



LAB. **TANTALUS** LTD.

INTO THE LIGHT
GREENHOUSE CANNABIS CULTIVATION
IN BRITISH COLUMBIA



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Executive Summary

The legal cannabis industry is one of the most promising nascent industry opportunities in Canadian history. British Columbia has the highest rate of support for the sector in the country, but its businesses are being left behind. 24 of the 41 legally regulated cannabis cultivation sites under the federal Access to Medical Cannabis Regulations (ACMPR) are situated in Ontario. These 24 sites make up 90% of the square footage legally designated to the production of cannabis.

Greenhouse cannabis cultivation on BC's Agricultural Land Reserve (ALR) offers an environmentally friendly, economical, and secure way to reverse this trend and help ensure the safety and prosperity of communities in the province. Despite this opportunity, a diverse patchwork of local bylaws is hampering the growth of an industry which could supply the province with as many as 15,000 new jobs in year one, with wages in excess of \$620 million. This industry also brings benefits in the form of tax, growth of ancillary industries, and by driving out dangerous and unregulated black market producers.

Concerns of local politicians and residents to Licensed Producers are largely due to confusion between Licensed Producers and illegal grow operations. Concerns of local residents have not been borne out by the construction and operation of legal greenhouse Licensed Producers in their area. While public conversations on cannabis cultivation continue to linger on the negative repercussions of illegal grow ops, opportunities to progress the dialogue on legal cultivation to topics such as sustainability, environmental consciousness, positive social impact, or even economic potential are frustrated.

Indoor cannabis cultivation is an environmentally, agriculturally, and economically irrational practice, borne out of the plant's clandestine history. This is in stark contrast to the best practices of other greenhouse agricultural sectors, in which BC specialises. Indoor cannabis cultivation under lights is one of the most wasteful forms of agriculture, using up to 2% of the electricity of British Columbia. Converting to greenhouse agriculture could slash energy consumption from cannabis cultivation activity by as much as 90%.

This new industry presents a unique opportunity for political and economic leadership. As the market establishes itself there will be a substantial first mover advantage to early policy action facilitating operators in the local market. British Columbia is placed to lead the legal cannabis industry in both quality, environmental, and industry standards. No other province has the same combination of skills, infrastructure, reputation and potential.

Stringent federal regulations have meant that only 41 of over 2,000 applications under the Access to Cannabis for Medical Purposes Regulations (ACMPR) have been granted. As well as federal requirements, provincial guidance gives discretion to municipalities to control many aspects of Licensed Producers. In addition to these safeguards and protections, this report provides a number of additional proposed guidelines to protect communities and the environment, prevent crime, and facilitate the growth of a mutually beneficial industry.

Policy aims can be achieved, among other measures, through the facilitation of Licensed Producers on the Agricultural Land Reserve, business licensing, strict adherence to federal and provincial regulations, prohibition of dispensaries at cultivation sites, and measures to reduce light, air, and odour pollution.



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01

THE NEXT
GREAT
BRITISH
COLUMBIAN
INDUSTRY



State of the Market

Canada has set off on a bold new path to legalize, regulate and restrict access to cannabis. Recent reports state that the Canadian Government is shortly due to announce that the adult use cannabis industry will be operational by July 1st, 2018.¹ This will provide for the 19% of adult Canadians (approx. 6.5m people) who use cannabis recreationally.² Deloitte recently predicted the new base market will be worth \$4.9billion to \$8.7billion with a potential upside to the Canadian economy of \$22.8billion.³

Until the recreational market is legalised, and despite the rapid growth of the medical market,⁴ the majority of demand for cannabis in Canada continues to be met by the illegal market. Estimates vary, due to the clandestine nature of the illicit market, but the illicit BC market is estimated to be worth \$2.7billion.⁵ 85% of that black market has been estimated to have some connection to organised crime groups, although this topic is hotly debated due to a lack of consistent data.⁶ Social costs of this predominantly criminal market include nontaxable incomes, associated violence and criminality, and products of dubious purity, potency, and provenance.

Over the next few years, Canada will undergo a rapid shift towards supplying a growing subset of Canadian cannabis consumers with legal, regulated, and controlled cannabis of verifiable purity, potency, and provenance. With this shift will come tax revenue, benefits to local economies in the form of jobs, increased revenue for related industries, and safer products.



ONTARIO HAS 90% OF CANADA'S LEGAL CANNABIS PRODUCTION FT²

Despite its favourable climate and international reputation for cannabis production, only 9 of the 41 licensed producers are based in B.C.

Ontario's 24 licensed producers are driving 90% of the national legal cannabis production.

1 Liberals to announce marijuana will be legal by July 1, 2018 (CBC News, 26th March, 2017) <http://www.cbc.ca/news/politics/liberal-legal-marijuana-pot-1.4041902>

2 <http://poll.forumresearch.com/post/2531/in-canada-8-in-10-drink-half-gamble-one-fifth-smoke-pot/>

3 Deloitte, Recreational Marijuana Insights, 2016

4 Focus Report: As High As The Rockies – The Canadian Marijuana Opportunity (Mackie Research, April 8, 2016) http://www.theglobeandmail.com/globe-investor/investment-ideas/research-reports/article29573050.ece/BINARY/Medical%20Marijuana_4-8-2016.pdf

5 D. Werb et al. / International Journal of Drug Policy 23 (2012) 436– 441

6 Organized Crime Agency of British Columbia's Annual Report (2001); RCMP Criminal Intelligence Directorate (2008)



It is our aspiration that British Columbia will play a central role in the formation of this new industry. However, at the time of writing, 24 of the 41 legally regulated cannabis cultivation sites under the federal Access to Medical Cannabis Regulations (ACMPR) are situated in Ontario. These 24 sites make up 90% of the square footage legally designated to the production of cannabis.⁷

Despite the longstanding cultural significance of cannabis in British Columbia, the fact that an estimated 40% of Canada's illegally produced and consumed cannabis originates in the province,⁸ and its favourable climate and international reputation for cannabis production, only 9 of the 41 currently Licensed Producers of medical cannabis are based in British Columbia.⁹

In Pursuit of Clarity

The production of cannabis in Canada and the many facets of both illegal and legal cultivation create a confusing landscape for the public and policymakers alike. A growing number of Licensed Producers provide medical grade flowered cannabis and select cannabis derivative products like cannabis oil to patients. Many more companies are awaiting a licence to cultivate cannabis for the medical market, often with an eye on expanding to the wider adult use market in due course. Additionally, medical cannabis patients may choose to grow their own cannabis at home. The illegal trade continues to flourish through dispensaries, which source their cannabis from illegal grow operations and offer a diverse range of unregulated products.

The line between legal homegrown medical cannabis and illegal grow ops is often blurry. The illegal trade through unregulated dispensaries is tolerated, particularly in British Columbia. The legal medical cannabis industry has aimed to differentiate itself as clearly as possible from its illegal counterpart, through scrupulous adherence to stringent regulations drawn up by Health Canada, and the adoption of the quality control measures afforded by a regulated market. Despite this, regulated and unregulated cannabis production are still frequently confused.

The lack of visibility of the legal industry, while generally considered a positive development by legislators, contrasts with that of illegal grow ops. In spite of their own aim to remain undetected, both by the public and authorities, far too often these illicit operations find themselves in the news. Such is the dominance of the public narrative on the illegal operations and their negative impact on communities, that the legitimacy of Licensed Producers is undermined simply through a lack of understanding and mistaken identity. While public conversations on cannabis cultivation continue to linger on the negative repercussions of illegal grow ops, opportunities to progress the dialogue on legal cultivation to topics such as sustainability, environmental consciousness, positive social impact, or even economic potential are frustrated.

With the Canadian cannabis industry in flux, and the regulation of adult use fast approaching, it may seem like the easiest solution for policymakers to this newly legal industry is to shut it out entirely, to bury heads in the proverbial sand. This approach may seem like the easiest solution for municipalities still ambivalent about regulating, let alone welcoming, legal cannabis cultivation in their area. Unfortunately, with the Federal Government determined to successfully abolish the illegal market, stepping back from this debate is neither feasible nor desirable, for the reasons we detail in this paper. At the least, municipalities and provinces who lag behind proactive efforts to regulate stand to bear substantial cost of their failure to capitalize on one of the

7 Health Canada, Authorized Licensed Producers for Medical Purposes <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php>

8 The Cannabis Market in Canada and British Columbia (Cannabis Life Network, 2016) <https://cannabislifenetowork.com/wp-content/uploads/2016/08/The-Cannabis-Market-in-Canada-and-British-Columbia.pdf>

9 Health Canada, Authorized Licensed Producers for Medical Purposes <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php>



most promising nascent industry opportunities in Canadian history. For these reasons, it is worth spending some time elucidating what we are advocating for in legal greenhouse cannabis cultivation, and extricating it from the cultural baggage that the illegal industry has attached to it.

