



# CLEANTECH SECTOR IN BRITISH COLUMBIA

DECEMBER 2023





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# ACKNOWLEDGEMENTS

This report was prepared by Natural Resources Canada and the Province of British Columbia.

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## PURPOSE

Currently, the growth of the environmental and clean technology (ECT) sector in Canada outpaces that of the rest of the economy. British Columbia (B.C.) is addressing the demand and need for innovation in this space. It has the third-largest cleantech sector in Canada and is home to more than a quarter of all Canadian cleantech companies.

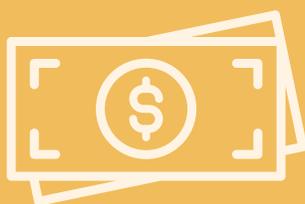
This profile provides a comprehensive overview of the current state of B.C.'s ECT sector, including information on the sector at large and specific data pertaining to pure-play cleantech companies. It will be updated on an annual basis to ensure its ongoing relevance and accuracy. It is meant to equip stakeholders, including government, industry, and academia, with information to make progress in their decision-making and activities within the ECT sector.

# KEY STATISTICS:

B.C.'s environmental and clean technology sector\*

## \$4.83 billion

revenue generated (2021)<sup>1</sup>



## \$275,333

GDP dollars per person  
employed in ECT sector (2021)<sup>2</sup>



## 40,086

jobs (2021)<sup>5</sup>



## \$2.45 billion

in exports (2021)<sup>3\*\*</sup>

## \$3.14 billion

in imports (2021)<sup>4\*\*</sup>

## \$96,350

average salary (2021)<sup>6</sup>

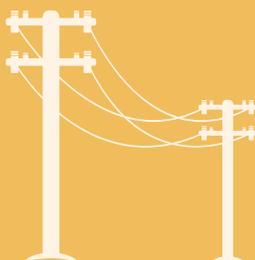
## 20.7%

growth from 2017  
to 2021, compared  
to 16.5% for the  
whole economy<sup>7</sup>



## 98%

of electricity generated  
from clean or renewable  
resources<sup>8</sup>



## 23.5%

of new motor vehicles  
were EVs in 2022<sup>9</sup>

\*See Appendix A for further details

\*\*Clean electricity accounts for \$470 million of B.C.'s international exports and \$90 million of its international imports (2021).

# KEY STATISTICS:

B.C.'s pure-play clean technology companies\*

**492** pure-play cleantech companies (2023)<sup>10</sup>



## Manufacturing & Utilities

are the main cleantech customers (2022)<sup>11</sup>

**4** identified Indigenous-owned companies (2023)<sup>12</sup>



**9.3%**

of companies managed by women (2023)<sup>13</sup>

## Stage of Development:<sup>14</sup>



**56** publicly listed companies (2022)<sup>15</sup>



**\$9.70 billion**

market cap of publicly listed companies (2023)<sup>16</sup>



**\$3 million**

on average spent on R&D (2020)<sup>18</sup>

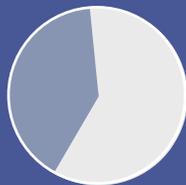
**\$5.4 million**

average export value (2020)<sup>17</sup>



**93%**

of companies have fewer than 100 employees (2023)<sup>19</sup>



**40%**

of companies have positive net income (2021)<sup>20</sup>

**83**

companies have patents (2020)<sup>21</sup>

**1280**

patents filed, the second most in Canada (2020)<sup>22</sup>



# WHAT IS CLEANTECH?

**Clean technologies\*** can be any good or service that remediates or prevents environmental damage, and/or is less polluting or more efficient than equivalent normal products. Clean technologies contribute to clean growth and the transition to a low-carbon economy, and provide solutions to environmental issues such as climate change, air and water pollution, and resource scarcity.

**Pure-play cleantech companies** are companies that are predominantly engaged in developing and/or using innovative technologies that provide environmental benefits.

**Cleantech spans several sectors,** including energy, waste, water, transportation, built environment, and agriculture, and includes applications of enabling technologies such as artificial intelligence and machine learning.



