, there is reliable science that points to typical negotiation techniques not necessarily being the most effective. The volume of empowered stakeholders, the complicated network of interests, the dynamic state of constant change, and the introduction of values-based (as opposed to interest-based) motivations, all give initiatives like the transportation of ammonia via rail the hallmarks of a "complex conflict." We must also recognize the ongoing influence and power of social media, giving actors worldwide the capacity to inform public opinion and mobilize opposition, further adding to the complexity.

Complex conflicts differ from negotiation largely because the unpredictable human element involved changes the behavioural drivers for those involved – values may be more important than interests, perception may be more important than reality, and non-rational drivers may be more important than hard facts, as discussed in Sections 5 and 6. One aspect of complex conflicts that is similar to negotiations is the vital importance of key individuals. The fact that many groups may be involved does not negate the importance of individuals with the power to make a material change to the conflict. In fact, these people need to be the central focus of any effort to manage, and be persuasive in, a complex conflict. The main difference is that the circle of influential individuals around those with power is wider than is often the case in negotiations.

The net result is that successful implementation of this kind of project must factor in the human environment from the outset. Addressing the identified risks and concerns of key individuals to ensure their buy-in will enable successful projects.

5 Perceived vs. actual risks

The primary obstacle that will need to be overcome in scaling up the transport of ammonia via rail is the perception of risk. In advocating for new oil pipelines across BC, a common talking point was that transportation of bitumen via rail was less safe than a pipeline. As discussed in the companion report, ammonia can be hazardous to human health and the environment, much more than bitumen, and the short-term plan is to vastly increase shipments of ammonia via rail.

When discussing the potential for ammonia exports, Ellis Ross, BC MLA for Skeena, has stated: "I think the only thing holding it back is the indemnification of the product being shipped by rail from Alberta to Prince Rupert, and what they're asking is the federal government and the provincial government to indemnify those goods in the same way they indemnify oil and gas products being shipped by rail. Because no insurance company will touch them."

Some are calling for indemnification as the risks of transporting ammonia may be high. In this case, the risk falls into the "low probability, high consequences" quadrant of a matrix. Proponents of ammonia via rail will focus on the low probability of an event; however, there is a need to acknowledge that the potential for extreme weather, land and rock slides/avalanches, human error, and mechanical and technical failure on this particular route increase risk which could require an unprecedented level of commitment and funding for track patrol and maintenance, more secure avalanche/slide fencing, training, and emergency response preparedness. Those potentially impacted will focus on avoiding catastrophe, which means that the perceived risks of the undertaking will far exceed the real risks, and it is the perceived risks that will be the focus of public debate and which will need to be addressed.

A discussion based on perceived risks is one largely based on values. People do not want to hear that there is a minuscule risk of serious human health impacts or damage to important fisheries habitat, they want assurance that it won't happen. And the perception of risk is shaped by the occurrence of events all around the world because if it has happened there, it could happen here.

Ten years after the Lac Mégantic rail disaster, concerns remain that a catastrophic incident could happen again. While rail transport in Canada is considered very safe, accidents still happen, and Edmonton-Prince Rupert is a high-risk rail corridor through remote and hard-to-access communities and waterbodies.

According to the Transportation Safety Board, unplanned and uncontrolled movements of rail equipment create high-risk situations that may have catastrophic consequences. Between 2010 and 2021, the number of uncontrolled movements has not shown a downward trend. Further, "among all rail transportation accidents in 2023, 87 involved dangerous goods. This is down from 110 accidents in 2022 and is lower than the 10-year average of 120. Six accidents in 2023 resulted in dangerous goods being released."

Accidents involving hazardous materials are rare, but they still occur. In 2002, a CP Rail train derailed in Minot, North Dakota, rupturing five cars containing ammonia, causing one death, eleven serious injuries and other injuries to 322 more. The National Transportation Safety Board report on that incident provides useful insights into managing a similar situation that could occur in northern BC. While dated, this chilling report describing a 1969 ammonia derailment in Crete, Nebraska, demonstrates the quick and severe consequences associated with an ammonia spill. In August 2005, a CN Rail train derailed into the Cheakamus River

in British Columbia, spilling 40,000 litres of caustic soda and causing the deaths of 500,000 fish. It was estimated that it would take the river a decade to recover, and CN was required to invest heavily in restoration efforts. In July 2024, 29 cars from a CPKC train carrying ammonia derailed, again in North Dakota, and 10-15 cars burst into flames. Fortunately, winds blew the smoke away from a nearby community. In 2019, a train carrying crude oil derailed in Guernsey, Saskatchewan, causing an explosion and fire. More recently, in September 2024, a fire caused by lithium batteries in a shipping container caused a lockdown near the Port of Montreal and led to questions as to the preparedness for similar incidents.

