Cannabis Industry Report

This report analyses the medicinal cannabis industry in Australia, Canada, Israel, U.S and Europe, as well as the recreational industry of Canada and US.

Companies’ Data

<table>
<thead>
<tr>
<th>Company</th>
<th>Ticker</th>
<th>Market Cap (M)</th>
<th>2017 YTD change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AusCann Group Holdings Ltd.</td>
<td>AC8</td>
<td>196.7</td>
<td>93%</td>
</tr>
<tr>
<td>Botanix Pharmaceuticals Limited</td>
<td>BOT</td>
<td>28.2</td>
<td>-32%</td>
</tr>
<tr>
<td>Cann Group Ltd.</td>
<td>CAN</td>
<td>255.7</td>
<td>320%</td>
</tr>
<tr>
<td>Cannpal Animal Therapeutics Ltd.</td>
<td>CP1</td>
<td>17.1</td>
<td>22%</td>
</tr>
<tr>
<td>Creso Pharma Ltd.</td>
<td>CPH</td>
<td>62.4</td>
<td>460%</td>
</tr>
<tr>
<td>eSense-Lab Ltd</td>
<td>ESE</td>
<td>16.8</td>
<td>41%</td>
</tr>
<tr>
<td>Hydroponics Co. Ltd.</td>
<td>THC</td>
<td>46.4</td>
<td>183%</td>
</tr>
<tr>
<td>Medlab Clinical Ltd</td>
<td>MDC</td>
<td>112.6</td>
<td>-19%</td>
</tr>
<tr>
<td>MGC Pharmaceuticals Ltd.</td>
<td>MXC</td>
<td>86.6</td>
<td>125%</td>
</tr>
<tr>
<td>MMJ PhytoTech Ltd.</td>
<td>MMJ</td>
<td>93.4</td>
<td>114%</td>
</tr>
<tr>
<td>Roto-Gro International Ltd.</td>
<td>RGI</td>
<td>29.2</td>
<td>80%</td>
</tr>
<tr>
<td>Zelda Therapeutics Ltd.</td>
<td>ZLD</td>
<td>59.6</td>
<td>-18%</td>
</tr>
</tbody>
</table>

Source: FactSet

Cannabis is emerging as one of the next big industries due to the growing awareness of its medical applications

Background on Cannabis

Though cannabis has been a known plant throughout history, only recently has its medicinal properties been recognised and gained attention in research and development. With over 500 different chemicals in cannabis, it is possible that varying these components could offer various therapeutic benefits. Hence, with increased clinical studies and research, the potential market and industry of medical cannabis crosses a broad spectrum of medicinal applicability.

Australian Medical Cannabis Market

Australia has legalised cannabis for medical use, effective 30 October 2016, with initial demands met through imports, while Australian entities establish themselves in the industry.

ASX-listed Cannabis Companies

The first listed cannabis company in Australia was MMJ in January 2015. However, as the industry has emerged, this number has grown significantly and as at the date of this report there are 22 cannabis companies listed on the ASX, of which 11 are pure-play.

Though all the companies are based around cannabis, their product offerings and target markets differ. A few companies are targeting nutraceuticals and developing products based on the therapeutic benefits of cannabis, namely, CPH and MMJ.

Others see the medicinal applicability of cannabis and are developing a range of medicines based on the drug. Companies such as ZLD, THC and MXC are targeting multiple diseases in which they think cannabis will be effective. These diseases include cancer, epilepsy and chronic pain.

Furthermore, companies such as MXC are aiming to penetrate the dermatology industry following the anecdotal evidence showing the effectiveness of cannabis as a skincare product and a topical treatment for acne.

Many companies researching cannabis are also making efforts to mass produce the plant. CPH, MMJ and CAN intend to produce cannabis through partners, subsidiaries and/or directly.

Other companies intend to penetrate less discussed areas such as: producing synthetic components of the cannabis plant (BOT and ESE); providing specialised growing equipment (RTO and THC); and researching animal healthcare (CPH and CP1).

Conclusion

The markets’ current appetite for cannabis stocks is only likely to intensify.
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BACKGROUND ON CANNABIS

Cannabis, also known as marijuana and hemp, has been completely legal for most of human history, and as recently as the 1920s. It has been a known plant for most of history, being used to make fabric and ropes, as well as for religious and medical purposes.

The plant contains over 500 chemical compounds, with 104 cannabinoids identified as of 2014. Cannabinoids are chemicals that act on the cannabinoid receptors of human cells, and varying these chemical compounds can alter the strength and medicinal efficacy of cannabis.

Of the cannabinoids, tetrahydrocannabinol (THC) is the main psychoactive compound and most known, with others such as cannabiol and cannabidiol (CBD) which are non-psychoactive. Most medicinal cannabis currently used is CBD based and is growing in interest due to its non-psychoactive qualities accompanied by a range of potential medicinal uses.

Other cannabinoids include cannabiol (CBN), cannabicyclol (CBL), cannabichromene (CBC) and cannabigerol (CBG); they have less psychotropic effects than THC, but may play a role in the overall effect of cannabis. The most studied are THC, CBD and CBN.

The cannabinoids contribute to the Entourage Effect – a notion that the pharmacological effects of cannabis are greater than the sum of individual cannabis chemical components.

The cannabinoids in cannabis interact with the ‘Endocannabinoid System’ in the human body which is made up of natural cannabinoid receptors. The receptors respond to the cannabinoids and have shown to affect a large number of pathological conditions – cardiovascular, neurodegenerative, reproductive, gastrointestinal, liver, lung skeletal, psychiatric, and cancer diseases.

The Endocannabinoid system also controls some of the most important life functions including immune system, memory, appetite, sleep pattern, mood and pain sensation.

