NORTHERN BC
HYDROGEN HUB

Hydrogen Sector Profile

Northern BC Hydrogen HUB

Northern BC is home to several leaders in low carbon initiatives that thrive in the business-friendly environment and growing economy.

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Overview

Economic hub for 70% of BC's land mass

- Highway and rail access from Pacific Coast to North America;
- Availability of industrial land and abundant natural resources;
- Access to renewable, reliable, low-cost power;
- Low time-cost permitting supports development;
- Skilled industrial workforce.

R&D, Workforce, and Education

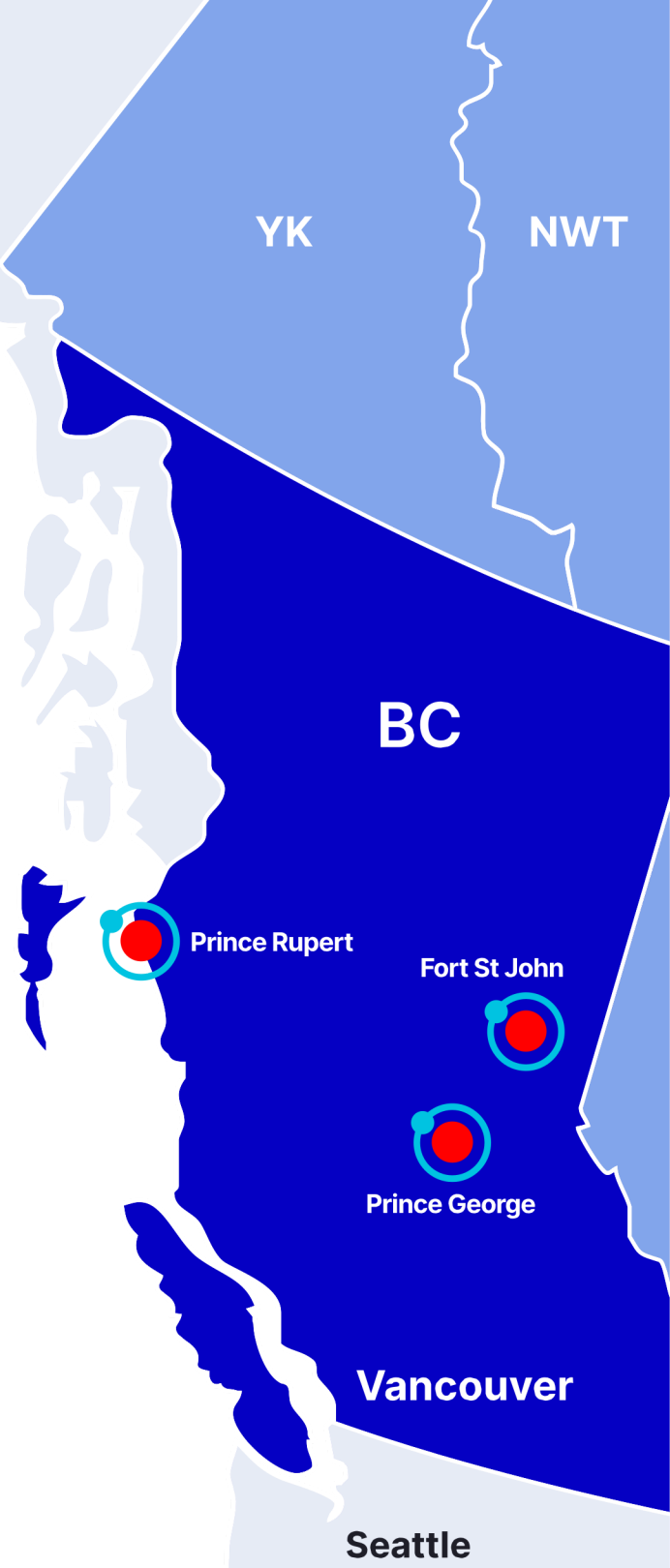
- University campuses allow for regional research;
- Professional, scientific, and technical services sector growth is supported by the University of Northern British Columbia;
- Regional colleges provide world-class Red Seal trades training, including automotive service technician skills for zero-emission vehicles.

