The Transition Accelerator | L'Accélérateur de transition

Canadian Hydrogen Association | Association Canadienne de L'hydrogène

HYDROGEN FDI AND CANADIAN MARKET FORMATION

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Hydrogen FDI and Canadian Market Formation

Project Team

Travis Southin, Future Economy Lead, The Transition Accelerator
Derek Eaton, Director of Future Economy, The Transition Accelerator
Prachi Jangid, Director of Low Carbon Fuels, The Transition Accelerator
Marissa Hunter, Calgary Region Hydrogen Hub Coordinator
Jonas Goldman, Senior Research Associate, Net Zero Industrial Policy Lab

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About The Transition Accelerator

Our Objective
The energy transition is disrupting global power. The Transition Accelerator is here to help Canada win — **economically** and **geopolitically**.

Our Work
The Transition Accelerator drives projects, partnerships, and strategies to ensure Canada is competitive in a carbon-neutral world. We're harnessing the global shift towards clean growth to secure permanent jobs, abundant energy, and strong regional economies across the country.

We work with 300+ partner organizations to build out pathways to a prosperous low-carbon economy and avoid costly dead-ends along the way. By connecting systems-level thinking with real-world analysis, we're enabling a more affordable, competitive, and resilient future for all Canadians.

Our Unique Approach

- We **understand the current system in practice**, not just in theory, identifying barriers to innovation and opportunities for change.
- We bring together industry, labour, government, Indigenous and other leaders to **define shared visions of success** for their sectors, regions, or communities.
- We mobilize partners to **develop pathways to get there**, understanding and refining them to ensure they are credible, capable, and compelling.
- We turn ideas into action and **take steps down those pathways** by launching projects and partnerships to build a more competitive future.

For more information or interview opportunities please contact
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Executive Summary

Canada is well positioned in parts of the emerging hydrogen economy, but investment conditions remain uneven across technologies, markets and project types. Canada already has a sizeable hydrogen production base and ranks among the larger producers globally, with output of roughly 4 million tonnes per year.[1] For now, most of that production still comes from conventional pathways, and virtually all H2 is used as an industrial feedstock for the petroleum and chemical industries, not as an energy carrier serving end-use markets.

At the same time, the global market for low-carbon hydrogen remains at an early stage of commercial development. Low-carbon hydrogen accounts for less than 1% of global production.[2] Production remains largely co-located with industrial demand. This reflects an important distinction in hydrogen use: as an industrial feedstock, it is typically produced and consumed on-site or near demand; as an energy carrier to displace fossil fuels such as diesel, natural gas, or gasoline, uptake depends not only on production cost but also on the cost of purification, transport, storage, and delivery. International trade is still limited, and only a small share of announced projects has reached final investment decision.

Foreign direct investment (FDI) is part of this story, but its role in Canada's hydrogen sector needs to be assessed carefully. To date, Canada has attracted a notable share of global hydrogen FDI, but that investment has been concentrated in a small number of large projects based on autothermal reforming with carbon capture and storage. At the same time, much of the hydrogen investment that has advanced globally has been financed domestically for domestic projects. This raises a more practical question for Canada: **where can foreign participation materially support hydrogen market development, and where are other barriers more decisive?**

This report examines cross-border hydrogen FDI patterns, using the IEA's Hydrogen Production and Infrastructure Projects Database,[3] and considers what these patterns suggest about investable opportunities in Canada's hydrogen sector, with a brief discussion of implications for FDI attraction and selected CHA 2026 trade mission markets. **Drawing on a scan of global hydrogen FDI activity, survey responses from 28 CHA members and seven hydrogen hub or hub-like entities, and detailed interviews with 13 CHA members**, it examines where foreign investment is valuable in advancing Canada's hydrogen sector, or where the more fundamental challenge is the weak connection between Canadian technology innovation, domestic deployment, and market formation.

Key Findings

Key Finding 1:

Canada stands out for the amount of inbound hydrogen FDI

Roughly one-fifth of global hydrogen investment is cross-border, with the larger pattern being domestic capital investing in domestic projects. Canada ranks as the 2nd largest recipient in attracting a share of hydrogen FDI, but inflows are concentrated in a small number of large projects, primarily in blue hydrogen, rather than flowing broadly across the value chain or supporting domestic market development.

Key Finding 2:

Hydrogen investments need offtake economies of scale

The absence of reliable offtake was consistently identified as the main constraint on investment. The most credible demand base today is domestic industrial offtake in co-located applications, while exports and transport demand remains uncertain. Transport investment is further hindered by limited incentives for distribution infrastructure, such as liquefaction, and by the expiration of demand-side supports that are out of sync with existing supply-side policies.

Key Finding 3:

There is a misconnect between domestic technology suppliers and deployment.

Canada is strong in hydrogen innovation in specific technology areas but has trouble scaling up firms and translating that innovation into domestic deployment. Hydrogen projects in Canada often deploy or plan to rely significantly on non-Canadian technology, and linkages between investment, deployment, and domestic supplier development remain weak, limiting domestic value capture.

If Canada wants foreign direct investment to matter for domestic market formation, it needs to do more than attract capital into isolated projects. It needs to create the conditions under which domestic capital moves earlier, foreign capital follows as projects advance, domestic industrial offtake provides demand certainty, and deployment creates customers for Canadian technology suppliers rather than bypassing them.

