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Foreword

BC's Cleantech sector has continued its impressive growth trajectory since the previous BC Cleantech Status Report in 2016 (the "2016 Status Report"). The number of clean technology ("Cleantech") companies has grown from 273 to 293, the total number of employees has increased by 2,400 to 16,300, with 9,604 based in BC, and the sector continues to access billions of dollars of equity investment. At the same time, average wages remain highly competitive at \$82,000, and the sector's revenue has grown to over \$2.4 billion.

This report highlights the fact that BC's Cleantech sector is export-oriented, with 87% of revenues forecast to be generated outside of the province in three to five years. Revenues are also diversified across a wide range of markets, including power generation, transportation, oil and gas, mining, chemicals, pharmaceuticals, and agriculture. This diversity not only reflects the breadth and depth of the sector but also the scale of the global market for Cleantech, which is now estimated at more than \$3 trillion.

By any measure, these are impressive results for such a youthful sector where more than two-thirds of companies are less than ten years old, and one-third have been in operation for less than five years. The stats also reinforce the sector's strong growth potential, as well as the fact that many companies are beginning to establish a foundation for sustained growth, scale, and momentum.

Over the past few years, BC has strengthened its position as a leading global centre of Cleantech innovation and investment. BC's Cleantech entrepreneurs continue to expand the economy by scaling-up high growth companies and launching dozen of new ventures. Today, the biggest challenge facing BC's Cleantech sector is moving beyond incubating great technologies to scaling-up billion-dollar companies that achieve global impact.

As a final note, I would like to thank the members of the BC Cleantech CEO Alliance for creating such a powerful and connected community of entrepreneurs. I would also like to express our deep gratitude to KPMG for its leadership and commitment to our sector. This report would not have been possible without their support.

Jonathan Rhone

Chair, BC Cleantech CEO Alliance
January 2020

About the BC Cleantech CEO Alliance

The BC Cleantech CEO Alliance ("the Alliance") is a community of leading BC Cleantech CEOs and entrepreneurs committed to scaling-up large cleantech companies and ensuring British Columbia is a global leader of cleantech innovation to address the world's most difficult energy and environmental challenges.

Executive summary

Participant profile

The *BC Cleantech 2019 Status Report* (“2019 Status Report”) targeted 293 companies within the Cleantech sector. Of the 92 companies that participated, 63% have been in operation for less than ten years, with the median corporate age being nine years. CEOs were the largest respondent demographic (63%), followed by other C-suite executives (23%).

Report highlights

- BC’s Cleantech sector is estimated to employ approximately 16,300 people in 2018, with 9,604 (59%) employees based in BC.
- 87% of respondents expect their company to hire more staff.
- The average annual salary for BC Cleantech employees is approximately \$82,000.
- Transportation and power and utilities industries continue to be the two main customers for Cleantech (20% of respondents and 16%, respectively).
- Continuing the trend seen in the 2016 Status Report, Cleantech companies are seeing a smaller and smaller percentage of their revenue come from BC and the rest of Canada and expect this trend to continue in the next 3 to 5 years.
- The sector continues to rank Scientific Research and Experimental Development (SR&ED) tax credits and Industrial Research Assistance Program (IRAP) funding as the most beneficial government initiatives.
- A third of respondents identified grants for demonstration projects as a key factor to accelerate the industry in BC, while a quarter identified low interest, flexible debt financing for scaling-up commercial operations, and enhanced research and development grant funding as beneficial.
- 73% of respondents file SR&ED claims, while 75% of respondents own at least one patent.
- Industry players continue to display optimism, with 65% of respondents expecting a substantial improvement in their business, and a further 27% anticipating moderate improvement.
- 80% of the respondents expect either substantially higher or moderate capital investment in their company in the next 12 months.

KPMG believes in the power of business and our people to drive social change. KPMG Social Impact is about just that – channeling our collective experience, skills and energy to build strong and sustainable communities by engaging our people, our clients and our community partners. For KPMG Social Impact, success is measured by the impact each one of us has when we are fully engaged.

Message from KPMG

KPMG is proud to be part of the Cleantech ecosystem and to support the sector as it continues to grow and thrive in BC. Building on many of the trends uncovered in our 2016 industry study, this report spotlights the collective success that the BC's Cleantech players have had within the province and their continuing ability to attract both talent and capital to their businesses.

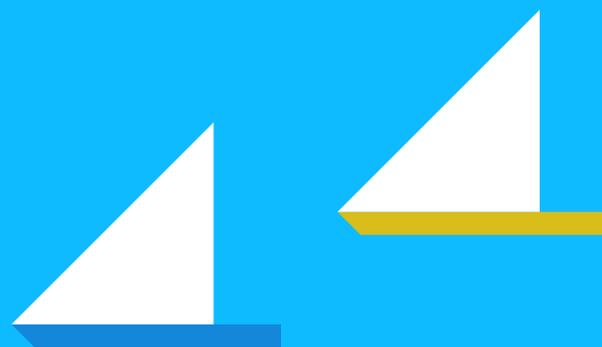
Many factors point to the long-term sustainability of BC's Cleantech community. The sector continues to exhibit consistent growth in revenue, as well as growing contributions to GDP and increasing employment in a broad range of industries within our economy.