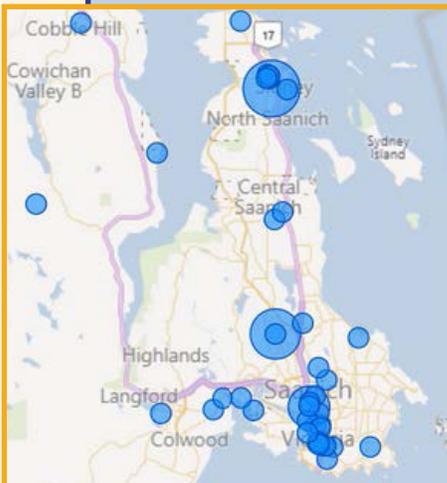
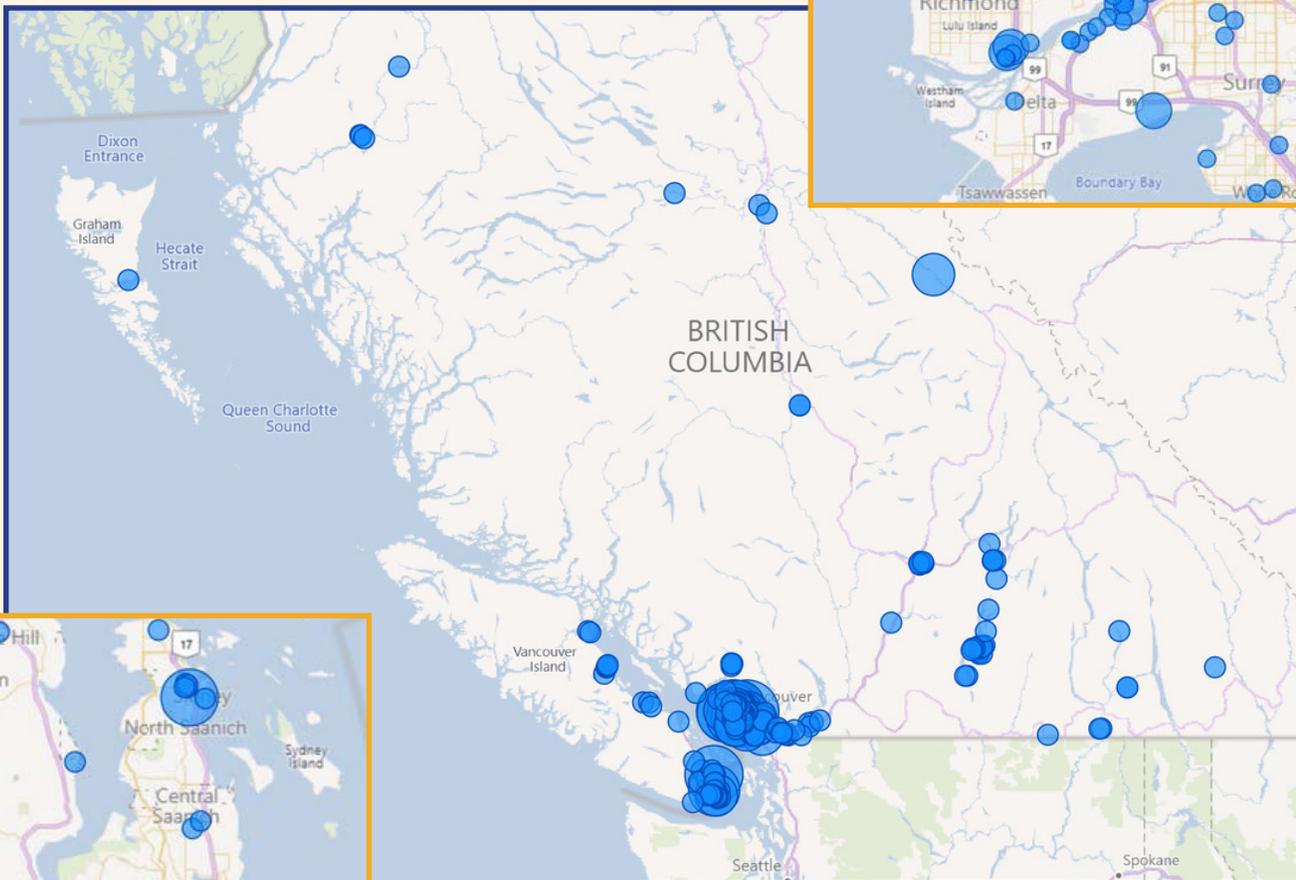
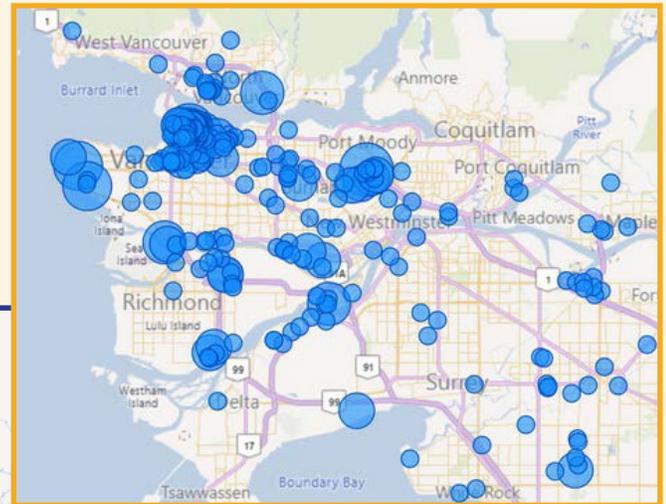
\*See Appendix B for further details