Logistics

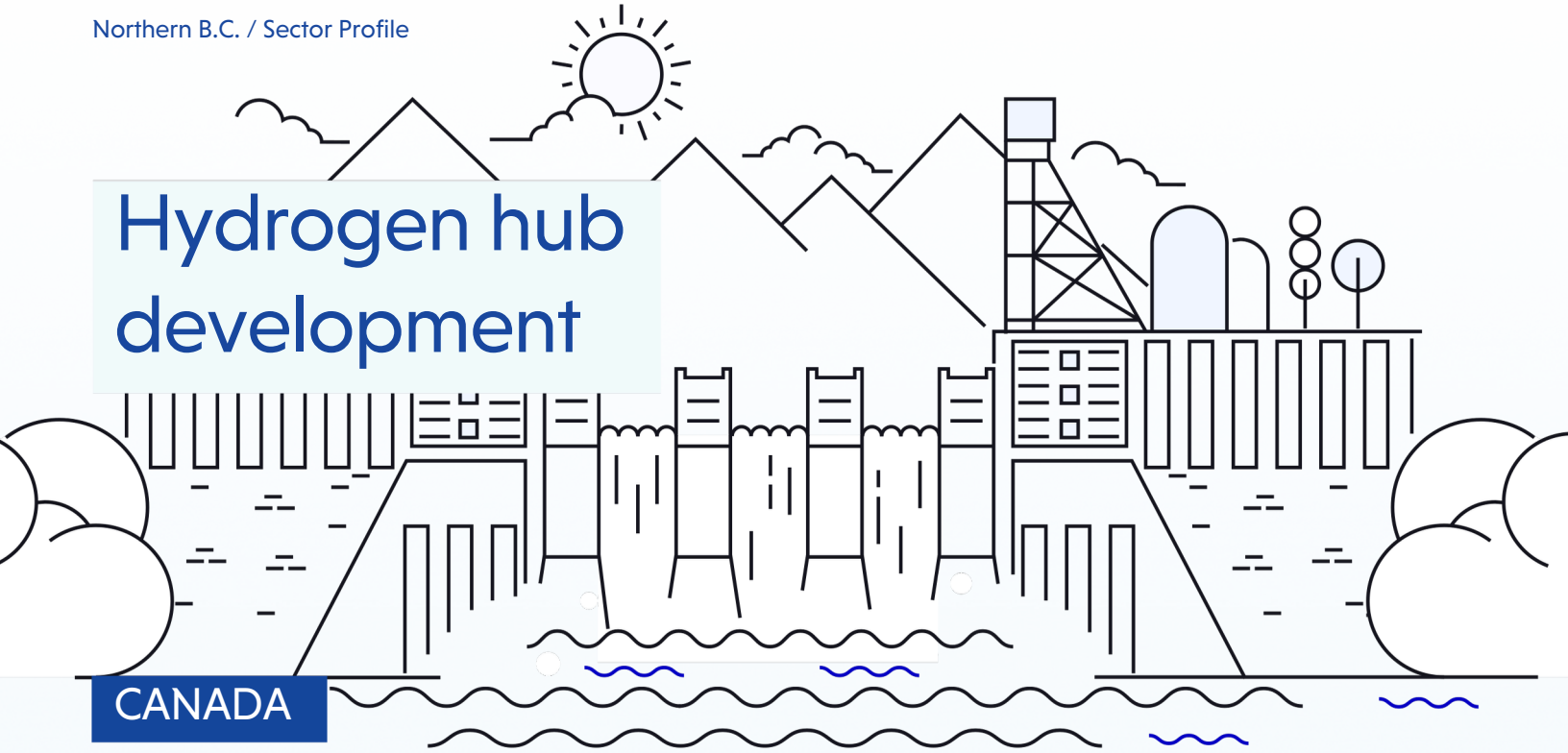
- Exports via the Port of Prince Rupert to overseas markets; CN Rail's intermodal facility in Prince George is connected to a robust rail network across North America;
- Major highway transportation routes along 16 & 97 allows for greater regional market access & distribution.

Emerging Hydrogen Cluster

- Tidewater Renewables produces renewable hydrogen as a feedstock for their renewable diesel facility;
- HTec's H2 Gateway program aims to drive the adoption of hydrogen as a transportation fuel, and plans to install three clean hydrogen production facilities located in Burnaby, Nanaimo, and Prince George;
- First Truck Centre provides local installation of hydrogen-diesel co-combustion engine retrofits;
- CO2 Lock has successfully injected CO2 at the SAM site 50km southwest of Prince George which highlights the immense potential of our Hard-Rock process — and its expected role in mitigating carbon emissions.



Hydrogen hub development

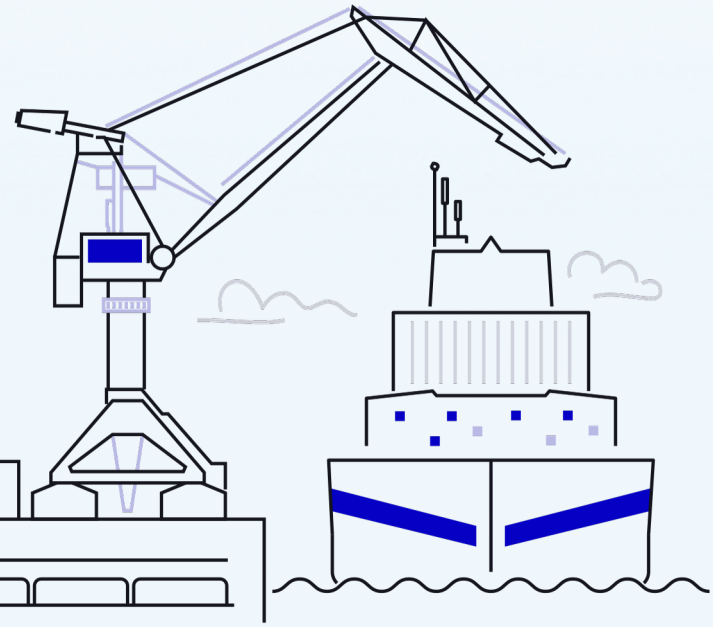


CANADA

Development of an at-scale, clean hydrogen economy is a strategic priority for Canada, needed to diversify our future energy mix, generate economic benefits, and achieve net-zero emissions by 2050.