Key areas of potential medical use of cannabis currently include, but are not limited to:

- Epilepsy;
- Anxiety;
- Stress;
- Chronic pain;
- Palliative care;
- Chemotherapy-induced nausea;
- Appetite stimulation;
- Muscle spasticity;
- Alzheimer;
- Parkinson Disease;
- Bronchodilation; and
- Glaucoma treatment.

The most serious complication affecting the use of cannabis for medicinal purposes (aside from regulation) is the uncertainty in its composition. As unless it is selectively modified, it is not a single substance for which purity and strength can be readily ascertained.
The two strains of cannabis

There are currently two widely accepted strains of cannabis: indica and sativa. Each strain has its own range of effects on the body and mind, resulting in a wide range of medicinal benefits. Indica strains generally provide a sense of deep body relaxation. Sativa strains tend to provide a more energising experience.

Cannabis strains range from pure Sativa to pure Indica and hybrid strains consist of both Indica and Sativa (30% Indica – 70% Sativa, 50% – 50%, 80% Indica – 20% Sativa).

Indica (High CBD)

Typically, Cannabis Indica plants are short, bushy plants with wide leaves. Indica plants typically grow faster and have a higher yield than the sativa variety. Medicine produced from Cannabis Indica plants have higher CBD and lower THC counts.

The major qualities of Indica medicinal strains include:

- Increased mental relaxation;
- muscle relaxation;
- decreased nausea;
- decreased acute pain;
- increased appetite;
- increased dopamine (a neurotransmitter that helps control the brain’s reward and pleasure centres); and
- are suited for night time use.

Sativa (High THC)

Cannabis Sativa plants are the opposite of the Indica strains and grow tall and thin with narrow leaves. Sativa plants are also generally a lighter shade of green than their counterpart, the Indica strain. Sativa strains take longer to grow, mature, and require more light. Medicine produced from Cannabis Sativa plants have lower CBD and higher THC counts.

The major qualities of Sativa medicinal strains include:

- anti-anxiety;
- anti-depressant;
- treats chronic pain;
- increased focus and creativity;
- increased serotonin (a neurotransmitter involved in the regulation of learning, mood, sleep, anxiety and appetite); and
- for day time use.
The Cannabis Plant Life Cycle

It can be assumed that most commercial cannabis cultivators would be growing their plants indoors or in greenhouses rather than outdoors due to a shorter growth cycle and the ability to influence the growth environment of the plant (thereby yielding higher quality marijuana).

The typical indoor life cycle takes around 2-3 months however it can vary depending on the strain, with Indica dominant strains generally having a shorter life cycle than Sativa dominant strains.

The growth cycle can be broken down to the following stages:

**Figure 1 Stages of Growth for Cannabis Plant**

- Germination: A cannabis seed is exposed to light and moisture, activating a series of hormones that will kick start the growth process.

- Seeding: The root systems at the base will begin to develop, and leaves will begin to sprout out. Time: 3-7 days.

- Vegetative: The cannabis plant will start producing big jagged leaves, essentially growing leaves and stalks. The duration of this phase is controlled primarily by light exposure. Time: about 1-2 months.

- Flowering: The end stage occurs after reduced light exposure. Time: 6-10 weeks depending on the specific strain.

  - Large quantities of sticky resin on the outsides will be produced containing the highest concentration of THC, with the intensity dictated by the amount of time spent flowering.

  - Environment conditions: Room temperature of 68-77°F, humidity of 60-80%, light cycle of 12 hours of orange-red lighting per day, and fertilizer with potassium and phosphorus.

Source: Everblu Capital
INDUSTRY OVERVIEW
Cannabis was recognised in 1961 under the United Nations’ Single Convention on Narcotic Drugs as a plant that no longer served any medical purpose and should be deemed essentially obsolete, this led to the sluggishness of development and research of medicinal cannabis. It should be noted that this conclusion was reached with almost no clinical trials or scientific evidence.

In recent years marijuana has been growing in public awareness in many countries around the world for its medical purposes. This has subsequently led to a number of jurisdictions either decriminalising cannabis, or legalising it for medical purposes with some countries moving towards full legalisation.

With the growing acceptance of cannabis in public awareness, we believe it would lead to the creation of two separate industries – a medical cannabis industry, and a recreational cannabis industry. And the cannabis plants in the two industries producing products with different strains and delivery mechanisms to meet consumer demand and preferences.

One of the most significant differences between the medical and recreational market would be the strains, with recreational cannabis having higher THC concentration for the psychoactive effect, whilst medical cannabis would generally have a higher CBD concentration and lower THC.

Medical Cannabis
With the increase in public awareness of cannabis for medical use, there is growing demand for consistent pharmaceutical grade cannabis-based products for its real or perceived benefits.

As marijuana has only recently gained medical attention and scientific research, there is a lot of uncertainty in respect to the products that can be produced and the areas of medicine in which it is applicable.

Moreover, one of the current barriers for medical cannabis is the lack of acceptance in the medical community such as doctors, due to the lack of clinical evidence.

Hence, we believe that once more clinical trials and quality assurances have been conducted, doctors would be more liberal in their prescription of medical cannabis, subsequently accelerating the growth of this industry.

With over 500 chemicals in cannabis it is possible that varying these components could offer different therapeutic benefits. Hence, with increased clinical studies and research the potential market and industry of medical cannabis crosses a broad spectrum of medicinal applicability.

Another aspect that would enhance the medical applicability of cannabis is the delivery mechanism of CBD.

As CBD is hydrophobic, poorly water-soluble, and therefore it is taken up badly by the human body. The absorption of CBD is dependent on the route of administration.

CBD has been delivered orally in an oil-based capsule in some human trials. Because of low water solubility, absorption from the gastrointestinal system is very poor. Bioavailability from oral delivery is very low and has been estimated at 6% due to significant first-pass metabolism in the liver.

