

# Leading the Hydrogen Revolution - Insights from the Canadian Hydrogen Association

Swedish Hydrogen Conference – Stockholm

December 11, 2024  
Ivette Vera-Perez  
President and CEO



Canadian  
Hydrogen  
Association

Association  
Canadienne de  
L'hydrogène

# About the Canadian Hydrogen Association

## The Voice of Canada's Hydrogen Sector



### Championing Canadian Hydrogen

- National industry-research association
- Established in 2009
- 200+ members
- Provincial affiliates in BC, Alberta, and Ontario
- Partnered with Atlantic Hydrogen Alliance and Hydrogène Québec

### The Voice of the Sector

- Advocacy
- Government relations
- Communications
- Networking



# CHA Tradeshows and Events



## CANADIAN PRESENCE

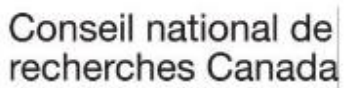
- The CHA was the official association partner for the Canadian Hydrogen Convention in 2024.
- We host Canada pavilions across the world at the largest hydrogen shows such as World Hydrogen Summit, H2MEET, FC Expo, Hyvolution, etc.
- The CHA is part of the planning committee for the Canadian Hydrogen Convention in 2025
- Canada is the country partner for Hannover Messe 2025 where CHA will be representing



# Our Members



## Sponsoring



## Executive



## Industry



## Small Business/End User



## Academic/Consultant



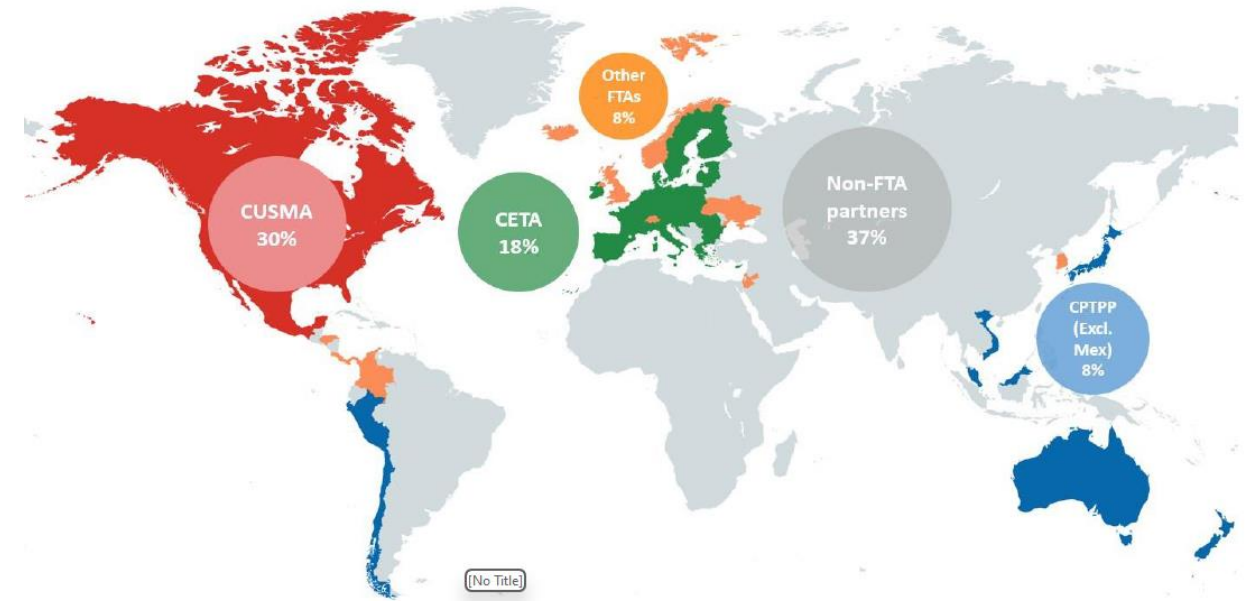
## Start-up



# Why Canada?

Strong Fundamentals

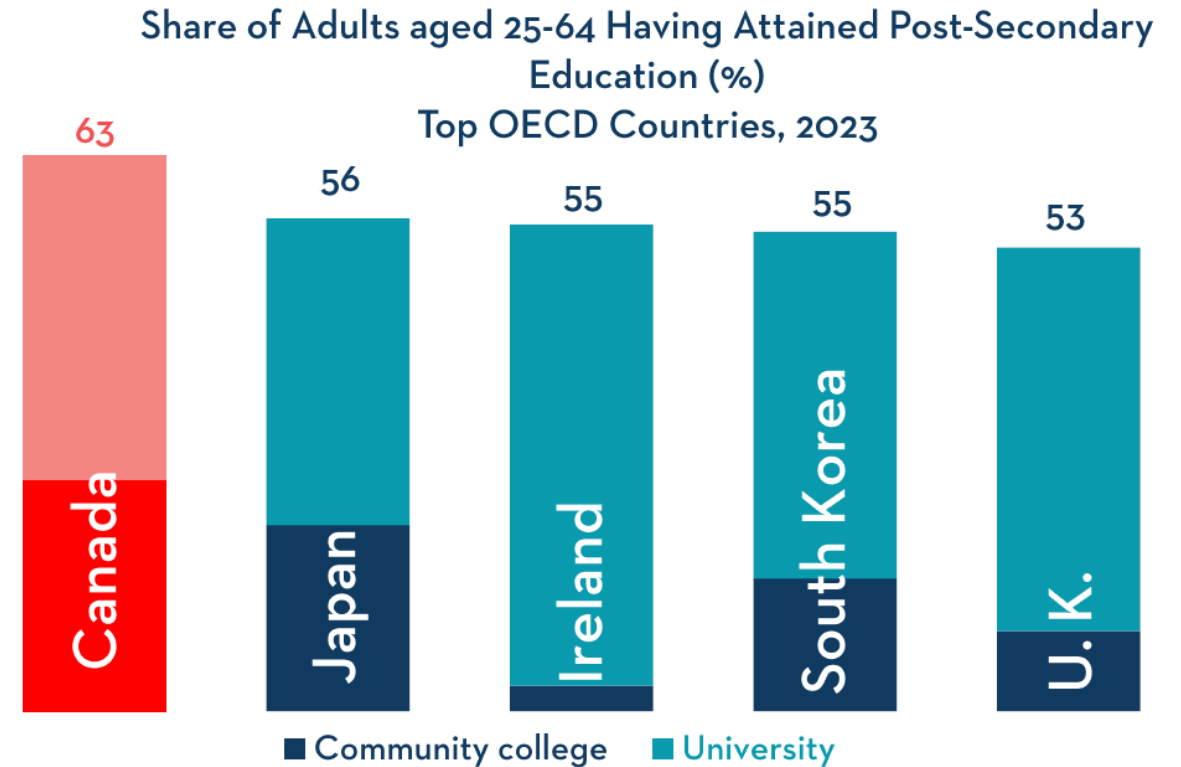
Share of Global GDP of Canada's FTA Partners in 2023