# SECTOR DISTRIBUTION

The ECT sector in Canada consists of ten industries. In B.C., cleantech companies are concentrated in five of these:\*

- Renewable and non-emitting energy supply: 20.9%
- Energy efficiency: 12.8%
- Transportation: 9.8%
- Biofuels, bioenergy, and bioproducts: 9.6%
- Water and wastewater: 7.9%

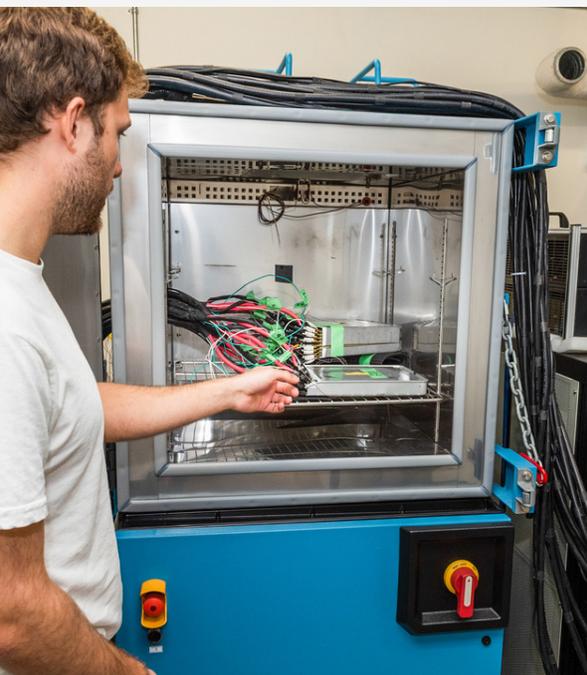
Around 13.1% of firms in B.C. operate in more than one of the above industries.



Over 70% of B.C.'s pure-play cleantech companies are headquartered in Metro Vancouver, with the rest mostly concentrated in Victoria and Kelowna.