The difficulty of delivering CBD orally in an oil-based capsule has led to attempts to improve the amount of the drug that reaches the systemic circulation. CBD has been formulated as sprays or lozenges for oral-mucosal in an attempt to improve absorption in experiments on animals and humans.
Current medical application of cannabis includes but is not limited to:

**Figure 2 Applicability of Cannabis to Medical Cannabis**

<table>
<thead>
<tr>
<th>MEDICAL CONDITION</th>
<th>POTENTIAL MEDICAL BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer patient undergoing chemotherapy treatment.</td>
<td>Aids in pain management and enhances appetite.</td>
</tr>
<tr>
<td>Glaucome caused by poor blood supply to the optic nerve fibres.</td>
<td>Decreases pressure inside the eye.</td>
</tr>
<tr>
<td>Epileptic seizures.</td>
<td>Controls seizures by binding to the brain cells responsible for controlling excitability and regulating relaxation.</td>
</tr>
<tr>
<td>Alzheimer diseases.</td>
<td>Slows the formation of amyloid plaques by blocking the enzyme in the brain that makes them.</td>
</tr>
<tr>
<td>Painful symptoms of multiple sclerosis.</td>
<td>Binds to receptors in the nerves and muscles to relieve pain.</td>
</tr>
<tr>
<td>Treatment for Hepatitis C infection (negative side effects).</td>
<td>Helps lessens treatment side effects such as nausea, muscle aches, loss of appetite, and depression.</td>
</tr>
<tr>
<td>Inflammatory bowel diseases like Crohn's disease.</td>
<td>Interacts with cells in the body that play an important role in gut function and immune responses.</td>
</tr>
<tr>
<td>Parkinson's disease.</td>
<td>Significantly reduces pain and tremors and improves sleep for Parkinson's disease patients.</td>
</tr>
<tr>
<td>Concussion or other traumatic injury.</td>
<td>Lessens the bruising of the brain and helps with healing mechanisms after a traumatic injury.</td>
</tr>
</tbody>
</table>

Source: MMJ Phytotech Prospectus p.31

One of the key benefits of medical cannabis over contemporary medication is the improvement of quality of life in patients and the lack of side effects.

Anecdotal evidence has suggested that patients suffering from a range of complications from pain to chemo-induced nausea reported a significant improvement in quality of life, and the absence of side effects that they would normally experience with their currently prescribed medication.

Furthermore, with a prescription medication overdose death every 19 minutes in the US paired with the fact that there has not been known overdoses with cannabis throughout history, it is becoming evident that cannabis is a safe alternative for many prescription medicines.

This notion is underpinned by a study from the University of Mississippi, which revealed on mice that CBD blocks opioids reward suggesting the compound may be useful in addiction treatment settings.

The current challenges patients face in the medical cannabis industry are:

- Continuity of supply to meet therapeutic needs;
- Unknown consistency of cannabinoid content;
- The varying responses of individuals to cannabinoid content; and
- Unregulated, and unnecessary high prices.

This notion is reflected by Canadian based company MedReleaf Corp, citing that only 10-15% of doctors are currently prescribing marijuana as many have no idea what or how much to prescribe.
Furthermore, a combination of social stigma with limited research and development of medical cannabis has resulted in many patients self-medicating with medical cannabis.

Hence, we believe the key areas of differentiation for players in this industry to be:

- Development of strains – as clinical data is not available for medical marijuana, the companies that develop strains which exhibit consistency in relief or improvement for patients would have a competitive advantage;
- Knowledge of formulation and protocols – understanding the correct administration method, when and in what dosage would be a key determinant in clinical effectiveness of cannabis as a medicine; and
- Delivery mechanism – as patients are taking cannabis for medical purposes many would be bothered by the smoke, and would prefer a different consumption method. This has been the case with current medical cannabis markets, with 49% of 2017 sales in Canada being cannabis oils, and 22% in US (inclusive of recreational markets).

Figure 3 - Top 5 symptoms relieved by medical cannabis reported by patients


From the data, it is revealed that most patients do not use medical cannabis to relieve symptoms of AIDS or cancer (nausea 27.7%), instead there is growing diversity in the patient population of medical cannabis ranging from pain relief, muscle spasms, to improvement of sleep and relaxation.

Figure 4 - Improvements provided by medical cannabis

Anxiety
A number of medical cannabis patients cited decrease in anxiety and stress from consuming marijuana. We believe this would lead to the creation of a significant market opportunity if regulatory constraints were to be loosened. Due to the prevalence of anxiety in developed nations it is plausible that many patients would take medicinal cannabis supplements to reduce their stress and anxiety, with on average 1 in 3 women in Australia experiencing anxiety some time in their life, and 1 in 5 men.

Furthermore, as the current medications for anxiety are SSRI and SNRI products (both drugs influence serotonin in the brain, causing a chemical imbalance, and subsequent withdrawal effects as it inhibits the brain’s ability to naturally produce serotonin) that entail significant side effects, we believe medical cannabis would be an alternative many patients would be willing to try especially if the symptoms are mild.

Various companies are conducting research into the effectiveness of cannabis as a drug to help relieve anxiety.

Cresco Pharm Ltd (ASX: CPH) aims to produce cannabis-based nutraceuticals for anxiety and stress among the many diseases it is targeting, through its hemp-based nutraceutical product CannaQIX, which stimulates psychological performance to reduce stress, and enhance mental focus and overall health using proprietary delivery technologies enhancing bioavailability and absorption.

Auscann Group Holdings Ltd (ASX: AC8) also sees the potential for cannabis-based medicines to provide relief for anxiety and aims to develop research-proven products.

Epilepsy
With roughly 15% of children with epilepsy passing away and 25,000 diagnoses each year in Australia, there is growing demand from patients for alternative solutions due to a lack of known cures and symptom reliefs.