"Hydrogen's moment has come. The economic and environmental opportunities for our workers and communities are real. There is global momentum, and Canada is harnessing it."
- Seamus O'Regan - Minister of Natural Resources - Announcing the Canadian Hydrogen Strategy 2020.

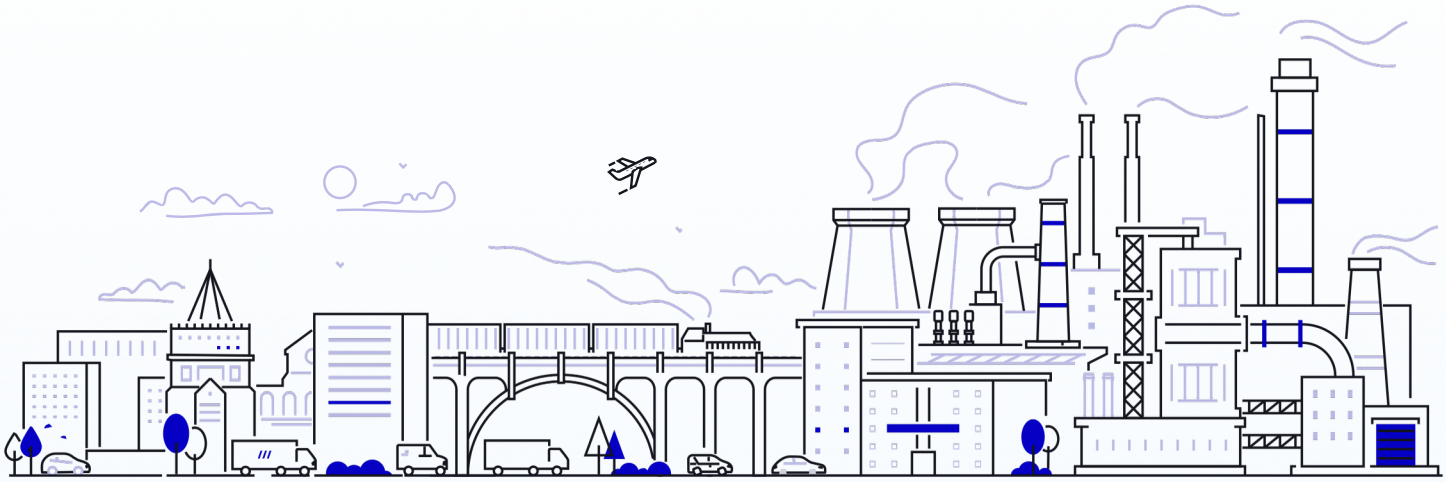
- Committed to reducing GHGs by 30% by 2030, and achieving net-zero by 2050.
- Up to 30% of Canada's energy to be delivered in the form of Hydrogen by 2050.
- Hydrogen in Canada has projected market revenues of over $50 billion by 2050.
- Only G7 member with free market access to all G7.
- 15 Free Trade Agreements covering 51 countries and 2/3 of the global economy.



BRITISH COLUMBIA

British Columbia was an early supporter of fuel-cell innovation, and today is home to the largest hydrogen and fuel cell sector in Canada, with 51% of companies located here. BC has already established many hydrogen-associated organizations, policies, and incentives, such as the Centre of Innovation and Clean Energy, CleanBC, the Low Carbon Fuel Standard, and the Clean Industry and Innovation Rate.