Illegal Grow Operations Versus Legal Cannabis Cultivation

Growing cannabis in Canada has, until very recently, been viewed solely through the lens of criminal justice: an offence, a source of public nuisance, a threat to public health and safety, and a beacon for other forms of criminality and social decline. The huge amount of money to be made from illegal grow operations has led to their proliferation, with an estimated 13,000-18,500 illegal grow ops thought to be in operation in British Columbia alone in 2010.¹⁰ They are run by anyone, from opportunistic lone actors, well meaning medical cannabis patients overstepping their home grow limits, to more sinister organised crime groups.

Illegal grow ops, by their very unregulated and clandestine nature, bring with them a host of problems that have been widely reported on, regardless of whether they are large, commercially viable operations, or smaller grow ops primarily intended for personal use. Housed in buildings in no way designed for horticultural cultivation, unregulated development incentivizes the minimum possible expenditure or thought for safety. As a result, illegal grow ops present significant potential fire hazards.¹¹ High intensity lights wired up to systems that frequently lack sufficient capacity to deal with substantial levels of electricity consumption, means that grow op fires are a frequent risk.¹²

Typically, poor ventilation and inefficient cooling systems compound this problem, while also creating high humidity environments that encourage mould growth, pest proliferation, and mildew. Indoor grow ops can be deleterious for the the health of those exposed to them. Clandestine grow op ventilation often presents a public nuisance through venting pungent odours into surrounding residential areas. Haphazard use of carbon dioxide atmosphere enrichment presents a risk of asphyxiation to those working inside of the grow op. Theft of electricity and contamination of water are also common accompanying offences. Maintenance of illegal grow ops can be unpleasant, dangerous and labour intensive; extreme cases of forced child labour, human slavery¹³ and trafficking have all been historically reported.¹⁴

The regulation of medical cannabis in Canada in 2001 started a bright new chapter in the history of the plant in this country. Not only did it allow thousands of Canadians to legally benefit from the unique medical and therapeutic value of this plant (a number that stood at 98,000 people in October 2016 and continues to rise),¹⁵ but it brought production of this plant above board, legitimizing a new industry. Both the legal industry and the federal and provincial governments have begun the work to ensure that the hazards endemic in illegal grow ops have been robustly regulated against, and good practice in the legal medical cannabis production industry

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- 10 Diplock, Plecas, and Garis, Revisiting the Issues Around Commercially Viable Indoor Marijuana Growing Operations In British Columbia (University of the Fraser Valley, 2012) <https://www.surrey.ca/files/RevisitingtheIssuesAroundCommerciallyViableIndoorMarijuanaGrowingOperationsinBritishColumbia.pdf>
- 11 Community Response to Marijuana Grow Operations: A Guide Towards Promising Practices (City of Surrey and University of the Fraser Valley, September 2009) p.3 <https://www.surrey.ca/files/CommunitResponsetoMarijuanaGrowOperations.pdf>
- 12 Firefighters uncover marijuana grow-op in Pierrefonds home (CBC, 12th July 2016) <http://www.cbc.ca/news/canada/montreal/fire-pierrefonds-pot-1.3674828>
- 13 Trafficked and enslaved: the teenagers tending UK cannabis farms (The Guardian, 25th March 2017) <https://www.theguardian.com/society/2017/mar/25/trafficked-enslaved-teenagers-tending-uk-cannabis-farms-vietnamese>
- 14 S. Boyd & C. Carter, 'Using Children: Marijuana Grow-ops, Media, and Policy' in Critical Studies in Media Communication (Routledge, 2011) p.8 <http://web.uvic.ca/~sboyd/documents/usingchildren.pdf>
- 15 Health Canada Market Data <http://www.hc-sc.gc.ca/dhp-mps/marijuana/info/market-marche-eng.php>



remains a point of pride. Health Canada designed its original Marijuana for Medical Purposes Regulations (MMPR)¹⁶ to ensure cannabis cultivation by ACMPR Licensed Producers is undertaken in safe and secure environments. Security mandates include stipulations on minimising ducting, securing facility perimeters, and placing breakage sensors on all glazing panels. Regulations for Licensed Producers have been based on opioid production facilities, with medical cannabis being treated as a pharmaceutical product. Licensed Producers found to be breaching regulations on use of inappropriate pesticides have been sanctioned,¹⁷ and regular compliance inspections of the cultivation facilities of Licensed Producers are conducted. Actions varying from sanctions, seizure of produce, or removal of licences have taken place.¹⁸ Legal cultivation of cannabis for recreational adult use has not yet begun.

The reality is that there is no more of a similarity between the cultivation facility of a Licensed Producer and an illegal grow op than there is between a quality controlled and regulated craft beer brewery and a prohibition era bathtub moonshine peddler.

Indoor, Outdoor, and Under Glass

Aside from cannabis, no other agricultural product is grown almost exclusively indoors, under artificial lighting. It is this peculiarity of the cannabis industry that inhibits its legitimacy and prevents cannabis from sitting alongside other crops as an equal partner. Even when grown legally, in stringently regulated warehouses and factories, the indoor nature of production suggests that there is something to hide. Indoor growing in a regulated environment touts many benefits, including the tight control and optimisation of variables in the growing environment including light, temperature, and humidity. As such, indoor growing has become the industry norm. However, indoor growing under lights consumes huge amounts of energy, as cultivation facilities employ banks of high output grow lights, which in turn require large air conditioning systems. This is proving both economically and environmentally costly.

What is the alternative? Are we likely to see fields of cannabis lining the Fraser Valley? Looking elsewhere in the world, Jamaica has a longstanding tradition of outdoor cannabis farms, which are now finding legitimacy in the country's own legal medical cannabis programmes, while outdoor growing is finding limited appeal in California and elsewhere in the US. In Canada it is currently permitted under a home growing medical licence.

However, there exist agricultural and social drawbacks to outdoor growing. Without environmental controls, protection from pests, or protection from extreme weather, the cultivation process becomes unpredictable and insufficient for the reliable production of a pharmaceutical product. There also exists the major issue of security risks with open fields, which makes outdoor growing unworkable and prohibited under Canadian commercial licensing regulations today.

Nonetheless, we are not faced with the false dichotomy of growing cannabis either in warehouses under lights or unprotected in fields. While cultivation in the US is still predominantly indoors, in Canada a small but growing number of Licensed Producers are now cultivating 'under glass', in greenhouses, with 8 of the 41 Licensed Producers today¹⁹ cultivating at least partly in greenhouse environments.

Greenhouses provide the best of both options, allowing the harnessing of the Sun's energy and leveraging

16 Guidance Document: Building and Production Security Requirements for Marijuana for Medical Purposes <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/bp-securit-eng.php>

17 Two medical marijuana companies face new rules after banned pesticide use (The Globe and Mail, Feb. 09, 2017) <http://www.theglobeandmail.com/news/national/health-canada-adds-new-rules-to-licences-of-two-medical-marijuana-companies/article33976056/>

18 Health Canada Annual Compliance and Enforcement Report 2014-2015 <http://www.hc-sc.gc.ca/dhp-mps/marihuana/compliance-conformite/2015-annual-annuel-eng.php>

19 Health Canada Authorized Licensed Producers for Medical Purposes <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php>; websites of all licensed producers

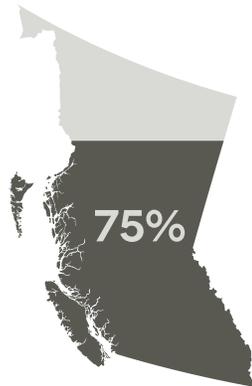


patient with permission from their healthcare practitioner to access and produce their own cannabis. In June 2013, the Canadian Government implemented the Marihuana for Medical Purposes Regulations (MMPR) which allowed for commercial producers to grow cannabis for medical patients. This commercial medical production system has since been dovetailed with licensed home growing and renamed the Access to Medical Cannabis Regulations, or ACMPR. [Understanding the New Access to Cannabis for Medical Purposes Regulations (Health Canada, August 2016) It was during this transitional period that the lines between legal and illegal, and home-based grow ops and licensed, regulated producers became blurred. The legacy of this period of quick legal changes and changing attitudes towards cannabis is one that continues to cloud the debate around greenhouse growing in British Columbia.

