



Conversations for
Responsible
Economic Development



Is BC poised to be the next tech hot spot?

.....
**Exploring the role of advanced technology industries
in BC's provincial economy**

Conversations for Responsible Economic Development

*Building informed discussion about long-term
prosperity on Canada's West Coast*

February 2015

About CRED

Conversations for Responsible Economic Development is a not-for-profit research organization focused on catalyzing dialogue about long-term prosperity on Canada's west coast. We bring together professionals, business leaders and academics from the tourism, real estate, tech, health, creative and other service-based sectors.

We love and value the west coast for its creativity, innovation, quality of life and unparalleled natural beauty. This is why we live, work and own businesses here. Our vision is for a prosperous and thriving region economy that safeguards our long-term wealth, the health of local communities, the natural beauty of the region and our "beautiful BC" brand. To us, this is true responsible development.

We believe there is a need for more information about the types of energy and resource development and transportation that are compatible with this vision. Through research and events, we hope to spur conversation about our long-term economic vision for the region – a dialogue that includes a wide range of industries. Where do we see the best opportunities for responsible development? What trade-offs are we willing to accept to create new jobs and grow our wealth? What risks are we unwilling to take? This report aims to contribute to that essential dialogue.

Businesses and organizations are invited to join the conversation at www.CredBC.ca/add-your-name

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Our team



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THE FUTURE OF BC'S TECH SECTOR

Executive summary

Canada's west coast is known for its natural beauty, quality of life and, increasingly, its spirit of innovation as knowledge-based industries move into center stage. Today, BC's high tech sector is a key driver of the provincial economy, creating over 84,000 high paying jobs and representing the third biggest part of our economy.

The spirit of innovation that led to this growth continues to drive the sector forward; three people can gather at an Internet cafe and using nothing more than free wifi, their laptops and their coding skills, rapidly prototype an idea or minimum viable product and push it out to an audience at scale. From this, Canada's own "maple syrup mafia" is building an empire of tech companies - creating value out of ideas, talent and a fast internet connection. Alongside these breakthroughs, technology manufacturing is growing in leaps and bounds as local companies pioneer solutions to some of our most pressing global challenges in areas from cleantech to quantum computing. Together, this is dramatically changing the playing field.

This report set out to answer the questions: How can British Columbia's tech sector contribute to a diverse and thriving regional economy? Does it lead or lag behind other provinces? What incentives are needed to find and support emerging tech companies? And how can technology companies be a force for social good? To write the report, we delved into the best available data and also spoke directly with over a dozen leaders across the sector, including support bodies, investors and company leaders.

Key findings

- 1 BC's tech sector is thriving.** It's growing at double the rate of the overall provincial economy, it supports 84,000 well-paying jobs and most of the sector has full employment. There are more jobs in the tech sector than in forestry, mining, oil and gas combined.
- 2 When tech grows, everyone benefits.** Overall, the tech sector is responsible for \$23-26 billion of BC's GDP and more than 165,000 jobs. Growth in the sector benefits the rest of the economy more than growth in primary resource industries.
- 3 The potential is huge.** If BC's tech sector caught up to the US average, it would create at least 65,000 more jobs and generate \$9.1b more in GDP. However, BC still lags behind other tech-producing provinces and the US, particularly in exports, jobs and overall GDP contribution.
- 4 More investments are needed.** Strategic government support, increased access to venture capital, investments in talent development, reduced barriers to recruitment, and increased support for regional tech hubs are needed to help BC achieve its potential.
- 5 Tech as a force for social good.** High tech innovations could help anchor a responsible economy and solve some of the most pressing problems of the 21st century at the same time. The growing cleantech sector is a great example of how tech can be a force for social good.

THE FUTURE OF BC'S TECH SECTOR

BC high tech sector snapshot

Tech sector overview

The numbers don't lie: BC isn't a resource-based province anymore. Initially founded by European settlers motivated by the riches of the fur trade, the city of Vancouver grew up around the booming forestry industry and much of the rest of BC was settled by mining prospectors looking to strike it rich. We can be forgiven for thinking that finding and exporting raw materials is in our DNA.

However, for the past several decades a quiet revolution has been taking place. These days, with more than four out of five British Columbians working in a service job,¹ a flourishing entrepreneurial culture and more small businesses per capita than anywhere else in the country,² it could be argued that ideas are our most lucrative trade. Even though the traditional resource sectors still play an important role in BC, it's clear that knowledge-based industries are moving into centre stage.

The thriving high tech sector is a prime example of this shift. It's currently the province's third largest sector and sixth largest employer, and it's growing at a rapid pace - double the rate of the rest of the provincial economy.³

Technology contributes more to BC's wealth and employment than all of the traditional resource-based sectors (oil & gas, mining, fishing, forestry and utilities) combined. Clusters of expertise in areas from visual effects to biotechnology have sprung up, mostly in Vancouver but increasingly in places like Surrey, Kelowna, Kamloops and even the Comox Valley. And it's easy to see why - it's more cost-effective to set up shop in Canada than the US, BC is time zone friendly to Silicon Valley, and the swim-and-ski lifestyle here is enticing to employees.

All this growth has been cementing the region's reputation as Silicon Valley North. A combination of homegrown start-ups such as social media management company Hootsuite, fuel cell company Ballard Power Systems, online dating site Plenty of Fish and security systems provider Avigilon - BC's fastest-growing tech company - together with new local offices for global leaders like Microsoft, Amazon and Facebook and the established presence of global start-ups like Slack are sustaining steady growth in the sector.