# A first-rate business environment

- **A gateway to North American and the world:** 15 free trade agreements covering 51 countries (e.g. CUSMA, CPTPP and CETA)
- **Easy access to markets:** Most direct routes to and from Asia and Europe
- **Highly educated and competitive workforce:** Canada has the most educated talent pool in the OECD: 63% of its population aged 25 to 64 has completed tertiary level education
- **Environment conducive to leading-edge innovation:** Canada ranks 2nd in the G7 in research and development (R&D) spending in post-secondary research as a share of GDP
- **Abundant and reliable clean energy:** 82% of total electricity is on average non emitting, with provinces such as Newfoundland & Labrador, Quebec, Ontario, Manitoba and BC being predominantly non emitting
- **Supportive incentives for clean energy**



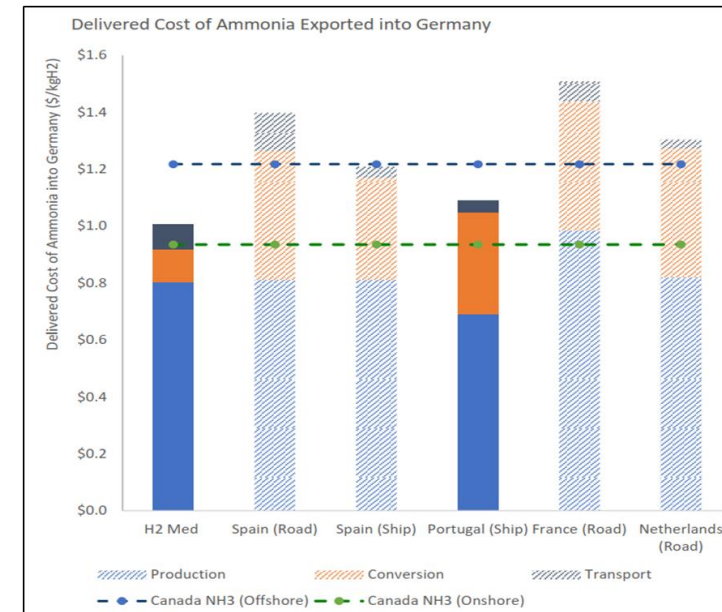
Source: Office of the Chief Economist, Global Affairs Canada

# The Canadian H2 value proposition



Leading energy exporter	Top-10 H2 producer at 3 tons per year	100+ years of expertise in electrolyzer technology & products
40+ years of expertise in hydrogen fuel cell technologies	Hydrogen production expertise (electrolysis, biomass gasification, pyrolysis, reforming)	CAD \$500MM sector revenues
Diverse industrial ecosystem spanning the entire value chain	4,000+ highly skilled professionals	Every province in Canada has strong competitive advantages

As one of the world's largest and most advanced green hydrogen projects, Bear Head is developing an industrial scale green hydrogen and ammonia production, storage, and loading facility located on the Strait of Canso. Backed by a leading midstream company, the project will allow Nova Scotia to export its abundant wind energy resources.



# Hydrogen Landscape in Canada Today

Competing in a world that has embraced hydrogen



# Canada's Hydrogen Journey

ESTABLISHING PIONEERING LEADERSHIP



1905 – 1970s

## *Beginnings*

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**1905** – A.T. Stuart presented the opportunity for electrolysis of water in Niagara Falls.

**1913 - 1948** – “Stuart Cell” and The Electrolyser Corporation.

**1973** – The oil crisis led to renewed interest in hydrogen. Investments in hydrogen research to reduce dependence on imported oil.

1980s- 2010s

## *Strategic Developments*

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**1983** – Ballard Power Systems is founded.

**1987** – Hydrogen National Mission for Canada is published.

**2016** – Hydrogenics partnered with Alstom to develop hydrogen-powered trains.

2020s

## *Accelerating towards a hydrogen economy*

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**2020** – Canada’s “Hydrogen Strategy for Canada” is released.

**2022-2024** – Numerous projects were announced, including the development of hydrogen hubs in AB, SK and ON, and increased investments in electrolyzers and FC.