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Hydrogen FDI and Canadian Market Formation

This section presents the three key findings from our analysis of hydrogen investment in Canada, highlighting where foreign direct investment (FDI) has been successful, the conditions needed to support broader market formation, and the role of domestic technology deployment. It also summarizes the factors shaping investment and includes select survey responses in the appendices.

Key Finding 1:

Canada stands out for the amount of inbound hydrogen FDI

Canada has done relatively well in attracting a small share of global hydrogen FDI, but that success is concentrated in a narrow set of projects and does not yet amount to broad domestic market formation.

a. Most global hydrogen investment is domestic capital investing in domestic projects. Most recent estimates state that $110 billion USD [4] in hydrogen production investments had cleared the final investment decision stage (FID) as of late 2025, covering more than 500 projects. Review of the top 100 projects, which account for roughly 95 percent of projected capacity, suggests that only about $20.7 billion USD of that total is cross-border investment (see Figure 1). In other words, roughly one-fifth of global hydrogen investment is FDI, but the larger pattern is still domestic capital investing in domestic projects.

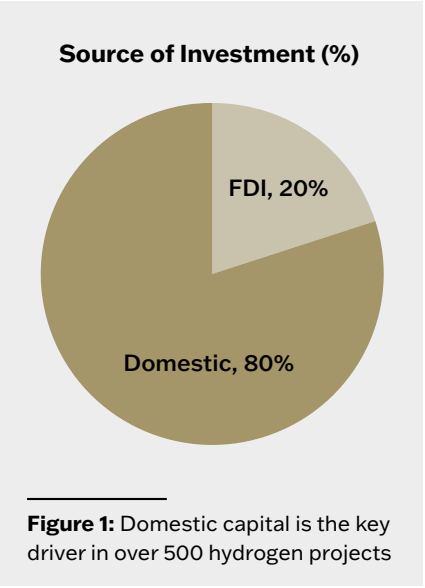


Figure 1: Domestic capital is the key driver in over 500 hydrogen projects

b. The global pattern is uneven across regions. Of the $110 billion that has cleared FID, roughly $33 billion has been committed by China, $23 billion by North America, and $19 billion by Europe. The near totality of hydrogen investment in China appears to come from Chinese domestic capital. Europe shows greater cross-border investment flows, though significant amounts of capital still remain invested within national origin. North American firms invest abroad, but many domestic hydrogen projects in North America are also financed with domestic capital.

The largest sources of hydrogen FDI globally are the United States, followed by the UK/Ireland, Japan, Australia, and the UAE. This does not mean these countries are the largest investors in hydrogen globally. Most of China's investment and much of the Gulf's clean hydrogen investment comes from

domestic capital. These five countries are simply the top sources of foreign investment. The prominence of the US and UK/Ireland reflects the global leadership of companies such as Linde and Air Products, which have successfully developed major industrial offtake projects around the world. The UAE has also played an important role in supporting large green hydrogen projects in India, Oman, and Austria, contributing to the growth of the global hydrogen economy.

c. Canada does well going after this relatively small pool of hydrogen FDI. Canada ranks highly as the 2nd largest recipient for FDI in hydrogen, but the inflows are narrow and concentrated (see Figure 2). Investments have primarily gone to a small number of large-scale blue hydrogen projects, particularly in petrochemicals and refining where it substitutes for existing process hydrogen use, rather than to broad-based market formation for hydrogen as an energy carrier across end-use sectors and for domestic technology deployment.