Medicinal cannabis for treatment of epilepsy gained national attention in the United States when a girl called Charlotte gained assistance and research from a medical marijuana group to develop a strain of marijuana that had high concentration of both CBD and THC, which is now known as Charlotte’s Web. The anecdotal evidence from this case study revealed a reduction in Charlotte’s seizure frequency from 50 convulsive seizures per day to 2-3 nocturnal convulsions per month, these benefits have since been reported by many epilepsy patients.

This notion is underpinned by empirical evidence released by Epilepsia – Official Journal of the International League against Epilepsy, which revealed 48% of epileptologists and general neurologists, and 98% of epilepsy patients would advise medical cannabis in severe cases of epilepsy.

Figure 5 Clinical Trials on Epilepsy

<table>
<thead>
<tr>
<th>Year</th>
<th>Title</th>
<th>Medication</th>
<th>Route</th>
<th>Participants</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>Chronic administration of cannabidiol to healthy volunteers and epileptic patients.</td>
<td>Cannabidiol</td>
<td>Oral</td>
<td>15</td>
<td>Improvement noted</td>
</tr>
<tr>
<td>1986</td>
<td>Anticonvulsant effect of cannabidiol</td>
<td>Cannabidiol</td>
<td>Oral</td>
<td>12</td>
<td>No effect</td>
</tr>
</tbody>
</table>

Source: University of Sydney, MXC, and BuddingTech White Paper

The Hydroponics Company (ASX: THC) has agreements and acquisitions in place across multiple countries with regards to distribution, equipment supply and research relating to cannabis. Among these, the acquisition of Canndeo Limited will target multiple markets with high purity cannabidiol, including a new drug-resistant epilepsy market.

MGC Pharmaceuticals Limited’s (ASX: MXC) agreement with SipNose has allowed MXC to penetrate into the global epilepsy market. The company is soon to commence its phase 2A (non-pivotal) epilepsy clinical study in Slovenia.

MMJ PhytoTech Limited (ASX: MMJ) is focused on developing an efficient delivery systems and treatments to deliver cannabis drugs that help with epilepsy.

Zelda Therapeutics Limited (ASX: ZLD) is also emerging within the epilepsy field and is conducting research for medicine to treat neurological diseases.
Cancer

There are two potential applications of cannabis in respect to cancer patients - as a cure and as a supplement to current treatments.

One is using the plant as an oncology medicine for the treatment of cancer. The efficiency of this is largely unknown due to the lack of clinical trials and research. Hence, this sector should see minimal growth in the short-term as companies would still need to develop strains and clinical trials to properly utilise cannabis as an oncology medicine.

On the other hand, there are also a growing number of cancer patients that are consuming medicinal cannabis to ease the nausea and side effects of chemotherapy with some patients revealing significant improvement, resulting in an improved quality of life for the patient and their family.

![Figure 6 Clinical Trials on Chemotherapy](source)

<table>
<thead>
<tr>
<th>Title</th>
<th>Participants</th>
<th>Medication</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary efficacy and safety of an oral unstandardized cannabis extract in chemotherapy-induced nausea and vomiting.</td>
<td>56</td>
<td>Whole-plant cannabis-based medicine</td>
<td>Compared with placebo, CB1R agonist reduced nausea but provided no protection against delayed CINV.</td>
</tr>
<tr>
<td>Efficacy of dronabinol alone and in combination with ondansetron vs ondansetron alone for delayed chemotherapy-induced nausea and vomiting, Cancer-Related Pain.</td>
<td>64</td>
<td>Dronabinol (Delta-9-tetrahydrocannabinol)</td>
<td>Dronabinol or ondansetron was similarly effective for the treatment of CINV.</td>
</tr>
</tbody>
</table>

Source: University of Sydney, MXC, and BuddingTech White Paper

Medlab Clinical Ltd (ASX:MDC) is conducting research into the effects of cannabis for coping with chemotherapy induced nausea through its drug Nanabidial, as well as employing cannabis as an oncology drug through NanaBis.

Besides ZLD’s research in the epilepsy area it is also researching medicinal cannabis for insomnia, autism and eczema, and has begun pre-clinical studies examining effect of CBD in breast, brain and pancreatic cancer.

Chronic Pain

People suffering from intense chronic pain has also reported great success from using medicinal cannabis, with a large number of patients purchasing cannabis for its pain relief qualities. Furthermore, as most strong pain medications are opioid based it can be assumed patients suffering from pain would explore medical cannabis as an alternative.

Furthermore, a University of New Mexico study reveals that 34% of participants (chronic pain patients) enrolled in their research program ceased use of all scheduled prescription medications by the last six months of the observation period.

![Figure 7 Clinical Trials on Chronic Pain](source)

<table>
<thead>
<tr>
<th>Title</th>
<th>Participants</th>
<th>Medication</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nabiximol for opioid-treated cancer patients with poorly-controlled chronic pain: a randomized, placebo-controlled, graded-dose trial.</td>
<td>263</td>
<td>Nabiximol (Sativex, sublingual)</td>
<td>“Nabiximol... may be a useful add-on analgesic for patients with opioid-refractory cancer pain.”</td>
</tr>
</tbody>
</table>

Source: University of Sydney, MXC, and BuddingTech White Paper

Besides MDC’s research in cancer, it is also a diverse pharmaceutical company with product developments that are currently focused on obesity, chronic kidney disease, depression, anti-aging and pain management.

Dermatology

The loosening of legislation with regards to cannabis around the world has caused increased interest in the plant and its benefits from both investors and the general public.

However, hemp seed oil has also been used in cosmetics and anti-aging skin care long before this due to its anti-inflammatory effects and antioxidant properties. Hemp is also widely used in shampoos and conditioners as it is rich in omega-3 and omega-6 fatty acids and as such a great emollient for hair.
The anti-inflammatory effects of CBD make it an ideal candidate for counteracting acne.