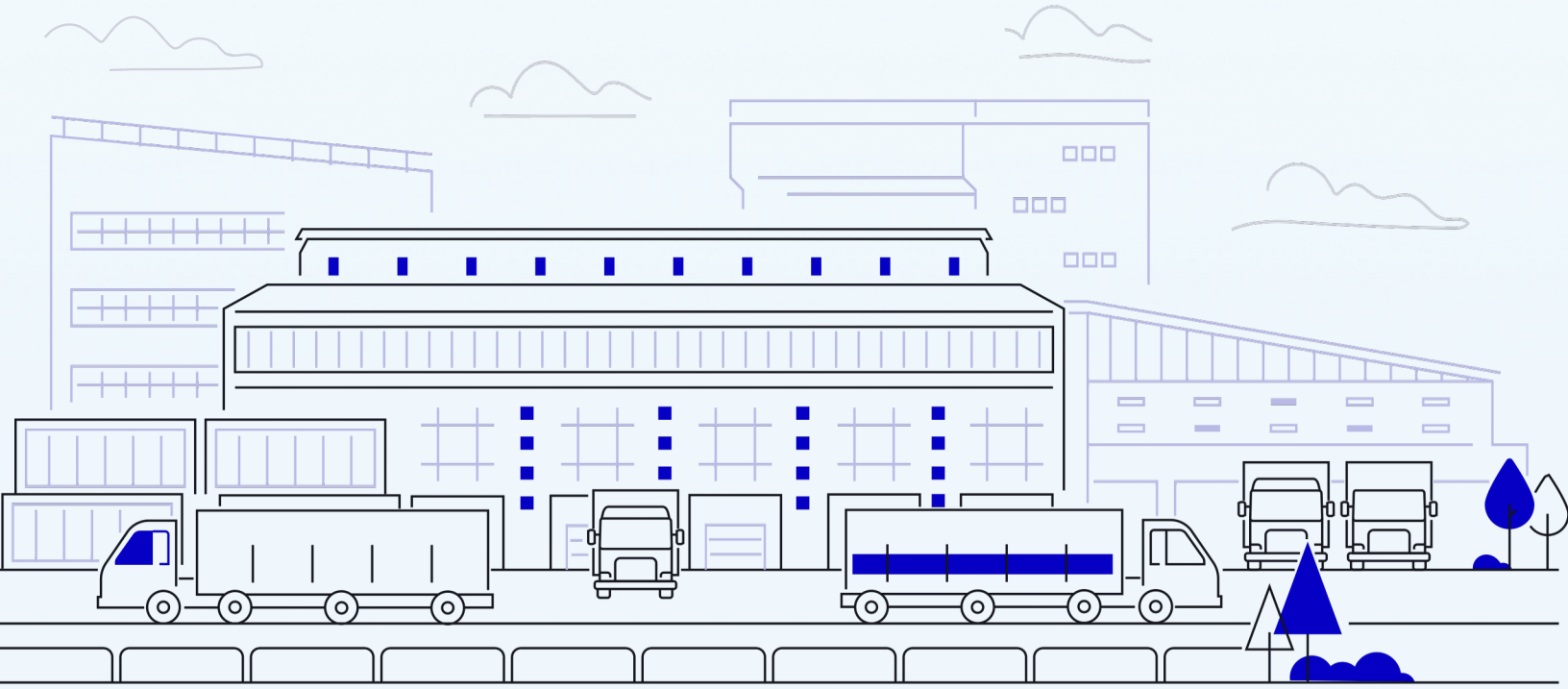
- Hydroelectricity, wind, and biomass account for 95% of the province's electricity production.
- Abundant supply of freshwater resources, biomass, carbon storage geology, pipelines, and fossil fuel reserves.
- Deep-water harbours present accessible locations for production and supply of large quantities of hydrogen to export markets.
- Coastal access and proximity to leading markets, including California, Japan, China, and South Korea, with a projected market of $87 billion by 2030 and $305 billion by 2050.



Northern BC

To foster the co-location of hydrogen supply and demand, the Province of British Columbia selected Prince George to anchor the development of a Northern BC Hydrogen Hub. With an abundance of land for development and access to renewable resources, utilities, and logistical advantages, Prince George can leverage its assets to advance and expand its existing low-carbon fuels sector.

- Home to an established and growing market of hydrogen and low-carbon fuels.
- Seasoned chemical and industrial manufacturers.
- Proximity to saline and Brucite aquifers for CCUS.
- Demonstrated excellence in low-carbon tech.
- The Port of Prince Rupert handles millions of tonnes of Cargo a year and is establishing an international green shipping corridor from Canada's west coast to Asia and the Middle East.



Invest in Prince George

CITY OF PRINCE GEORGE

Prince George is a leader in low-carbon initiatives, playing its role in reducing GHGs from various sectors including transportation and manufacturing. Hydrogen can be produced locally with existing chemical manufacturing processes and via electrolysis. Prince George's central location provides convenient access to a majority of the province's land mass, reducing local transportation and distribution costs. Additionally, Prince George can reliably export through the Port of Prince Rupert via a direct rail line and a major highway.

Prince George's competitive advantages and investment opportunities in low-carbon projects are evident through the availability of industrial land equipped with clean power and water resources. The region boasts a favourable cost of doing business, along with access to provincial and federal government offices, supports, and incentives.

Local organizations are primed to assist investors and new businesses with lending, funding, and other supports.