Further, it is important to recognize that many BC residents and stakeholders, especially municipal and provincial government leaders, are aware of the lethal nature and risk of ammonia. In 2017, an ammonia leak at a hockey rink in Fernie, BC, led to the deaths of three rink attendees and injuries to several others. Similar incidents have occurred across North America during the last 20 years.

Incidents like the above will forge public opinion, and they will be difficult to placate. However, from the recent progress report of the British Columbia Energy and Resource Table, it appears that the federal and provincial governments are focused on education and the internal development of facts and protocols to promote hydrogen prior to engaging with communities and First Nations. As an example, the First Nations Energy and Mining Council aims to educate First Nation communities in British Columbia about the practical aspects of hydrogen generation, storage, and regeneration, with a focus on addressing local needs and exploring potential trade opportunities. The perception may be that decisions have been made before the concerns of communities and First Nations have been heard.

6 Values vs. interests

It is often said that interests can be reconciled, but addressing differing values is much more difficult. Those who are focused on interests look to start a facts-based discussion with people impacted by a project. Yet those who take a values-based approach to the same issue may come to different conclusions even when the facts are agreed, which can lead to conflict. Project proponents tend to look at things through their own lens. If the project is in their interest and makes economic sense to them, and if the risks can be identified and mitigated to a level that is acceptable to the proponent, then they often have a hard time understanding how anyone could look at the project differently. At best, the parties will waste time talking past each other with little progress being made. At worst, this could lead to direct conflicts, such as rail blockades. Yet for a project to be successful, and to gain community acceptance, it is important that values and interests are reconciled.

Dan Gardner, the author of many books and recently the co-author of *How Big Things Get Done*, neatly sums up the potential conflict between values and facts:

> You looked at objective reality and saw one thing, and I am telling you I saw something else. It follows — "logically" — that I did not look at the same thing as you and, as a result, I am missing information you have. I am, in a word, ignorant. But there's a cure for that! Give me the information I lack. Then I will see things the way you see them. So you ask me to look again. And you helpfully provide me with facts and figures. I do as you ask. And I say I still see things differently than you.
>
> You are floored. My ignorance has been cured yet I still don't see things as you do! How is that possible?! (In the corporate world, this little drama plays out all the time, and at considerable expense: When corporations have external problems — consumers or regulators don't see something the way the corporation sees it — they commonly create a communications strategy to fix the problem. "They don't see things the way we see them? They must lack information! Let's give them that information, then they'll see things the way we see them." These strategies commonly fail because they misunderstand both people and the problem.)

A proponent will have to reconcile interests with some stakeholders and also reconcile (or not) with those who hold different values.

The following are some areas in which an interest-based discussion of real risk may conflict with a values-based discussion of perceived risk.

6.1 Engaging with stakeholders

Fortescue Future Industries proposed a massive hydrogen project in Prince George. Steve Appleton, Canada Country Manager, has stated "I don't want to underestimate there are a number of moving parts with this project because its complex. There's a number of communities along the right of way that CN moves freight by and we haven't started that (consulting) process because we want to be certain before we engage them. It's incumbent upon us to talk about it." There is enough experience with engagement and consulting, particularly with First Nations, to know there is a need to start early, nothing can be assumed, and proponents cannot just show up only when we want something. Transparency is critical, and it is necessary to listen to concerns and respond accordingly, not tell people what we think they ought to be concerned about. Project proponents should be prepared to commit and invest in early engagement and

communication. This includes investment in the processes, resources and mechanisms to track and address concerns and ensure the required follow-through. Yet talking to people impacted by an initiative is rarely done before the proponent, and often governments, have decided that it is worth moving forward.