Acne is currently treated through either topical creams, oral antibiotics or laser. All of these having issues with safety or effectiveness. The use of CBD or THC in ointments for muscle pain have proven to be safe. Therefore, depending on the effectiveness of cannabis based treatments for acne, the use of cannabis could become widespread in this area.

Studies from the Federation of American Societies for Experimental Biology have also found that cannabinoids are responsible for lipid production, a core chemical the body produces to counteract dry skin. Lipid also further aids the anti-inflammatory effects in combatting acne.

The wide variety of applications components of cannabis provide for dermatology has led to many companies initiating research, ultimately aiming to commercialise their products.

MXC’s Dermatology division has completed a comprehensive safety and efficacy clinical testing program, resulting in European regulatory approval of the products. The company has also entered into wholesale reseller agreements for CBD based cosmetic products line with dispensaries and cannabis lifestyle retailers in Spain, Italy and Romania.

Bod Australia (ASX: BDA) is a developer, manufacturer, distributor, exclusive importer, exporter and marketer of premium brands and products for the skincare, beauty and health industries for the natural segment of the market. The company is now conducting research and signing agreements to prepare itself for the inclusion of cannabis components in its skincare products.

Animal Health

Much of the available research on cannabis relates to human use but its effects can be expected across all mammalian species, including cats and dogs, as the Endocannabinoid System is present in all mammals.

![Figure 8 Endocannabinoid System of a Dog](source)

Source: Cannpal Animal Therapeutics Ltd Prospectus

Companies are now conducting research into the medical benefits of cannabis in animals.

ASX listed company CannPal (ASX:CP1) is investigating the potential for their Lead Drug Candidate CPAT-01 in relieving osteosarcoma pain in dogs. They then aim to extend the application of this drug into cats. Ultimately, CannPal aims to commercialise regulatory approved cannabinoid-derived therapeutics for global animal health markets.

CPH is also aiming to penetrate this market with their hemp-derived nutraceutical products. CPH aims to target multiple medical conditions of animals including both mental and physical illnesses and symptoms. They have signed agreements to distribute these products globally.

True Leaf Medicine International is listed in Germany, Canada and the US. It has commercialised its hemp-based pet chews and is currently selling its products in United States.

Naturally Splendid Enterprises is listed in Canada and has developed a topical treatment to keep dogs’ noses and paws healthy.
Recreational Cannabis

Currently recreational cannabis is limited to only a number of jurisdictions, however, with the increasing liberalisation of cannabis control it is plausible there will be growing recreational markets across the globe in the mid to long term.

One of the key incentives for governments to legalise recreational cannabis is the tax revenue that can be derived from sales.

This is reflected by the current three States that have a developed recreational market – Colorado, Washington and Oregon, which gained $200m, $256m, and $60m in tax revenue for 2016 respectively, with the most mature market Colorado reaping $500m in recreational cannabis tax revenue since legalisation in 2012.

It has become evident in the growing fully legalised cannabis markets namely – Colorado, Washington, and Oregon that the market potential for initial recreational markets is roughly double that of the medicinal markets, with Colorado - the industry’s earliest US market, reaching $834m in recreational cannabis sales in 2016 with a population of around 5.5 million.

Figure 9 Cannabis Sales Data 2016

![Cannabis Sales Data 2016](image)

Source: Arcview – The State of Legal Marijuana Markets

In the recreational market, there are two opportunities for growth and revenue generation:

- **Black market conversion** – Converting black market users to purchase cannabis from legal sources, this would require growers to produce consistent quality products at lower price points than black market operators; and
- **Non-users** – With the decrease in social stigma around cannabis paired with legalisation, it is likely a number of previous non-users would begin to use cannabis recreationally.

Furthermore, evidence is suggesting millennials shying away from alcohol for cannabis. For reasons including:

- **Safety** – millennials have express fear of making poor decisions when consuming alcohol, whereas with cannabis they feel more in control of their actions;
- **Cost** – many millennials state their overall spend on alcohol outstrips that of high quality cannabis; and
- **Health** – millennials experience hangover from alcohol that lasts the entire next day, while cannabis usage had no noticeable lasting effects.

Currently both CPH and MMJ are targeting the Canadian recreational market.

CPH, through its acquisition of Mernova Medicinal Inc., would have a scalable 200,000 sq ft indoor facility to produce and commercialise medical and recreational cannabis in Canada.

MMJ, through its subsidiary United Greeneries, is also aiming to have a presence in Canada’s recreational market.
OVERVIEW OF GEOGRAPHICAL MARKETS

As the cannabis market is still in an infancy phase all markets are still emerging in respect to both recreational and medicinal use.

Figure 10 – State of regulation in global cannabis markets

<table>
<thead>
<tr>
<th>Region</th>
<th>State of Regulation</th>
<th>Market Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Legalised for medical use. Recreational use legalised effective 1 Jul 2018</td>
<td>$300m 2017 for medical, $4.9b-$8.7b for recreational</td>
</tr>
<tr>
<td>Canada</td>
<td>29 States legalised for medical use, 8 for recreational</td>
<td>$7.1b medical and recreational in 2016</td>
</tr>
<tr>
<td>United States</td>
<td>Sativex, Marinol, Cesamet &amp; Bedrocan authorised</td>
<td>€2b medical cannabis in 2016</td>
</tr>
<tr>
<td>Israel</td>
<td>Medical cannabis legalised in 1999.</td>
<td>$40m</td>
</tr>
</tbody>
</table>

Source: TGA, Deloitte, Government data

Australia

Figure 11 – State of medical cannabis in Australia

<table>
<thead>
<tr>
<th>Region</th>
<th>Legislative Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Legalised for medical use, and in effect as of 30 October 2016. Patient access, and product manufacturing will be determined in conjunction with State and Territory governments.</td>
</tr>
<tr>
<td>NSW</td>
<td>On 5 December 2016, the NSW government initiated trial of botanical medicinal cannabis for palliative care, employing Bedrocan BV – developed by Bedrocan a subsidiary of Canopy Growth a Canadian based company.</td>
</tr>
<tr>
<td>VIC</td>
<td>Children with severe intractable epilepsy will be the first group of eligible patients in Victoria in 2017. Eligible patient groups may be expanded in the future on the advice of the Independent Medical Advisory Committee.</td>
</tr>
</tbody>
</table>

Source: Department of Health, Health NSW, Health VIC

In respect to medical cannabis there are two factors positioning Australia as a global leader in medical cannabis – strict regulations and government-led research labs.