\*See Appendix B for further details

# OVERVIEW OF SECTOR



## The environmental and cleantech sector is a major economic contributor in B.C.

- In 2021, the GDP generated by the sector in B.C. was \$11.04 billion. This accounted for 15.1% of the total GDP contributed by the sector in Canada and about 3% of B.C.'s overall GDP (in nominal terms).<sup>23</sup>
- As of 2021, B.C. ranks third in the country in terms of contribution to the cleantech labour market, providing 40,086 jobs with an average salary of \$96,350. This is higher than the Canadian average.<sup>24</sup>
- As of 2021, B.C. produces \$275,333 GDP dollars per person employed in the ECT sector, well above the national average of \$232,593.<sup>25</sup>

## B.C. is the second-largest centre for clean technology in Canada.

- 492 pure-play cleantech companies are located in B.C., accounting for 20.3% of the national total.<sup>26</sup>
- These companies mostly operate in energy-related industries, such as renewable energy supply and energy efficiency.
- In 2021, B.C. was the third-largest exporter of ECT products in the country, with exports valued at \$2.45 billion.<sup>27</sup>
- Vancouver's strategic location as a gateway to the USA and Asia allows ECT companies to be successful in export markets.
- The USA, Europe, Asia-Pacific, China, and India have the most potential for Canadian ECT companies.<sup>28</sup>
- From 2010 to 2020, 1280 patents were filed by 83 pure-play cleantech companies, the majority in the USA and Canada, and through the World Intellectual Property Organization and European Patent Office.<sup>29</sup>



# OVERVIEW OF SECTOR

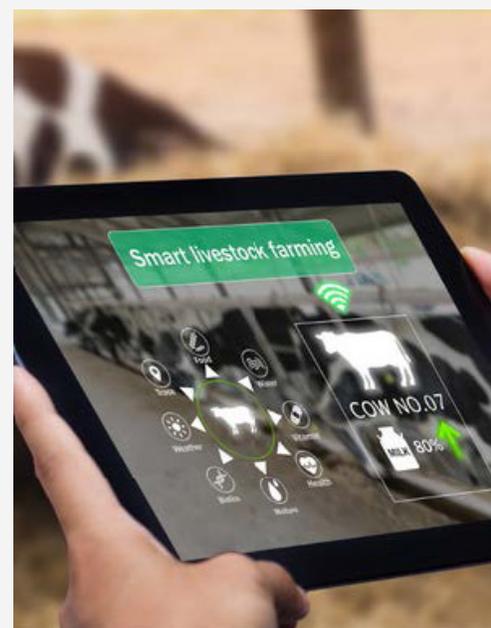


## B.C. has leading expertise in water, fuel cell, and high-performance building products and services.

- Over half of Canada's hydrogen and fuel-cell companies are located in B.C., and the province generates 60% of research investment in hydrogen and fuel-cell development.<sup>30</sup>
- Resource recovery is a particular strength of B.C.'s water tech sector.<sup>31</sup>
- By 2030, B.C. aims to reduce emissions in buildings and communities by more than 50%.<sup>32</sup>
- 98% of B.C.'s electricity is generated from clean or renewable resources, making it the cleanest jurisdiction in western North America.<sup>33</sup>
- Other top B.C. trade and investment products and services include wastewater remediation, carbon capture, smart grid and energy storage, energy efficiency, green building, and advanced materials.

## The cleantech sector in B.C. continues to be on a growth trajectory.

- B.C.'s cleantech market size grew 7.1% from 2017 to 2021, approximately six times the national growth rate.<sup>34</sup>
- Increasing proportions of cleantech revenue are being generated internationally, rather than in-province or within Canada.<sup>35</sup>
- B.C.'s growing cleantech sector is complemented by a dynamic ecosystem of innovators and supporters. The contributions of this sector will be critical in helping B.C. meet its CleanBC Roadmap to 2030 and StrongerBC Economic Plan goals, which also provide a framework to increase demand for cleantech sector solutions in the province.