Responses to this ever-evolving legislation have been varied. BC municipal governments in Abbotsford, Chilliwack, and the Fraser Valley Regional District have fought to control where cannabis producers can build their facilities.²⁴ As far back as 2013 there was resistance in Abbotsford to production on the Agricultural Land Reserve.²⁵ In Delta, Mayor Lois Jackson conceded that regulating licenced producers is better than allowing home growers, but added that cannabis production facilities 'aren't appropriate use on farmland'.²⁶

After the City of Pitt Meadows objected to cannabis production on the Agricultural Land Reserve and the province gave it the go ahead, their mayor, John Becker, argued that the people of Pitt Meadows were worried the facilities would attract criminal behaviour and that they would better suit 'light industrial properties' instead of agricultural farmland.²⁷

Opportunity for Political & Economic Leadership



**75% OF BRITISH COLUMBIANS
SUPPORT CANNABIS LEGALIZATION**

**this level of support is higher than any
other province or territory**

This new industry presents a unique opportunity for political and economic leadership. At 75% of the population, the support for cannabis legalisation is higher in British Columbia than in any other province or territory.²⁸ Now is the time for provincial and local leadership to ensure British Columbia gets a stake in the benefits of reform, and ultimately takes the lead in shaping the industry.

²⁴ B.C. bracing for conflict over marijuana grow-ops (The Globe and Mail, Jan. 13, 2014) <http://www.theglobeandmail.com/news/british-columbia/bc-bracing-for-conflict-over-marijuana-grow-ops/article16316242/>

²⁵ Abbotsford seeks to keep commercial grow-ops out of the city (Abbotsford News, Oct 24, 2013) <http://www.abbynews.com/news/229123251.html>

²⁶ Delta bylaw prohibits medical marijuana (The Delta Optimist, Feb 26, 2014) <http://www.delta-optimist.com/news/delta-bylaw-prohibits-medical-marijuana-1.868234>

²⁷ Province torpedoes Pitt Meadows' medical pot bylaw (Maple Ridge News, May 12, 2015) <http://www.mapleridgenews.com/news/303486461.html>

²⁸ Majority of Canadians agree pot should be legal: poll (The Globe and Mail, Feb. 29, 2016) <http://www.theglobeandmail.com/news/politics/majority-of-canadians-agree-pot-should-be-legal-poll/article28944411/>



As the market establishes itself there will be a substantial first mover advantage to those early operators in the market. Ontario based Canopy Growth Ltd, an early player in the medical market which owns Licensed Producers Mettrum and Tweed, is now valued at over \$2billion. The race is far from over though, in the fourth quarter of 2015-16, Licensed Producers produced just over 4,000 kilograms of dried medical cannabis. This represents only 2.5% of estimated total quarterly Canadian cannabis demand in 2018,²⁹ and further growth can be expected from expansion into new legal cannabis markets abroad.



02

GREENHOUSES
WILL RAPIDLY
DOMINATE
INDOOR GROWS



How did Cannabis end up Inside?

“We know how to grow plants in the Fraser Valley. You do it in greenhouses, which are made of glass, not in people’s homes, which have drywall.”

These are the words of Mayor of Chilliwick Sharon Gaetz, commenting on indoor grow ops in 2011.³⁰

Across North America, the vast majority of cannabis cultivation occurs indoors, under high output lighting in buildings composed of concrete and metal on all sides. Of the 21 tonnes of cannabis grown by Licensed Producers in the rapidly expanding legal Canadian medical market in 2016,³¹ the vast majority was grown inside under lights. Only 8 of the 41 Licensed Producers currently plan to grow using sunlight, and most of these eight have not yet begun production or sales. Meanwhile in the expansive illegal market, demand is estimated loosely at 770 tonnes,³² and is almost exclusively cultivated indoors. Until the recent past, cannabis was never grown indoors. Indeed, it was never meant to be. When cannabis was banned in Canada in 1923, cannabis cultivation was virtually unknown in the country. As its popularity grew through the 20th century, so too did illegal cultivation, necessitating indoor growing in basements and bunkers.

When cultivation of medical cannabis was regulated, reliable methods of growing consistent, high quality cannabis were required, and so the nascent industry adopted techniques developed through illegal cultivation and optimised them for legitimate industrial use. The emphasis on containment, discretion, and security important to clandestine cultivation also came to be seen by regulators as a benefit in legal cultivation. This model emphasized theft of a controlled drug as a principle concern, as well as community concerns such as odour and light pollution. A plant that grows quickly and easily under natural light had been trapped indoors, under the false perception that this was necessary for both quality and security. It was only in 2014 that first greenhouse cultivation facility was opened by a Licensed Producer. Despite 7 more greenhouse cultivation facilities gaining licences since, so too have 33 indoor facilities.³³

Regulation of cannabis cultivation, while effective in identifying and minimising the dangers inherent in illegal grow ops, has done little in the way of evolving the growing procedure for a diverse and socially conscious legal industry. An added cost is the disincentivization to utilise the existing skills and knowledge of the Canadian agricultural workforce.

That reinvention is now beginning to take place, with the gradual adoption of greenhouse cultivation. Undue inertia and scepticism from stakeholders and local governments will dictate which provinces lead, which follow, and which are left out. While the Task Force for the Legalization and Regulation of Cannabis called in its Final Report in November 2016 for a move away from energy intensive indoor cultivation under lights, it made no mention of the invaluable role greenhouse cultivation will undoubtedly play in providing an alternative as the industry rapidly expands.³⁴ Alberta, while not having taken a major role in the early stages of legal

30 Kent Spencer, ‘Legal Grow-Op Nightmare’, (The Province, 14 March 2011) <http://www.pressreader.com/canada/the-province/20110314/282561604684503>

31 Health Canada Authorized Licensed Producers for Medical Purposes <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/market-marche-eng.php>

32 The Cannabis Market in Canada and British Columbia <https://cannabislifenetwork.com/wp-content/uploads/2016/08/The-Cannabis-Market-in-Canada-and-British-Columbia.pdf>

33 Aphria Medical Marijuana to double its Leamington operation (CBC, April 2 2015) <http://www.cbc.ca/news/canada/windsor/aphria-medical-marijuana-to-double-its-leamington-operation-1.3019046>; websites of all licensed producers

34 Government of Canada <http://healthycanadians.gc.ca/task-force-marijuana-groupe-etude/framework-cadre/index-eng.php>



cannabis cultivation, will be home to one of the largest greenhouse cultivation facilities in the country,³⁵ while greenhouses in Ontario and Quebec continue to appear and expand. However, it is British Columbia that is uniquely placed to lead in this area, on the back of its sophisticated and innovative local greenhouse industry, if it grasps the opportunity.³⁶

Environmental Benefit

Canada has a responsibility to the environment, both to its own climate and to that of the world. In signing the Paris Agreement on Climate Change, Justin Trudeau made a commitment to reduce Canada's CO2 emissions and radically cut the country's impact on the environment. New industries are in a uniquely privileged position, as they are not constrained to traditional, unsustainable practices. Cannabis innovators have the opportunity to redraw the industry's relationship with the environment in a positive, progressive and socially conscious contract. Despite this, the nascent cannabis industry has so far failed in its responsibility to do so, by eschewing more energy efficient greenhouse cultivation to adopt indoor growing techniques

In 2008, it was estimated that 1% of the electricity production of the entire US was devoted to cannabis production, enough to power 3 million homes. In Washington and California that figure rises to 3%. Closer to home, it is estimated that 2% of the electricity consumed in Canada is used to grow cannabis, which is more than is used by the Canadian mining industry.³⁷ The carbon output from the production of one kilogram of indoor grown cannabis is as much as 4600kg, the equivalent of eleven coast to coast car journeys across the North American continent. When compared with other products, indoor cannabis production is hugely energy intense in its current form: per unit cost, cannabis comes in at twenty times more energy consuming than alcohol, eleven times more than machinery production, nine times more than food, and two and a half time more than metal production.³⁸

Also, there is no way of avoiding the fact that cannabis, grown indoors under intense lighting, requiring high levels of temperature control, air conditioning and irrigation, is an incredibly energy intensive process. Sungrown, greenhouse cultivated cannabis is the solution.

Reduces Electricity Usage

There's a fundamental drawback to growing plants inside a warehouse, bunker, or converted chocolate factory: it's dark inside, and plants need light. Lighting alone in indoor cultivation contributes in excess of 38% of the total electricity usage. Cooling, air conditioning and temperature control systems required by indoor cultivation take up another 57%.³⁹

Moving from indoor cultivation under lights to greenhouse cultivation has been estimated to reduce energy consumption by up to 90%.⁴⁰

One of the most effective tools we have at our disposal for reducing our electricity expenditure is to bring cannabis out from under grow lights, and let the sun provide natural fuel for the plant's growth.