Australia passed the legislation to legalise the cultivation of cannabis for medicinal and related research purposes on 29 February 2016, and this came into effect on 30 October 2016. Consequently, cannabis-based products are only available for specific patient groups under medical supervision.

The cultivation, production and manufacturing of cannabis and cannabis products for medical and scientific use is licenced by the newly established Office of Drug Control (ODC).

Under this framework, the Commonwealth has overall legislative control of the cultivation of cannabis plants and production of cannabis and cannabis resin and the manufacture of medicinal cannabis products (which reflects the requirements under the Convention), whilst the State and Territory Governments may introduce their own legislation and licensing requirements to cover manufacture, wholesale, supply and patient access to medicinal cannabis products within their respective jurisdictions.

The manufacturing, registration and supply of medicinal cannabis products are regulated by the Therapeutic Goods Administration (TGA).

Medicinal cannabis products would be classified under prescription medicines, and accordingly would be subject to the Therapeutic Goods Act.

As of 5th of July 2017, there have been 12 businesses in Australia that have received a licence to either grow or manufacture medicinal cannabis.

There are currently three main Australian licensing schemes for medicinal cannabis:

- Medical cannabis licence (cultivation for supply for human medicinal use);
- Cannabis research licence (cultivation for scientific research purposes); and
Manufacturing licence (authorises the manufacture of cannabis products, and related activities i.e. supply, packaging, transport, storage, possession, control, disposal or destruction).

Subsequent to obtaining a licence, the ODC will then provide permit(s) that indicates the type of strain that may be cultivated/manufactured and the quantity.

The licences are currently limited to one year to ensure annual review of compliance, as the system matures the licensing period may be increased to 2 or 3 years depending on the circumstances.

The current legislative framework in Australia also enables the importation of medicinal cannabis with the requirement of an importation permit and licence from the ODC, as well as regulatory approval from the exporting country. Whereas, exporting medicinal cannabis is currently not permitted, though however there have been speculation that Australian cannabis could be cleared for export next year in accordance with Cannacord Genuity and Cann Group.

**Figure 12 Australia’s Medicinal Cannabis Regulatory Framework**

<table>
<thead>
<tr>
<th>Process step</th>
<th>Therapeutic Goods Act (TGA)</th>
<th>Narcotic Drugs Act (ODC)</th>
<th>States and territories involved?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient need</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical authorisation</td>
<td>Access®,</td>
<td>x No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special access scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import (if obtaining from overseas)</td>
<td>Import</td>
<td>Responsibility of the sponsor</td>
<td>Yes</td>
</tr>
<tr>
<td>Distribution</td>
<td>x No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient with medical authorisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture of medicine in its dosage form</td>
<td>Licensable</td>
<td>Licences and permits</td>
<td>Yes</td>
</tr>
<tr>
<td>Manufacture of active ingredient</td>
<td>Licensable</td>
<td>Licence and permit to import controlled substances</td>
<td>Yes</td>
</tr>
<tr>
<td>Harvest (termed ‘production’ in the Narcotic Drugs Act)</td>
<td>x No</td>
<td>Licences and permits</td>
<td>No</td>
</tr>
<tr>
<td>Cultivation</td>
<td>x No</td>
<td>Licences and permits</td>
<td>No</td>
</tr>
</tbody>
</table>


In respect to patient access, State and Territory governments in conjunction with the TGA will determine which patient groups will have access to medicinal cannabis products, and which particular products can be manufactured.

It is difficult to grasp the industry size of medical cannabis in Australia due to the sector still being in its infancy. Though, the ODC noted in July 2016 that “it is difficult to address the predicted tonnage of cannabis required until we know more about patient numbers and likely dosage requirements. Various estimates suggest somewhere between 5 and 10 tonnes is likely to satisfy Australia patients which could be fulfilled with approximately 2 hectares of greenhouses or 10 hectares of broad acre crop.”
Hence, it can be speculated that the size of the Australian medicinal cannabis wholesale industry in FY18 could be roughly $50-$100m. Based on the assumption of initial demand of 5 to 10 tonnes, and a sale price of $10/g.

**NSW**

The NSW Government is committed to developing a better understanding of the potential for cannabis and/or cannabis products to alleviate symptoms or potentially treat a range of debilitating or terminal illnesses. The NSW Government is investing $9 million over the next five years on clinical trials of cannabis products. The trials will explore the use of cannabis and/or cannabis products in providing relief for patients suffering from severe paediatric epilepsy, chemotherapy-induced nausea and vomiting, and for symptom relief for those with terminal illness.

On 5 December 2016, the NSW government initiated Australia’s first trial of botanical medicinal cannabis for palliative care, employing Bedrocan BV – developed by Bedrocan a subsidiary of Canopy Growth a Canadian listed company.

A Canadian company PUF Ventures has entered into a strategic partnership with the Richmond Valley Council of NSW to build the biggest medical cannabis processing plant in the southern hemisphere, a 9.3 ha greenhouse operation with the capacity to produce 100,000 kg of cannabis p.a.