# LEADING COMPANIES

The annual Global Cleantech 100 Reports highlight the world's most innovative companies with the most potential to make significant market impact. Several cleantech companies from B.C. have made the list over the past two years:

 <p>2023, 2022</p>	 <p>2023, 2022</p>	 <p>2023</p>
 <p>2023</p>	 <p>2023, 2022</p>	 <p>2022</p>
 <p>2022</p>	 <p>2022</p>	 <p>2023, 2022</p>

B.C. is also home to many leading cleantech incubators, accelerators, agencies, and supporting organizations, some of which include:

# OPPORTUNITIES TO SUPPORT CLEANTECH

## Federal Opportunities

- [Clean Growth Hub](#)
- [Industrial Research Assistance Program](#)
- [Strategic Innovation Fund](#)
- [Low Carbon Economy Fund](#)
- [Clean Technology Investment Tax Credit](#)
- [Scientific Research and Experimental Development tax incentives](#)
- [Sustainable Development Technology Canada](#)
- [PacifiCan](#)

## Provincial Opportunities

- [Advanced Research and Commercialization Program](#)
- [BC Manufacturing Jobs Fund](#)
- [CleanBC Industry Fund](#)
- [Commercial Vehicle Innovation Challenge](#)
- [Guidelines, support, and standards in CleanBC Roadmap](#)
- [Indigenous Forest Bioeconomy Program](#)
- [Innovative Clean Energy Fund](#)
- [Rural Economic Diversification and Infrastructure Program](#)
- [Small business venture capital tax credit](#)

## Other Opportunities

- [B.C. Centre for Innovation and Clean Energy](#)
- [COAST Venture Accelerator Program](#)
- [Foresight B.C.'s Net Zero Innovation Network](#)
- [FortisBC's Clean Growth Innovation Fund](#)
- [InBC](#)
- [Innovate BC's BC Fast Pilot, ScaleUp Program, and Venture Acceleration Program](#)
- [Raven Indigenous Capital Partners](#)

## Groups in academia providing opportunities for cleantech partnership and support include:

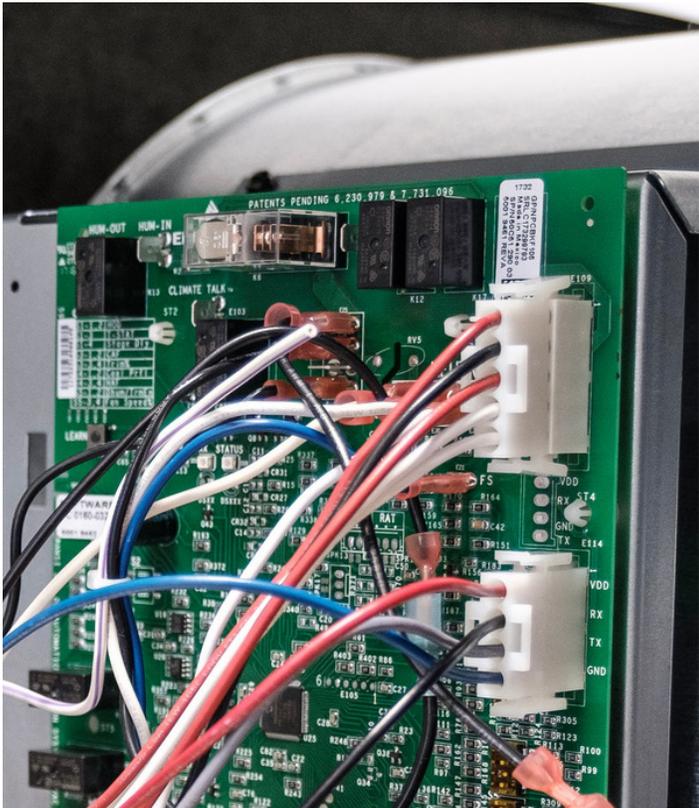
- [BCIT's Smart Microgrid Research Team](#)
- [Simon Fraser University's 4D LABS](#)
- [University of British Columbia's Clean Energy Research Centre](#)
- [University of British Columbia's Cleantech Hub](#)
- [University of British Columbia's Climate Venture Studio](#)
- [University of Victoria's Vancouver Island Impact Investing Hub](#)
- [University of Victoria's Institute for Integrated Energy Systems](#)

# NEXT STEPS AND FOCUS



B.C. has ambitious climate action policy frameworks through its [CleanBC Roadmap to 2030](#) and [Climate Preparedness and Adaptation Strategy](#). Combined, these policies aim to reduce climate-changing emissions by 40% by 2030 while preparing communities for the changing climate. Looking forward, the Province prioritizes the transition to a clean economy through CleanBC, which in turn supports the development of clean technologies. Notably, continuing to leverage B.C.'s clean hydroelectric power is at the forefront of the strategy.