# Hydrogen Strategy for Canada – Progress report



May 2024 – The Progress Report confirms that hydrogen continues to have a role in meeting global energy needs in the context of energy security, energy transition and the broader climate imperative

Canada's priorities for next reporting period (2024-2026):



De-risk high-impact production projects of low-carbon hydrogen



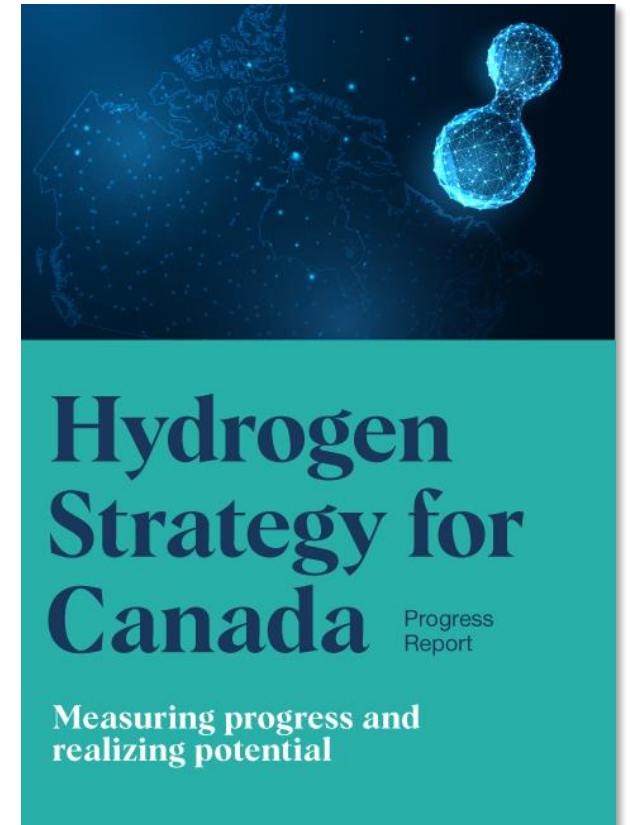
Achieve scalable hubs and strategic corridors, targeting end-uses with greatest potential



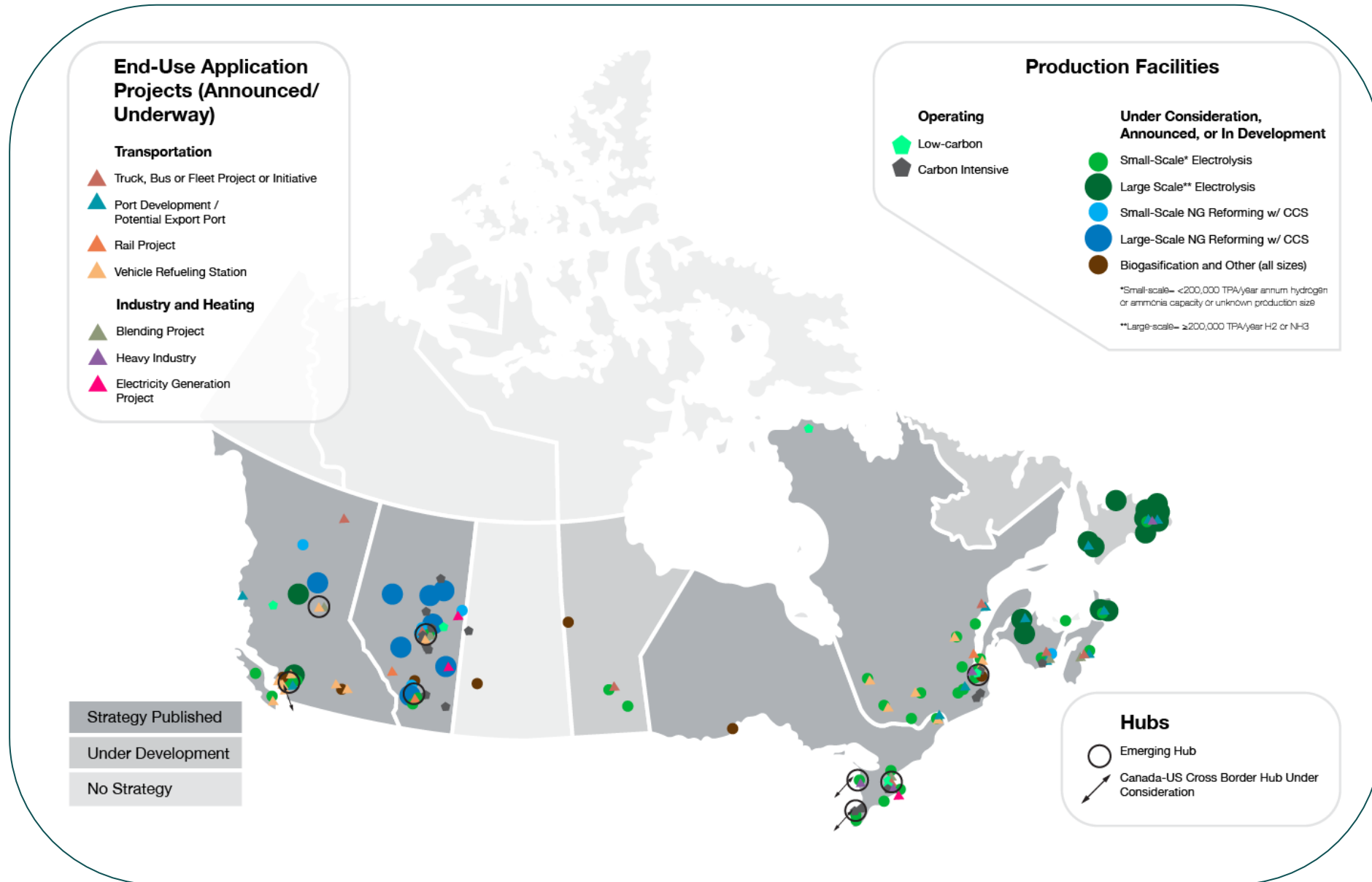
Continue development of codes and standards