Even still, while the 2019 Status Report indicates impressive growth for the sector, and survey respondents exude optimism for the following year, it is important to note that the government's ongoing support and the sector's continuing ability to attract capital are critical to fueling innovation and driving commercialization.

While this report highlights the economic importance of this sector to the province, we also draw attention to the profound impact that these companies are having on the sustainability and quality of life for British Columbia, Canada and the world as they develop and commercialize new technologies.

George Kondopulos

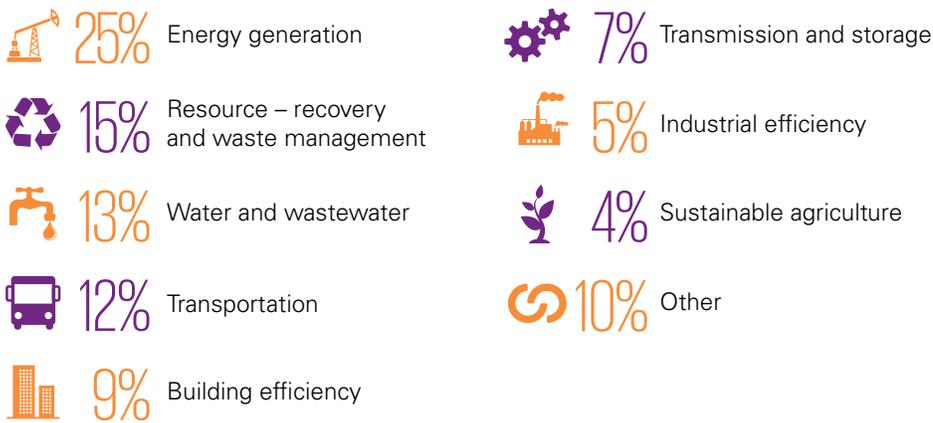
Partner and Greater Vancouver Area Industry Leader
for Technology, Media and Telecommunications
KPMG in Canada
January 2020



Profile of the Cleantech sector

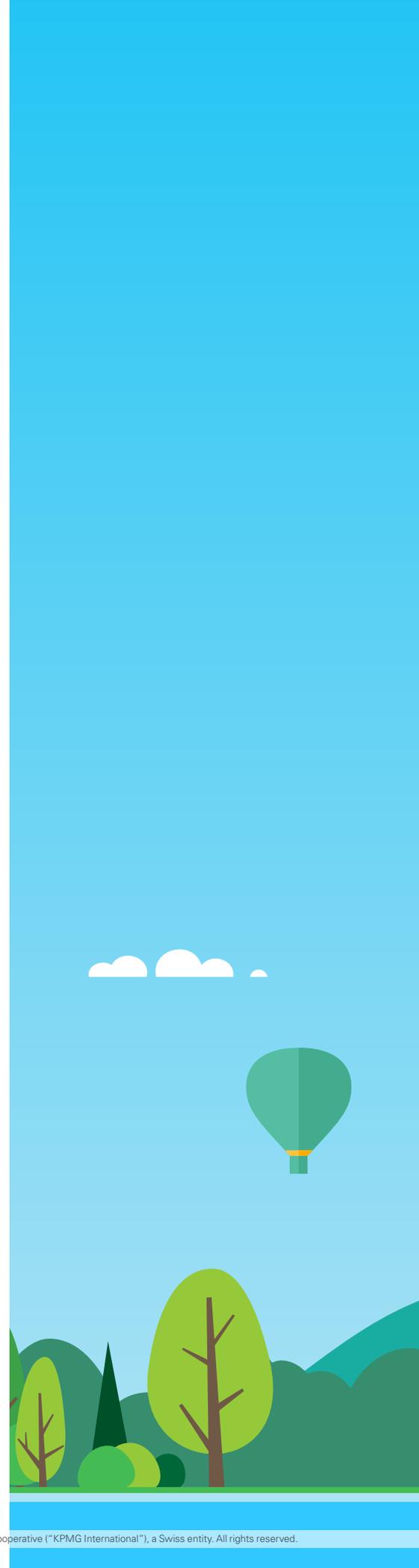
Similar to our research methodology for the 2016 Status Report, Cleantech companies were defined as those which primarily develop new technologies related to clean energy production, transmission, storage or use; water treatment and management; and/or efficiency in energy or resource management and use.