Overall, the strengths of B.C.'s cleantech ecosystem are underpinned by the federal government's and Province's policies driving clean and inclusive growth. B.C. has a growing and flexible workforce, leading post-secondary institutions, and significant research and development capabilities, including several centres of excellence. B.C. has abundant natural resources, a reliable supply of clean, low-cost power, and transportation corridors and infrastructure that grant access to North American and global markets. Finally, a cluster of entrepreneurs, businesses, academia, and investors has led B.C. to be recognized as a global leader in cleantech sectors such as hydrogen and fuel cells, mass timber, and enabling technologies (for example, artificial intelligence and quantum computing).



Addressing current barriers to cleantech growth will help the province reach its climate targets. Key challenges identified by stakeholders and the [2022 Cleantech Industry Survey](#) were raising capital, evolving geographic markets, and supporting the growth of the workforce.



# APPENDIX A

The data referenced in relation to B.C.'s ECT sector and pure-play cleantech companies are from the following sources:

## **2022 Cleantech Industry Survey Results**

Completed by Natural Resources Canada, this targeted survey was sent out to 2427 pure-play cleantech companies identified through the Clean Technology Data Strategy. A total of 640 unique survey responses were received. In this report, data on the main customers of pure-play cleantech companies (sample size n=40) and cleantech company stage of maturity (sample size n=140) are sourced from this dataset.

## **Canada's Business Registries**

The Business Registries' data is linkable to the Clean Technology Company List. In this report, data on pure-play cleantech company size (sample size n=257) and employment numbers are sourced from this dataset.

## **Clean Technology Company List**

This dataset, internal to Natural Resources Canada, provides information on pure-play companies across Canada. It was last updated in April 2022 and includes information from the Indigenous Business Registry. In this report, data on pure-play cleantech companies is sourced from this dataset, including the number of companies managed by women.

## **Derwent Innovation**

The Canadian Intellectual Property Office (CIPO) sourced patent data from Derwent Innovation. Natural Resources Canada then matched CIPO's filings to the Clean Technology Company List to retrieve pure-play patent data (sample size n=492 for British Columbia).

## **Environmental and Clean Technology Economic Accounts (ECTPEA)**

Published by Statistics Canada, ECTPEA provides information on the economic impact of ECT products. In this report, data on the ECT sector's employment, wages, exports, and imports are sourced from this dataset.

## **Linkable File Environment (LFE)**

This dataset, internal to Natural Resources Canada, connects the Clean Technology Company List to Statistics Canada's linkable file environment. In this report, data on pure-play cleantech company research and development spending (sample size n=80), profitability (n=300), average export value (n=90), and market size of the ECT sector (n=295 for B.C. and n=1590 for Canada) are sourced from this dataset.