Increase awareness and improve market data



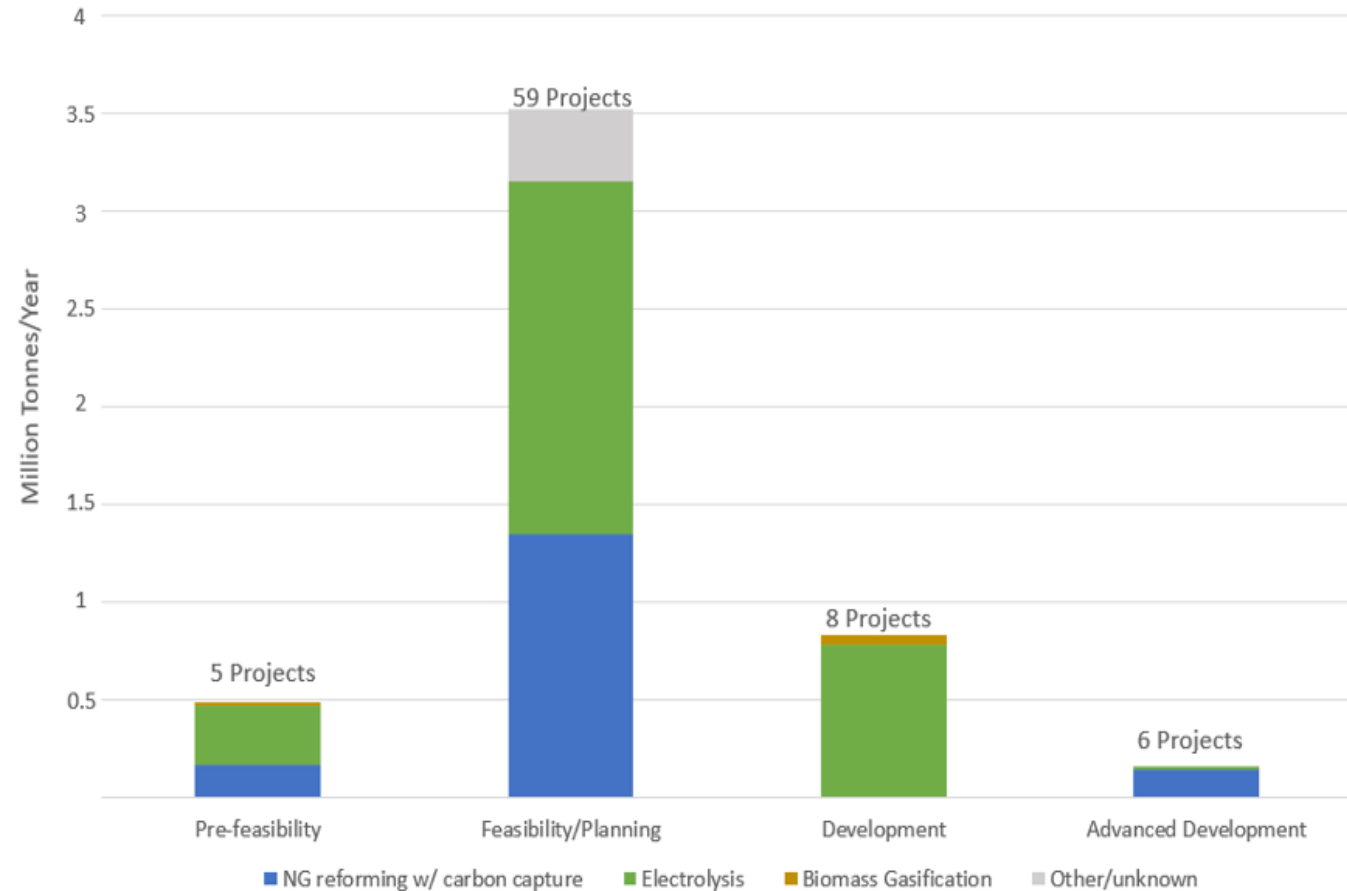
# All Provinces Can Offer FDI Opportunities



# Canadian Projects in 2024



- 12 low-carbon hydrogen production facilities in operation.
  - 5 electrolytic & 7 natural gas + CCS
  - The Air Liquide 20 MW electrolyser in Bécancour, QC, began operating in 2021
- 80 production projects have been announced since 2020.
  - 5 million tonnes of annual low carbon hydrogen production capacity
  - \$100+ billion in potential investment.