In 2016, Petronas' Pacific Northwest LNG project on Lelu Island at the mouth of the Skeena River was opposed by the Lax Kw'alaams Band and eventually canceled despite receiving federal approval. This happened after $1.15 billion was offered to the community, which wasn't sufficient to persuade them that it compensated for the risks to salmon, eelgrass and cultural sites and loss of access to the island. The Lax Kw'alaams Band is currently opposing the Ksi Lisims LNG development in the region, and they can also be expected to oppose ammonia shipments through their territories.

More recently, in August 2024, residents of Nairn, ON and surrounding communities found out that the Province of Ontario was planning on transporting 40 tonnes of radioactive material to their community for disposal in the tailings pond of an abandoned mine nearby, a move that had been in the works for several years. No consultation with the communities had taken place. In response, the communities convened an emergency joint meeting of municipal councils. While they were assured by the provincial government that the process was safe, some in the communities had trouble reconciling that with the intensive safety protocols that were being followed. The province is now in the position of having to gain the acceptance and trust of a number of communities and First Nations with work already underway on the project.

At present, little ammonia is transported via rail across northern BC. Alberta's plans to export one million tonnes of ammonia annually by 2030 will not happen all at once and shipments will likely increase over time. The point at which the amount of ammonia being transported becomes a public concern is unknown. It is best to be proactive on the issue before a critical mass is reached as the consequences of a backlash at that point could be significant.

6.2 Complacency as the infrastructure is largely in place

Transporting large quantities of ammonia from Edmonton to Prince Rupert will require additional rolling stock and potentially new sidings for the railway but, unlike new pipelines for bitumen, the rails themselves are in place and that can impart a degree of complacency. The McLeod Lake Indian Band, north of Prince George, is proposing to produce hydrogen for export in partnership with Mitsubishi. Chief Harley Chingee has stated "We've already got the right-of-way identified...They've been hauling (petroleum) condensate to Prince Rupert since the 1960s and they're still doing it and there hasn't been a spill. The rail is already there, that's the beauty of it. Existing infrastructure is already there and there's no need for consultations and all this other stuff."

The infrastructure for transporting ammonia may be in place, and may need to be expanded, but it is ammonia itself that will be the focus of public and community concern. Just because the infrastructure is largely in place and will not involve large construction does not mean the proponents can be complacent about the potential challenges. Alberta and BC stakeholders and First Nations have a lot of experience with issues associated with the production and delivery of fossil fuel products, but ammonia/hydrogen presents a new and largely unknown challenge, and the risks need to be better understood.

6.3 Historical safety record

There is no doubt that CN has been operating rail transport across northern BC in a safe manner. However, there is no guarantee that First Nations, communities and the public will be less concerned about the risks to be posed by scaling up the transport of hazardous materials, and addressing those concerns could come at considerable financial cost.

For example, oil tankers have been loading at the Westridge Marine Terminal in the Port of Vancouver since the 1950s without incident. With the completion of the Trans Mountain Pipeline Expansion, the number

1 https://www.cbc.ca/news/canada/sudbury/nairn-hyman-radioactive-waste-1.7583133

of tankers has increased sevenfold, from roughly one per week to one per day. Critics claim that this is a seven-fold increase in the risks of a spill, which is correct; however, a sevenfold increase in a low probability is still a low probability. And tankers departing the Westridge Marine Terminal comprise only a small percentage of shipping traffic and less than half the tankers operating in Canada's coastal waters. Nevertheless, as a result of the Trans Mountain Pipeline expansion, all tankers departing the Westridge Marine Terminal must now have enhanced tug escorts and pilots until they are near the point of departure from Canadian waters. Further, now that the pipeline is operational and tanker traffic has increased virtually overnight, protests are continuing as more people are suddenly aware of what has been agreed.

With the historical safety record of transporting oil through the Port of Vancouver, is that level of precaution warranted? Or is that level of precaution necessary to assuage public concerns about the potential risks and consequences of a spill? What additional safety measures will need to be put in place to address public concerns over the transportation of ammonia?

6.4 Ensuring capacity for emergency response

The emergency responder community is a huge stakeholder in this issue, as they will be responsible for dealing with incidents across a significant stretch of railway. The level of hiring, training and the provision of resources required will add significant costs to the transportation of ammonia.