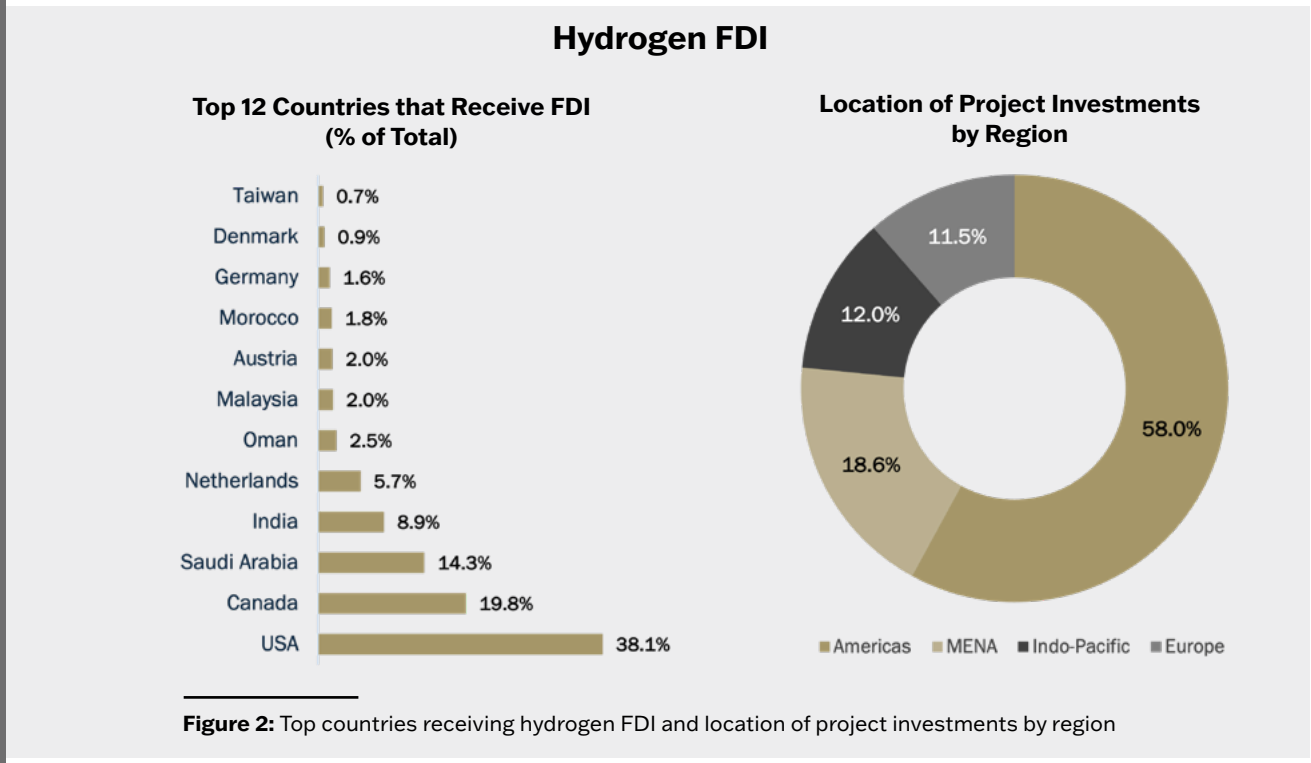


Figure 2: Top countries receiving hydrogen FDI and location of project investments by region

d. Expectations for future inbound FDI are concentrated in a small number of strategic partner markets. Survey respondents identified Germany, South Korea, Japan, and the United States as the most promising source countries for inbound hydrogen investment into Canada over the next 3–5 years (see Figure 3). This expectation is also consistent with recent developments: in January 2026, the Canada-Germany H2Global auction cleared a major regulatory milestone with EU approval for Germany's €200 million contribution to a joint auction for Canadian renewable hydrogen and derivatives.[5] In March 2026, Canada and Japan launched a new Comprehensive Strategic Partnership and Roadmap that includes energy security, trade, investment, and supply-chain cooperation.[6] Similarly, South Korea recently deepened industrial cooperation with Canada with Hyundai signaling openness to strategic hydrogen partnerships in Canada.[7]

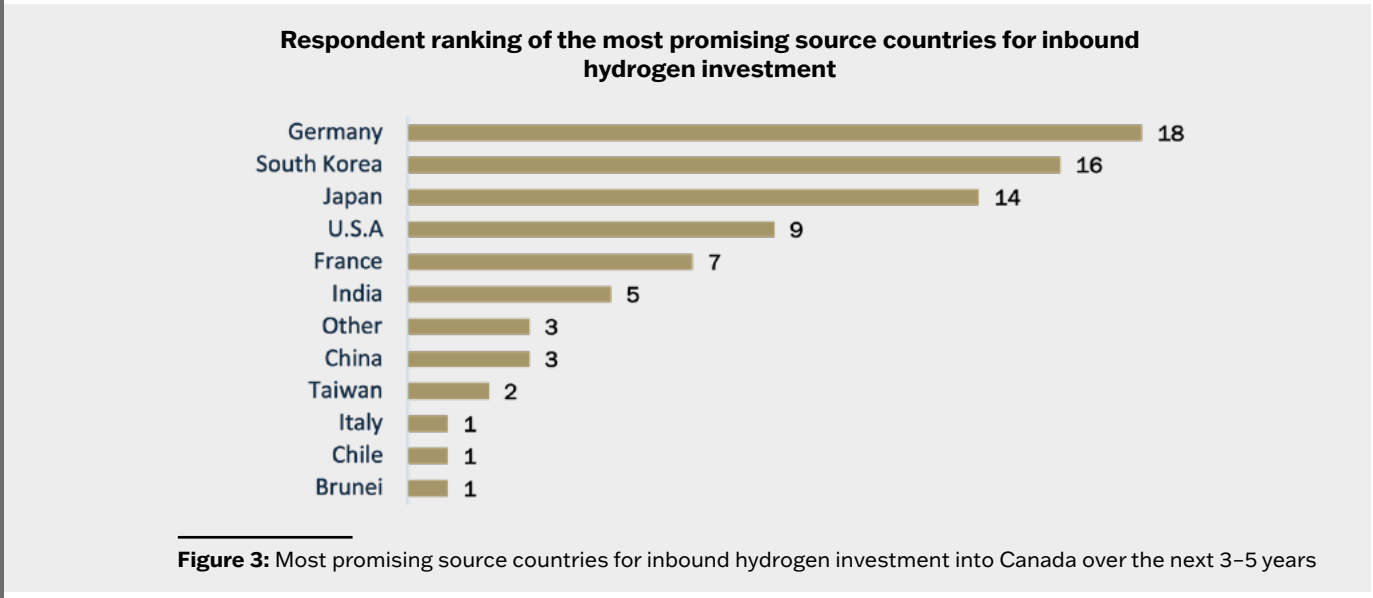


Figure 3: Most promising source countries for inbound hydrogen investment into Canada over the next 3–5 years

e. Canada is not yet seeing FDI flow broadly across the different hydrogen value chains. Instead, it has concentrated primarily in blue hydrogen and other projects where risks are already lower because of very low-cost natural gas, favourable carbon management conditions including storage capacity and an established and supportive regulatory regime, public financial support, and project scale.

f. Several interviewees suggested that too much focus on foreign versus domestic capital can be a mistake, particularly at the early stages of project development. Their view was that domestic capital is often better placed to absorb Canadian regulatory, policy, and offtake risk, while foreign capital becomes more relevant once those conditions are clarified.