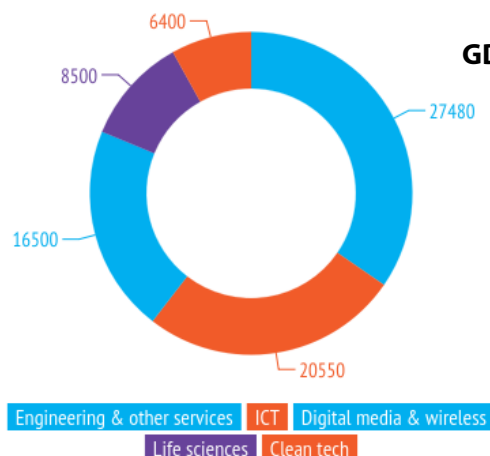
Defining the technology sector

The BC Technology Industry Association breaks high tech down into the following sub-sectors:⁴

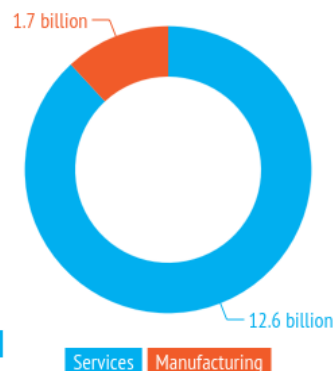
- Engineering and other services
- Information & communications (ICT)
- Digital media & wireless
- Life sciences
- Cleantech

The sector is often broken down into manufacturing and services industries. Manufacturing includes pharmaceutical and medicine, computer and peripheral hardware, navigational and guidance instruments. Service industries include video games, software, film, TV and video production, and geophysical surveying and mapping services.⁵

BC tech sector jobs breakdown



GDP breakdown



Source: BC Stats Profile of the High Tech Sector, 2013

THE FUTURE OF BC'S TECH SECTOR

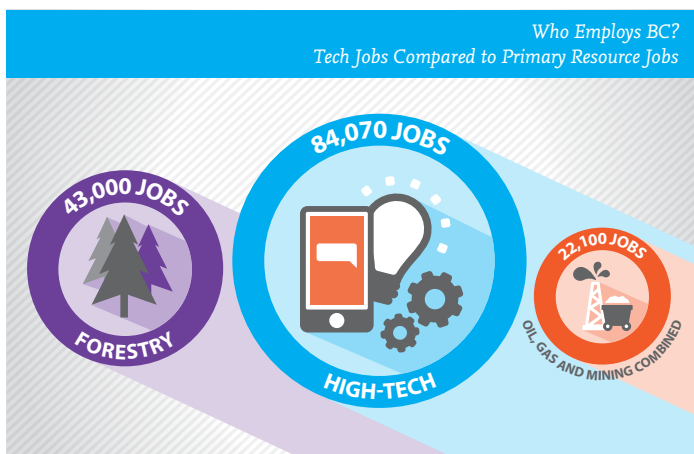
BC high tech sector snapshot

Direct economic benefits

High-paying, skilled jobs

The high tech sector is a significant source of employment in BC. Although job growth in 2012 was relatively flat, it still stands as the province's 6th-largest employer⁶ and the second-largest contributor to private sector jobs growth over the past decade.⁷

Most industries within the sector are relatively labour-intensive and rely on skilled workers, particularly high tech services, which make up the vast majority of the sector. In total, the high tech sector employs over 84,000 people - about 3.5% of BC's total workforce and more than forestry, mining, oil & gas, and utilities combined.⁸



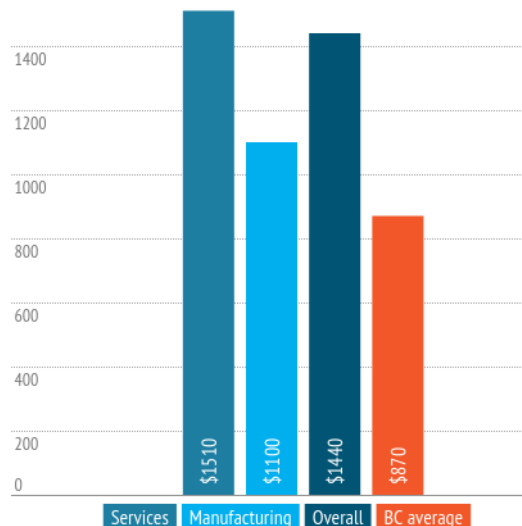
Wages within the sector are notably high and continuing to grow. In 2012, the average wage for a high tech worker rose to its highest-ever level at \$74,880.

Average weekly wages in the sector are \$1,440 compared to just \$870 for the average BC worker.⁹ As an example, the average starting salary for a web developer in Canada in 2012 was \$80,000.¹⁰

Size of the sector - by the numbers:

- There are over 9,000 tech companies with employees operating in BC. When businesses with no employees are included (representing self-employed entrepreneurs), there are over 40,000 tech companies in BC ¹¹
- 2012 saw the creation of 253 new companies
- 600 BC-based start-ups have received angel or venture capital investment over the last few years ¹²
- The sector is responsible for 7.6% of provincial GDP (which translates to \$15.5 billion annually)
- It currently represents 6.5% of BC's exports
- It's one of BC's fastest-growing sectors; the high tech sector has grown 12% since 2007, double the rate of BC's economy as a whole ¹³
- Both the service and manufacturing sides of the sector are growing, although services are far outpacing the production of tangible goods ¹⁴
- There is consistent full employment in the ICT and digital media industries ¹⁵