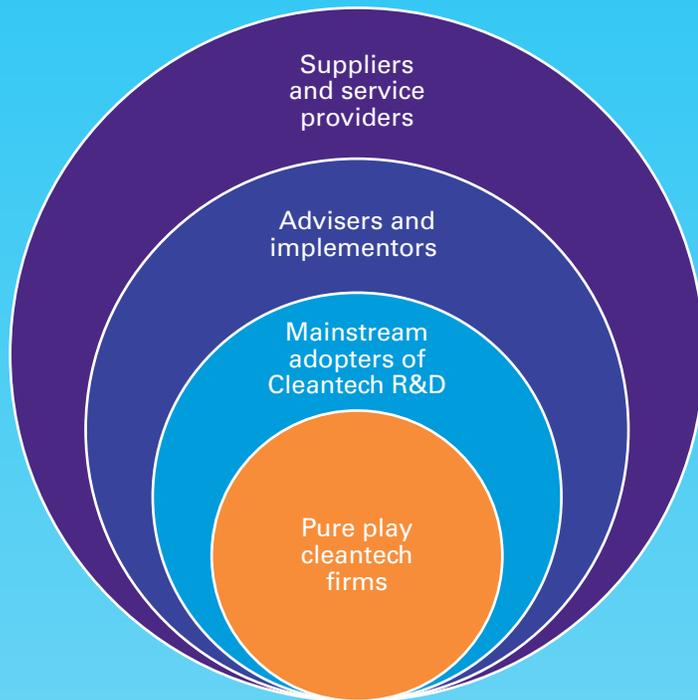
The following is a breakdown of how the respondents in the 2019 Status Report classified their operations:



Business focus of Cleantech companies

Our definition of Cleantech organizations excludes early mainstream adopters of Cleantech technologies; businesses that generate power for sale; and those that manufacture, service, implement, integrate, or consult solely with respect to technologies or systems developed by other companies.





This report focuses solely on the companies generating new intellectual property, business models, or service offerings – called “pure play Cleantech” in the diagram – and does not include the much larger set of companies that implement these products and services in their own operations.



Signaling innovation

The costs of research, innovation, and development can be capital intensive in the Cleantech industry. As such, the industry's growth benefits from federal and provincial government support. This is evident throughout the 2019 Status Report, wherein 73% of survey respondents file claims for SR&ED tax credits, a number which aligns closely with 2016's survey group.

The volume of patents held by Cleantech organizations also mirrors with our previous study. Once again, three-quarters of respondents claim to hold one or more patents.

Industry Diversity

The push for greener energy is intensifying. 25% of respondents in the 2019 Status Report are in the business of developing technologies and solutions to enhance or create new sources of energy generation, representing a 5% increase from 2016. Moreover, when these Cleantech organizations are combined with those that focus on energy transmission and storage, the number climbs to 32% percent.

The second-largest group in this study are companies that focus on resource recovery, including waste management. They represent 15% of respondents, followed by companies that work in water and wastewater (13%) and transportation (12%). As in 2016, the smallest category of Cleantech companies belongs to those which work in industrial efficiency (5%) and sustainable agriculture (4%).

A Maturing Community

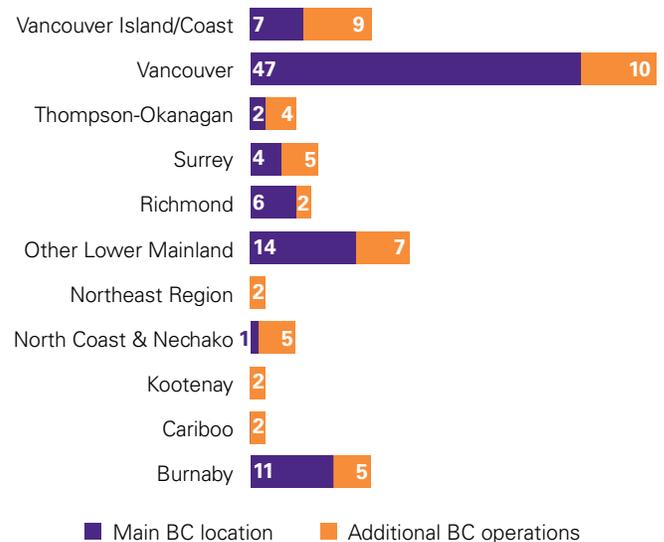
Nearly two-thirds (63%) of this study’s participants have been in the Cleantech sector for less than ten years. By comparison, only one-fifth has been operating for 16 years or more.

As the numbers show, the Cleantech sector is primarily home to young organizations, with a third being in their first five years of operations. This overall youthfulness of the sector is consistent with the results of our 2016 survey and reflects a similar reality that while the industry has strong growth potential, it is subject to the same risks of talent retention and turnover as any other emerging technology sector.

A Connected Ecosystem

Vancouver remains the home base of choice for BC’s Cleantech companies, with 51% of respondents having their main office and another 11% having an additional location in this city. That said, 58% of companies are running operations in multiple locations throughout BC, providing significant employment opportunities throughout the province.