For example, in addition to the increased safety precautions associated with the expansion of the Trans Mountain Pipeline cited in Section 6.3, the ability to respond to an oil spill on the West Coast received a major boost. The Western Canada Marine Response Corporation (funded by industry) invested $170 million in new equipment, doubling the number of response vessels to 88, and increasing personnel from 30 to 220 across eight bases.

In August 2023, CN mounted an Emergency Response Spill Exercise in the mouth of the Skeena, engaging communities and First Nations, including the Metlakatla Guardians, in the drill with a positive response. First Nations, such as the Metlakatla, have been expressing their concerns about increased marine traffic in their territories and the risks that it poses to sites of ecological and cultural importance. In response, the British Columbia government, in partnership with 17 Coastal First Nations, has developed marine plans (MaPP) for the North Coast and Haida Gwaii regions through which ammonia-bearing ships departing from Prince Rupert will need to pass. Marine spills and response capacities are components of these plans, but the focus is on oil with no mention of other hazardous materials, such as ammonia. That will undoubtedly change.

Trans Mountain provides another example of the complexities of emergency response. While Ian Anderson, CEO of Kinder Morgan and later Trans Mountain Corporation, was widely praised for his effort to engage First Nations in the process of expanding the pipeline, Trans Mountain ran into a roadblock in the City of Burnaby. Burnaby's opposition was led by Burnaby Fire-Rescue. The expansion plans involved almost doubling the size of the Westridge Marine Terminal's tank farm from 13 to 24 tanks, and the tank farm is located between a residential development and Simon Fraser University. Burnaby Fire-Rescue was not convinced that its equipment could access the site in case of emergency, which meant any emergencies would be handled internally by Trans Mountain. Although the pipeline is now operational, tensions still exist between Burnaby and Trans Mountain regarding the adequacy of emergency response and the city is still preparing for worst case scenarios relating to a fire at the storage tank facility.

Past experience indicates that corporate emergency response procedures will not be acceptable to communities along the route that ammonia will be transported. The need for equipment and training in communities along the route should not be underestimated. It must be emphasized that the remoteness and hard-to-access territory along the corridor significantly complicates the task of emergency preparedness and response. It will take substantial investment in the capacity to respond quickly and effectively.

6.5 First Nations engagement

The federal government and the BC government have adopted the UN Declaration on the Rights of Indigenous Peoples, which has many references to Free, Prior and Informed Consent (FPIC). This is defined as "the importance of recognizing and upholding the rights of Indigenous peoples and ensuring that there is effective and meaningful participation of Indigenous peoples in decisions that affect them, their communities and territories. More specifically, FPIC describes processes that are *free* from manipulation or coercion, *informed* by adequate and timely information, and occur sufficiently *prior* to a decision so that Indigenous rights and interests can be incorporated or addressed effectively as part of the decision-making process – all as part of meaningfully aiming to secure the consent of affected Indigenous peoples." While transporting ammonia via rail is not subject to an environmental assessment, it is useful to consider how the British Columbia government addresses Free, Prior and Informed Consent in its environmental assessment processes. Further, the British Columbia Assembly of First Nations has in place a policy paper addressing FPIC and business that sets out their collective expectations regarding projects or proposals that impact First Nations.

The relationship between railways and First Nations has always been fraught, as First Nations see the railways as a vector for colonization that, to this day, significantly impacts their rights and is a major impediment to reconciliation. However, when discussing a huge increase in the amount of hazardous material to be transported along the route, trust in the rail company takes on a new dimension. In December 2023, the entire Indigenous Advisory Council to CN Rail resigned en masse to protest the company's unwillingness to act on some of its recommendations. A few months later, CN released a new Indigenous Relations Policy, which is heavily focused on economic opportunities but very light on safety issues other than a commitment to provide emergency response training to communities. There is a lot of work to be done between the company and First Nations to engender the level of trust required to transport significant quantities of hazardous materials through their territories.