35 Massive marijuana production facility being built in Leduc County, Alta. (Global News, November 30, 2016) <http://globalnews.ca/news/3097353/massive-marijuana-production-facility-being-built-in-leduc-county-alta/>

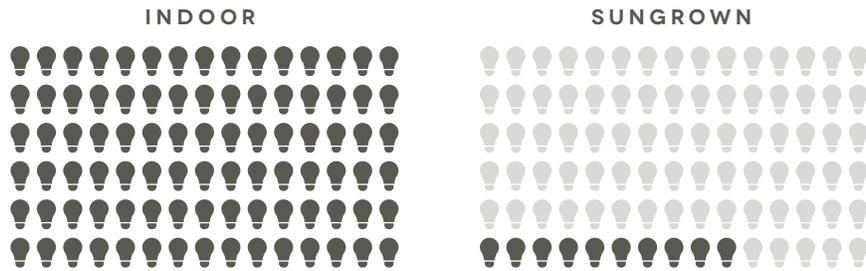
36 Aurora Cannabis Plans Expansion the Size of 10 Canadian Football Feilds (Calgary Sun, August 23, 2016) <http://www.calgarysun.com/2016/08/23/aurora-cannabis-a-licensed-alberta-marijuana-grower-plans-expansion-the-size-of-10-canadian-football-fields>

37 Energy Up in Smoke, Evan Mills, 2011 <http://www.countthecosts.org/sites/default/files/Energy-Up-In-Smoke.pdf>; <https://tantaluslabs.com/populace/cannabis-grow-ops-use-more-electricity-than-the-mining-industry-in-canada/>

38 Greenhouses are the Future (The Populace, 2015) <https://tantaluslabs.com/populace/greenhouses-are-the-future/>

39 Energy Up in Smoke (Evan Mills, 2011) <http://www.countthecosts.org/sites/default/files/Energy-Up-In-Smoke.pdf>

40 The Future of Marijuana is Sungrown (The Populace, 2015) <https://tantaluslabs.com/populace/the-future-of-marijuana-is-sun-grown/>



**Greenhouse cultivation uses up to 90% less electricity
than indoor cultivation**

Reduces Water Consumption

Cannabis is a notoriously thirsty species, with an individual plant needing up to three to five gallons of water per day. Indoor production, where huge amounts of energy is spent cooling the atmosphere constantly heated by grow lights and controlling the humidity levels to prevent mould, leads to significant amounts of water loss simply through evaporation. Indoor cultivators may seek to reuse the water through a condensation process requiring more energy, or choose simply to use greater amounts of water. Although humidity must still be tightly controlled in closed greenhouse technology, water loss can be much lower, due to the absence of the constant air cooling needed in indoor facilities.

Additionally, greenhouse roofs provide a perfect opportunity to further reduce water consumption through the collection and recycling of rainwater. Indoor cultivation facilities, particularly multi storey facilities, may not lend themselves to the same possibilities, especially if converted from other industrial uses.

Reduces Carbon Footprint

Legal cannabis cultivation does not exist in a vacuum, but replaces illegal and environmentally burdensome grow ops. Every gram of greenhouse grown cannabis displaces one grown in energy intensive indoor grow ops. It presents a clean solution to one of the most serious and underestimated environmental threats facing Canada today. BC has more to gain from this shift to greenhouses than any other province, due to its concentration of both leading greenhouse enterprises and illegal bunker grow ops.

A common agricultural technique used to boost yields of closed system cultivation operations is carbon dioxide enrichment. This is the process whereby carbon dioxide is captured through smokestacks and catalytic converters, cleaned of other waste emissions and particulates, and used to enrich the atmosphere of closed system greenhouses. This leverages waste material that would otherwise be released into the atmosphere to provide an optimum growing environment. The process is widespread in other greenhouse sectors, providing for easy adoption in greenhouse cannabis cultivation. The use of cannabis plants as a carbon sink is just one additional way the legal cultivation industry can make amends for the wasteful practices of illegal cultivation.

Regulating for indoor cultivation helps shut down the illegal grow ops, but does little to tackle the environmental impact of cannabis cultivation, whether legal or not. It is the equivalent of shutting an unregulated dirty coal power plant, only to open up a new coal plant, when a modern, renewable alternative exists.



Greenhouse cultivation presents us with another opportunity to make BC-grown cannabis famous, and for a reason we can all be proud of - as the most environmentally sustainable cannabis in the world.

Economic Benefit

BC's Greenhouse Sector

Canada has an 23 million square metres of industrial greenhouse space, a third of which is located in British Columbia. Greenhouse floorspace in BC has been continuing to increase in recent years, more than doubling since 2001, and continuing to rise. As the province with the most temperate climate in the whole of Canada, it is home to thriving and respected greenhouse vegetable, floriculture, and nursery sectors. These are mainly concentrated in the Fraser Valley area. It would be hard to find a better place to lead a revolution in greenhouse grown cannabis than British Columbia, where there exists both a skilled labour population and a greenhouse sector renowned as an industry leader in pioneering practices.⁴¹

We Have the Skills

The BC Greenhouse industry is known as a world leader in biological pest management techniques,⁴² yet it was an Ontario based Licensed Producer, Aphria, incidentally also the first to adopt greenhouse cultivation in Canada, that pioneered its use in cannabis cultivation.⁴³ With the use of conventional pesticides being a contentious issue in cannabis cultivation, this is one example of the specialized knowledge that would place BC at a competitive edge over other provinces.⁴⁴

The greenhouse agriculture sector in BC employed 6600 people in 2010, and this number has continued to increase as the sector has grown.⁴⁵ Every one of these people is trained in skills that would be directly transferable to greenhouse cannabis cultivation.

BC universities offer a wealth of knowledge, with courses specialising in agronomy, horticulture, cultivation science, and other relevant specialisms, offering up a stream of graduates perfectly placed to fill skilled positions a greenhouse led industry. These institutions will respond to an increased labour force demand, creating a feedback loop of momentum and opportunity for British Columbian universities to establish themselves as world leaders in the cannabis job skills market, as well as a broad opportunity for relevant research.

We Have the Infrastructure

Which would you guess is more suitable for conversion into a cannabis cultivation facility: A warehouse: previously designed for storage, a factory: previously designed for non-agricultural industry, or a greenhouse: previously designed for plant cultivation?

Having long been a centre for greenhouse cultivation, British Columbia is also home to the relevant skilled construction, glazing and greenhouse system industries needed as greenhouse cannabis cultivation expands.⁴⁶ While the repurposing or construction of industrial buildings for indoor cannabis consumption may seem more

41 A Profile of the Greenhouse Industry in British Columbia and Clues to Climate Change (Luis AL Aguiar, 2011) http://warming.apps01.yorku.ca/wp-content/uploads/WP_2011-10_Aguiar_Profile-of-Greenhouse-Industry-BC.pdf; <http://www.statcan.gc.ca/pub/95-640-x/2011001/p1/prov/prov-59-eng.html>

42 Right to Farm (BC Ministry of Agriculture) http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/farm-practices/870218-17_greenhouse.pdf

43 Agriculture (Financial Post, November 9, 2016) <http://business.financialpost.com/news/agriculture/canadas-cheapest-pot-producer-sees-sunshine-as-the-secret-to-dominating-legalization-era>

44 Pesticide Laden Marijuana (Globe and Mail, March 14, 2017) <http://www.theglobeandmail.com/news/national/pesticide-laden-medical-marijuana-spurs-third-lawsuit/article34308153/>

45 A Profile of the Greenhouse Industry in British Columbia and Clues to Climate Change (Luis AL Aguiar, 2011) http://warming.apps01.yorku.ca/wp-content/uploads/WP_2011-10_Aguiar_Profile-of-Greenhouse-Industry-BC.pdf

46 <http://bchothouse.com/> and <http://www.prt.com/>



coherent in old industrial centres in Ontario, it is far more beneficial for the provincial economy familiar with greenhouse agriculture and technology, and more in keeping with its agricultural tradition to adopt greenhouse cannabis cultivation in BC.

Challenges still abound for greenhouse manufacturers looking to supply the cannabis industry. The regulatory requirements of cannabis cultivation facilities have led cultivators in other provinces to abandon greenhouse plans in favour of indoor cultivation,⁴⁷ but this can be viewed equally as an opportunity for BC to stand out as an industry leader. As the legal cannabis industry is set to grow, greenhouse manufacturers that have mastered the regulatory requirements of the cannabis industry will find themselves in increasing demand, placing these companies at a nationwide competitive advantage.

Lowers Overheads, Increases Tax Revenue, Helps Tackle Illegal Grow Ops

Electricity doesn't come for free, but sunlight does. A Licensed Producer that chooses greenhouse cultivation can make huge savings on their energy bills, which means more can be spent on research and development, optimisation, and innovation. Another externality is greater taxable revenue for governments, as 65% of the price of retail cannabis grown indoors represents electricity usage.

