



Hydrogen In Motion

Innovative Hydrogen Storage Solutions Delivered To You!

Presentation To The Standing Committee On Natural Resources

Grace Quan, President & CEO | May 14, 2021

THINK GLOBAL, ACT LOCAL

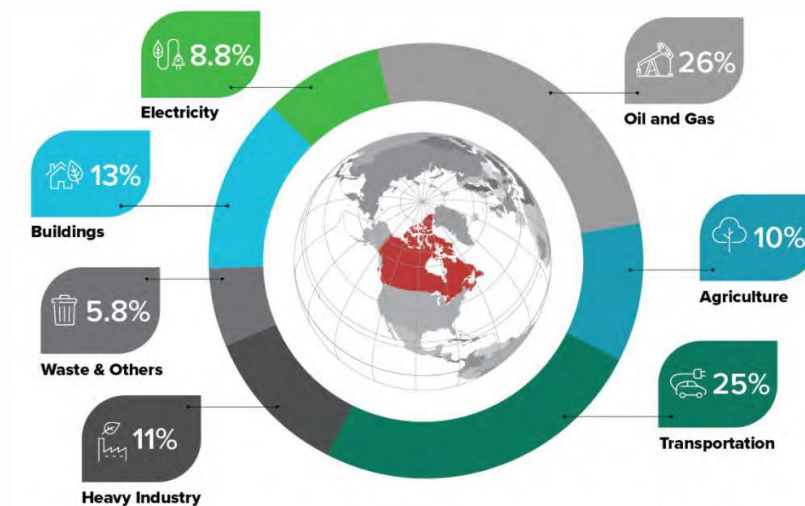
GLOBAL

- 1.5° Cap
- Paris Accord



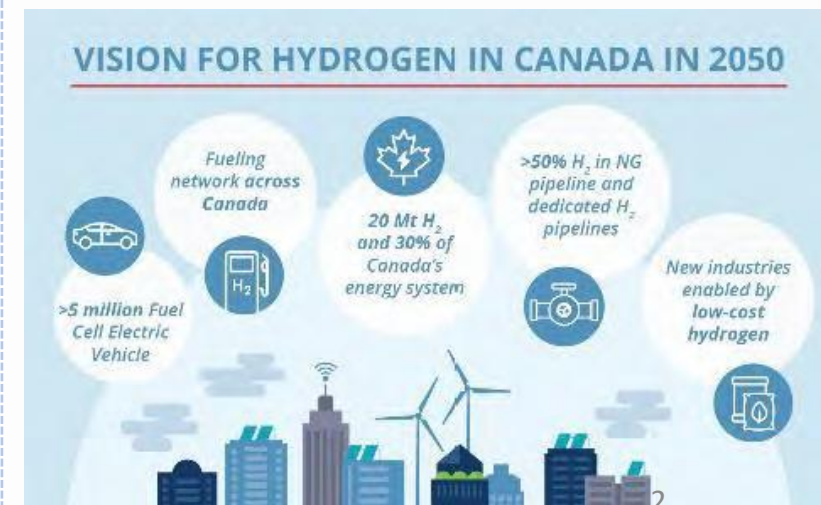
NATIONAL

- ↓ 40% CO₂ by 2030
- 293 Mt CO₂ Reduction
- Net Zero by 2050

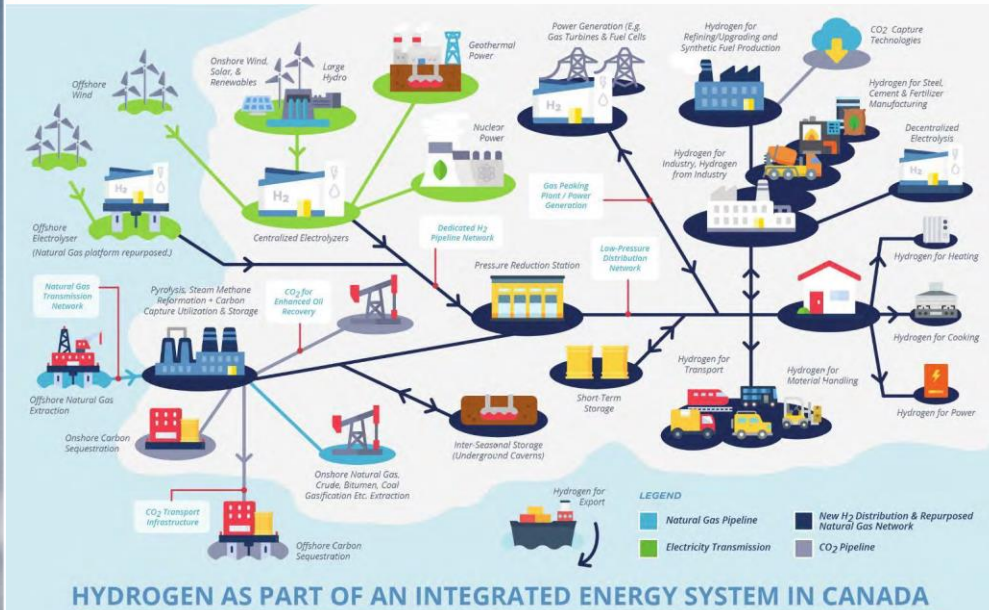


LOCAL

- Carbon Pricing
- ZEV & Clean Fuel Infrastructure
- Sectoral Approach



HYDROGEN ESSENTIAL TO MEET GHG GOALS



IMPACT

GHG

- Abating **190 MtCO₂e** of GHG by 2050 (30% of Canada's end-use energy)

Employment

- Hydrogen sector ~ **140,000 jobs 2030**, ~**350,00** by 2050
- Workforce Diversification: training in H₂ skills in various sectors including transportation, rail, marine, power

Global Leadership

- Canada can be **top 3** global clean hydrogen producers with domestic supply **>20 Mt/H₂/year**
- Canadian Companies lead in Hydrogen Innovation

Infrastructure

- Nationwide energy supply from regional H₂ production
- Multi-modal use case and refueling across Canada
- H₂ Innovation Hubs

Economic / GDP

- \$100 billion** hydrogen sector domestic and export revenue
- Team Canada hydrogen supply chain integration

Production: Canada wide Hydrogen production pathways utilizing different technologies in different regions

1. Electrolysis via renewables or nuclear
2. Biomass technologies
3. SMR with Carbon Capture and Sequestration
4. Other emerging technologies

H2 OPPORTUNITY: H2M MULTIMODAL NETWORK

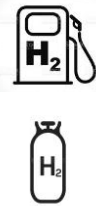
PROPOSAL: A PAN-CANADIAN SINGLE USE CASE WITH REGIONAL GENERATION IN RAIL/TRUCK MULTI-MODAL H2 NETWORK.



H2 PRODUCTION



NODES



RAILWAY & TRUCK

1% diesel displacement saves annually
4,5 Millions Gallons Diesel
46 000 tCO₂

Initial Average Node Size **300 tH₂/yr**