Health NSW has produced a list outlining the type of cannabis products that may be considered for NSW authority to approve consisting of:

- Pharmaceutical grade products that have been approved for use in Australia, by the Australian Register of therapeutic Goods (ARTG) – which currently only has one product being Sativex;
- Pharmaceutical grade products registered with an overseas medicine regulator; and
- Pharmaceutical grade products not yet registered with an overseas medicine regulator but is produced to pharmaceutical GMP standards.

Non-pharmaceutical grade products that are not manufactured to pharmaceutical grade products will generally not be considered for approval by the Secretary, except under special circumstances. Such products may, or may not, have been intended to be used as medicines.

**VIC**

The Victorian Government is developing a medicinal cannabis product that will be available through a scheme scheduled to commence later this year. The launch of this scheme will include an online register of medicinal cannabis products that are approved for use in the Victorian scheme.

The Victorian Government has also imported medical cannabis from Canadian based company Tilray for the treatment of 29 critically ill children with epilepsy.

At the date of this report Children with severe intractable epilepsy will be the first group of eligible patients in Victoria in 2017. Eligible patient groups may be expanded in the future on the advice of the Independent Medical Advisory Committee.

The Independent Medical Advisory Committee, established in 2016, will consider all available evidence when advising on eligible conditions and symptoms and medicinal cannabis products appropriate for their treatment.

**Queensland**

In December 2015, Queensland became the first state in Australia to permit patient access to unregistered medicinal cannabis products for therapeutic use in Australia through amendments to its Health (Drugs and Poisons) Regulation 1996 (HDPR). These amendments allowed the supply of medicinal cannabis products in clinical trials to individual patients through approval by the TGA and Queensland Health.

**Western Australia**

In Western Australia, the Misuse of Drugs Act 1981 governs the misuse of certain drugs, including cannabis. The Western Australian Department of Health has advised that the rescheduling of cannabis-based products for medicinal or research purposes as a controlled drug will enable specialist doctors (who have obtained permission from the Department of Health) to prescribe medicinal cannabis products.
Canada

Recreational Cannabis
Canada has introduced a legislation aimed at regulating recreational marijuana use by 1 Jul 2018, becoming the first G7 country to fully legalise cannabis.

Though the legislation is not finalised the government indicated that it would be comparable to current tobacco legislation. With both focusing on common public health objectives, such as restricting access to youth and enhancing public awareness of health risks. The Act would also contain promotion and packaging prohibitions similar to tobacco, and include smoking restrictions in certain areas.

When the legislation is in full effect, each province and territory would have varying regulation in respect to retail stores and minimum age. However, consumers would still be able to purchase cannabis directly from federally licenced producers through online ordering.

Whilst the legislation is permitting production, distribution and sale of cannabis, oil, plants and seed, edibles would not be legalised till a future date to allow the government to fully develop and implement regulations that will result in safe edible products coming into market.

We are of the opinion that once the legislation for recreational cannabis has been drafted the Canadian government would offer the first recreational sales licences to those that currently possess a medical cannabis licence, as was the case with Colorado.

As the legislation has not yet come into effect it is difficult to estimate the total market size.

However, the growth in number of medical cannabis patients may provide some indicators as doctors have expressed concern that a growing number of recreational users are receiving prescription to smoke medical marijuana.

Furthermore, Deloitte Canada has projected Canada’s recreational marijuana use market could be between CAD$4.9b to $8.7b. Various other industry estimates have also placed the total market size including ancillary products and services to total more than CAD$20b.

The Trudeau Government in Canada has proposed a tax of CAD$1 per gram of legalised recreational marijuana. The government has also stated that the tax should not exceed CAD$1 per gram or 10% of the producer’s price, whichever is higher. The proposed taxes associated with recreational cannabis affirms the role of Canada as the leader in recreational marijuana jurisdiction around the world. Total tax revenue from this initiative is expected to be as much a CAD$1 billion a year.

Figure 13 Canada’s Recreational Cannabis Market

Source: Deloitte Canada, Recreational Marijuana insights and opportunities

According to the finance minister of Ontario the biggest challenge for Trudeau’s legal recreational marijuana market is a shortage of cannabis, and there have been discussions of a supply crunch with provincial and federal governments.
The shortage would be initially met through black market channels, however as the legal market develops it would cannibalise illegal sales as was the case in Colorado - Colorado’s $1b illicit market in 2013 has decreased to less than $500m of a $1.8b overall market in 2016, according to ArcView.

Stats Canada survey data in 2015 reveals 3.6m (12% of population) had used cannabis in the past year, 2.6m (9%) in past 3 months, and 840,000 (3%) people used it daily/almost daily. We believe these figures will grow with legalisation of recreational cannabis, as previous non-users would consider trying marijuana. This notion is underpinned by a study that surveyed 5,000 Canadians revealing that 39% (11.5m) of adult-age Canadians admit they will be cannabis consumers when recreational cannabis is legalised (Colin Firth and OraclePoll Research).

**Medical Cannabis**

Health Canada (HC) is the primary governing body for the Canadian medicinal cannabis industry.

It conducts regular inspections of licensed producers to verify their compliance with the standards set out by the Access to Cannabis for Medical Purposes Regulations (ACMPR) - a set of regulations for the production and distribution of medicinal cannabis - and penalises any party acting in contravention to it (through seizures and suspension of licenses). As medicinal cannabis is sourced entirely from licensed producers, Health Canada is assigned to overlook all aspects of licensing and regulation for registered producers.

Canada has 58 licenced cannabis producers (as of September 2017), and 167,754 registered patients (as of March 2017). This medical purpose regime will continue to exist to provide for patients who need cannabis for medical purposes, with an evaluation of the medical access framework to be conducted within five years of implementing the new cannabis legislation.

HC has estimated in 2013 that Canada would reach 450,000 patients and a market size of approximately $1.4b by 2024, though current data is exceeding these forecasts (in 2016 there were roughly 130,000 registered patients, HC estimated 60,000).

