

INVEST
VANCOUVER

Clean Transportation:

Findings and actions to strengthen the sector in the Metro Vancouver region

Report Summary

November 2021

Damon Motors



Overview



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Methodology

2

Clean Transportation in
Metro Vancouver

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Findings & Recommendations

Invest Vancouver helps position the region for success in a rapidly evolving global economy





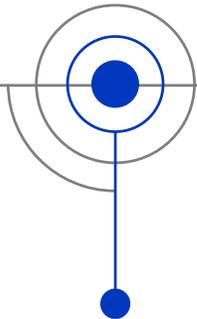
The key question addressed by this report: What actions can policy-makers take to build capacity in the clean transportation sector?

- 1 Identifying competitive advantages based on the firms who are here now
- 2 Strengthen by identifying and remedying challenges faced by firms in the region

Research consisted of 4 main stages, between September and November 2021



Sector Definition

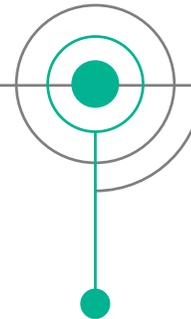


Established the scope of the analysis

Identified firms in the region



Industry Interviews



Interviewed CEOs and founders of firms at all stages of development supplemented by secondary research e.g. PitchBook, Emsi Analyst

Analyzed findings and formulated recommendations



Sector Highlights

60 Firms

2,800+ Employees

Median Employment: 21

**\$2.6 Billion+ in Capital
Invested in the last 5
years**

2017: \$94.33M

2018: \$271.48M

2019: \$102.17M

2020: \$663.14M

2021: \$1.54B



Three main categories of clean transportation firms exist across the Metro Vancouver region

Low & Zero Emission Vehicles & Components

Example firms:

- Ballard Power Systems
- Damon Motors
- ElectraMeccanica Vehicles
- FVT Research

Renewable & Low Carbon Fuels & Charging Infrastructure

Example firms:

- Ekona Power
- G4
- HTEC
- VoltSafe

Transferable Technologies and Services

Example firms:

- 7 Generation Capital
- Breeze Traffic
- Plugzio
- Spare Labs

Clean Transportation Firms in the Region



Low and Zero Emission Vehicles and Components



Renewable and Low Carbon Fuels and Charging Infrastructure



Transferable Technologies and Services



Regional specializations include hydrogen, niche markets, and renewable natural gas, biogas, and low carbon fuels



Hydrogen

Fuel cells
Production and storage

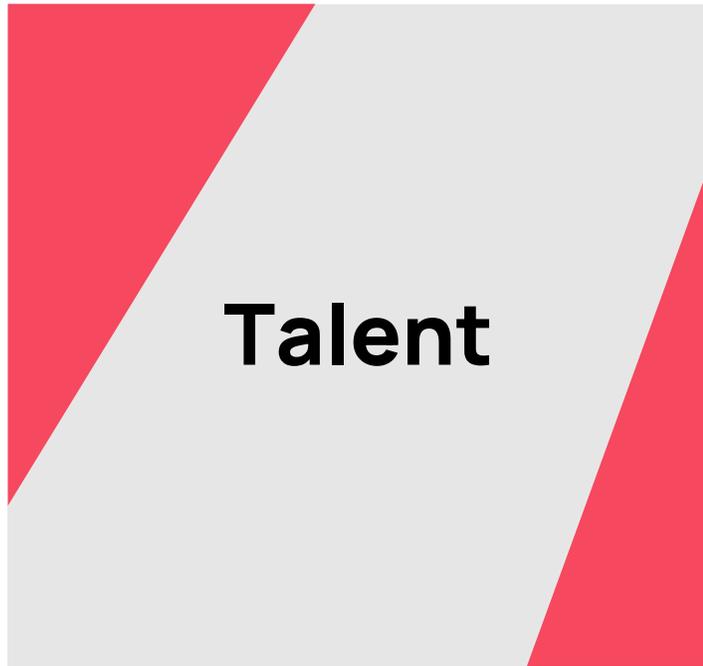
Firms Serving Niche Markets

Electric motorcycles
Single occupant ZEVs
Electric drives for mining equipment

Renewable Natural Gas, Biogas, Low Carbon Fuels



The region benefits from advantages in talent, a strong innovation ecosystem, and an advanced hydrogen cluster



Challenges and opportunities to strengthen our clean transportation sector are organized around six economic development-related themes.

- Talent and Training Programs
- Permitting Processes and Rules
- Physical Spaces
- Financial Capital Formation and Access
- Cluster Capacity Building Opportunities
- Culture of Innovation

Talent and Training Programs



What we found

- Key competitive advantage is talent
- Recruiting from outside the region is difficult, especially mid-career positions
- Shortage of technologists in emerging clean energy fields

Recommendation

Expand capacity within the BCIT Chemical and Environmental Technology program to increase the number of students graduating from 30 to 60 by 2025

Permitting Processes and Rules



What we found

- Delays in acquiring permits are a **major** problem
- Permitting problem acute for using and storing hydrogen
- Existing regulatory environment doesn't account for hydrogen

Recommendations

- Modernize permitting processes for projects to provide greater accountability, certainty, predictability, and reduced risk
- Update and harmonize the rules governing hydrogen

Physical Spaces



What we found

- Lack of suitable industrial space a major barrier in this sector
- Need for additional power at specialized research and development sites

Recommendations

- Invest in industry-critical physical spaces to be leased to firms at below-market rates
- Amend the CleanBC Facilities Electrification Fund eligibility to include utility upgrades of warehouses to meet clean technology R&D power needs

Financial Capital Formation and Access



What we found

- Access to capital is challenging but improving
- Government cleantech funding is a good start, but difficult to access
- “Relationships based” funding often excludes women, BIPOC communities

Recommendation

Assess the capital formation and syndication relationships and network interactions within the region’s clean transportation industry through predictive analytics work

Cluster Capacity Building



What we found

- The region shows **significant leadership** in the hydrogen space
- Competencies along the entire hydrogen value chain
- Demonstration and testing opportunities are out of province and overseas
- **Danger that cluster drifts away, one firm at a time**

Recommendations

- Launch a hydrogen hub
- Fund a large-scale hydrogen powered heavy-duty vehicle demonstration project
- Establish a centre to assert global leadership in hydrogen certification
- Create certainty by establishing a long-term electric power rate for hydrogen production
- Expand eligibility for ZEV subsidies to include hydrogen fuel cell vehicles
- Strive for technology-neutral rules whenever possible

Culture of Innovation



What we found

- Disappointment that commitment to tackling climate emergency not matched with support for local firms developing technologies
- Municipal risk-aversion – avoiding new technologies and new firms
- More receptive municipalities in the U.S. and Alberta

Recommendation

Encourage greater participation in “Project Greenlight” and other public-private partnerships to encourage a culture of innovation across the Metro Vancouver region

Three urgent actions to strengthen the regional value proposition



Permitting

Improve the permitting process to provide greater accountability, certainty, predictability and reduced risk

Municipal action



Physical Spaces

Invest in industry-critical physical spaces to be leased to firms at below-market rates

Provincial action



Hydrogen Cluster Development

Launch a hydrogen hub in the region to co-locate hydrogen supply and demand

Multi-stakeholder collaboration

Conclusion & Next Steps

Invest Vancouver will lead:

- ① Best practices for permitting
- ② Data analytics work to assess capital formation
- ③ Advocacy and collaboration with relevant decision makers

Read the full report at
investvancouver.ca





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Opportunity, Amplified. In a region like no other.