## **S&P Capital IQ**

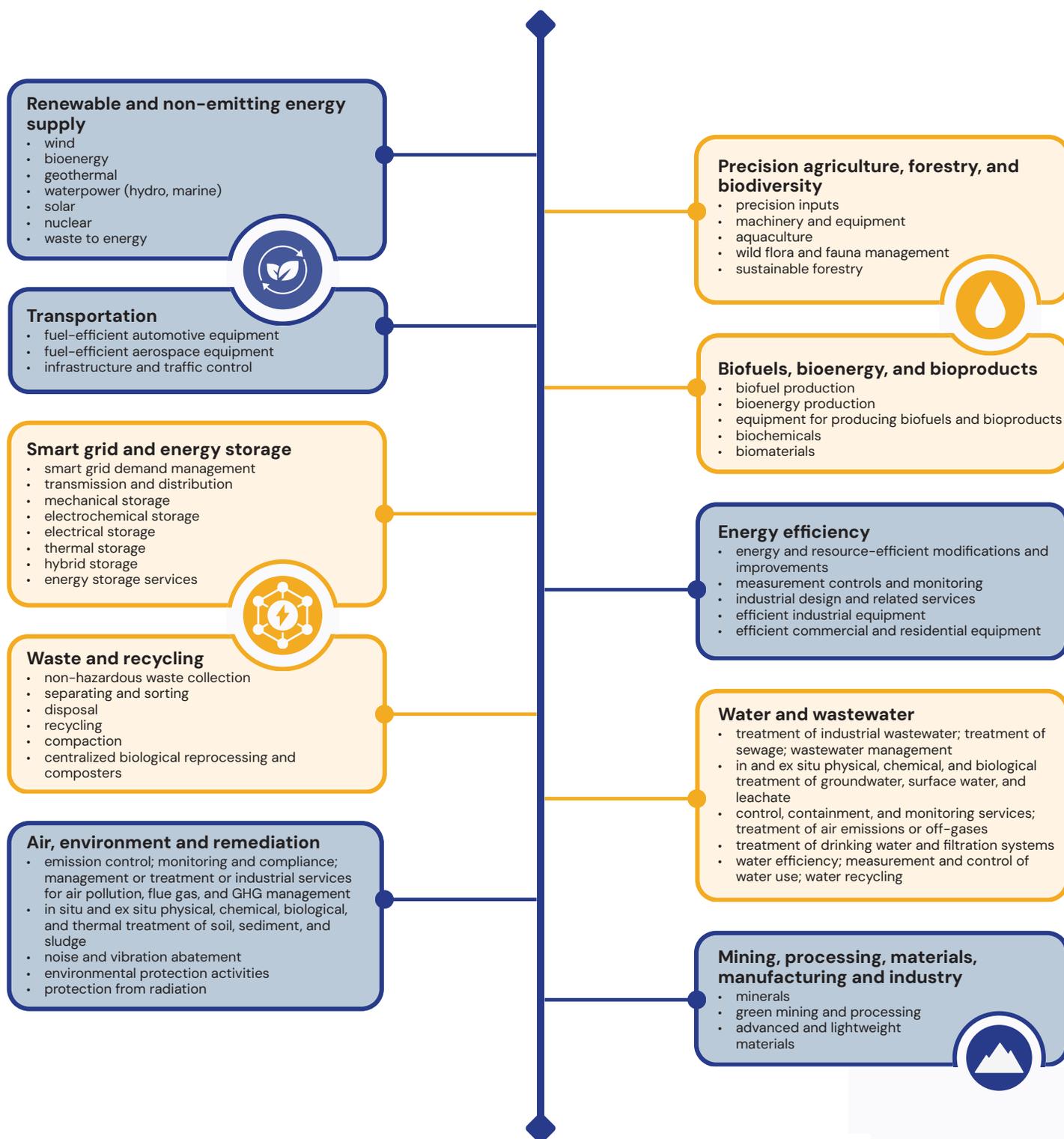
This dataset by S&P Global provides global financial intelligence, including information on public and private companies and market snapshots. In this report, data on the number of publicly listed companies and their market cap are sourced from this dataset.

## **Survey of Environmental Goods and Services (SEGS)**

Published by Statistics Canada, SEGS provides information on sales and exports of ECT goods and services. In this report, data on the ECT sector's revenue is sourced from this dataset.

# APPENDIX B

The following taxonomy represents the suite of products considered to be clean technologies by the Government of Canada.



# SOURCES

- 1 Statistics Canada. (2021). *Survey of Environmental Good and Services (SEGS)*. <https://bit.ly/3PRlgH8>
- 2 Statistics Canada. (2021). *Environmental and Clean Technology Products Economic Account, 2021*. <https://bit.ly/3LCfUOM>
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All photos are sourced from the [Province of British Columbia](#) and [Unsplash](#).



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