82 Rail hours from Chicago

17 Rail hours from Prince Rupert

12-40 Hours closer to Asia than other west coast ports

12-26 Truck hours access to North American markets

Connected to domestic & international markets

Crossroads of 2 major highways (16 & 97)

Training & Education

Red Seal automotive service technicians for Zero-Emission Vehicles

Power

Low-cost, clean, reliable 500kV transmission line

Robust Workforce

Diverse & skilled labor from award-winning local institutions

Government Support

Supportive leadership and a fast, clear permitting processes

Business Opportunity

Expansion of alternative fuels, refuelling stations, and fuel supply

Resources

Abundant natural resources & feedstock

Land

1000s of acres of land for development

Low Cost of Business

Stable business property tax rates

Watson Island's H_2 Advantage

The Watson Island Industrial Park is a strategically located brownfield redevelopment site on the North Coast of British Columbia, Canada, serviced by rail, road and marine access. As industry moves north due to congestion in the lower mainland, this site represents a unique opportunity for potential hydrogen development.

Watson Island is situated adjacent to the fastest growing port in North America, and the 3rd largest port in Canada, with deep water shipping lane access. The site is also home to a private hydro substation, and the City has Agreements in Principle with BC Hydro to meet future industrial need.

The City of Prince Rupert also works closely with the Province of British Columbia's regulatory and business arms and has a Certificate of Compliance and Agreement in Principle on site for the existing propane terminal operator. Additionally, the City works to maintain good working relationships with local First Nations.

3m3/ sec

Through Rate Water Supply

1 Executed Approval In Principle With Ministry Of Environment

2.5 Days

Closer To Asian Pacific Markets

75

Acres Of Land For Development

Local Demand

Potential industry interest in hydrogen fuelled vehicle fleets

Rail Access

CN mainline bisects the site with opportunities for spurs

Available Power

Private Hydro substation on site to meet potential demand

Shipping Access

Deep water access to shipping lanes

City of Terrace, British Columbia, Canada

Terrace boasts over 1200 acres of continuous greenfield industrial zoned land. The parcel is named the Skeena Industrial Development Park (SIDP) which is a joint venture and revenue sharing partnership with the Kitselas First Nation. Over ¾ cleared and levelled with main road lighting and utility conduit installed, SIDP is perfect for any large or small operation.

A joint venture between the City of Terrace and the Kitselas First Nation, a partnership designed to support certainty for investment at the park, to attract a variety of businesses, to foster development of the regional economy and to provide a return on investment for both communities. The City of Terrace has the principal responsibility for management of the Joint Venture and the SIDP and takes a lead role as proponent liaison.
A management committee is the mechanism by which the partners consult, share information and address any issues that may arise. The joint venture is responsible for a variety of activities that facilitate the development of the industrial park, including a role in reports, studies, infrastructure and utility construction, marketing and related activities. The joint venture financially contributes to these activities and the City of Terrace.

Servicing

Water: Water available but not connected. Rate suitable for Hydrogen production. There are wells that have been dug. Available at 134.5 meters per second.

Hydro: BC Hydro available. 500 kv transmission along the southeast of the parcel. 2,500 volt – 3 phase distribution available from the southwest of the parcel. Approximately 3km to Skeena Substation.

Natural Gas: Pacific Northern Gas main line borders park property 10 inch pipe along the south east edge of the lot.

On-site storm drainage: Gravels provide excellent capacity for groundwater recharge.

Skeena Industrial Development Park (SIDP) Terrace, BC

CN Intermodal: Prince George Distribution Centre

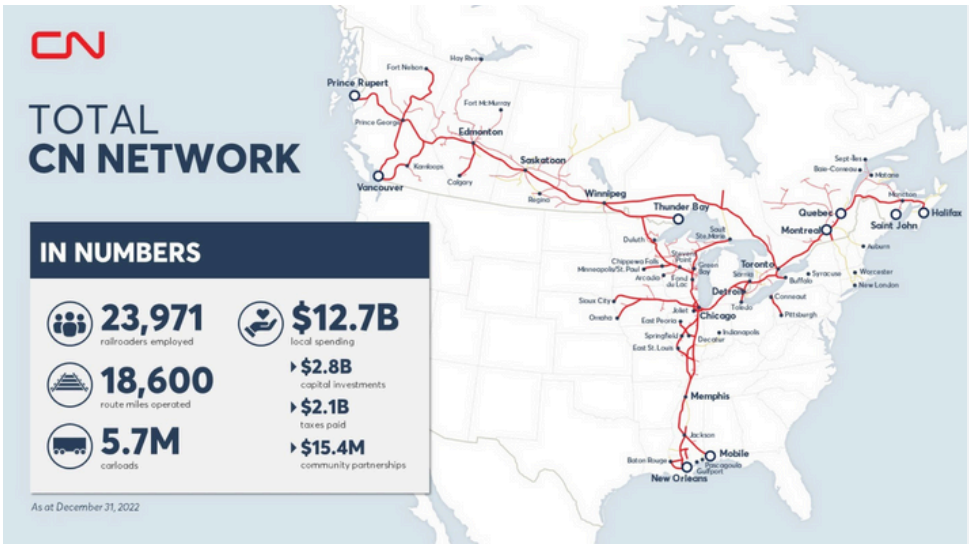
Geographic Facts:

Prince George is located in an area of significant forest production including lumber, wood pulp, newsprint and container board. This makes it a strategic location for supply of containerized products for export to Asia via the Port of Prince Rupert.