Number of BC operations by location



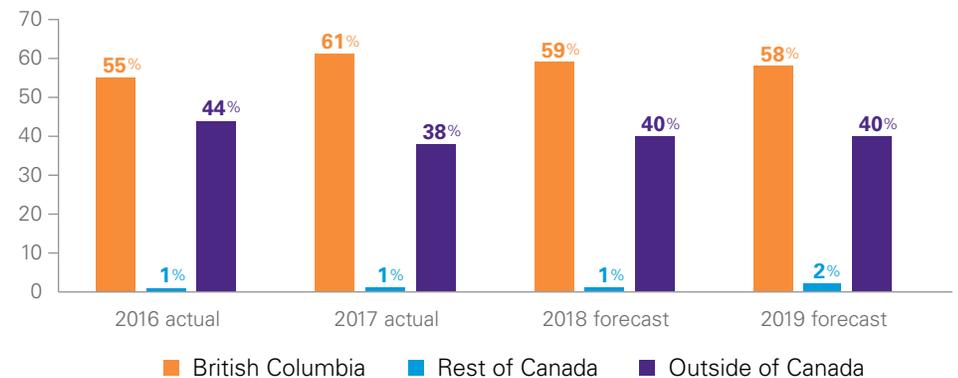
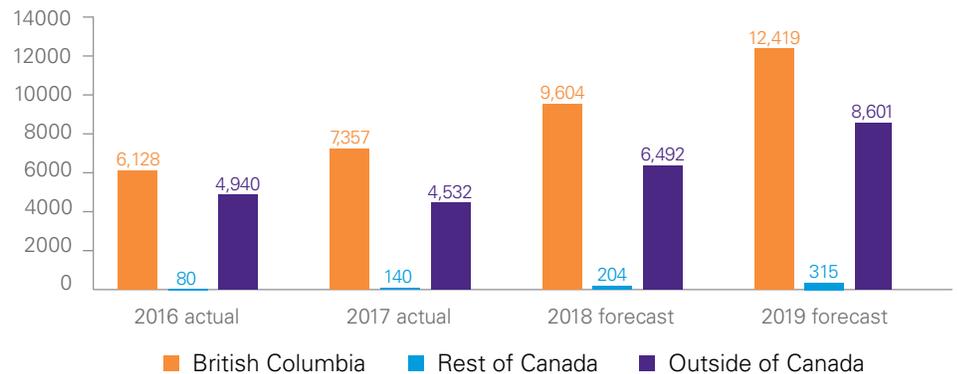
A growing workforce

BC's Cleantech community is home to a broad range of skilled talent, including engineers, designers, sales, and marketing professionals. Promisingly, the sector continues to expand its ranks and is estimated to employ 16,300 people as of 2018, with 9,604 of these employees working within BC.

Looking ahead, the sector's employment rate is expected to continue its upward trajectory, bringing thousands more Cleantech professionals to the province.

Compensation within the sector remains competitive. The estimated provincial payroll for 2018 is approximately \$807 million (up from \$640 million in the 2016 Status Report). That said, the average salary per BC employee has dipped slightly to \$82,000 from \$84,000 just three years prior.

Employment



A Promising Forecast

Several factors point to the long-term viability of BC's Cleantech sector. Its companies are growing, its talent base is flourishing, and the sector has become a reliable source for rewarding and enriching careers. Even at its relatively young age, the sector is generating products and services that are contributing to a greener, more sustainable world – both within Canada and beyond. For these reasons and more, the Cleantech industry has become a source of opportunity for BC residents and an influential driver for BC's economy.