Tech sector average weekly wages



Source: BC Stats Profile of the High Tech Sector, 2013

THE FUTURE OF BC'S TECH SECTOR

BC high tech sector snapshot

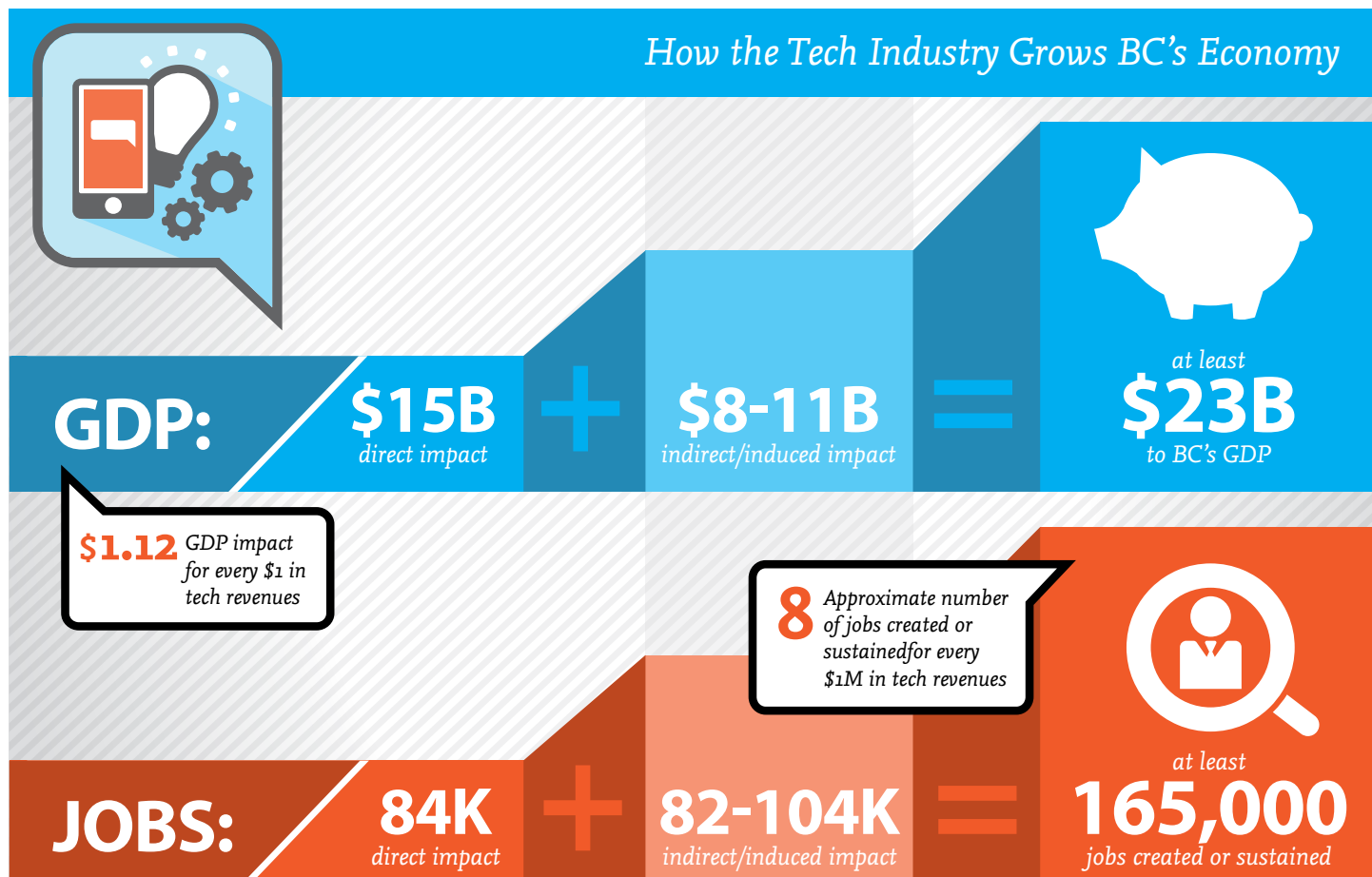
Contributions to economic growth

Beyond the direct benefits of jobs and wealth creation, technology companies are providing important benefits to BC on a wider scale. Each time a tech company works with a local supplier, shipper, consultant or customer, it's helping to spread wealth throughout different parts of the economy, causing what's known as a multiplier effect. These wider effects are measured by adding indirect and induced impacts to a sector's direct GDP and employment numbers.

According to KPMG's 2014 tech sector report card, each additional dollar in tech sector revenues leads to an overall impact on provincial GDP of \$1.12.¹⁶

Since this multiplier is much higher than other sectors - for example, the construction, forestry, and oil, mining and gas sectors all have a GDP impact of less than \$.90 per dollar of revenue - it would be wise to make investments in our high tech sector. One thing is clear: growing our tech sector creates more jobs and wealth throughout the economy than growth in oil, mining or gas.

While the tech sector's direct impact on the economy is already significant, the total impact is even more impressive - it's responsible for \$23-26 billion of BC's GDP and creates or sustains more than 165,000 jobs.



THE FUTURE OF BC'S TECH SECTOR

BC high tech sector snapshot

The face of BC's growing tech sector

Google 'Vancouver tech start-ups to watch' and you'll find an almost endless list of results. Throughout the ICT, clean tech, digital and life sciences industries, there is no shortage of emerging tech companies that could all be the Next Big Thing. This list can only give a very small taste of the depth and breadth of BC's thriving tech sector, both within Vancouver and beyond.

D-Wave Quantum Computing Company

If this Burnaby-based company can deliver on its promises, it'll be responsible for the most exciting computing innovation in a long time - by far the world's most powerful computer. Powered by quantum physics, D-Wave is hoping to revolutionize the speed at which computers can solve problems, effectively leapfrogging existing Artificial Intelligence systems. D-Wave is still relatively new and, some say, still untested - it released its first system in 2010 and its second model in 2013, and it hasn't proven to outsiders that it's actually employing quantum technologies. However, some of the world's biggest players are betting on its success - Google, NASA and Lockheed-Martin are among its early customers. And as of July 2014, the company had raised a round of investment totaling \$160 million.¹⁷

Plenty of Fish

The world's first free online dating site has come a long way from the start-up run out of founder Mark Frind's basement in 2003. Today, Plenty of Fish employs 75 people in downtown Vancouver and has the distinction of being one of the world's largest online dating sites. The company seems to epitomize the tech start-up dream: it earns a hefty profit entirely through ad revenue, and the founder boasts of not working more than 10 hours a week. It's managed to stay relevant as new competitors joined the marketplace, developing a successful mobile app that now accounts for over 70% of all site traffic.¹⁸