Illegal grow ops continue to be a major concern for municipal authorities and law enforcement, while also a major drain on BC resources. Policy responses so far have focused on action from traditional stakeholders— police, fire departments, municipal government, and public health.⁴⁸ One of the principle aims of the federal government's decision to regulate adult use of cannabis was to drive out the illegal market through the introduction of the legal market, and yet no attempt has been made to court the legal industry about its role in combatting the illegal trade.

While the price of retail cannabis will depend on many factors, a common aspiration is that it should undercut the illegal market. More efficient cannabis production resulting from greenhouse cultivation allows greater freedom in the competitive market equilibrium pricing of retail cannabis, as the illegal market is effectively undercut while maintaining a substantial tax revenue on top of the costs of regulated cannabis production. These include maintaining security, quality assurance, testing, reporting, and supply chain transparency standards that are not borne by black market producers.

A Superior Product

Much is made of British Columbia's reputation for high quality cannabis. Despite the Liberal government's pronouncements that Canada will not become 'to cannabis, what France is to wine' as one reporter phrased it,⁴⁹ there is plenty of truth that the legal industry in BC will be riding on the reputation built up from its historic illegal industry, however dissimilar the two are in reality. It would be an embarrassment to the province if Ontario or elsewhere became the new benchmark for quality cannabis. If legal BC cannabis fails to claim its status as a superior product, it will hamper efforts to drive out the illegal grow op trade that would still continue to capitalise on its historic reputation. While the Liberal government may not like the comparison, BC cannabis could, and should, be considered Canada's answer to champagne.

Much time and effort has been spent designing and optimising the best synthetic lights to grow cannabis. This interest was fuelled both by the growing legal industry and the expansive illegal market, and resulted in research and development pushing grow lighting used in the cannabis industry far past industry norms in other areas of greenhouse agriculture. Despite these best efforts, the fact remains that the best light for photosynthesis is sunlight, as it produces the optimum balance of light within the photosynthetic range (the wavelengths of light required for photosynthesis).⁵⁰

47 Canadas Island Garden (Lift June 18, 2016) <https://news.lift.co/canadas-island-garden-pei-medical-marijuana/>

48 Targeting Marihuana Growing Operations <http://christianregenhardcenter.org/pdfs/TargetingMarihuanaGrowingOperationsinBC.pdf>

49 Canadas Marijuana Industry (Huffington Post, 2016) http://www.huffingtonpost.ca/2016/06/08/canada-marijuana-industry-alan-gertner-tokyo-smoke_n_10358472.html

50 Tantalus Labs, 2015 <https://tantaluslabs.com/populace/why-dont-we-grow-tomatoes-in-basements-an-analysis-of-synthetic-vs-natural-light/>



Indoor grow operations simply cannot match sungrown performance. While the intensity of sunlight may vary substantially, a typical summer's day in BC will receive light at five times the intensity of a plant ideally situated under a 1 kilowatt high pressure sodium grow light. Strategic use of supplementary lighting and blackout curtains can ensure greenhouse cultivation can maintain year round growing cycles of optimum productivity.⁵¹

There is another benefit to using sunlight - you can use just as much as you need. Space inside an indoor cultivation facility is at a premium, with every inch of artificial light that falls on empty space rather than photosynthesising plant going to waste. Greenhouse cultivators have no such concern, and can consequently design their space and plant distribution to ensure each individual plant is exposed to optimum levels of sunlight. This both exposes a greater proportion of the plants to light and produces faster growing plants.

Growing speed is an important variable to optimise, but the source of light also seems to play an important role in other properties of cannabis that relate directly to its quality. The profile of terpenes, flavonoids, and cannabinoids that a cannabis plant exhibits—a chemical composition which arguably marks the quality of a cannabis product—is strongly affected by the light source used. Plants grown in natural light exhibit more desirable chemical profiles than the equivalent plants grown solely under synthetic lighting. Many other variables contribute to the chemical profile of a given plant, but sunlight is an important contributing factor, and consequently its use is to be encouraged in the production of high quality cannabis.

Perceived Security Concerns

One enduring public fear of greenhouse cannabis cultivation is the perception that greenhouses, simply by merit of being made of glass, are less secure than indoor grows. Thefts or attempted thefts from any legal cannabis cultivation facilities are as of yet unheard of, due to the stringent regulations on security placed on Licensed Producers. Health Canada's regulations on securing cannabis cultivation facilities make explicit mention that all glazing must be secured to the building frame to prevent removal, and recommends glass break sensors or similar are installed throughout all glazing.⁵² Greenhouse cannabis cultivation is every bit as secure as indoor, and that has been demonstrably proven to be the case in existing ACMPR licensed cultivation facilities.

What's the Catch?

Greenhouse cultivation comes with its own set of challenges to address for companies hoping to produce cannabis, particularly of a standard and consistency suitable for medical use. Variability in light intensity, crucially, is particularly difficult to control for, as darkness in winter months is not conducive to cultivation. Temperature regulation is another concern, where greenhouses will require heating in winter, yet possibly cooling in summer.⁵³ Challenges with greenhouse cultivation are largely operational, and have their equivalents in indoor cultivation, with Licensed Producers noting that neither procedure is more onerous than the other from a procedural perspective, and both having their own difficulties when meeting Health Canada regulations.⁵⁴

Greenhouse cannabis cultivation facilities may choose to implement systems seen in their legal industrial agriculture analogs to help tackle some of these challenges. Using grow lights to supplement natural light on darker or shorter days and provide heating enabling year round production that would otherwise halt during colder and darker winter months is common in other greenhouse industries. However, even with supplementary grow lights the benefits of utilising sunlight as a primary source still endure, with energy consumption levels remaining only a fraction compared to indoor cultivation and other benefits of greenhouse cultivation still remaining in place.

51 The Future of Marijuana is Sungrown (Tantalus Labs, 2015) <https://tantaluslabs.com/populace/the-future-of-marijuana-is-sun-grown/>

52 Health Canada Guidance Document <http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/bp-securit-eng.php>

53 Canadas Growing Number of Cannabis Greenhouses (Lift, 2015) <https://news.lift.co/canadas-growing-number-of-cannabis-greenhouses/>

54 Growing Like a Weed (Greenhouse Canada, 2016) <http://www.greenhousecanada.com/crops/medical-marijuana/truly-growing-like-a-weed-31624>



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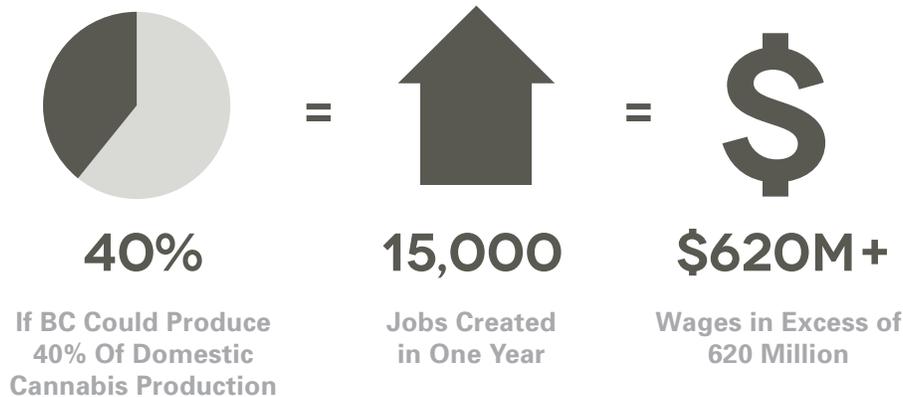
AN
UNPRECEDENTED
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OPPORTUNITY



Economic Benefits of Cannabis Production

Job Market

There is a real and imminent opportunity for British Columbia to build extensive new employment opportunities within the cannabis market. If BC could produce 40% of legal domestic cannabis in the new Canadian market, then estimates suggest that 15,000 jobs could be created in year one of the provincial industry, with wages in excess of \$620 million.⁵⁵



The stringent federal licensing which mandates quality control, security and record keeping activities creates jobs in compliance, security, and technology, as well as the technical skills and labour needed to operate the cultivation, processing and businesses. This industry needs an extensive range of skilled and unskilled labour ranging from botanists, to lawyers, to labourers.

Ancillary industries are also likely beneficiaries from economic ripple effects with the addition of the adult use market to the medical cannabis market. The business, management and ancillary services needed to construct and operate greenhouse facilities mandated to comply with the high air filtration, security and quality standards necessitates job creation in a range of sectors including construction, logistics, legal services, consultancy, business services, life sciences, and sales, to name a few. Municipalities and provinces that are slow to facilitate greenhouse cannabis production risk foregoing the myriad benefits which these facilities represent.