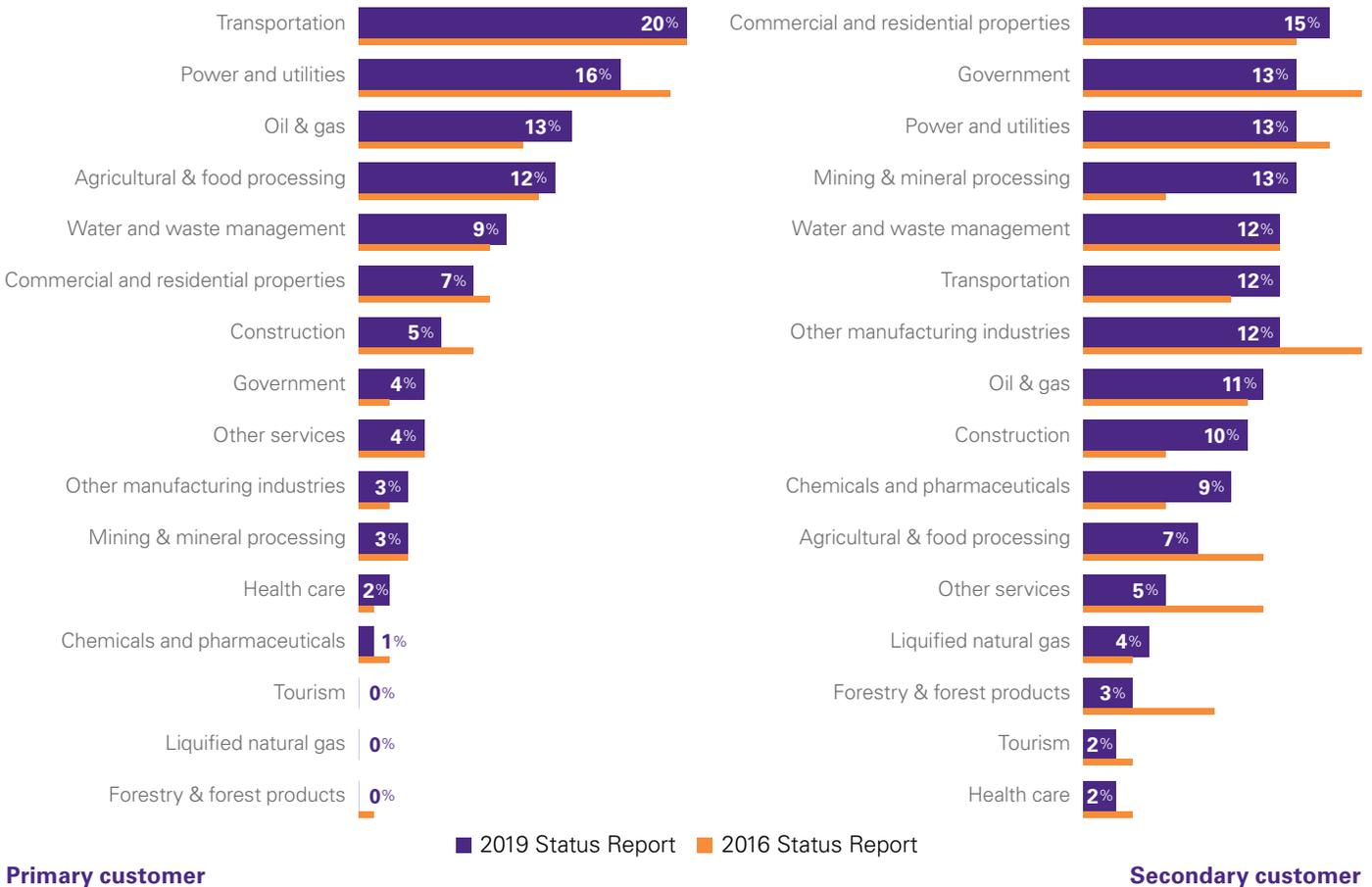


Customers and revenue

Strong Diversified Demand

BC's Cleantech sector serves a wide range of consumers, with a wide range of industry sectors identified as primary and secondary customers. Transportation, power and utilities, and oil and gas remain the top primary customers at 20%, 16%, and 13%, respectively.

Customers



In the 2019 Status Report, companies were asked to identify two secondary markets (either current or target). Commercial and residential markets ranked at the top with 15% of responses, followed closely by government, power and utilities, and mining & mineral processing, which were each identified by 13% of survey participants.

Overall, the responses point to a sector that serves a wide variety of market sectors. As such, it remains well protected against the ebb and flow of market conditions in any one sector.

Rising revenues and shifting geographic markets

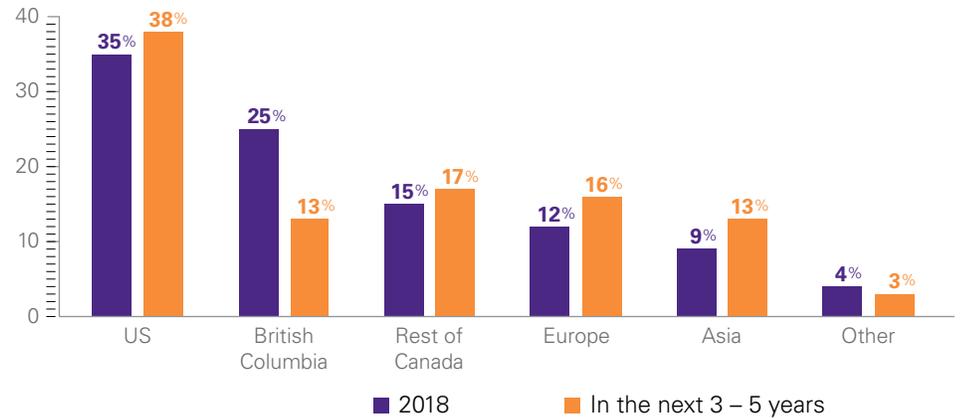
Total estimated revenues for the industry is forecast to be \$2.4 billion in 2018, increasing to \$3.5 billion in 2019.

Total revenues – all respondents		Total revenues – industry overall	
2016 Actual	\$453 m	2016 Actual	\$1.4 b
2017 Actual	\$589 m	2017 Actual	\$1.9 b
2018 Forecast	\$742 m	2018 Forecast	\$2.4 b
2019 Forecast	\$1,086 m	2019 Forecast	\$3.5 b



Continuing the trend from the 2016 Status Report, we see a decreasing dependency on the domestic markets for revenue and increased reliance on the US, Europe, and Asia. The respondents forecast that this trend will continue over the next three to five years, albeit with increased attention on markets south of the border and overseas.