TZOA wearable environmental tracker

At this year's consumer electronics trade show, wearable technologies were all the rage. This bodes well for local start-up Clad Innovations, which is currently developing a wearable device that tracks air pollution, UV radiation and even temperature and humidity. Through its users, it also produces a crowd-sourced map of environmental data so users can choose the cleanest bike route or park. Clad Innovations was founded in 2013 and despite being approximately \$35,000 short of its crowd funding goal in December 2014, it's moving forward with development. Its uphill battle for funding seems to be reflective of the challenges many local startups are facing.¹⁹



Photo credit: TZOA Facebook page

Avigilon security systems

Avigilon is one of the fastest-growing tech companies in Vancouver. Named Canada's fastest-growing company by Profit 500 in 2013 and 2014, it designs and manufactures high-resolution video surveillance systems, used worldwide in airports, casinos, public transit and stadiums. The company's stock has fluctuated on the TSX, and has been the object of speculation by analysts due to its quick pace of growth and run of spending acquiring companies and patents. However, the company shows no signs of slowing down; CEO Alexander Fernandez says he plans to hire more salespeople and eventually build manufacturing plants in Brazil and China.²⁰

THE FUTURE OF BC'S TECH SECTOR

BC in comparison to other markets

How is BC lagging behind?

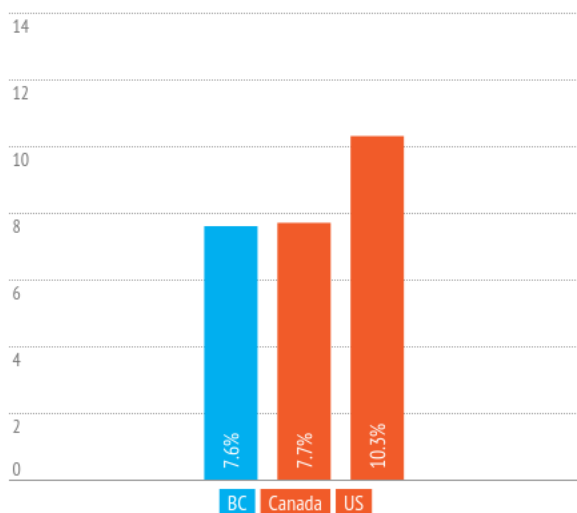
Where is BC under-performing?

In the past two years, BC's high tech sector has just about caught up with other provinces in Canada; however, it's still lagging behind the US and the major technology-producing provinces of Ontario, Quebec and Alberta in both jobs and revenue per capita. The American tech sector is 30% bigger than in BC, representing over 10% of the country's GDP.

Exports

Products and services created by the tech sector are in general highly mobile, so the industry is well placed to become a significant exporter. In Canada, on average 40% of all tech products and services are exported outside the country. In BC this is just 28%. Even though the tech sector is responsible for 6.8% of BC exports – a significant amount – this proportion has been declining over recent years, as tech exports grow more slowly than other sectors.²¹

High tech as a percentage of overall GDP



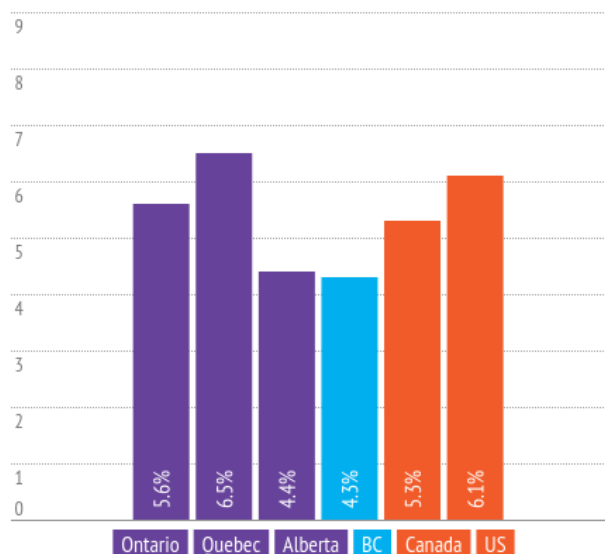
Source: BC Stats Profile of the High Tech Sector, 2013

Wages and jobs

Right now, 11% of Canada's high tech jobs are in BC, compared to 41% in Ontario, and employment growth has been relatively flat since 2009. Although many leaders in the sector report that the number of jobs has been rising again since 2012 (the last year for which data is available), there isn't any data yet to support that anecdotal evidence. Compared to Ontario, Quebec, Alberta and the US average, employment growth in BC is lackluster.

In BC, tech sector wages are on par with Ontario (and above the Canadian average), but trail Alberta and the US. This differential means that even though wages are relatively high in BC, it is still attractive for global tech companies to set up offices here because employees in BC are cheaper than in the US.²²

High tech jobs as a percentage of overall employment



Source: BC Stats Profile of the High Tech Sector, 2013

THE FUTURE OF BC'S TECH SECTOR

BC in comparison to other markets

Why is BC lagging behind?

The reasons BC hasn't reached its full potential yet are no secret - most people who follow the industry closely will list the same main barriers. In 2012, the BC Technology Industry Association (BCTIA) collaborated with consultancy KPMG to measure the progress of the tech sector and develop a plan to help it thrive. In late 2014, an updated Tech Sector Report Card was released. Its main conclusion was that while the sector has made leaps and bounds in many areas, key gaps remain, particularly in access to talent and venture capital. But what's behind each of these challenges?

Not enough early-stage investment

Lack of investment capital is still the biggest barrier facing growing tech companies. Without the funds to grow, companies will stagnate. The venture capital community in Canada is small, and the pool of local funds in BC is even smaller. There are a good number of supports in place for early stage start-ups, but as soon as a company needs to make significant capital investments, but isn't yet turning a profit and able to access mainstream loans, it hits roadblocks.