Source: Hydrogen Strategy for Canada Progress Report, National Resources Canada

# Canadian Government Support



## Regulatory measures

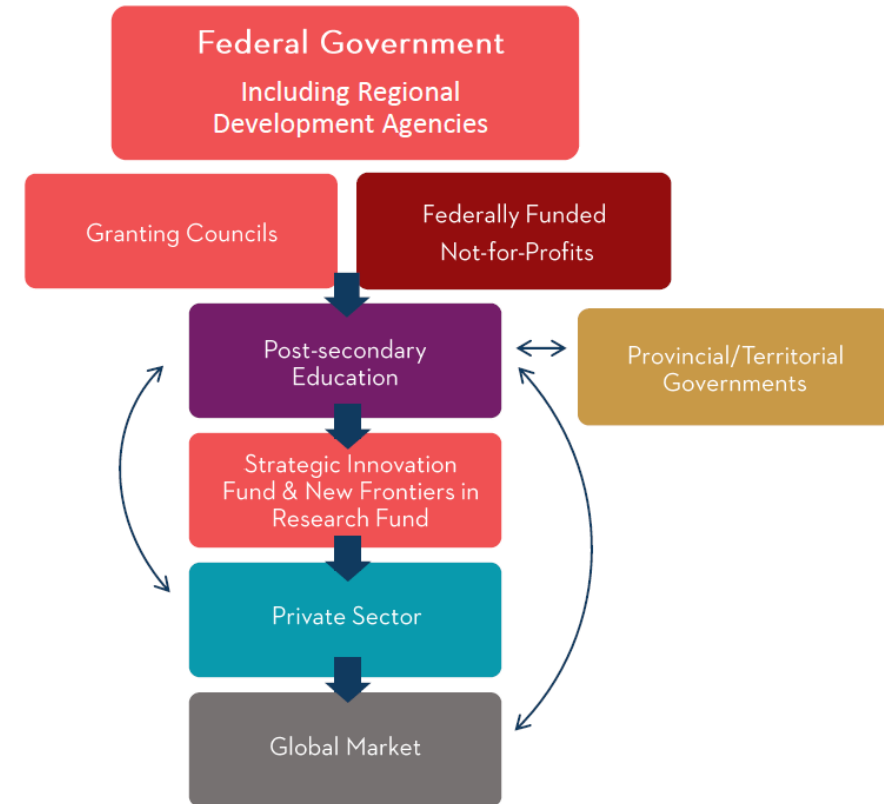
- Clean Fuel Regulations (CFR)
- Carbon Pollution Pricing
- Methane Regulation

## Funding programs

- Clean Fuels Fund (CFF), Strategic Innovation Fund – Net Zero-Accelerator (SIF-NZA), Canada Growth Fund (CGF), Canada Infrastructure Bank (CIB), Zero Emission Vehicle Infrastructure Program (ZEVIP)