With over 2,000 applications to cultivate cannabis under the Medical Marijuana Production Regulations, only 41 licences have been granted. 68% have been outright rejected with the remainder withdrawn or proceeding at some stage of the licensing process.⁵⁶ Health Canada has also been quick to refuse licences from any breaches of licensing conditions which create a risk of diversion onto the black market or threaten product quality. These onerous standards have created high barriers to entering the market, thus ensuring that only sophisticated companies, with high standards of compliance, and thoroughly vetted personnel can operate in the legal market. This both increases the jobs associated with the industry and enhances the first mover advantage, heightening the importance of quick and decisive political leadership in British Columbia.

Tax

Greenhouse cannabis cultivators in British Columbia operating with a federal licence on ALR land are eligible to pay industrial property tax rates, not the lower agricultural rate. This provincial decision ensures that local municipalities who support cultivation on their land will gain substantial tax revenue from the potentially profitable new market.

⁵⁵ The Cannabis Market in Canada and British Columbia (Cannabis Life Network, 2016) <https://cannabislifenet.com/wp-content/uploads/2016/08/The-Cannabis-Market-in-Canada-and-British-Columbia.pdf>

⁵⁶ Canaccord Genuity, Canadian Cannabis, Canadian Equity Research, 28 November 2016



British Columbia

Demand

There is a high demand for cannabis in British Columbia, with only Nova Scotia reporting higher per capita usage levels.⁵⁷ This demand is currently predominantly met by the illicit market. With a rapidly growing medical market and imminent recreational legislation, the supply is inexorably shifting towards tightly regulated legal domestic producers.

Cultural Significance

British Columbia has a global reputation for the production of high quality illicit cannabis. 'BC Bud' is synonymous with quality among consumers worldwide. The region is a longstanding net exporter of illicit cannabis. Thanks in part to its reputation for high quality, BC has been a substantial untaxed source of income for organised crime groups. As the tide of cannabis reform sweeps across the globe, this is changing. Regulated producers in Colorado, California, Washington, Oregon and elsewhere are fast becoming regions famed for their high quality products. There is a significant opportunity here for local BC businesses to capitalize on the region's reputation, lest it be permanently lost.

Regressive Local Policies

Despite the advantages of a reputable region, favourable climate and pro-cannabis population, British Columbia is yet to claim its rightful position atop the Canadian industry. Local fears around odour [B.C.'s weed problem: Medical pot grow-ops stink, residents say,⁵⁸ criminality, unwanted structures, resource misuse, political perception, and unspecific social cost⁵⁹ have been influential in a number of local decisions attempting to hamper the growth of this new industry.⁶⁰

Regressive municipal bylaws and policies are in part to blame, as they have severely restricted the areas in which cannabis can be legally grown. This is despite the Provincial Agricultural Land Commission declaring as early as June 2013⁶¹ that farming of medical cannabis in the British Columbian Agricultural Land Reserve is permitted and such a use of the land is 'farm use'. This decision was upheld by the Provincial Government on June 24th, 2014 stating that they continued

"to view medical-marijuana production as an allowable farm use within the Agricultural Land Reserve that should not be prohibited by local government bylaws... Local governments looking to propose a bylaw prohibiting medical marijuana may wish to seek legal counsel as enacting such a bylaw may give rise to a constitutional challenge as frustrating a lawful initiative of the federal government."

This legal position was formalised on May 7th, 2015 when the BC government amended the Agricultural Land Reserve Regulation to specifically identify federally licensed medical cannabis cultivation as a farm use in the ALR, which local governments can regulate, but not prohibit. The City of Kamloops, the District of Maple Ridge, and the City of Armstrong were all singled out as examples of local bylaws in need of review by the Ministry of Agriculture's Bylaw Standard.⁶²

57 Cannabis Performance Metrics for Policy Consideration: What Do We Need to Measure?, Research Report: 2016-R009 (Public Safety Canada, 2016) p. 7 <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/2016-r009/2016-r009-en.pdf>

58 The National Post, January 21, 2015 <http://news.nationalpost.com/news/canada/b-c-s-weed-problem-medical-marijuana-grow-ops-stink-residents-say>

59 Province torpedoes Pitt Meadows' medical pot bylaw (Maple Ridge News, May 12, 2015) <http://www.mapleridgenews.com/news/303486461.html>

60 Province snuffs out bylaw prohibiting medical marijuana production on ALR (Business In Vancouver, June 26, 2014) <https://www.biv.com/article/2014/6/province-snuffs-out-bylaw-prohibiting-medical-mari/>

61 Information Bulletin: Medical Marihuana Production In The Agricultural Land Reserve (Agricultural Land Commission, June 2013) http://www.saanich.ca/assets/Local-Government/Documents/ALC_Info_Bulletin_Marihuana_June_2013.pdf

62 BC Ministry of Agriculture: Regulating Medical Marihuana Production Facilities in the Agricultural Land Reserve Bylaw Standard <https://goo.gl/yhvhk>



Regressive local bylaws may be informed by genuinely held concerns regarding protection of the local area, but in effect they have stifled the growth of an important industry with wide public support. Attempts to ban or unduly restrict cultivation sites on agricultural land deprive BC of an opportunity to focus cultivation within the areas for which they are best suited, with other similar agricultural activity. The ALR exists for this very reason, yet municipalities who benefit from large allocations of ALR land are some of the most resistant to permitting cannabis cultivation facility development. While the same licence to cultivate cannabis can also allow for processing and selling (via mail delivery only) cannabis, the core activity is an agricultural one.

There is however still hope to turn the tide, drive black market producers out of BC and build a thriving industry that contributes to prosperous, safe and secure communities. The spurious concerns of opposed local residents have not historically been borne out by the reality of having a cannabis production facility in the neighbourhood. Indeed the opposite is true: by encouraging a thriving legal cannabis cultivation industry to flourish, illegal grow ops and associated criminal activity will be reduced. Facilitating the establishment of strictly regulated greenhouse cultivation will achieve the policy aims that drove local resistance to allowing cannabis cultivation on ALR land.

Ontario

Successful provincial guidance and local policies can be seen in operation in Ontario. ACMPR Licensed Producer Tweed's conversion of the abandoned Hershey's factory in Smith Falls into a cannabis production facility is just one example of how new cannabis companies are improving local areas.⁶³

Local policies have been the key in driving the development of Ontario businesses which have prospered despite being only an hour's drive from neighbouring Quebec, where lower electricity costs, water, and labour costs ought to give Quebec the competitive advantage, attracting companies like Aurora Cannabis Inc.⁶⁴ The importance of a favourable political climate and the backing of local politicians and pragmatic rules are essential. As Bruce Linton, CEO of Canopy Growth says:

*"It's really about the public policy. That doesn't sound sexy or exciting. But if you don't have the right public policy, you don't have the right business opportunity."*⁶⁵

As well as having clear provincial leadership, the success in Ontario stems from clear, pragmatic and not overly restrictive requirements for cannabis cultivation. In the City of Toronto, Ontario requirements for medical cannabis cultivation include little more than the mandatory federal requirements and that they:

- take place within an enclosed building;
- require a 70 metre setback from residential, commercial, institutional and open space zones; and
- require a 70 metre setback as well as from schools, day nurseries, and places of worship.⁶⁶

63 Inside the \$1 billion marijuana 'unicorn' that operates out of a once-abandoned Hershey's factory (Business Insider UK, Mar. 14, 2017) <http://uk.businessinsider.com/photos-canopy-growth-tweed-marijuana-grow-site-2017-3/#the-42-acre-chocolate-factory-located-at-1-hershey-drive-was-sitting-vacant-when-canopy-growth-scooped-it-up-in-january-for-66-million-4>

64 Aurora Begins Construction on 800,000 Square Foot "Aurora Sky" Expansion (CNW Newswire, Nov. 30, 2016) <http://www.newswire.ca/news-releases/aurora-begins-construction-on-800000-square-foot-aurora-sky-expansion-603742136.html>

65 The marijuana industry's first \$1 billion 'unicorn' is a Canadian company you've probably never heard of (Business Insider UK, Feb. 2, 2017) <http://uk.businessinsider.com/canopy-growth-1-billion-revenue-giant-marijuana-industry-2017-2>

66 Regulating Medical Marijuana Production Facilities in the Agricultural Land Reserve: Discussion Paper and the Minister's Bylaw Standards (Ministry of Agriculture, 2nd March 2015) p. 19 http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/local-government-bylaw-standards/medical-marihuana/medical_marihuana_discussion_paper_march_2_2015_final.pdf



Debunking Perceptions and Fears

Two features are shared by many of the concerns raised by municipalities. Firstly, these concerns are often addressed by the existing regulatory framework. Secondly, the concerns relate to cannabis cultivation in general, rather than to Licensed Producers growing under glass. It is therefore important to disambiguate the concerns and understand how concerns can be met by sensible regulation of greenhouse Licensed Producers.