Manufacturing companies face particular challenges because they need access to patient capital - in many cases, they need high capital investments before they can even prove their model or manufacture a prototype.

Foreign venture capital is starting to flow, but there are risks with this too. According to KPMG, an over-reliance on foreign investment makes successful companies more likely to relocate to other jurisdictions.²³

"In our pre-commercialization stage we were more likely to go to the US to find investors who were willing to look more long term, take on more risk, and access bigger pools of capital. Silicon Valley investors can hold their investments for a decade or more." - Warren Wall, D-Wave

Talent and recruitment challenges

According to the tech leaders we interviewed for this report,²⁴ Canada spends far fewer public and private dollars on training - both in education and on-the-job - than other countries, and this level of spending is only decreasing over time. As a result, it can be difficult for companies to hire local talent, particularly for specialized roles like distributed wind manufacturing or quantum engineering.

Bringing in talent from outside Canada is even more challenging. It's always been difficult for companies to attract middle and senior management to Vancouver - a city with a notoriously high cost of living and low wages compared to US levels, and recent changes to immigration laws have only made things harder.

Industries in need of specific skills, in particular visual effects, film and TV and R&D-heavy companies, are really feeling the impact of changes to the Temporary Foreign Workers program. There is concern from many in the sector that the Federal government is lumping tech workers into the same category as restaurant and mine workers, when those sectors don't rely on access to highly specialized talent from around the world. According to the Vancouver Economic Commission, one highly qualified international hire might enable a project that creates 75 local jobs, and some local sub-sectors have already lost tens of millions in contracts as a result of these changes.

THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

Closing the gap through tech hubs

One way to grow BC's tech industry is to follow Vancouver's example and invest in more regional hubs. Clusters are already beginning to emerge in locations across the province from Surrey to Kelowna; however, they're all relatively nascent. If these emerging hubs can offer collaborative workspaces, practical support for start-ups, collective marketing opportunities, and training programs to develop a more skilled local workforce, they could have a big impact on the sector's overall output.

Vancouver, the original BC tech hub

Vancouver has been known as a fertile ground for tech innovations since the early nineties, when the start-up scene began its steady growth. Its tech ecosystem is currently ranked one of the top 10 in the world. From the proliferation of accelerator programs like GrowLabs, Wavefront and Launch Academy, training programs like Lighthouse Labs and municipal incentives like the City of Vancouver's highly publicized deal with Hootsuite to find affordable office space in the city, there's no shortage of support for tech companies trying to get a start here. Much like Vancouver looks to Silicon Valley and San Francisco for inspiration, other aspiring tech centres in BC can learn a lot from Vancouver's model.

The City of Vancouver has prioritized tech and, in particular, cleantech as a strategically important sector. As a result, fast-growing tech companies can access targeted support to help them stay in Vancouver as they grow - often through help finding the right real estate.

The Vancouver Economic Commission invests in global outreach to build the brand of Vancouver as a tech hub on the world stage. Goals include encouraging international businesses to set up local operations, bringing in more venture capital, and encouraging talent from Canada and abroad to relocate to Vancouver. Selling points include the low corporate tax rate, competitive wages, the ski and swim lifestyle, time

zone compatibility with Silicon Valley, and location within a strong start-up ecosystem.²⁵ The proliferation of co-location spaces is also important - they're places where companies can continually get inspired, learn from each other, and problem-solve together.



Launch Academy's Demo Day. Photo credit: Kairos Exposures

The role of local government

Although the most substantive funding comes from the provincial and federal level, cities can raise the profile of their local tech sector at home and abroad, help connect start-ups with space - ideally collaborative spaces - and set and promote a vision for the future of the sector. Former Surrey Mayor Dianne Watts worked hard to sell a vision of Surrey as a leader in health innovation and cleantech, and thanks to her efforts, "innovation boulevard" is becoming a reality.

Local government can support accelerator programs and make sure that they're partnered with investments in training, so that emerging start-ups are run by people with the right talents and hard skills.²⁶ And lastly, practical supports - like New Westminster's investment in fibre optic cables for super high-speed internet through the city - shouldn't be under-estimated.

THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

Tech hubs beyond Vancouver

In order for BC's tech sector to reach its potential, regional hubs throughout the province need to leverage the same level of support that Vancouver has received. The BC Innovation Council has been instrumental in starting to bridge this gap. A successful hub and spoke model could see these centres connected to Vancouver in the same way that Vancouver is connected to California, learning from the more established market while taking unique contexts into account, and together showcasing BC's innovation on a global stage. Although some of the factors that make Vancouver's ecosystem successful will be hard to replicate across BC, there are advantages to being located outside an urban centre that's been voted the second most unaffordable city in the world. Investing in regional tech centres also has the benefit of creating high-paying, skilled jobs in rural and more remote communities, giving local talent an opportunity to stay instead of fleeing to the city.

Surrey's growing cleantech focus

The October 2014 launch of the Foresight Cleantech Accelerator marks the first program of its kind in Western Canada.²⁷ Even though the BC Innovation Council has funded about a dozen regional tech hubs throughout the province, the others are all focused on IT or biotechnology, and none on cleantech specifically.²⁸

Foresight's CEO, Neil Huff, calls attention to the unique needs of cleantech manufacturers. They're developing materials, hardware and systems, so they need much more than a laptop and a desk to be successful. They generally have longer development times, longer market cycles and higher capital requirements. They also can't be as iterative as IT companies, because of the high cost of prototypes, so they need to develop their products in tandem with vigorous customer consultations, getting things right the first time around. Foresight currently incubates 22 companies across four product types: waste to value, advanced materials development, energy and energy efficiency, and smart technology.