## Investment Tax Credits

- Clean Hydrogen Investment Tax Credit (CH ITC)
- Clean Electricity Investment Tax Credit
- Clean Technology Investment Tax Credit
- Clean Technology Manufacturing Investment Tax Credit
- The Investment Tax Credit for Carbon Capture, Utilization and Storage (CCUS ITC)

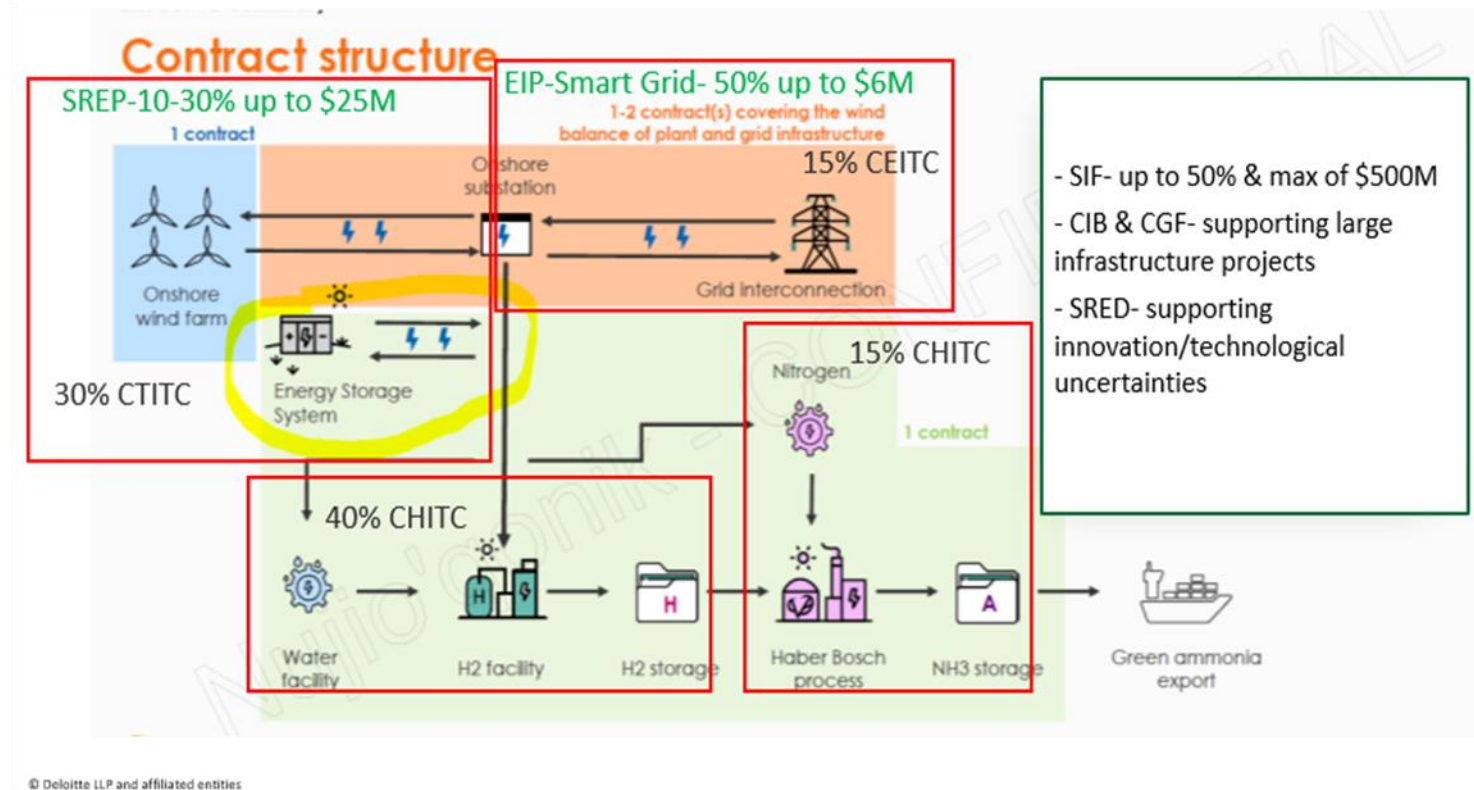
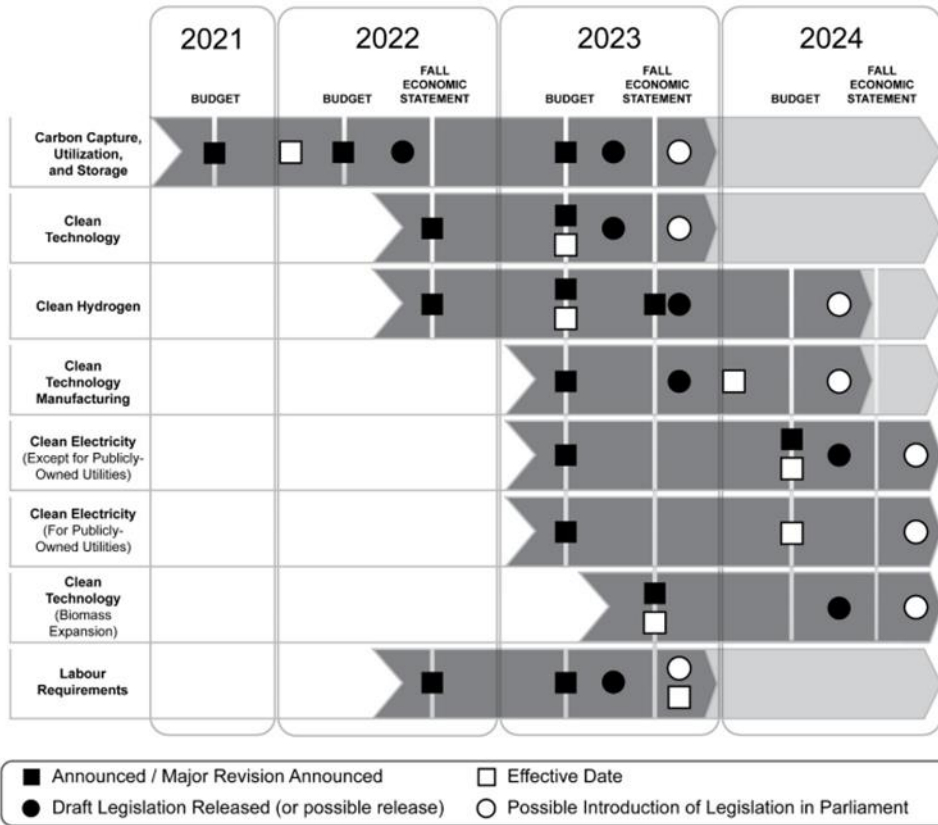