> Canada has shown that it can attract major private investment into complex, industrially anchored hydrogen projects...The next question is whether [it] can build on these successes to support wider hydrogen market formation.

Figure 4: Path2Zero: A world-scale C$10.1B net-zero integrated facility in Fort Saskatchewan, expected to produce 3.2 million metric tonnes of polyethylene and ethylene derivatives annually. Source: Dow/Linde.

Key Finding 2:

Hydrogen investments need offtake economies of scale

At scale: Industry

Currently, the most credible large-scale demand base is domestic industrial offtake anchored in low-carbon hydrogen adoption in established end-use markets such as polyethylene and renewable diesel. These markets share two advantages: they are embedded in existing North American regional fuel and polymer value chains, and they do not require hydrogen to be transported long distances. Instead, through existing processes, hydrogen is converted into an energy-dense fuel or industrial product that is easier to store, ship, and sell through existing distribution channels. Hydrogen projects are complex and capital-intensive, and are difficult to finance unless there is confidence in long-term, large-scale offtake. **Respondents repeatedly said that the absence of reliable offtake is the critical barrier.** Even with ITCs lowering part of the cost of production, hydrogen often remains uncompetitive for end users relative to incumbent fuels. Carbon pricing helps, but many interviewees saw it as insufficient on its own.

Moreover, respondents emphasized that hubs, which concentrate supply, demand, infrastructure, and customers in the same location, are particularly important for supporting nascent fuel-switching markets, including heavy-duty transport. Market development in Canada may be better served, at least in the near term, by spending more time and public support making existing hubs work, rather than moving hydrogen long distances before local market formation is strong enough. This underscores that Canada's current success in a few large projects is not evidence that the wider hydrogen market is forming on its own.

Figure 5: Electrolyzer modules at Air Liquide's 20MW green-hydrogen facility in Bécancour, Canada, support battery materials and existing industrial cluster in Quebec. Source: Air Liquide.

Not at scale: Hydrogen exports and transportation

Exports

For exports, the economics of shipping hydrogen in ammonia form remains uncertain. On the Atlantic coast, proposed green hydrogen projects aimed at Europe have not yet produced a robust wave of final investment decisions, and Canadian projects would also face future competition from Southern Europe and the MENA region, while the European Commission's hydrogen auctions continue to support a growing mix of domestic and regional supply in Europe. That said, there may still be a modest strategic role for Canada in helping northwest Europe diversify fuel sources and strengthen energy security, if buyers value supplier diversity alongside cost. On the Pacific coast, proposed blue ammonia projects would face a different set of challenges: less the underlying cost of production than the safety and infrastructure requirements of transporting hydrogen or ammonia to the coast for export. Western Canadian exporters would also face competition in East Asian markets from suppliers in Australia and the MENA region.

Transport

In transport, domestic hydrogen offtake is not yet developing at scale, and the familiar chicken-and-egg problem persists: without reliable demand, infrastructure does not get built; without infrastructure, demand does not emerge. This makes the economics even more challenging when supply and demand develop in small, piecemeal fits rather than a coordinated at-scale build-out. Interviewees argued that policy is not helping much. The end of federal purchase incentives for medium- and heavy-duty zero-emission vehicles is out of sync with the existing supply-side supports, while current investment tax credits do not cover critical distribution equipment such as liquefaction.

Rail transport. CPKC's locomotive program demonstrates Canada's leadership in hydrogen rail innovation, with low-horsepower locomotives already in service and high-horsepower testing now underway. Unlike road transport, where each fleet might experiment with adopting hydrogen incrementally and demand is highly distributed, hydrogen offtake by locomotives occurs in the range of tonnes per day, aligning more closely with the capital-intensive nature of hydrogen production and simplifying coordination of supply and infrastructure.

The partnership between CPKC and CSX is important because it will help validate and scale low-horsepower hydrogen locomotive technology beyond a single operator.[8] A longer-term question for Canada is: If hydrogen locomotive conversion develops into a credible and cost-competitive alternative to purchasing diesel-electric locomotives, how can Canada position itself not only as a technology leader and developer, but also as a location for a greater share of the manufacturing, retrofit, and modernization activity associated with the higher-horsepower platforms in the long run?

Figure 6: Hydrogen locomotive program.

Key Finding 3:

Misconnect between domestic technology suppliers and deployment

Canada may succeed in deploying hydrogen projects without necessarily helping Canadian hydrogen firms scale at home and compete globally.

a. **We are deploying hydrogen technology that is not Canadian** (for example, imported electrolyzer technology). Several interviewees, including new project developers and hydrogen companies with operating projects, indicated that many key project components and technologies were sourced from outside Canada, with limited reliance on Canadian suppliers. The misconnect between strong innovation and weak deployment uptake of Canadian technology means that even if a rush of investment were to pour into deployment, Canadian technology suppliers might not benefit, including many domestic firms that are active in the hydrogen ecosystem.