Kelowna's Okanagan Centre for Innovation

Although the Okanagan's tech sector is small compared to Vancouver, it's economically significant for the region: a report released in January 2015 by Accelerate Okanagan found that the sector is worth \$1.02 billion to the local economy and sustains over 6,500 jobs.²⁹ The region also boasts a proven track record of successful technology companies, including Club Penguin, Vineyard Networks and StarDyne Technologies.³⁰ Hoping to build on this foundation, the City of Kelowna broke ground on a new high tech centre, the Okanagan Centre for Innovation, in late 2014, which aims to help incubate budding tech start-ups.³¹

Victoria aka "Tecktoria"

According to the Mid-Island Science, Technology and Innovation Council, Vancouver Island has more than 1,200 high technology firms.³² The Victoria Advanced Technology Council has recently valued its local tech sector at \$3 billion and noted that there are 900 tech companies in Greater Victoria employing over 13,000 people. In March 2014, VIATeC invested in a new start-up incubation space in downtown Victoria with the goal of further accelerating this growth.³³



Photo: Victoria Island Technology Park



THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

The burgeoning cleantech sector

Supporting BC's growing cleantech sector is another way to help the province meet its full potential. The government defines the 'clean economy' as including clean energy supply and storage, clean transportation, green building and energy efficiency. Together the industry was responsible for 123,000 jobs and \$15 billion in GDP in 2011 - about equal to the number of jobs created in tourism, and six times the number of BC jobs in oil, mining and gas.³⁴

A 2014 report by Analytica Advisors echoed this trend – reporting that the more narrowly defined clean tech sector was responsible for 41,000 jobs in 2012, with revenues increasing nine percent over 2011. Compared to the oil, mining and gas sector, which grew less than one percent over the same time period, this is highly significant. One company alone – Ballard Power Systems – employs 420 people in its Burnaby offices.³⁵

What is needed to grow the sector?

Public policies and programs have supported this recent growth, in particular B.C.'s Greenhouse Gas Reduction Targets Act and the Carbon Tax, and BC's cleantech sector is still one of the most vibrant in Canada.³⁶ More than \$24 billion has been invested in clean energy since 2009, with the majority of provincial investments going to solar and wind power in Ontario and Quebec, and hydro power in BC.³⁷

However, the sector is still new and vulnerable to risk. Barriers include trouble finding skilled workers and lack of investment capital.³⁸ A 2011 KMPG cleantech report noted that the sector could benefit from more investment in R&D, demonstration projects, and early adoption incentives. There was actually a significant drop in venture capital investment in the sector from 2012-2013.³⁹ And finally, a recent Clean Energy Canada report underlines the need for greater federal support to push the sector into maturity.

Defining the cleantech sector

Because this sector is still new and rapidly evolving, there is no definitive definition of a cleantech job. What is clear is that cleantech companies are diverse, serving a wide range of needs from energy storage to cleaning up contaminated soil, and from renewable energy to green consumer products. According to a 2012 Globe Advisors Clean Economy report,⁴⁰ right now the major cleantech areas in BC include:

- Biofuels and biochemicals
- Power generation
- Energy infrastructure
- Green building and energy efficiency
- Process efficiency and abatement
- Remediation and soil treatment
- Transportation
- Recycling
- Waste and recovery
- Water and wastewater

Some analysts also include green consumer products as a major cleantech area.⁴¹

The same GLOBE report noted that BC is leading the way in lithium-ion batteries as back-up power for telecoms, ultra-efficient fiberglass windows and doors, and intelligent transportation systems.



THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

BC's cleantech companies in action

General Fusion

One certainly can't accuse General Fusion of a lack of ambition. According to VP Michael Delage, the Burnaby-based clean energy company is hoping to succeed at one of the most technically challenging tasks that humanity has ever tried to do. If successful, they'll have found a nearly unlimited source of clean energy, rendering fossil fuels obsolete in one fell swoop. Founded in 2002, the company secured its first round of venture capital funding in 2009 and now numbers around 60 staff. Its team is working to build a prototype fusion energy system this year, with hopes of a fully functioning reactor by 2020.⁴²

Corvus Energy

This Richmond-based company designs and manufactures high power lithium ion energy storage systems for use in heavy industrial applications throughout the world. Corvus Energy was named one of Canada's tech companies to watch by Deloitte in 2014.⁴³

Solegear Bioplastics

Founded in 2006 in Vancouver, this company produces and distributes high-performance plant-based plastics, such as bioplastic pellets, sheets, and finished goods for rigid packaging and durable products. Solegear received \$1.6 million in funding from the federal government this past summer and won the Best Emerging Technology 2014 award from the Globe Foundation.⁴⁴

Powertech Labs

A subsidiary of BC Hydro specializing in clean energy consulting, independent testing and power system solutions, Powertech Labs operates the only hydrogen refuelling station in the lower mainland that can fuel the equivalent of a full tank. Powertech also tracks over 350 of BC's 550 public electric charging stations.⁴⁵

Endurance Wind Power

In 2007, Glenn Johnson, a Surrey resident, founded Endurance Wind Power. Less than 10 years later, his wind turbine manufacturing and energy generation business employs just under 200 staff. Around 80 of these are based in Surrey, where its head office is located. Endurance manufactures and sells turbines for homeowners, businesses, and institutions around the world. The company's success is all the more impressive considering Canada's almost non-existent domestic market for wind turbines - cheap electricity prices throughout most of the country have hindered the growth of wind power.

Even though it exports the majority of its turbines, Endurance has no plans to leave Surrey anytime soon. In an interview for this report, Endurance representative Randeep Dosanjh noted that early investment and ongoing support from Export Development Canada has been crucial to their success, allowing the company to remain in Canada while doing business abroad. They've also opened an office in the UK, where they manufacture another line of turbines.⁴⁶



Photo credit: Endurance Wind Power

THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

Closing the gap: expert recommendations

In addition to supporting more regional tech centers and helping cleantech companies thrive, the industry leaders that we interviewed for this report had concrete suggestions for how BC can catch up to Alberta, Ontario, Quebec and our American counterparts. Proven government support programs can be protected and expanded, immigration laws can make it easier for companies to hire talent from abroad, training programs can be expanded and access to capital can be improved.