The distribution centre is co-located inside the CN Intermodal yard, allowing for in-park movement of containers and significantly reducing drayage and handling costs for customers. Shipping via Port of Prince Rupert cuts up to 58 hours off the traditional sailing time between the west coast and Asia.

Key Services:

- Product transfer / Crossdocking;
- Container loading / Unloading;
- Inventory management;
- Outside and covered storage;
- Trucking and delivery services;
- Products handled: lumber, panel, pulp;
- Consumer goods;
- Type of railcars handled: Centerbeams;
- Flatcars, boxcars.



Prince George Facility

Railcar spots: 40

Trackmobile is available on site.

Storage:

- 84,000 square feet warehouse
- 15 acres outside storage

Security: Fenced

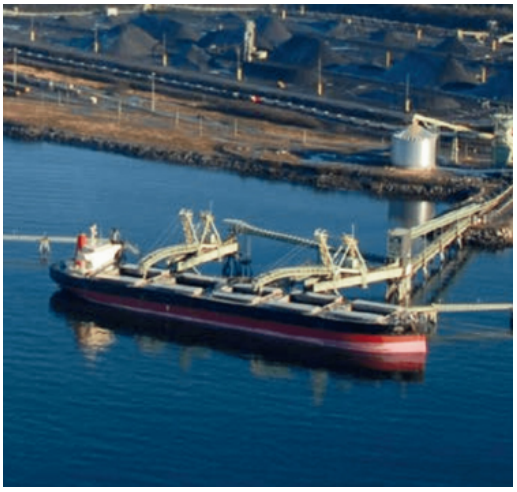
Shortest and Most Cost-Effective Route to North America

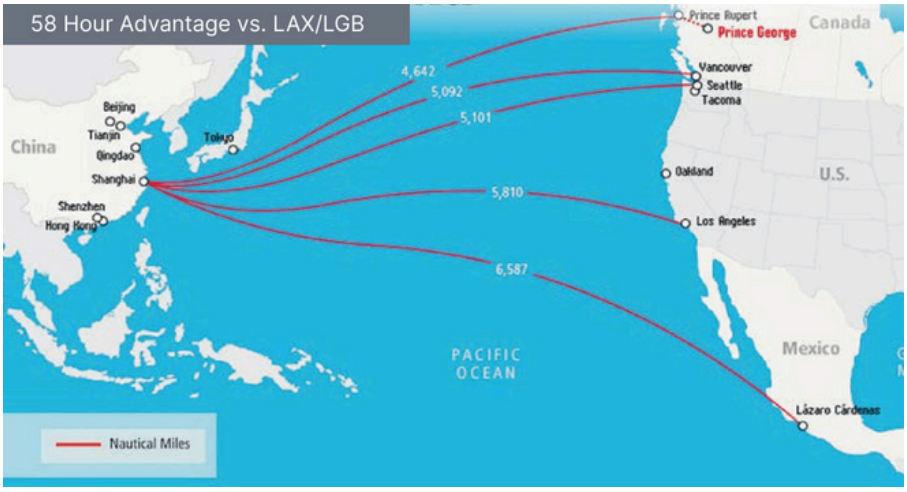
Port of Prince Rupert Advantages:

- Closest North American Port to Asia: One to two days closer to Asia than any other West Coast port.
- Direct connection to CN's North American network: Flattest rail grade through the Rocky Mountains.
- Deepest natural harbour in North America: Channel depth of 35m, terminal berth depths of 17m, ice-free year round.
- Safe and simple ocean access: 2 hours transit through piloted waters.

Port of Prince Rupert Terminals:

- Fairview Container Terminal: One of North America's fastest growing intermodal terminals;
- Delivers fast, reliable service connecting Asian markets with Central Canada and US Midwest. (Capacity: 1.6 million TEUs);
- Ridley Coal Terminal: World leader in the handling of bulk metallurgical coal, thermal coal and petroleum coke. (Capacity: 1.2 million tonnes);
- Prince Rupert Grain Terminal: Most efficient terminal on Canada's west coast. Handles bulk grains like wheat, canola, and barley. (Capacity: 7 million tonnes);
- Westview Wood Pellet Terminal: First purpose-built bulk wood pellet export facility in North America. (Capacity: 1.3 million tonnes).





Prince George Airport Authority

Cargo/Logistics

Objective: Develop Prince George as an air logistics gateway to North America, a main competitor to Anchorage for Pacific refuelling business, and a maintenance base (MRO) for aircraft overhaul checks and modifications.