b. **Canada's ability to compete with economies of scale in electrolyzer manufacturing remains uncertain**, particularly given the current oversaturated global market. It is unclear whether domestic firms could profitably export electrolyzers at scale. Instead, the more relevant question may be how Canada can strategically position itself: for example, by developing novel electrolyzer IP, supporting Canadian technology leaders, or attracting foreign technology leaders to establish manufacturing locally. A similar question applies on the blue hydrogen side: where key ATR+CCS technologies are not Canadian, domestic technology capture may still be weak even where Canada is strong in project deployment. A broader consideration might be to understand how Canada can balance domestic capability development with leveraging global technology leadership to maximize economic and industrial benefits.

c. **Canada is perceived as well-positioned in specific technology "races,"** particularly blue hydrogen, methane pyrolysis, fuel cell manufacturing, hydrogen bus manufacturing, hydrogen–diesel dual fuel applications, hydrogen locomotives, hydrogen storage, and potentially natural hydrogen. However, Canada currently lacks a clear and targeted industrial strategy for the hydrogen sector that identifies which segments of the value chain to prioritize for technological leadership. Developing such a strategy could help ensure that domestic technology capture generates value by supporting innovation, scale-up, and domestic jobs.

H2M AND SOLID-STATE HYDROGEN STORAGE

Canadian innovation such as H2M's solid-state storage can help position Canada in emerging hydrogen transport markets. H2M's approach uses a solid-state format that stores hydrogen at ambient temperature and low pressure, supporting safer, modular transport and helping reduce infrastructure barriers for containerized hydrogen shipments.

d. **Canada is strong in innovation but has trouble scaling up innovative firms.** Without access to domestic customers via hydrogen deployment, and without domestic investors, often the most viable growth path is foreign acquisition. One of the reasons why foreign equity stake was selected as the most desired form of FDI by interviewees was that this pathway was seen as necessary in an environment of limited domestic capital availability.

    › One example raised by interviewees was a Canadian hydrogen technology firm that, after years of public R&D support to develop leading technology, was acquired by a U.S. company. The concern raised was that this path can result in Canada helping create strategic technology capability, but not necessarily retaining the production base, scale-up pathway, or long-term value capture.

e. **Some interviewees raised concern that parts of the public R&D support system may lean heavily toward patent generation** without sufficient attention to commercialization and scale-up pathways for Canadian firms.

f. **Joint ventures are seen as a pathway to market growth.** However, many OEMs are not making equipment in Canada and are not sourcing from Canadian technology suppliers. This type of FDI is desired by technology suppliers because it can create a route to market, but right now the domestic linkage is weak.

g. **OEM presence can support domestic technology uptake.** One example raised in interviews was that there are no truck OEMs in Canada, which limits the ability of Canadian fuel cell suppliers to participate in that part of the value chain. The position is somewhat better in buses, where bus OEMs with manufacturing operations in Canada, such as New Flyer and Nova Bus provide a more plausible route for domestic technology uptake (see Figure 7).

Figure 7: Ballard has a dominant market share in PEM fuel cell engines installed in transit buses currently operating in North America.[9] Image courtesy of Strathcona County.

Policy solutions might therefore need to focus on tying deployment more directly to domestic supplier development. This could mean:

- Attracting FDI from OEMs and hydrogen producers whose projects make use of Canadian technology, thereby creating customers for Canadian suppliers
- Continuing to support the development of novel electrolyzer IP and ensuring that foreign investment helps scale Canadian capabilities while retaining strategic value in Canada.
    - › Hydrogen Optimized is a good example of Canada's electrolysis heritage: the company's RuggedCell electrolyzers build on more than a century of Stuart family leadership in industrial water electrolysis, while its partnership with ABB is an example of how foreign participation can help commercialize and scale differentiated Canadian technology (see Figure 8).
- Attaching Buy Canada conditions to deployment funding; and creating a warranty program to backstop smaller Canadian suppliers and reduce buyer risk.

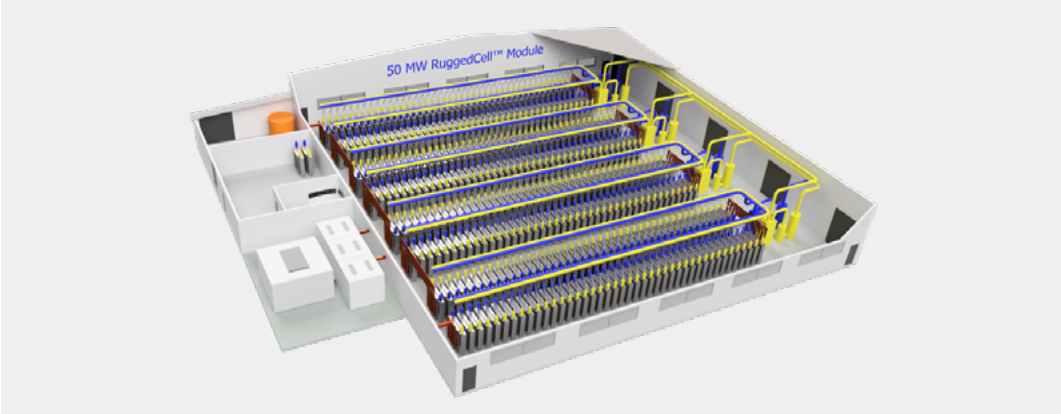


Figure 8: ABB made a strategic investment in Hydrogen Optimized in 2022. RuggedCell's large-scale electrolyzer design is well matched to ABB's high-power rectifier technology to enable large-scale hydrogen production in industrial applications such as steel, ammonia, and synthetic fuels.
Source: Hydrogen Optimized.