Developing local talent

The tech sector as a whole has full employment, which means that few engineers or developers are actively looking for work. As a result, training homegrown talent and attracting promising talent from outside Canada should be a priority. The success of initiatives like the HTML 500, an annual free mass learn-to-code event, has proven the demand for these types of skills.

More companies could take a similar approach to Hootsuite and place a large emphasis on training and skills development. Workers can also take advantage of the world-class training opportunities typically offered by the global companies that are opening up offices here. And the government could be quicker to support new educational programs that are teaching people the hard skills needed to thrive in the sector. Students in these programs would benefit from access to student loans, government funding and scholarships.

Making skilled worker recruitment easier

Changes to the Temporary Foreign Workers program have had a big impact on companies' abilities to bring in the specialized skills they need to thrive. One potential solution would be to create a special fast-tracked visa category for high tech workers to enable easier recruitment and entry into Canada.

Improving access to private capital

There are signs that venture capital and private equity funding is starting to flow more quickly into Vancouver, but the market is still uncertain and the local pool is small. There was just \$97 million of venture capital invested into the BC tech industry in 2014, compared to \$201 million of angel funding.⁴⁷ In addition to this, large Canadian companies with corporate venture capital arms, for example Telus and Cenovus, are still the exceptions to the rule. More venture capital arms, along with support for local early stage investors like Chrysalix and HIGHLINE (formerly GrowLabs), would help keep successful start-ups from leaving BC.

The government can also play a role in encouraging more venture capital investment. For example, programs like the Small Business Venture Capital tax credit (VCC), which help make equity investments more attractive to local investors, could be expanded and made even more powerful.

Mid-stage companies that are still in the R&D stage and are not yet profitable should also be able to access bridging financing more easily. Private sector bridging capital is available, but at very high interest rates. One solution would be to allow companies to take out small businesses loans against government tax credits at a reasonable interest rate.

"Tech start-ups in BC benefit from strong early stage funding but suffer from a scarcity of middle to late stage funding. While a few lenders are profitably focusing on innovative ways to bridge the capital gap, like factoring SR&ED tax credits, institutional lenders like BDC could be supporting this critical capital phase with similar programs at more favourable terms." - Matthew Quetton, Momentum Venture Partners

THE FUTURE OF BC'S TECH SECTOR

Approaches for bridging the gap

Closing the gap: expert recommendations continued

Provincial government initiatives

The BC government's recent creation of a Ministry of Technology Innovation and Citizens' Services signalled the increasing importance of this sector to British Columbia's economic well-being. However, concrete initiatives to support the growth of the sector could be strengthened. When asked about the most important provincial initiatives that support the tech sector, the industry leaders interviewed for this report overwhelmingly mentioned the importance of the BC Innovation Council, which supports a network of accelerators throughout the province. Many recommended that the BCIC be given more capacity and funding to expand its work.

Many companies attributed their early successes to the availability of industry-specific provincial tax credits, like the gaming industry's Digital Media Tax Credit. Others commended the BC Carbon Tax and recommended that it be maintained, and that profits get funnelled into innovation in the energy sector. In a low oil cost environment, this kind of initiative would make an even bigger impact.

Federal government support

The Canadian high tech sector has grown to where it is today because of effective federal government investments. The Scientific Research and Experimental Development tax credit (SR&ED) was universally cited as the most high-impact government initiative that helps the growth of the tech sector. This tax credit against R&D spending allows companies to use the regular cash injections they receive from SR&ED to make strategic investments in the growth of their companies.

Other programs are also clearly making a positive impact on the sector as a whole. Sustainable Development Technology Canada (SDTC), the Industrial Research Assistance Program (IRAP), Export Development Canada, the Natural Sciences and Engineering Research Council of Canada (NSERC) and Western Economic Diversification Canada are all stepping in to fill sector-wide financing gaps. However, these programs could all be strengthened and remaining gaps could be filled; for example, the cleantech sector would benefit from a federal price on carbon and from the renewal of the now-lapsed Integrated Clean Energy Fund.

Strategic government investments

The Canadian government could employ a similar model to the one used by the US Department of Energy and make sector-specific strategic investments. When the DoE announces big investments in, for example, solar technologies, this acts as technical due diligence for other investors and makes the sector significantly less risky, attracting new investment. Sustainable Development Technology Canada might be well-suited to play a similar role in Canada. According to Warren Wall, COO of D-Wave, the field of quantum computing is one example where strategic government support would be highly beneficial. Right now, Canada is 5-10 years ahead of the rest of the world in this cutting-edge industry and, as a result, investments today in quantum technologies and supporting university programs could help to establish an industry that is the best in the world.