Total Annual Hydrogen **4,000 tH₂/yr**

Region	BC	Prairies	Ontario	Quebec	Maritimes
Node	Prince George Vancouver	Calgary Edmonton Saskatoon Regina Winnipeg	Toronto Sudbury	Montreal Quebec	Moncton Halifax

Pan Canadian hydrogen production and distribution infrastructure ~\$500M

- Railways as anchor customer
- 13 Low-pressure H2 refueling nodes with regional H2 generation
- Integrating H2 supply chain using innovative Canadian storage, generation, and fuel cell technologies
- Multimodal capability: rail, heavy duty & light duty road mobility and distributed power to remote communities
- Integrating various H2 generation opportunities specific to each region across Canada



GOV TOOLS TO FAST TRACK IMPLEMENTATION

IMPLEMENTATION BODY

- Crown corporation champion: Channel direct funding
- Hydrogen hubs for innovation, demos and implementation
- Facilitate H2 skills with post-secondary internships with companies

FISCAL TOOLS

Direct Funding

- Grants & Contributions, => R&D commercialization
- Targeted funds => H2 Hubs and demonstrations
- Exemptions to grants and contributions, and loans, stacking limits

Indirect Funding

- Carbon taxes
- Marketplace for carbon offsets
- Low Carbon Fuel Standard

REGULATIONS

- Reduce Rail, Marine, Transport Regulatory barriers
- H2 regulatory review including low-pressure storage, transport and refueling regulations



Innovative Hydrogen Storage Solutions Delivered To You!

Corporate Profile:

- Canadian SME founded 2014 in Vancouver, BC
- Product: Low-pressure solid-state hydrogen storage (smaller, safer, & cheaper)
- Developed & patented groundbreaking nanomaterial that stores hydrogen under low pressure (50 bar) at same weight and higher density of a high pressure (700 bar) H₂ tank
- Currently upscaling production for commercialization of innovation
- Grace Quan, co-founder & CEO, grace.quan@hydrogeninmotion.com, 778-888-9590