At the same time, where Canada does not have a credible domestic technology base or a realistic path to build one, the policy objective should not be to force domestic content. In those areas, Canada should actively seek partnerships and import the lowest-cost technology available, while concentrating domestic support on the segments where Canadian firms have a realistic prospect of scaling and competing.

Conditions needed to move investment

Some respondents noted Canada's challenge is not innovation; it is scale-up, deployment, and execution. Reliable domestic offtake, better coordination across the value chain, mechanisms to scale domestic firms, and alignment of demand-side incentives with supply-side supports can help move investment and strengthen market conditions.

As federal and provincial governments recalibrate their hydrogen strategies, this report can help clarify how the role of foreign direct investment could be articulated within a broader hydrogen industrial strategy.

If Canada wants foreign direct investment to matter for domestic market formation, it needs to do more than attract capital into isolated projects.
It needs to create the conditions under which:

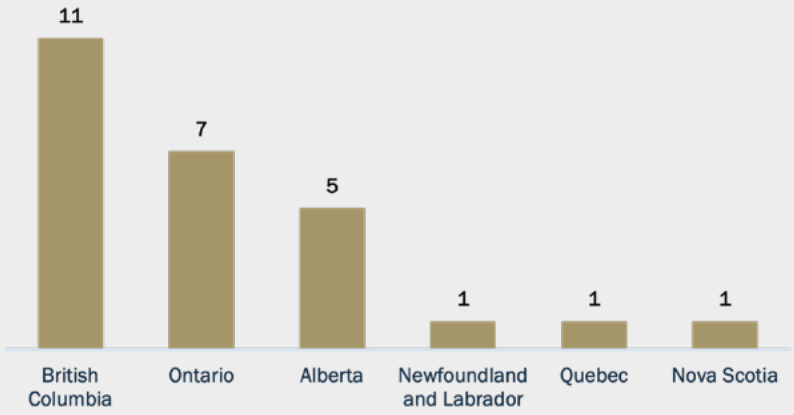
- Domestic capital moves earlier,
- Foreign capital is more likely to follow as more projects move through investment stages,
- Domestic industrial offtake provides the demand certainty needed for scale, and
- Deployment creates customers for Canadian technology suppliers rather than bypassing them.

Appendix A: Survey Responses

Appendix A includes only the survey responses that could be clearly shown in charts or other quantitative formats. The main themes from the qualitative and open-ended responses are already reflected in the report.

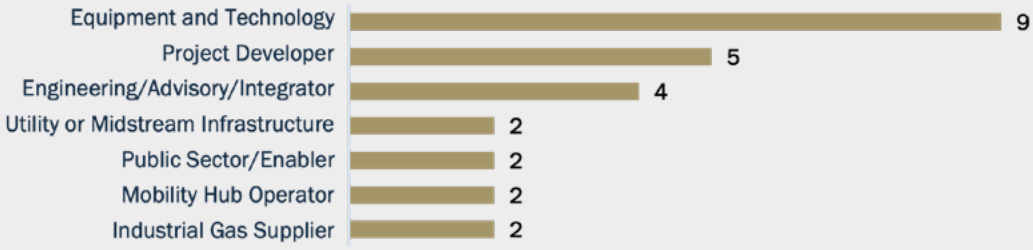
Question 2: In which city and Province (or Territory) are you and your organization located?

Regional distribution of respondent organizations in Canada



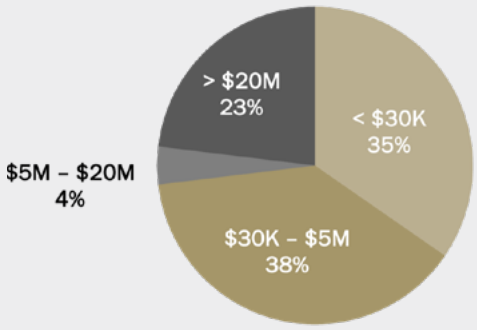
Question 3a: Where does your organization fit within the hydrogen value chain?

Where respondent organizations operate in the hydrogen value chain



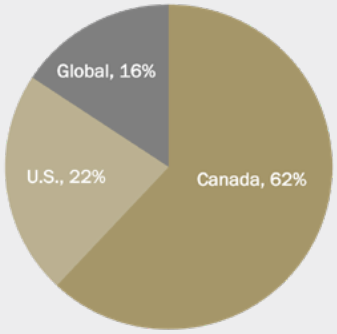
Question 4a: For the last fiscal year, what was the approximate annual revenue of your company or organization?

Approximate annual revenue of organization



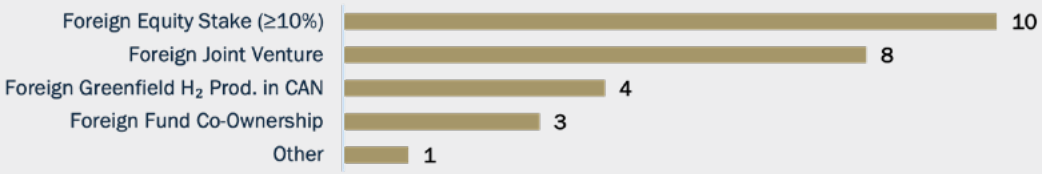
Question 4b: Please list roughly what share of your sales comes from the following 3 sources.