THE FUTURE OF BC'S TECH SECTOR

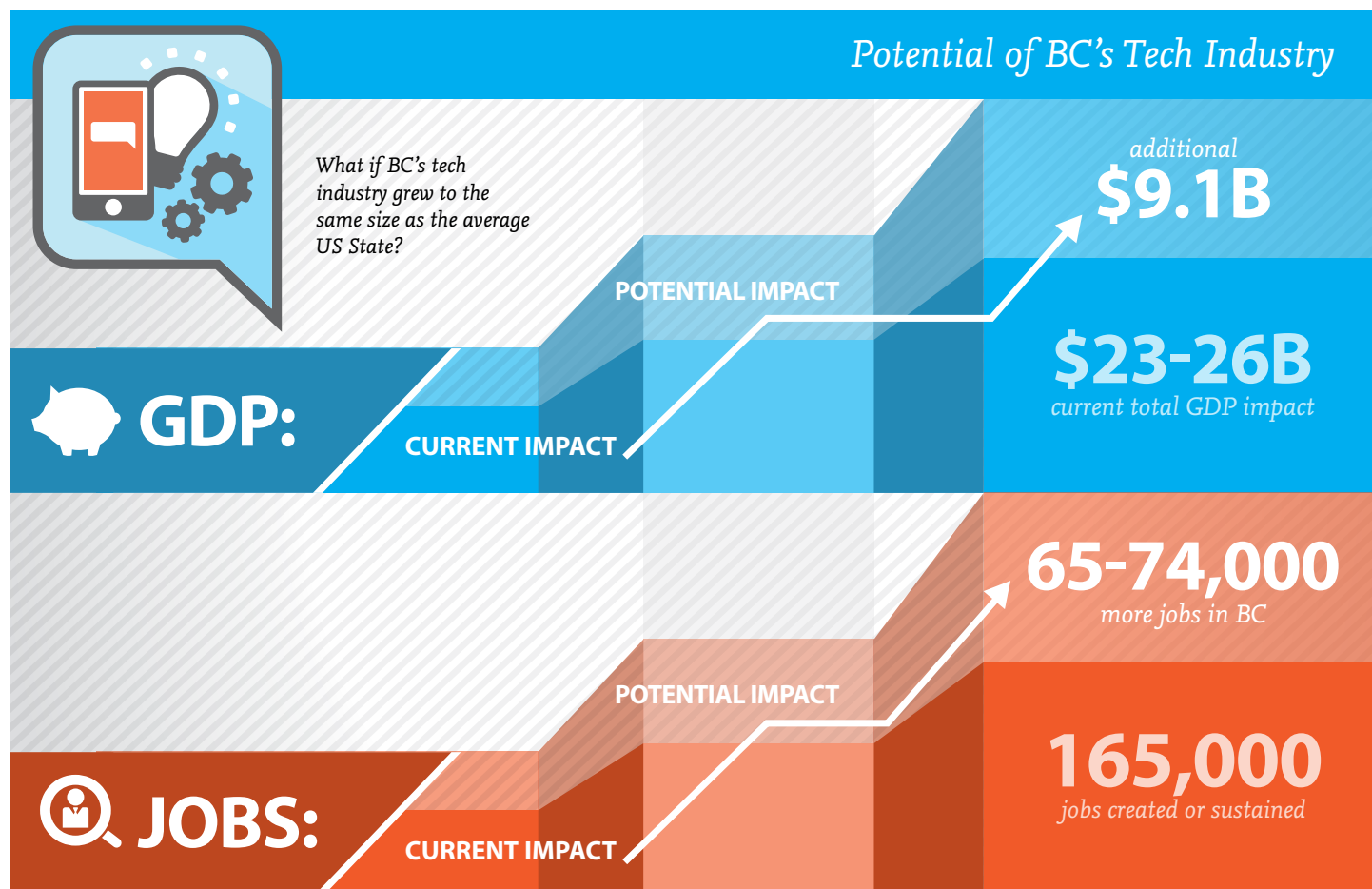
Approaches for bridging the gap

Benefits of closing the gap

What would happen if BC caught up to the US?

The same KPMG study that has been mentioned throughout this report found that per dollar of output, the tech sector has a greater effect on the overall economy than a dollar of growth in the forestry, mining, oil and gas or construction sectors. When the tech sector grows, the rest of the economy grows significantly.

The study found that if BC's high tech sector caught up to the US average, we would see 65,000-74,000 more jobs and an additional \$9.1 billion in GDP. These numbers are significant, and a good reason to address the challenges that have been clearly identified and support strong growth in the sector.





THE FUTURE OF BC'S TECH SECTOR

Which way forward?

The tech sector as a force for social good

Benefits to British Columbians

It's clear that a thriving high tech sector is beneficial to British Columbians. In addition to supporting over 80,000 direct and 165,000 total jobs - many highly skilled and well-paid - growth in the sector has a greater positive impact on other parts of our economy than oil, mining and gas, forestry or even construction. This indicates that investments in high tech industries will reap more benefits for the overall economy than investments in oil, mining or gas. As a general rule, the tech sector also weathers boom and bust cycles better than primary resource sectors.

Additionally, the tech sector has the potential to be the cornerstone of a diverse and resilient regional economy. While non-renewable resources become increasingly scarce over time, the solutions generated by the knowledge economy often become more abundant and affordable over time. Within knowledge-based sectors, it's also possible to generate solid economic growth without risking the assets that safeguard our quality of life - our beautiful coastline, stunning biodiversity, and everything else that beautiful BC has to offer.

Solving global problems

From fusion energy to health breakthroughs, homegrown companies are working to address some of today's most pressing social challenges. The cleantech industry in particular is a great example of responsible economic development. It's clear that the sector is a strong job creator and an important part of our export mix. It also has the potential to explode in size given the right level of investment. Considering this, it might be wise to make deeper public and private investments now in promising local cleantech companies.

Building for the future

The sector as a whole is still relatively new and it's not yet certain exactly how it will develop. Compared to Silicon Valley, Vancouver does seem to exhibit more of a social innovation spirit, possibly because the lack of billion dollar venture funds translates into far less pressure to grow big and sell.

"Can Vancouver declare its interest in being a tech city focused on solving the problems of the 21st century and then get people attached to that vision? If so, making a profit becomes a nice byproduct instead of the main goal." - Jonathan Dowdeswell, Blackbird Interactive

However, questions remain about how fast-growing tech companies can be good neighbours as they move into established communities, rather than contributing to skyrocketing rents and pushing out local businesses. How can global companies be incentivized to stay and put down roots rather than hire talent and leave? How can industry leaders and new start-ups alike be encouraged to develop products and services that meet the biggest challenges of the 21st century? How can we grow leaders who will invest in strengthening the local ecosystem?

Now, while the sector is still young, is the most important time to be asking these questions and thinking critically about how to shape it for the better. If technology can be the cornerstone of a responsible economy, we should do everything in our power to build the most resilient, locally rooted and globally innovative tech sector that we possibly can.

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