# Ottawa's Hydrogen Strategy has investment and pipeline problems

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Last week Ottawa announced the Hydrogen Strategy for Canada, a plan for the development of a domestic hydrogen market potentially worth $50 billion and creating 350,000 jobs by 2050.

The good news is the hydrogen strategy proposes to largely rely on hydrogen derived from natural gas reserves.

One of the key findings of the strategy is that it could build the Canadian hydrogen sector to supply world markets stating,

"With worldwide demand for hydrogen increasing, the global market could reach over $11 trillion by 2050…Based on their existing country strategies, demand potential, and proximity, Europe, Asia, and the United States have been identified as potential export markets for Canadian clean hydrogen."

The bad news is the current administration has been its own worst enemy and has to reverse direction from a six-year campaign undermining the Canadian oilsands and the Canadian energy sector. They may find it difficult to undo the damage they have done.

The success of the strategy depends on billions in near-term investments. According to the plan the Canadian hydrogen sector will require between $5B and $7B in public and private investment over the next five years with no specific commitment of how much the federal government is contributing to the sector. The government plans to use tax credits, subsidies and attract international investment to drive development to 2050, stating, "While the sector must ultimately be self-sustaining, temporary support is needed in the next 5-10 years to attract and de-risk industry investment."

Attracting and de-risking international investment has not been the strength of the current Federal administration. Many working in a financial capacity in the energy industry have shared an opinion that the exclusion of Canadian oilsands this year by some global investment funds is merely a public rationale for a decision that is based on a lack of regulatory certainty for investment in Canadian projects. Regulatory risk or in other words- political risk. According to Jack Mintz, at the U of C School of Public Policy, "Since 2015, there has been more Canadian business capital flying abroad than there has been capital flying into Canada."

The success of the hydrogen strategy also depends on a reversal of messaging from the Ministers of Infrastructure (Catherine McKenna) and the Environment (Jonathan Wilkinson) and the Prime Minister himself.

Pierre Poilievre, MP, Shadow Minister of Finance has insight into the challenge faced by the administration in attracting international investment. Speaking to the BOE Report, he recommended action to eliminate the regulatory delays that have been the reason for the flight of capital out of Canada stating,

"Canada can and should be an energy superpower. The overburdensome regulatory regime the Liberals have put in place prevents this from happening. It drives good-paying energy sector jobs and investment out of this country and to our competitors. To bring our economy roaring back to life, we need our entire energy sector firing. The government's role should be to clear the regulatory approvals as fast as possible to get critical projects built, especially in our oil and gas sectors."

Assuming for the moment that the current administration hears Poilievre's message and attempts corrective measures, there is another serious stumbling block ahead. The investments needed for success include investments in infrastructure, such as gas pipelines. The strategy includes subsidies to encourage more Canadian industrial and transport sectors to move to hydrogen. Long-haul transport, rail, aviation, mining, oil refining, and ammonia and steel production are industries identified to use hydrogen to reduce emissions, but industrial sectors need pipelines. From 2030 to 2050, the strategy envisages Canada will have a robust hydrogen infrastructure network, including pipelines.

The problem with pipelines is that the current administration has changed the regulatory approval landscape creating ongoing battles for pipeline projects in Canada. The strategy proposes a regional hub approach. Hubs will act as jumping-off points to expand hydrogen use into other sectors between 2025 and 2030. including Alberta's Industrial Heartland which already has CCS, infrastructure, and ample natural gas supply. Alberta has hydrogen initiatives underway. Oil companies already use hydrogen to refine crude, and there is a pilot project with hydrogen-powered truck transport between Edmonton and Calgary. In addition, Emissions Reduction Alberta has dedicated $11M to help the development of Fort-Saskatchewan-hydrogen-blending together with ATCO Gas and Pipelines as well as the development of Standing Wave Reformers Inc's hydrogen production process using no water and producing no CO2.

However, regional hubs will need increased pipeline infrastructure, in part due to the nature of hydrogen. Some assume hydrogen fuels can be transported in existing pipeline infrastructure, but it is not so simple. There are opportunities for blending hydrogen gas with natural gas for transportation in existing steel pipelines, but the percentage of hydrogen has to be quite low. There is a risk to transporting hydrogen through existing steel pipelines, which can absorb hydrogen over time and become brittle causing safety issues. The percentages that the US National Renewable Energy Laboratory recommends is just 5% to 15%. But a 15% blend wouldn't move very much hydrogen thus requiring the construction of new pipelines.

With a different perspective, a 2020 Siemens Energy article notes that depending on the quality of the steel and exposure to hydrogen, embrittlement can accelerate the propagation of cracks, especially in older pipelines, reducing the pipeline's service life by 20 to 50 percent. Although the article states that a greater percentage of hydrogen is feasible in existing natural gas pipelines, the article indicates major equipment changes will be necessary,

"If the share of hydrogen exceeds 40 percent, the compressors will need to be replaced. A complete switch to a 100 percent hydrogen pipeline requires installing new and more turbines or motors and more powerful compressors to deliver the three-times higher volume flow of hydrogen compared to natural gas."

If new pipelines are needed – could the necessary infrastructure be built? It is a critical question given the regulatory impasses and political uncertainty which currently exist for building major pipelines. Several pipeline projects have been proposed then cancelled or delayed as a result of regulatory challenges or political decisions in the last decade. Kim Moody, CEO and Director of Moody's Tax sees the upside if pipelines and foreign investment efforts are successful stating:

"It's interesting that the government is willing to invest in infrastructure like pipelines for hydrogen and to provide tax credits and other incentives. While the devil is in the details, anything that can help incentivize long term investment – including foreign investment – into our natural resource sector might be worthwhile exploring since such investment often comes with job creation."

*Maureen McCall is an energy professional who writes on issues affecting the energy industry.*

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Good article.

"According to Jack Mintz, U of C School of Public Policy, "Since 2015, there has been more Canadian business capital flying abroad than there has been capital flying into Canada."

True. But that has a lot to do with the price uncertainties of fossils due to the market being over supplied. So the Investments have stayed in the low cost producers.

If one looks at a more granular level, other sectors have attracted investments.

As for the Hydrogen strategy I see it as way more hype from Ottawa. They have not yet addressed the demand side which is not yet established. Yes there is potential for Hydrogen for Heavy Transport and energy storage. But since everyone will be in the business of producing it, no country could have a specific advantage.