Distribution of sales across domestic, U.S., and international markets



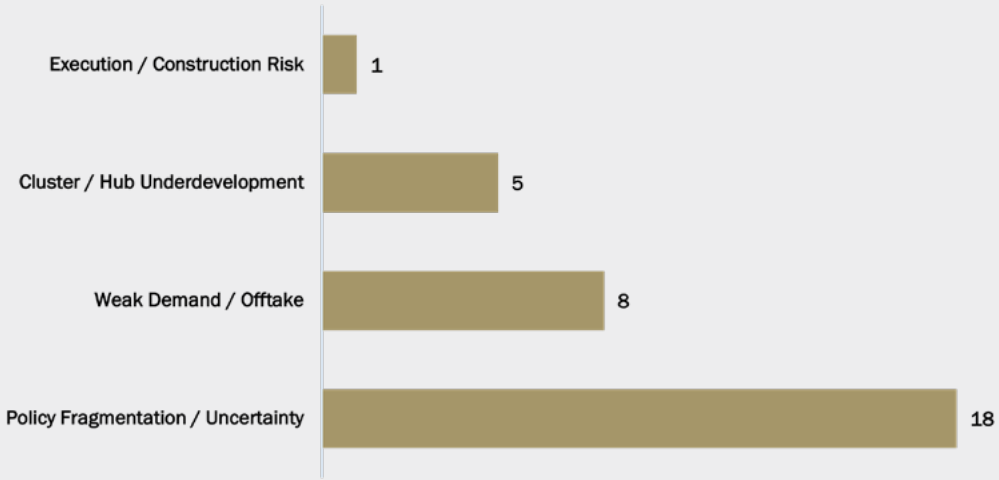
Question 6a: If your firm is interested in or actively seeking FDI, what type of foreign direct investment would be most beneficial for your company?

Type of FDI most beneficial to respondent organization

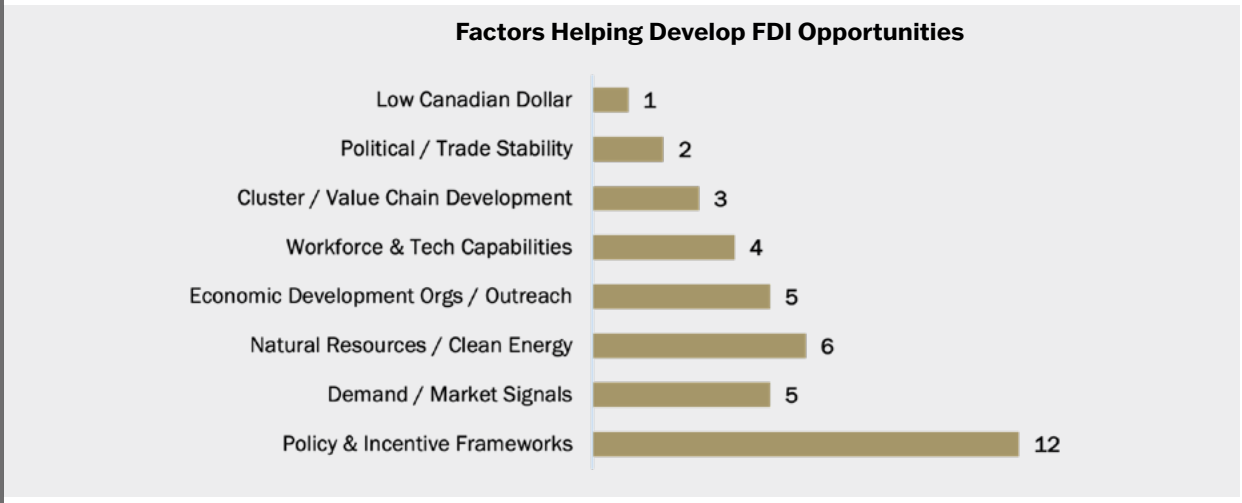


Question 9: What factors are limiting FDI opportunities?