Source: Office of the Chief Economist, Global Affairs Canada

# Canadian Investment Tax Credits



Figure 3.3  
Delivery and Implementation Timeline for Investment Tax Credits



# Canadian Hydrogen Sector Profile 2024

Informing CHA's Priorities



Canadian  
Hydrogen Sector  
Profile 2024

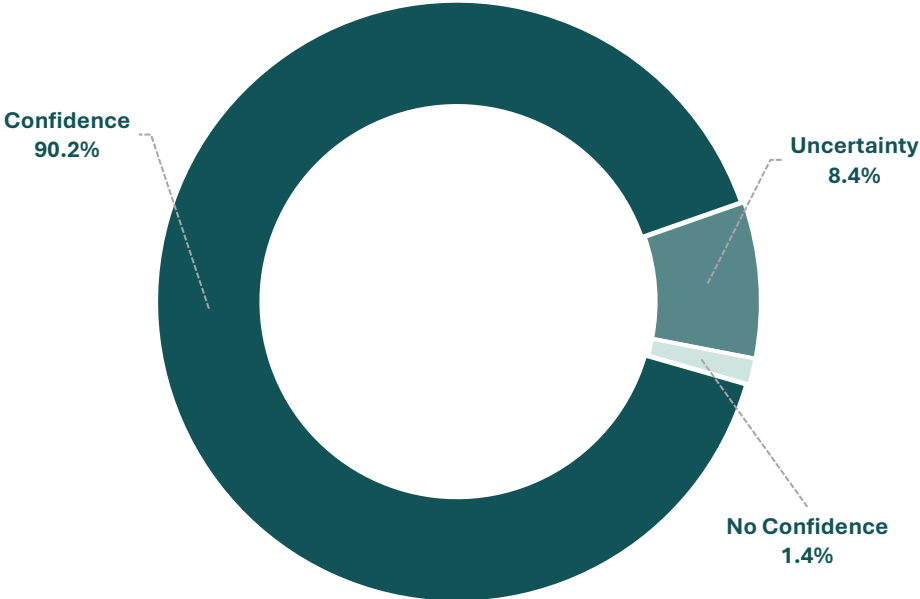
# Key to Canada's Net-Zero Ambitions



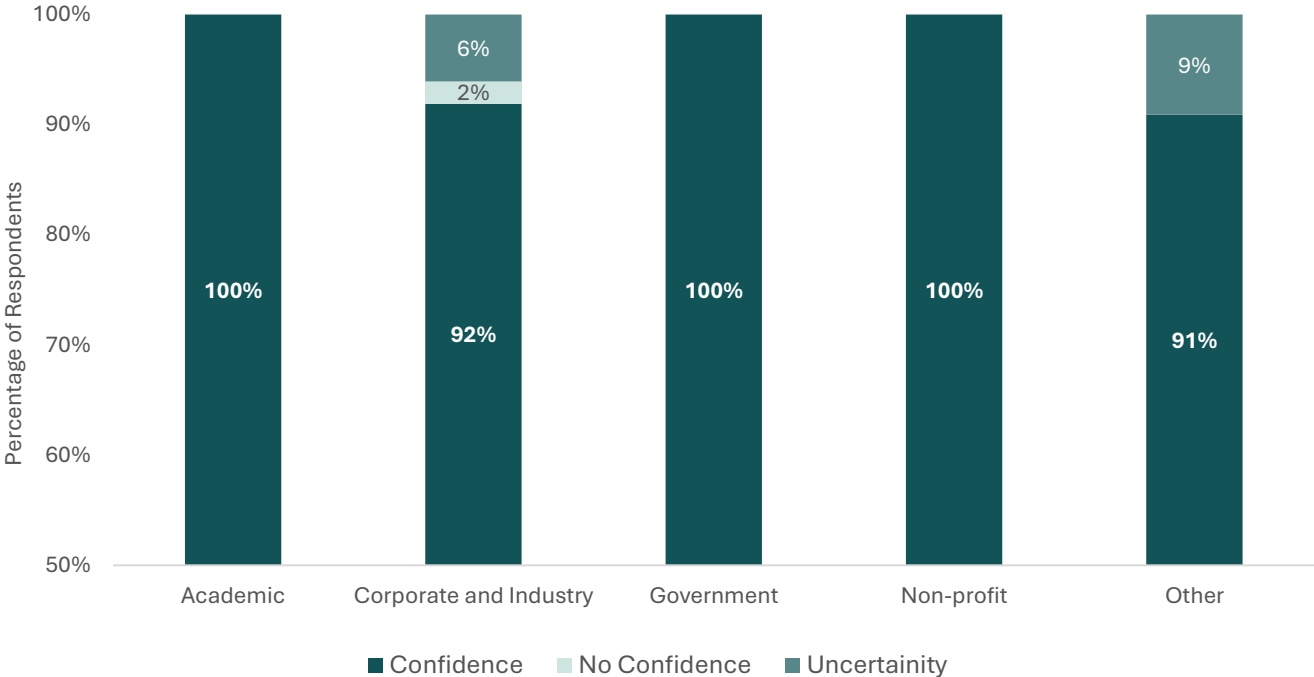
**90.2%**

of respondents reported that hydrogen has the potential to play a significant role in **Canada's** roadmap to a net-zero future.

Confidence Vs. Uncertainty in Hydrogen's Role for Net-Zero Future



Reported Confidence Level in Hydrogen for Canada's Net-Zero Ambitions by Respondent Group



Note: Not all respondents provided information for every question.



# Sector Outlook 2024 takeaways



Key insights	Details
Belief in Hydrogen's Role	90.2% of respondents see hydrogen as key to Canada's decarbonization.
Regional Concentration	Western Canada is a hub for production and jobs; inclusive national growth needed.
Barriers	High infrastructure costs; low public awareness on safety and benefits.
Opportunities	Incentives for investment; awareness campaigns to promote hydrogen.
Investment & Growth Potential	Infrastructure, policies, and funding critical for progress.
Policy & Workforce Development	Need for training programs, scholarships, and skilled labor development.
Call to Action	Leverage strengths, address barriers, and collaborate for global leadership.



# Examples of FDI Activities Between Sweden and Canada

# Cespira – A Volvo-Westport partnership



- Born from a joint venture between Volvo Group and Westport Fuel Systems
- Independent company committed to accelerating the development and global accessibility of HPDI fuel system technologies for long-haul truck and off-road applications.



391  
PATENTS



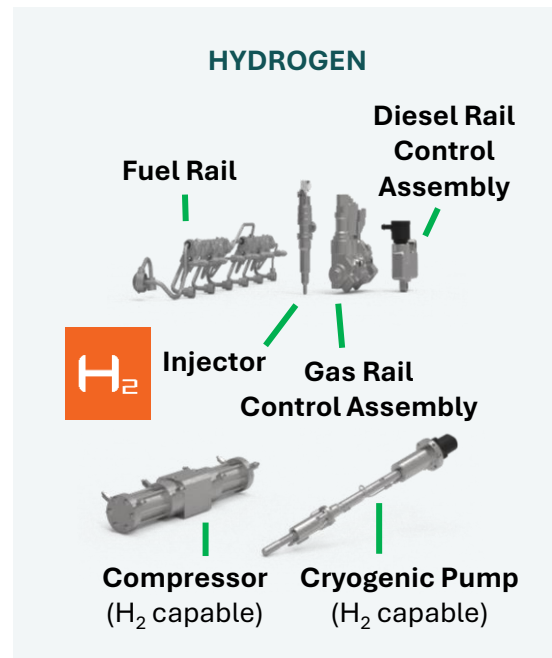
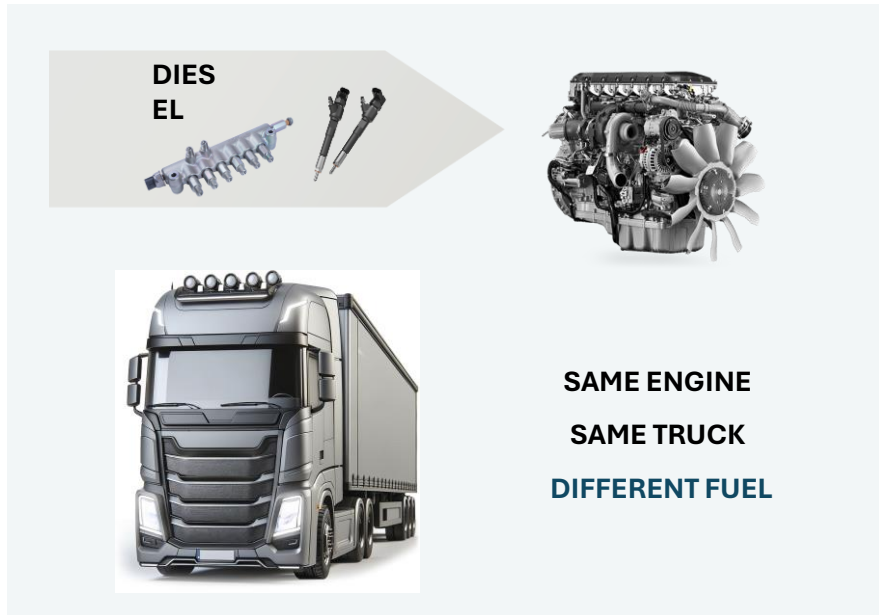
+6000 TRUCKS  
ON THE ROAD