A) Develop an air logistics hub by investing in on-airport and off-airport lands that connect road, rail, and air between Asia and North American.
B) Develop a logistics network connecting road, rail, ocean and air that optimizes time and cost to market.

Competitive Advantages

- State of the art 600,000L Jet A1 common fuel storage facility;
- Strategically located on the 'Great Circle' routes between Asia and the United States;
- 24/7 operations, no operational restrictions;
- Only hours to any North American
- destination via air.

Technical Data

- 3,490 metres (11,450 ft.) runway;
- CAT 1 ILS with high intensity lights
- CAT 2 centreline LED lighting;
- 25,000 sq.ft. cargo warehouse.

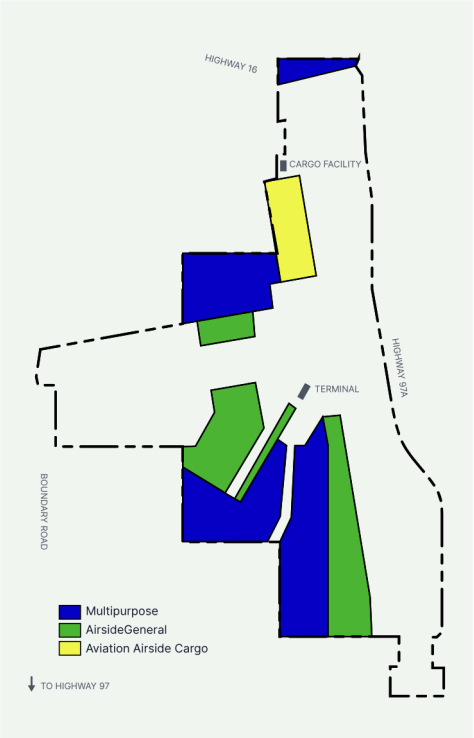
Land Development Opportunities

The Prince George Airport (YXS) is adjacent to the 860 ha (2,125 acres) Global Logistics Park. Direct access from the park lands to the airport can be negotiated.

On Airport Development

- 283 ha (700 acres) of available land;
- Airport and non-airport related development opportunities include cargo logistics development;
- Low airport land lease rates;
- Hangars, flight school operations, aerospace, and multi-purpose land.

Land Available for Lease at the Prince George International Airport



- Long term lease capabilities;
- Proximity to two major highways (north/south and east/west) and a dangerous goods route;
- Under 10 km to transcontinental rail line.

Sector Successes

HTEC's H2 Gateway program is focused on simultaneously developing demand and supply for hydrogen as a transportation fuel through a regional, ecosystem-based approach. HTEC's network of stations will be supplied by three new clean hydrogen production facilities located in Burnaby, Nanaimo and Prince George.

Through an Integrated Marketplace project led by Innovate BC, four zero and low-emission heavy-duty (HDZEV) trucks (two hydrogen powered, one battery electric and one hydrogen-diesel co-combustion) have been added to operations at the Port of Prince Rupert to help reduce greenhouse gas emissions and support sustainability in the province's transportation sector. These operations will provide data to better understand the range, reliability and potential best use case for the vehicles.

The City of Prince Rupert's wholly owned development arm, Prince Rupert Legacy Inc has signed a lease option agreement for 79 acres on Watson Island with renewable energy development company, Hy2gen Canada Inc. (Hy2gen). The project proposes a green energy export project on the existing brownfield site.

Hydrogen Fuel Enhancement Units have been purchased from Empire Hydrogen to be attached to diesel engines at airports in Smithers and Prince George. These units provide more effective fuel combustion results through lower fuel consumption, reduced harmful exhaust emissions, fewer diesel particulates, and more power and torque.

Source3 Energy X Inc. (Source 3X) and the Skeena Industrial Park (SIDP) located in Terrace, BC signed an MOU to collaborate on the development of the Skeena Clean Hydrogen Hub project. Once this project is fully developed it will be able to produce up to 50,000 tonnes per annum of carbon free hydrogen or its downstream products such as clean ammonia, e-fuels or sustainable aviation fuels annually.

Tidewater Renewables, a subsidiary of Tidewater Midstream, is focused on near- term production of Renewable Diesel, Renewable Natural Gas, and Hydrogen. The Renewable Diesel Refinery co-located at the Prince George Refinery utilizes renewable feedstocks to produce Renewable Diesel. The project includes an over-built renewable hydrogen plant as part of refinery operations.

Arbios Biotech is a commercial-scale facility that uses hydrothermal liquefaction technology to produce renewable bio-oil. To recognize the ongoing partnership with the Lheidli T'enneh First Nation, whose unceded and traditional territory the facility is sited, Arbios asked Lheidli T'enneh Elders to name the plant. The Arbios Biotech facility was named Chuntoh Ghuna meaning "the forest lives".

Funding and Supports

CANADA

Canada is making significant investments to preserve its advantages and accelerate its transition to net-zero, with increased spending and expanded eligibilities beginning as recently as March 28, 2023 until 2034.