Community cohesion

Above all, communities must feel like their values are being respected and that they have control over their future. Communities often fear change, because if that change is not properly controlled, it could be damaging to their way of life. Councilor Bruce McDonald of Delta, speaking to a local newspaper in 2014 said, "The new methods of producing medical marijuana are coming, there is no question about that. [...] What Delta's intention here is to create a situation where the community has some control of the things that are happening within our community."⁶⁷

In the eyes of some BC municipalities these issues have yet to be addressed sufficiently by provincial and federal policymakers. These include how involved the local authorities are in the locating and licensing process and how they stand to benefit from licensing cultivation in their area. As the rest of the country moves forwards at a rapid pace, many fear that they will be the ones to bear the brunt of any negative impact of cannabis production.

Signalling

Conservative attitudes towards drug consumption can often influence the regulation of cannabis cultivation. For this reason, licensed cannabis production has for some time been relegated to areas where they are less visible.⁶⁸ Preconceptions about cannabis and criminality are no doubt playing a large part in people's reluctance to allow production facilities in their area.

It is important to separate these attitudes when discussing the licensing and zoning of production facilities. Facilitating cannabis cultivation in a community does not necessitate changing attitudes towards cannabis consumption. To mitigate local concerns, these facilities could justifiably only be zoned to function as production-only sites, explicitly precluding any on-site sale.

Aesthetics

Location is key to understanding and assuaging aesthetic concerns. Mayor of Langley Jack Froese voiced a familiar concern when he stated his objections to 'heavily fortified' production facilities and the high costs the city would face in regulating them.⁶⁹

The California Department of Food and Agriculture neatly outlines the concerns of the public in relation to the aesthetics of cultivation of cannabis. The majority of concerns related to the impact cultivation has on scenic views, both during the day and at night. Concerns also included the visibility of equipment, land clearing and light pollution.⁷⁰

In BC the Provincial Bylaw Standard⁷¹ addresses a number of concerns relating to the visibility of cannabis cultivation sites. The standard gives municipalities discretion to limit certain aspects of infrastructure which may be cause for aesthetic concern. Municipalities can set maximum heights (no less than 15 metres) to buildings, and facilities have to be at least between 15 to 30 metres from property lines, while also having a minimum

67 Delta bylaw prohibits medical marijuana (The Delta Optimist, Feb 26, 2014) <http://www.delta-optimist.com/news/delta-bylaw-prohibits-medical-marijuana-1.868234>

68 Business In Vancouver, June 26, 2014, <https://www.biv.com/article/2014/6/province-snuffs-out-bylaw-prohibiting-medical-mari/>

69 Province torpedoes Pitt Meadows' medical pot bylaw (Maple Ridge News, May 12, 2015) <http://www.mapleridgenews.com/news/303486461.html>

70 California Department of Food and Agriculture Medical Cannabis Cultivation Program Scoping Report, January 2017, <https://static.cdfa.ca.gov/MCCP/document/Medical%20Cannabis%20Scoping%20Report%20-%20January%202017.pdf>

71 Regulating Medical Marijuana Production Facilities in the Agricultural Land Reserve - Discussion Paper and the Minister's Bylaw Standards (March 2, 2015)



setback of no more than 30 metres from any neighbouring residential use outside of the ALR if a buffer is used, and 60 metres if a buffer is not used.⁷²

The standard suggests that buffers can combine separation, vegetation and fencing to mitigate the impacts of farming and urban activities. To reduce the impact on other residents, the minimum setback from any neighbouring park and school has to be a minimum of 150 metres.

Greenhouses need not be perceived as garish stains upon BC's agricultural landscape. BC's Agricultural Land Reserve is already well populated by farm purpose greenhouses for vegetable production. A focus on design and creating structures that fit with the natural environment of BC farmland can effectively reduce the impact greenhouse cannabis production facilities will have on the landscape.

"The opaque polypropylene walls, embracing the elected interior climate, scatter the changing colours of the surrounding trees. When the greenhouse is uniquely designed for the cultivation of cannabis, as Tantalus Labs is, the surrounding political environment is also hard to ignore."⁷³

Safety

Some associations are hard to shake. The association of cannabis with danger is deeply embedded. This is one of the most commonly voiced concerns by municipalities. In 2014, Abbotsford attempted to prevent Licensed Producers from growing on the Agricultural Land Reserve (ALR). Their proposal was rejected by the province. Their concerns about tax exemptions were quelled, but they felt public safety, danger of fires and cost on local services issues had not been resolved.⁷⁴

The media is partly to blame for the proliferation of the idea of the 'unsafe grow op'.⁷⁵ Years of discussing the harms and dangers of residential grow ops— fires, water contamination, flooding, air pollution and destruction of properties— has had a permanent effect on the perceived safety of new and regulated cannabis cultivation sites. Health Canada's stringent regulations about how these facilities operate and regular site inspections have addressed such concerns with historical effectiveness.⁷⁶

Security & Criminality

It is no wonder that the link between cannabis and organised crime is so firmly set in the mindset of BC residents. The legal status of cannabis has ensured its association with criminality, and furthermore, the 'constructing of crime waves' by police forces to suit their policing goals⁷⁷ in the past has created a lingering preconception that where there is cannabis, there is crime.

The current Access to Cannabis for Medical Purposes Regulations (ACMPR)⁷⁸ guidelines are strict when it comes to limiting the potential for cannabis production to divert to the illicit market. Licensed cannabis producers must comply with a huge number of federal regulations, of which a large amount deal with security. These security concerns are not only structural, but focus on personnel working in the facilities. For example, organised crime links are not tolerated, with high levels of scrutiny placed on all potential employees. Security clearance is of

72 Federally licensed medical marijuana production in the ALR (Ministry of Agriculture, May 7, 2015) <https://news.gov.bc.ca/stories/federally-licensed-medical-marijuana-production-in-the-alr>

73 Changing Seasons (Tantalus Labs, Oct 2016) <https://tantaluslabs.com/populace/changing-seasons/>

74 Abbotsford's proposed ban on agricultural land grow-ops denied (Abbotsford News, Jul 6, 2014) <http://www.abbynews.com/news/265852871.html?>

75 S. Boyd & C. Carter, 'Using Children: Marijuana Grow-ops, Media, and Policy' (Critical Studies in Media Communication, 2011), p. 7

76 Health Canada: Access to Cannabis for Medical Purposes Regulations Quarterly Compliance and Enforcement Report - Inspection Data Summary <http://www.hc-sc.gc.ca/dhp-mps/marihuana/compliance-conformite/2015-Q1-4-eng.php>

77 S. Boyd, C. Carter, Killer Weed (University of Toronto Press, 2014), p.13

78 Ministry of Justice, Access to Cannabis for Medical Purposes Regulations <http://laws-lois.justice.gc.ca/PDF/SOR-2016-230.pdf>



utmost priority to the the federal government and this sentiment is felt throughout the ACMPR guidelines.⁷⁹

Costs & Taxes

As some concerns have faded, others have risen. Along with the feeling of being left out of the decision making process, and the fear that municipalities may bear the brunt of any negative impacts, focus has turned to costs and taxes.⁸⁰

In a recent letter to the Cannabis Legalization and Regulation Secretariat of the Task Force on Marijuana Legalization and Regulation, Al Richmond, President of Union of British Columbian Municipalities clearly states one of the most pressing issues for municipalities. His concern is that local governments will be the ones who 'absorb a large portion of the impact [of the new regulatory system]' and they should receive a portion of any future federal tax collected.⁸¹

Municipality bylaws are not needed to ensure the safety and security of the production facilities, but if communities are still concerned about possible costs on their services, more work needs to be done to ensure they are fully briefed and supported by provincial and federal governments over the coming years. They must be made aware that their concerns are being listened to.

Communication

Groups like the Union of BC Municipalities play a key role in the communication of federal protection of their municipal rights, as well as those of the producers, and they actively call for more communication from a federal level.⁸² One issue that is oft raised is that third parties, often community groups or residents on neighbouring land, are not entitled to be privy to the licensing process and discussion on locating cannabis production facilities.⁸³

The BC government have, at times, been good at responding to the concerns of local government.⁸⁴ They have also been clear in providing guidelines to municipalities over the years. In 2015 they published their bylaw standard, which was designed to ensure 'the ALR is used for agricultural purposes, while balancing the needs of communities and other legislation'.⁸⁵

As the Liberal government's system for legal and regulated adult use of cannabis develops in Canada we will see more examples of how municipalities can benefit financially from the safe and secure locating of greenhouse facilities on their agricultural land. These need to be clearly communicated if they are to be understood and embraced.