~200  
EMPLOYEES



PRESENT ON  
3 CONTINENTS

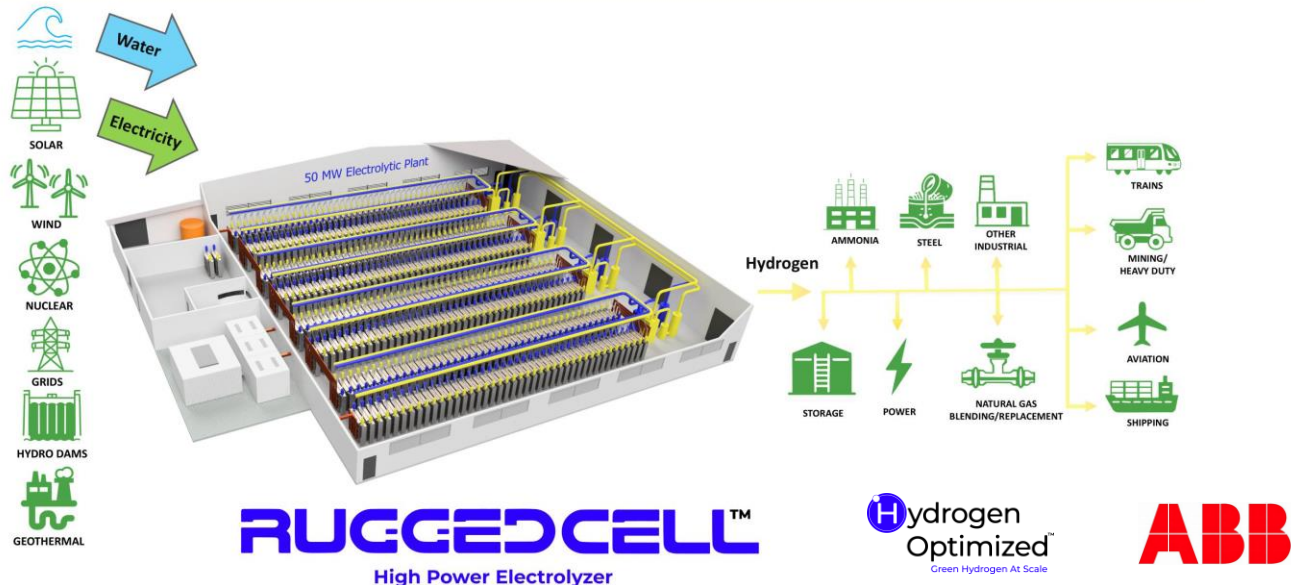


# Hydrogen Optimized – ABB partnership



In 2022, ABB concluded a strategic investment in Hydrogen Optimized holding company. The partnership encompasses:

1. Integration of ABB world leading rectifiers with RuggedCell™ electrolyzer systems
2. Incorporation ABB automation, digitization, and energy optimization products into the offering
3. Build-out of RuggedCell™ manufacturing with ABB automation robots



# cellcentric – A Daimler Truck and Volvo Group company



- cellcentric is a 50:50 joint venture between Daimler Truck AG & Volvo Group
- cellcentric develops and supplies fuel cell systems among others to Volvo (Sweden) for use in Volvo heavy-duty fuel cell trucks and for testing purposes as part of the joint venture
- The location in Burnaby (Canada) is cellcentric's advanced development hub with approx. 30 years of expertise & experience as well as a significant contributor to the H2 valley in the Burnaby area



Volvo Fuel Cell Truck during test drives around the Arctic Circle





# Upcoming Events in 2025

# Meet the CHA at these 2025 events



- Jan. 28-30 - PARIS - Hyvolution
- Feb. 19-21 - TOKYO - H2&FC EXPO
- Feb. 26-27 - SEATTLE - Green Hydrogen Summit West Coast
- March 31-April 4 - HANNOVER - Hannover Messe
- April 22-25 - EDMONTON - Canadian Hydrogen Convention
- May 20-22 - ROTTERDAM - World Hydrogen Summit
- June 3-5 - VANCOUVER - Hy-fcell Canada
- June 10-12 - CALGARY - Global Energy Show
- June 25-26 - HOUSTON - Hydrogen Technology Expo NA
- Oct. 21-23 - HAMBURG - Hydrogen Technology Expo Europe
- Oct. 29-31 - SEOUL - H2 MEET



# Thank you

Ivette Vera-Perez  
President and CEO  
iveraperez@canadah2.ca  
+1-416-889 9804



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