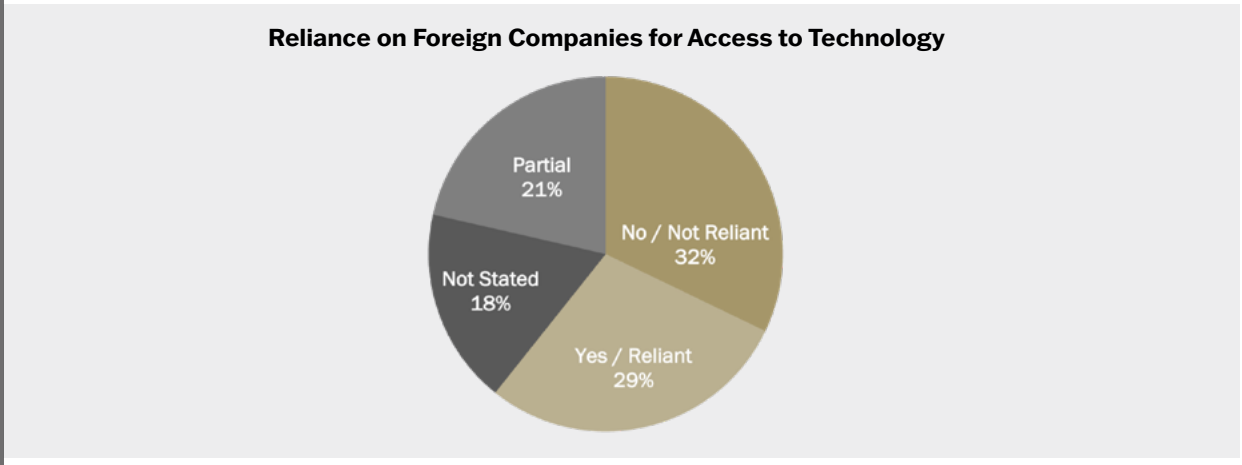
Factors Limiting FDI Opportunities



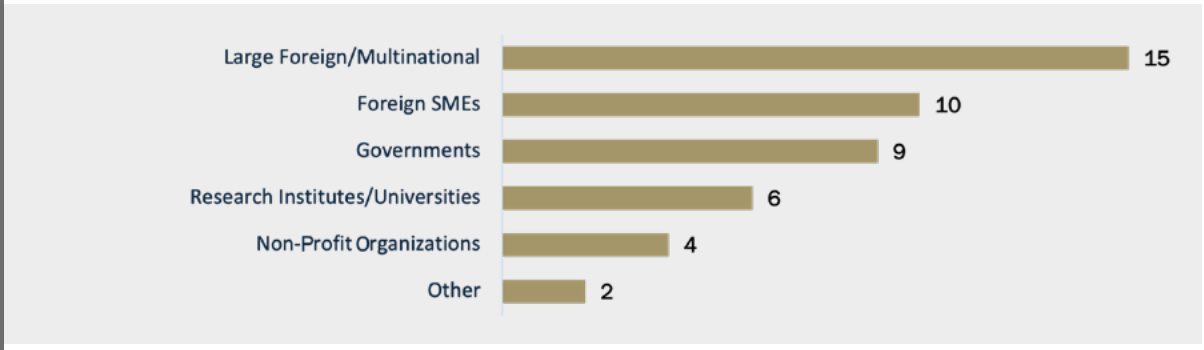
Question 10: What factors are helping develop FDI Opportunities?



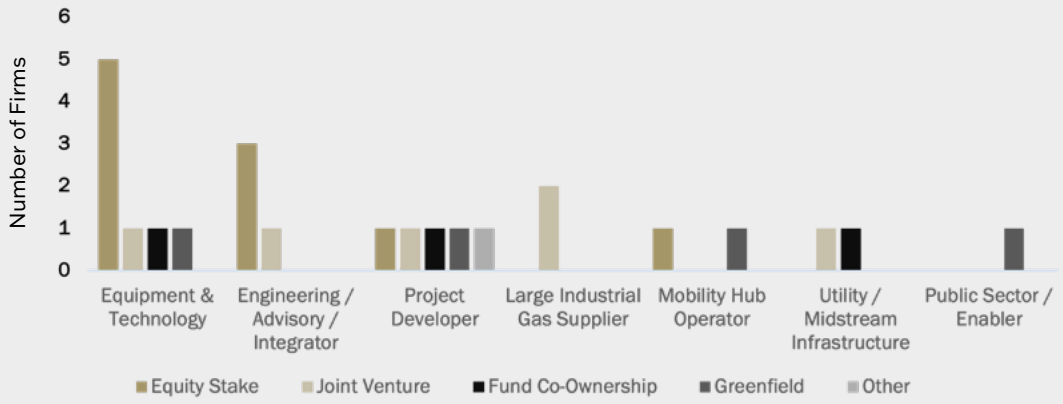
Question 11: Are you reliant on foreign companies for access to technology?



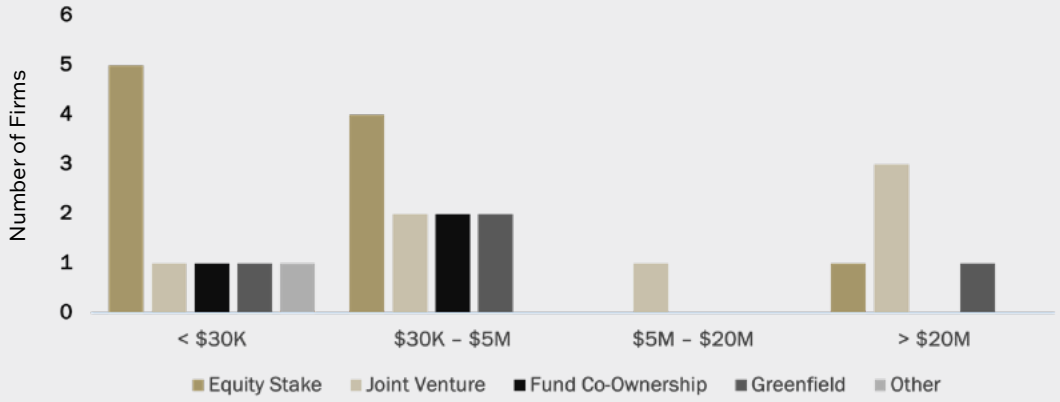
Question 12a: Does your organization engage in collaboration with any international organizations/companies?



FDI Structure Preferences Among Surveyed Firms, by Value Chain Role



FDI Structure Preferences Among Surveyed Firms, by Annual Revenue



Endnotes

1 https://energy-information.canada.ca/sites/default/files/2025-11/energy-fact-book-2025-2026.pdf

2 https://www.iea.org/reports/global-hydrogen-review-2025/executive-summary

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