First Nations don't always agree, and there will be a diversity of views within and among First Nations along the route. The recently completed Coastal GasLink natural gas pipeline exacerbated tensions within First Nations communities over who has the authority to make decisions on territories. Elected officials of the Wet'suwet'en First Nation supported the pipeline, but some of the hereditary chiefs did not, leading to extended and often violent confrontation. This opposition is continuing through initiatives such as the Peace and Unity Summit. As noted in 6.1, the Lax Kw'alaams Band, who successfully opposed the Pacific Northwest LNG project are currently opposing the Ksi Lisims LNG project (a partnership between the Nisga'a First Nation, Western LNG and Rockies LNG) due to its potential impact on their treaty lands.

Another example comes from the selection of a site for the disposal of Canada's nuclear waste. The Nuclear Waste Management Organization Guiding Principles for Site Selection were established in 2008, and a decision was announced in 2024. The NWMO recognized that those impacted along transportation routes needed to be consulted as well as the community selected for the site. One of the sites under final consideration, which was not selected, is the Municipality of South Bruce. Chief Greg Nadjiwon of the nearby Chippewas of Nawash says even if the dump is built in South Bruce, it's unlikely other First Nations would accept radioactive waste being transported through their traditional territories. "You're talking about transporting nuclear waste on the highway system. I think it has even less chance, which is just personal opinion. But, if you think about how many treaty territories that waste would have to go through, I don't think it will happen."

Finally, while hydrogen exports may benefit First Nations involved in the production and shipping of hydrogen or its carriers, those First Nations located in between, who will assume risk but are unlikely to receive proportional benefits, can be expected to challenge the transportation of hazardous materials across their territories. Further, where First Nations are owners of companies that are producing, transporting, storing or shipping hydrogen or hydrogen carriers they assume liability. Not just for the consequences if something goes wrong but under most Environmental, Social and Governance (ESG) frameworks, they will be accountable for how other First Nations impacted by their supply chain are treated.

First Nations engagement is extremely complex, time consuming and potentially confrontational. Yet it is a requirement. Thus, proponents need to ensure that they understand the full context and engage effectively, as has been done in other contexts.

6.6 Would you do this through southern British Columbia?

Robert Delamar, CEO of Kanata Clean Energy, a potential ammonia producer, made a thoughtful post on LinkedIn describing the risks of producing and transporting ammonia and how they ought to be managed. One of the advantages he cited for transporting ammonia across northern BC was that it was more sparsely populated than more southern routes. While recognizing the paramountcy of Indigenous engagement, Delamar inadvertently introduced the concept of environmental justice into the discussion.

In 2024, the Parliament of Canada passed a Bill *respecting the development of a national strategy to assess, prevent and address environmental racism and to advance environmental justice*. The Bill is based on the reality that a disproportionate number of people who live in areas exposed to environmental hazards are members of an Indigenous, racialized or other marginalized community and the establishing of environmentally hazardous sites, including landfills and polluting industries, in areas inhabited primarily by members of those communities could be considered a form of discrimination. As a result, the federal government is currently developing "a strategy to promote efforts across Canada to advance environmental justice and to assess, prevent and address environmental racism".

The logistical reasons for transporting ammonia across northern BC are clear; however, proponents must ensure that the population of the region is not subjected to risks that would be unacceptable in other parts of the country and the procedures and standards that need to be established to support hydrogen exports along this route ought to be no different than those that would be put in place to transport a similar volume of hydrogen or hydrogen carriers through any major metropolitan area in Canada.

6.7 Taking a narrow view of the risks vs. the benefits

Alberta's hydrogen export ambitions are being fueled by the demand for ammonia in countries like South Korea and Japan, and companies from these nations are partnering with Alberta companies to explore opportunities for hydrogen production. While the ammonia can be used for many purposes, one is that Japan and South Korea intend to co-fire ammonia with coal, reducing emissions from their thermal power plants. Critics have described this as simply extending the lifespan of coal plants and preventing switching to more renewable forms of energy. Alberta is proposing to produce hydrogen from natural gas in Alberta, sequestering the carbon emissions associated with hydrogen production, and converting the hydrogen to ammonia to enable it to be transported by rail and ship to Asia so that power producers in Asian countries can continue to burn coal. How the ammonia will be used in the destination country will be critical to understand.