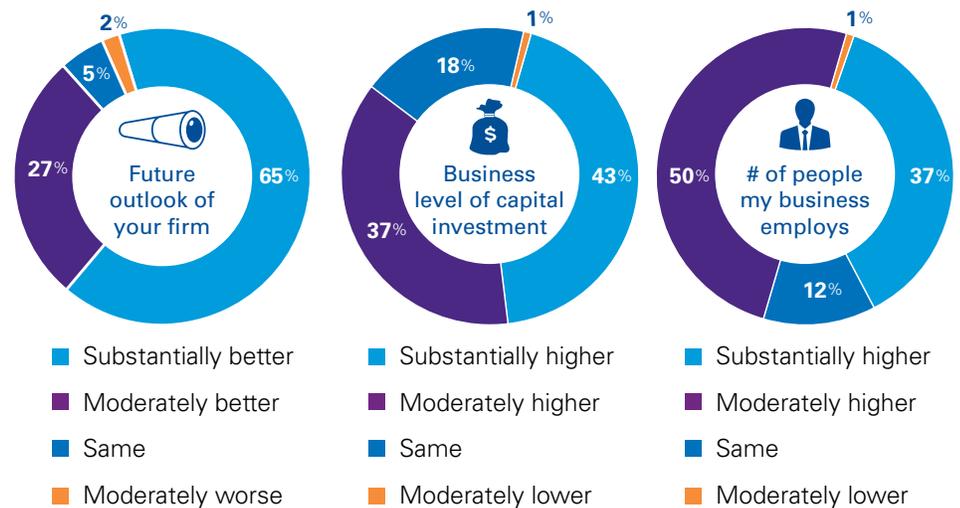
Three to five year trend



Business Confidence

There is a powerful undercurrent of confidence within BC’s Cleantech sector. 92% of respondents in the 2019 Status Report anticipate their firm will perform moderately or significantly better in the year ahead (up 2% from the 2016 Status Report), and 87% expect an increase in the number of people they employ. 80% of respondents also predict moderately to substantially higher levels of capital investment.

Business confidence



These levels of confidence are consistent with the respondents in the 2016 Status Report.



Equity

Equity raised

Equity is essential for Cleantech companies, be it to power research and development (R&D), commercialization, business development, or sales activities. As such, the ability of the sector to attract capital is critical to its growth and success.

Notably, our report found that the total equity raised by the respondents in the last 24 months totaled \$691 million (or an average of \$8.3 million per respondent) compared to \$555 million (or an average of \$6.9 million) reported by respondents in the 2016 Status Report. In addition, 18% of the respondents raised \$10 million or more in the last 24 months, compared with only 9% in the 2016 Status Report.

The total equity raised since inception by companies in the industry is estimated to be \$7.117 billion, a notable increase of \$2.863 billion from the 2016 Status Report. Promisingly, the total equity raised by the industry overall in the last 24 months is estimated to have been \$1.919 billion (almost twice as much as the same number estimated during the 2016 Status Report).



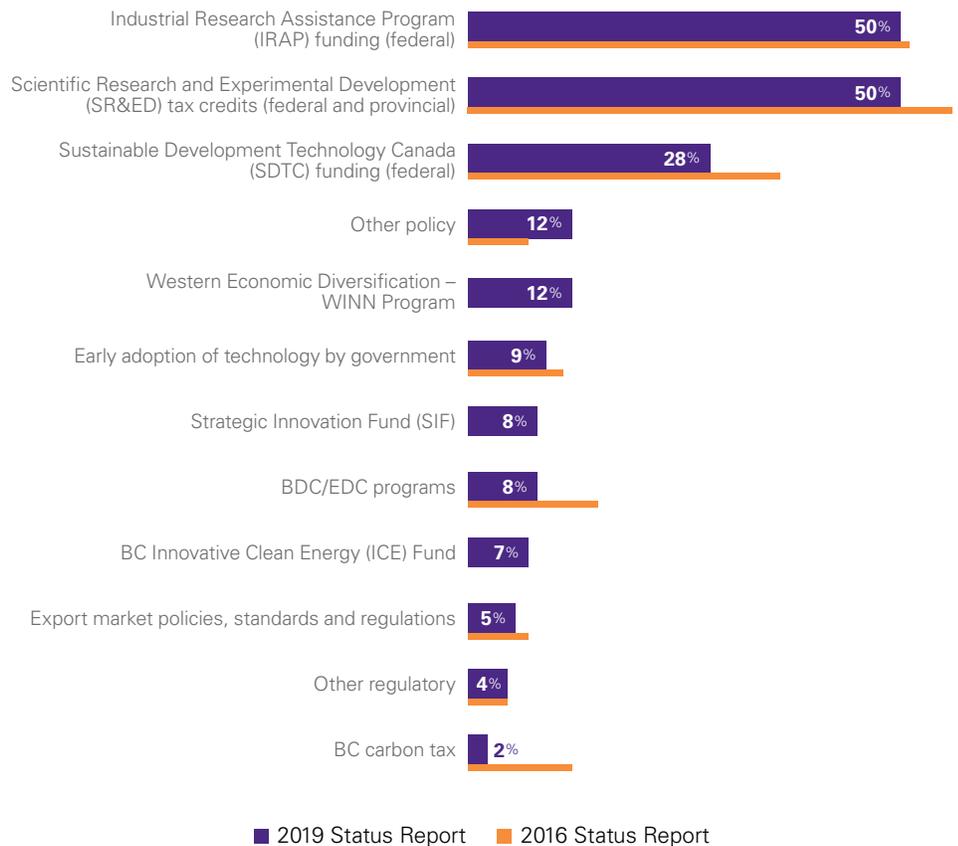
Public sector supports

As noted at the top of our report, BC’s Cleantech industry strongly benefits from government support from both provincial and federal levels. Consistent with findings from the 2016 Status Report, companies are drawing that support from a range of public sector grants, tax credits, policies, and industry initiatives. Specifically, 82% of respondents say their grant funding comes from federal sources (+4% from the 2016 Status Report), 16% from provincial (+3%), and only 2% from other sources (-7%).