Investment Tax Credits (ITCs)

- Clean Hydrogen (including Methane & Pyrolysis)
  - Credit rate between 15%-40%
- Clean Technology
  - 30% credit based on labour requirements
- Clean Technology Manufacturing
  - 30% refundable property
- Scientific Research & Experimental Development
  - 35% expenditures up to $3M
  - 15% amount over limit
- Carbon Capture, Utilization & Storage
  - 37.5% - 60% before 2030
  - 18.75% - 30% before 2040

Competitive Advantages

- Canadian Hydrogen Association
- Canada Innovation Corporation
- Export Development Canada
- PacifiCan
- Invest in Canada
- Canada Infrastructure Bank
- National Research Council
- Natural Resources Canada
- First Nations Bank of Canada
- Clean Fuel Regulations
  - Emission Reduction
  - Economic Growth

Incentives & Programs

- Accelerated Capital Cost Allowance
- Net Zero Accelerator
- Zero Emission Vehicle Infrastructure
- Low Carbon Economy Leadership Fund
- Green Shipping Corridor Program
- National Trade Corridor Fund
- Green Freight Program
- Energy Innovation Program
- Clean Fuels Fund
  - Indigenous led, building new domestic production capacity
    - funding to $50M up to a max 50% project cost
  - Building new domestic production capacity
    - $50M up to 30% project cost
  - Developing enabling codes & standards to support clean fuel tech

BRITISH COLUMBIA

By providing funding and support to scale-up new ideas, BC is building a stronger, cleaner economy. Collaboration with partners, industry, and governments will help us achieve our low-carbon economic goals.

Incentives & Programs

- Low Carbon Fuel Standard
- InBC Investment Fund
- Trade and Invest BC
- BC Indigenous Clean Energy Initiative
- Energy Innovation Program
- CleanBC
  - Go Electric
  - Better Homes
  - Better Buildings

Supporting Organizations

- Clean Energy & Major Projects Office
- Innovate BC
- BC Centre for Innovation & Clean Energy
- Hydrogen BC
- Geoscience BC
- Clean Energy BC
- Pacific Institute for Climate Solutions
- BC Research Inc.
- Institute for Integrated Energy Systems

Northern BC

Supports

- Permit times and costs are amongst the lowest in the Province
- Northern Development provides funding for businesses to innovate and optimize operations
- Northern Innovation Network supports companies launch, scale, and grow by implementing new tech
- Community Futures provides loans and coaching
- Northern Analytical Laboratory Service provides cutting-edge research services for industry
- CNC offers ZEV skills training for auto techs

Low-Carbon Fuel Sector

Low-carbon technologies encompass a range of innovative solutions that aim to reduce greenhouse gas emissions (GHGs) while promoting sustainability, energy security, and economic growth. By reducing our dependence on fossil fuels, these technologies encourage the development of renewable energy sources, many of which can be produced from feedstocks within our own economic boundaries and then traded domestically or exported internationally.

Low-Carbon Fuel Sector

Hydrogen

Hydrogen will contribute to lowering GHGs and act as a versatile energy carrier to offset many carbon intensive (CI) applications that are heavily reliant on fossil fuels, such as long-range transportation and heating. When used in fuel cells, the only byproduct produced is water vapour, resulting in zero emissions at point-of-use. Other applications include the distribution of combined-heat-and-power; systems for storing and enabling renewable energy; and fuel for forklifts, drayage trucks, and tractors.

Renewable Diesel

Renewable diesel is a hydrocarbon most often produced via hydrotreating and gasification. It provides a drop-in replacement for conventional diesel, allowing for a seamless fuel transition without significant changes. Prince George is home to a $342M renewable diesel plant, Tidewater Renewables, which has a capacity of 3 million barrels per day (45.99 MMgy). The facility also features an integrated renewable hydrogen plant for refinery opera- tions.

Advanced Biofuels

Similar to renewable diesel, advanced biofuels offer significant GHG reductions, utilize waste materials and non-food crops, and are compatible with existing fuel infrastructure, vehicles, and aircraft. These biofuels employ advanced conversion technologies to transform lignocellulosic biomass into transportation fuels. Arbios Biotech, a joint venture between Canfor and Australia's Licella, is currently permitting their facility in Prince George, where there is an abundance of wood-fibre supply from the surrounding area and biomass from sawmill residues.

Carbon Capture, Usage & Storage

A carbon management industry can play a critical role in meeting both BC's climate action and economic development objectives. Geological formations were studied by Geoscience BC in BC's portion of the Western Canada Sedimentary Basin in BC's Northeast Region. The research identified that 4,230 Mt of carbon dioxide could potentially be stored.

CO2 Lock successfully completed a suite of testing focused on storing carbon dioxide in BRSP rock through CO2 mineralization after injecting it in a deposit at their SAM project near Prince George.

NORTHERN BC HYDROGEN HUB

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