79 Ministry of Justice, Access to Cannabis for Medical Purposes Regulations p.65 <http://laws-lois.justice.gc.ca/PDF/SOR-2016-230.pdf>

80 Letter dated March 13, 2017 to Bill Blair Member of Parliament Parliamentary Secretary to the Minister of Justice and Attorney General from Murry Krause President, Union of BC Municipalities [http://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Community~Safety/Marijuana~Regulation/UBCM-Bill_Blair-Marijuana-2017-03-13.pdf#search="marijuana"](http://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Community~Safety/Marijuana~Regulation/UBCM-Bill_Blair-Marijuana-2017-03-13.pdf#search=)

81 Letter to the Cannabis Legalization and Regulation Secretariat of the Task Force on Marijuana Legalization and Regulation, from Al Richmond, President of Union of BC Municipalities (29th August, 2016) p.1 http://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Community~Safety/Marijuana~Regulation/2016-08-29_Marijuana_Task_Force.pdf

82 Letter dated March 13, 2017 to Bill Blair Member of Parliament Parliamentary Secretary to the Minister of Justice and Attorney General from Murry Krause President, Union of BC Municipalities [http://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Community~Safety/Marijuana~Regulation/UBCM-Bill_Blair-Marijuana-2017-03-13.pdf#search="marijuana"](http://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Community~Safety/Marijuana~Regulation/UBCM-Bill_Blair-Marijuana-2017-03-13.pdf#search=)

83 Neighbourly buds: Key Takeaways from the P&S Holdings Ltd. Decision (Lift, 22nd Feb 2016) <https://news.lift.co/neighbourly-buds-key-takeaways-from-the-ps-holdings-ltd-decision>

84 Letter from Cora Lee Oakes Minister of Community, Sport and Cultural Development Enclosures and Norm Letnick Minister of Agriculture to Mayor Bruce Banman of the City of Abbotsford (City of Abbotsford, June 26, 2014) <https://abbotsford.civicweb.net/document/41857>

85 Federally licensed medical marijuana production in the ALR (May 7, 2015) <https://news.gov.bc.ca/stories/federally-licensed-medical-marijuana-production-in-the-alr>



Political Implications

The Provincial Government and Ministry of Agriculture’s support for production facilities on the ALR is welcome, but more is needed in order to harmonise policy in the province. Now is the time to issue clear, concise and informative guidelines covering the law, its relevance to municipalities, and the way in which policy and politicians can support the industry while providing meaningful policy responses to local constituents’ understandable concerns and apprehensions.

Opposition of the current provincial Liberal administration have accused representatives of failing to show leadership on cannabis.⁸⁶ Without decisive leadership on the harmonization of municipality bylaws, cannabis risks becoming an influential party-political issue in the May 9th election in a province with the highest rate of support for the new adult use market. The following municipality policy guidance is a recommended starting point for engagement with local governments to facilitate harmonisation.

86 Christy Clark failing to show leadership on cannabis legalization (New Democrat, December 13, 2016) <http://bcndpcaucus.ca/news/christy-clark-failing-show-leadership-cannabis-legalization> [‘Who is protecting BC Bud?’ (Lift, December 12, 2016) <https://news.lift.co/protecting-bc-bud/>



04

POLICY GUIDANCE



Disclaimer

The following does not constitute legal advice. Should you require legal advice, you are advised to seek professional legal advice. If a local government is considering changes to a bylaw to regulate farm use, then it is recommended that the bylaw be forwarded to the Agricultural Land Commission for review. Information from Health Canada for municipalities may be found here⁸⁷

Federal Policy

Strict compliance standards are adhered to at the federal level.⁸⁸ Medical Marihuana Production Regulations require applicants for a commercial licence to notify the local government, fire, and police officials of the location of their facilities. Firms must comply with, and continue to comply with, all federal, provincial, and local government laws, and bylaws, including zoning bylaws. Cannabis production is a thoroughly regulated industry, therefore ideal policy would identify that no further municipality bylaws are needed to ensure the safety, security and minimization of impact of these facilities on local areas. However, should tighter local control be sought, the following is a guide to a lawful and pragmatic strategy of implementation.

Preventing Crime

Permitting legal cannabis producers tackles black market production by increasing the legal supply of cannabis, therefore regulations facilitating production sites can help fight crime. Licensed Producers have not historically become targets for organised crime groups where they have been permitted. The security and anti-diversion regulations contained with the MMPR provide ample measures to all but eradicate the risk of diversion onto criminal markets and deter would be thieves.

Environmental Protection

Greenhouse only – Local bylaws may wish to restrict commercial cannabis production to the ALR, to ensure any production facilities are in keeping with the agrarian nature of the crop. The bylaw may mandate that all structures must have transparent roofs, but not prohibit supplemental lights. Environmental regulations have already been established and refined for greenhouse crops such as tomatoes, green peppers, bedding plants, and forestry seedlings. Cannabis greenhouse environmental regulation should draw from the successful history of these policy measures.

Municipal Policy Guidance

Adhering to the Province's Bylaw Standard

The Ministry of Agriculture has developed a Bylaw Standard to help local governments align local bylaws with provincial regulations.⁸⁹ The standard provides ready-to-use bylaw provisions for this use within the ALR, and establishes limits to which local governments can restrict the cultivation of cannabis in the ALR.

87 Health Canada: Information for Municipalities <http://www.hc-sc.gc.ca/dhp-mps/marihuana/muni/index-eng.php>

88 Health Canada: Annual Compliance and Enforcement Report 2014-2015 <http://www.hc-sc.gc.ca/dhp-mps/marihuana/compliance-conformite/2015-annual-annuel-eng.php>

89 Regulating Medical Marihuana Production Facilities in the Agricultural Land Reserve - Discussion Paper and the Minister's Bylaw Standards (March 2, 2015) http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/local-government-bylaw-standards/medical-marihuana/medical_marihuana_discussion_paper_march_2_2015_final.pdf



According to the Ministry of Agriculture Standard, municipalities should not pass bylaws which:

- Prohibit medical cannabis cultivation in the ALR; and
- Provide minimum lot size requirements.
- The Standard provides the following rules and guidance for regulating cultivation sites in the ALR, which municipalities may incorporate into their bylaws:
 - A minimum setback of no more than 30 metres from any watercourse;
 - Bylaws should not restrict the area of a lot which may be covered by buildings and structures for farm use to an area less than 35%, or less than 75% for greenhouses.
 - Maximum height of no less than 15 metres;
 - Minimum setbacks between 15 to 30 metres (at the local government's discretion) from any property line;
 - Minimum setback of no more than 30 metres from any neighbouring residential use outside of the ALR if a buffer is used, and 60 metres if a buffer is not used (buffers can combine separation, vegetation and fencing to mitigate the impacts of farming and urban activities);
 - Minimum setback of no more than 150 metres from any neighbouring park and school;
 - Maximum 100 metre maximum building setback from the urban/ALR boundary;
 - Stormwater and agricultural liquid waste management plan if the facility is larger than 3700 square metres, or if it covers more than 10% of the lot; and
 - A requirement that a local government business licence must be obtained.

Controlling Cannabis

No dispensaries – the on-site sale of cannabis should be explicitly prohibited from greenhouse cannabis cultivation facilities.

Local government business licences – Establishing municipal business licence requirement bylaws which do not interfere with any of the provincial and/or federal regulation of these activities could assist in allaying local concerns and provide confidence in cannabis production activities to local government. One \$5,000 fee for all marijuana related business, in line with Victoria and other municipalities.

Municipalities may wish to restrict cultivation to land zoned for agricultural use - this is an agricultural activity with a few industrial elements as opposed to an industrial activity with a few agricultural elements.

Protecting the Local Community

Light pollution - We advocate for sungrown, greenhouse cultivated cannabis, which drastically reduces the use of high intensity grow lighting, and addresses concerns of light pollution from cultivation facilities. Setting standards for acceptable use of supplemental lighting would protect communities and promote industry best practices for lighting and energy use. Perimeter lighting is required alongside the use of standard security cameras to fulfil security obligations detailed in federal regulations. Municipalities may choose to mandate the use of infrared security cameras at perimeters instead to avoid the use of perimeter lighting.

Air pollution and odour prevention - Federal regulations require all cannabis cultivation facilities maintain strict controls on their air outlets and prevent any odour detection. We advocate for closed system greenhouses, recirculation of air and filtration. Where cultivation facilities choose to employ carbon dioxide enrichment, the guideline from the BC Ministry of Agriculture must be adhered to.⁹⁰

90 Regulating Medical Marijuana Production Facilities in the Agricultural Land Reserve - Discussion Paper and the Minister's Bylaw Standards (March 2, 2015) http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/local-government-bylaw-standards/medical-marihuana/medical_marihuana_discussion_paper_march_2_2015_final.pdf

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