When asked which support programs are most beneficial to the sector, half of the respondents indicated the Scientific Research and Experimental Development (SR&ED) tax credits and Industrial Research Assistance Program (IRAP) funding. At the same time, just under a third noted Sustainable Development Technology Canada (SDTC) funding. This is consistent with the findings of the 2016 Status Report.

There are three notable new sources of funding, relative to the prior status report. They are the Western Economic Diversification Canada’s Western Innovation Initiative (WINN), the Strategic Innovation Fund, and BC’s Innovative Clean Energy (ICE) Fund. These programs were understandably absent from the prior status report, as they are more recently announced programs.

Programs and incentives currently used





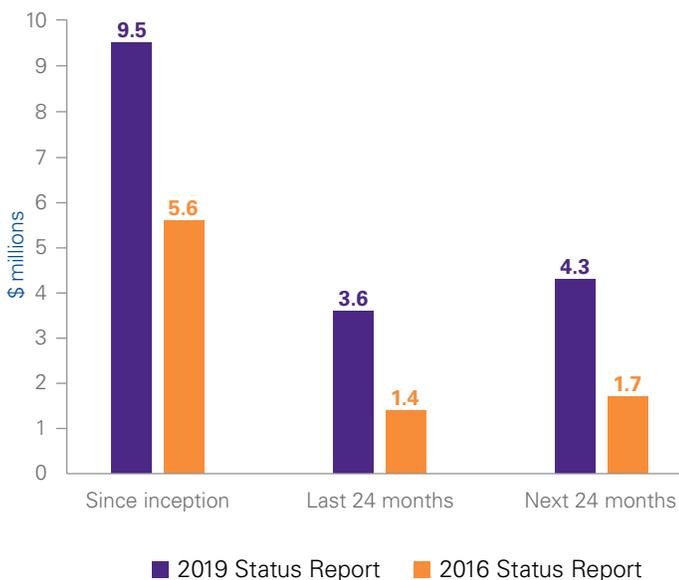
Grant funding, like equity, is vital to funding the design, development, and commercialization of clean technology. It supports the early stages of a Cleantech company’s growth and bridges the financing gaps towards breakthrough innovations.

To that end, the 2019 Status Report reveals that the average grant funding the respondents have received since inception has risen to \$9.5 million – a \$4 million increase from the 2016 Status Report. Encouragingly, a further \$4.3 million in grants is expected over the next two years.

Total grant funding – all respondents

	2019 Status Report	2016 Status Report
Since inception	\$238 m	\$368 m
Last 24 months	\$90 m	\$89 m
Next 24 months	\$104 m	\$107 m

Average grant funding – all respondents (M)



The road ahead

Looking ahead

As BC's Cleantech sector matures, many of its players are moving beyond their initial research and development stages. And as Cleantech companies turn their focus to scaling up or commercializing their innovative products and services, the appetite for public sector support and resources is intensifying.

In our 2019 Status Report, we asked Cleantech leaders what kind of supports they would like to see from various levels of government. Respondents were provided with ten ideas and asked to select two that would most benefit their company.