6.8 Potential public opposition

The broader public perception of transporting significant quantities of ammonia across northern BC is not yet known, but history suggests there will be opposition. A significant determining factor will be the willingness of conservation or environmental nongovernmental organizations or First Nations to raise the alarm. If there is one lesson that ought to have been learned regarding industrial activities in northern BC, it is that the world is watching. From the "War in the Woods" of the 1990s through to battles over bitumen and natural gas pipelines, there is a worldwide audience prepared to engage in opposing proposed developments that pose a risk to the environment and peoples of the region. It is unrealistic to think that the transport of millions of tonnes of hazardous materials annually across the province will go unnoticed.

On the other hand, AltaGas just completed its Ridley Island Propane Export terminal in Prince Rupert without controversy. The terminal will offload 50-60 rail cars of propane on a daily basis, all of which is transported by CN across northern BC. It is true that entire trains of propane cars are routinely transported in Canada; nevertheless, there is little public opposition to this in Canada at the moment.

Public pressure can arise quickly, though, and can have profound impacts on corporate activities. The issue of transportation and storage of chlorine provides an illustrative example. Around 2007, opposition began to increase to the transportation of chlorine by rail in the USA due to the safety risks. Under pressure from legislatures and organizations such as Greenpeace, in 2009, Clorox announced that it would stop using chlorine in the production of its products, ending its role in the manufacture, storage and transportation of chlorine virtually overnight.

In 2010, Bruce Power proposed to send two shipments each containing 16 nuclear steam boilers with radioactive components to Sweden for recycling, with the radioactive components returned to Canada. Each boiler was the size of a school bus and weighed 100 tonnes. The radioactive component of each boiler was estimated at 28 grams. The shipments would travel through three Great Lakes and then down the St. Lawrence. Even though the Canadian Nuclear Safety Commission said there was little, if any, threat to human health or the environment, and it was approved by the federal government, opposition to the proposed shipments from Canada and the USA was fierce, with the Kahnawake Mohawks pointing out that the ship would pass within 30m of their village. The proposal was eventually canceled due to public opposition.

In the end, First Nations and communities opposed to the transportation of ammonia will have little difficulty securing national and international support for their cause. In addition, provincial, national and international conservation and environmental protection groups work to support the protection of important watersheds, fisheries and sensitive habitats. If the transportation of ammonia does become a public issue, it will not only be a local issue, facilitated by increasingly sophisticated ENGOs and the speed and reach of social media.

7 Building trust

Given the foregoing, a more creative, inclusive and proactive approach to engaging First Nations and communities is required if societal acceptance for the export of hydrogen from Alberta is to be achieved. It is proposed that the issues be explored through a workshop that engages those in the hydrogen export supply chain with external experts and carefully selected representatives of First Nations and communities to endeavour to find a constructive path forward.

The proposed workshop will be designed to contribute to the hydrogen value chain's ability to make a comprehensive and holistic assessment of the challenges before it. Questions that could be addressed include:

- How does transporting one million tonnes annually of a hazardous chemical through First Nation land and marine territories impact reconciliation?
- Should the transportation of ammonia be treated differently than other hazardous materials and be indemnified because it is seen to be "green" and contributing to the energy transition?
- How do the costs of enhanced safety measures and emergency response capabilities impact the transport of ammonia?
- While First Nations involved in the production or shipping of hydrogen may benefit financially, is revenue sufficient to adequately compensate those along the transportation corridors for the risks they will be taking?
- How can proponents meet the standards of Free, Prior and Informed Consent, as a recognized Indigenous right under the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), aligned with their recognized right to self-determination?
- The consequences of an ammonia spill on human health and on sensitive aquatic or marine environments could be so significant that there could be zero tolerance by communities. Can this be dealt with?
- How do we adequately take into consideration all differing views and opinions among and within First Nations regarding the impacts on cultural or heritage values?
- How does environmental justice apply to these types of projects (i.e., would a similar scaling up of hazardous materials on the rails be acceptable if it were passing through Vancouver)?
- How can we better understand the behavioural drivers for both individuals and communities to support the transport of hydrogen?
- How can proponents create implementation team structures and operating environments to ensure ongoing resilience and adaptability as the issue changes and unfolds over time and provide stakeholders with reports and updates on risk levels and mitigation efforts?

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