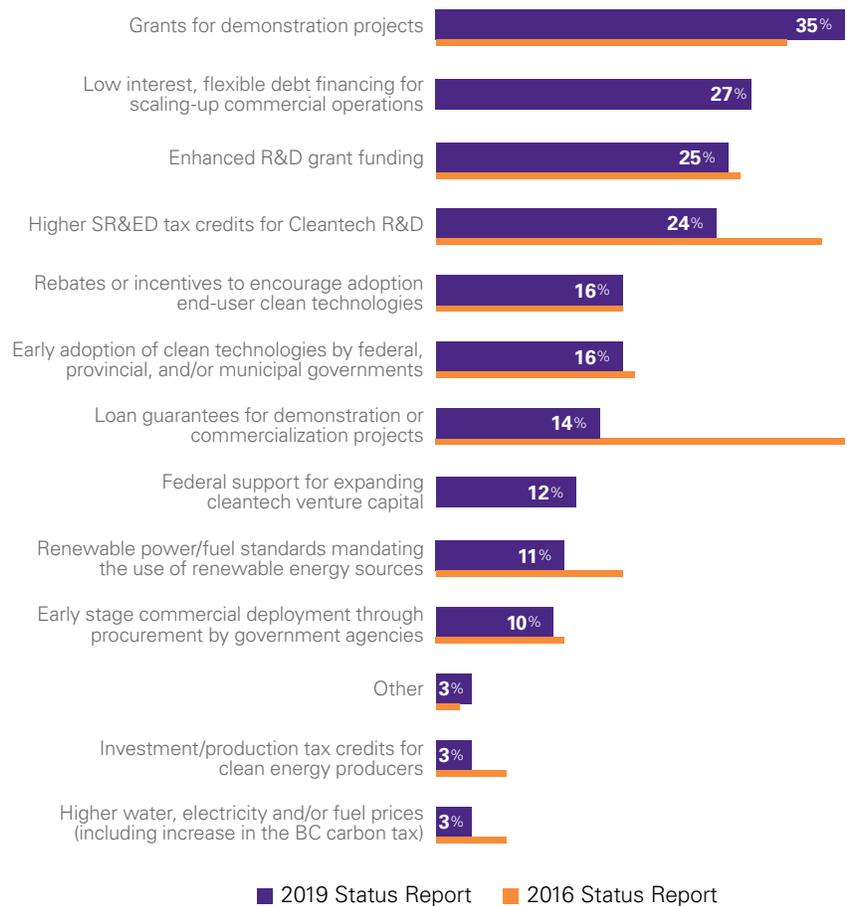
While every category registered interest from respondents, the three that are the most popular included:

- Grants for demonstration projects;
- low interest, flexible debt financing for scaling-up commercial operations; and
- enhanced R&D grant funding.

Respondents also noted interest in several non-financial supports. The top being:

- Early adoption of clean technologies by federal, provincial, and/or municipal governments; renewable power/fuel standards mandating the use of renewable energy sources; and early-stage commercial deployment through procurement by government agencies.

Future government programs



Total % age exceeds 100% due to respondents being invited to choose two categories.

About KPMG's Cleantech survey

Survey Goal

The Cleantech industry is one of BC's fastest-growing sectors. The province is home to one of the largest Cleantech clusters in Canada and North America, with new companies and industry talent adding to BC's ranks at a steady pace.

To update our understanding of this vital industry, KPMG in Canada teamed with the BC Cleantech CEO Alliance for the third time to develop this BC Cleantech 2019 Status Report.

The objectives of the report are to benchmark the size and growth of the industry, assess change since our previous studies in 2016 and 2011, and provide valuable insights for evaluating, advocating, and monitoring the growth and development of the industry in BC.

Additionally, this report serves to identify actions and economic impetus that could further industry growth.

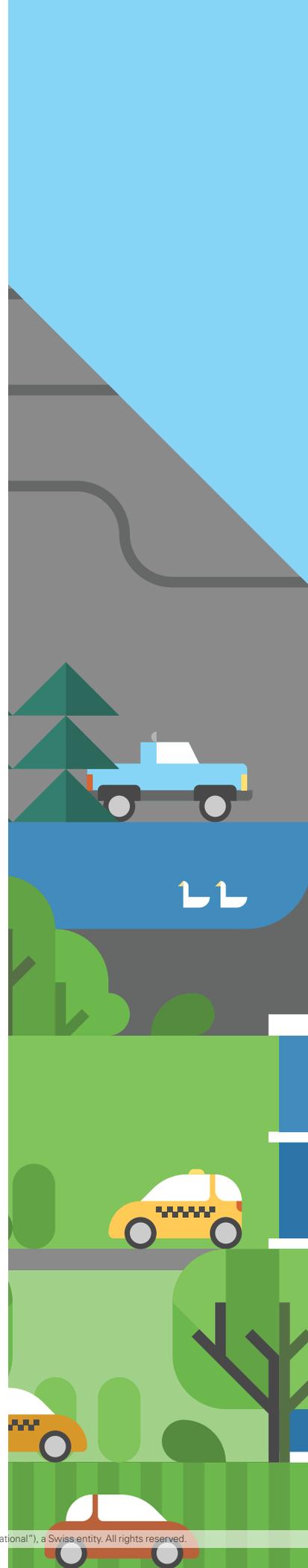
Survey Methodology

This status report has been developed based on an online survey sent to all active Cleantech firms identified in the province – 293 firms in total. The survey commenced in January 2019 and collected a total of 92 company responses.

The data presented is based solely on responses to the survey and has not otherwise been verified by KPMG. Total industry estimates were extrapolated from the survey data. For the purposes of this study, the definition of the Cleantech industry included firms with the primary purpose of developing new technologies related to clean energy production, transmission, storage, or use, and/or efficiency in energy or resource management and use. Early mainstream adopters or firms that generate power for sale, or that manufacture, service, implement, integrate, or consult solely with respect to technologies or systems developed by other firms are excluded from this definition.

Cleantech firms were identified through the review and integration of several relevant sectoral lists of firms. This industry identification process included reviewing the websites and placing telephone calls to many firms to verify their relevance to the Cleantech sector and their ongoing business operations.

Note: % ages presented in this report may not add up to 100% due to rounding and the opportunity to choose more than one answer to some questions.





Acknowledgements

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