*Figure 14 Total Number of Patients - Canada*

Source: Health Canada, Haywood Securities
**Key Players**

The size of the market and analyst expectations can also be reflected by the growing market capitalisations in the big marijuana companies in Canada such as:

<table>
<thead>
<tr>
<th>Name</th>
<th>Market Capitalisation</th>
<th>Production Facilities</th>
<th>Expected Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canopy Growth Corporation</td>
<td>CAD$1.49 B</td>
<td>Canada: 168,000 sq ft – Production Space&lt;br&gt;Netherlands: 50,000 sq ft – Processing Plant</td>
<td>22,200 kg p. a.&lt;br&gt;70,000 kg p. a. (post expansion)</td>
</tr>
<tr>
<td>Aphria Incorporated</td>
<td>CAD$798 M</td>
<td>Canada: 300,000 sq ft – Production space&lt;br&gt;300,000 sq ft – Expansion by CY18</td>
<td>21,000 kg p. a.&lt;br&gt;70,000 kg p. a. (CY18 post expansion)</td>
</tr>
<tr>
<td>Aurora Cannabis Incorporated</td>
<td>CAD$877 M</td>
<td>Canada: 55,200 sq ft – Alberta&lt;br&gt;800,000 sq ft – Edmonton Airport (CY18)&lt;br&gt;40,000 sq ft – Quebec (CY18)</td>
<td>439 kg p. a. (FY16)&lt;br&gt;1,145 kg p. a. (FY17)</td>
</tr>
<tr>
<td>MedReleaf</td>
<td>CAD$786 M</td>
<td>Canada: 55,000 sq ft facility&lt;br&gt;23,500 sq ft cultivation&lt;br&gt;210,000 sq ft expansion</td>
<td>Current capacity 7,000 kg p. a.</td>
</tr>
<tr>
<td>Emblem Cannabis Corporation</td>
<td>CAD$126 M</td>
<td>Canada: N/A</td>
<td>June 30 2017 – 90 kg p. a.</td>
</tr>
<tr>
<td>Supreme Pharmaceuticals</td>
<td>CAD$218 M</td>
<td>Canada: Wholly owned subsidiary 7ARCES – 342,000 sq ft</td>
<td>25,000 kg p. a.</td>
</tr>
</tbody>
</table>
United States

Marijuana is classified by the federal government as a Schedule I controlled substance, meaning that the drug has no accepted medical benefit and a high potential for abuse.

Because of this classification, researchers interested in marijuana must first obtain a licence from the Drug Enforcement Agency (DEA), and then apply for access to the supply kept by the National Institutes of Drug Abuse (NIDA) for research purposes. The challenges involved in obtaining the drug have prevented research into its potential uses as a therapeutic agent.

In the US cannabis use is illegal for any reason, with the exception of U. S Food and Drug Administration (FDA) approved research programs. However, individual states have enacted legislation permitting exemptions for various uses, mainly for medical and industrial use.

29 states have already legalised medical marijuana and 8 states in total have legalised it for recreational use.

The estimated size of the legal US marijuana market (both medical and recreational) was $7.1 billion in 2016 (approximately a 25% increase from 2015). This increase was mainly due to growth in states that approved recreational usage such as Colorado, Washington and Oregon.

United States legal sales of cannabis are expected to further increase to $18 billion in 2020.

Figure 15 North American Legal Cannabis Spending 2015-2021

Source: Arcview – The State of Legal Marijuana Markets

However, in many of the largest markets, like New York and Florida, sales are expected to remain limited to medical-use. Though in the 2021-2026 period, it is likely many of these states will build robust legal adult-use markets, and all but a few states will not make medical cannabis available legally.

Including the illicit market, consumer spending on cannabis in North America amounted to an estimated $56.1 billion in 2016, 88% of it outside legal channels, indicating the potential of the recreational market if completely legalised in America.

The medical market for cannabis in America is significant with nearly 1.9 million North Americans legally using cannabis to manage conditions as severe as polymorphic seizures and as common as chronic pain.

Millions more are consuming it legally in adult-use states with little or no negative impact.

Moreover, 63% of Americans are now living in states which allow medical cannabis usage.
The current States that have fully legalised cannabis are as below:

Figure 16 North American Legal Cannabis Spending 2015-2021

<table>
<thead>
<tr>
<th>Region</th>
<th>Legislative Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>29 states have already legalised medical marijuana and 8 states in total have legalised it for recreational use.</td>
</tr>
<tr>
<td>Colorado</td>
<td>In 2000 Colorado legalised medical cannabis and in 2012 recreational cannabis was legalised. The Colorado Medical Marijuana Registry allows patients with qualifying, debilitating medical conditions to receive an identification card for legal access to medical marijuana.</td>
</tr>
<tr>
<td>Oregon</td>
<td>In 1998 the Oregon Medical Marijuana Act was established, which allowed the cultivation, possession, and use of marijuana by doctor recommendation for patients with specific medical conditions. Marijuana for recreational use was legalised in 2014 and took effect on Jul 1st, 2015.</td>
</tr>
<tr>
<td>Washington</td>
<td>Medical usage was legalised in Washington in 1998 and recreational use was legalised in 2012. For a patient to obtain medical marijuana in Washington they must get a Medical Marijuana Authorization from a marijuana authorised healthcare practitioner and join the medical marijuana authorization database to get a medical marijuana card.</td>
</tr>
<tr>
<td>California</td>
<td>Cannabis for recreational use will be legalised in California starting January 2018.</td>
</tr>
<tr>
<td>Alaska</td>
<td>Alaska Measure 2 was a successful 2014 ballot measure in the U.S. state of Alaska, described as &quot;An Act to tax and regulate the production, sale, and use of marijuana.&quot; The measure went into effect on 24 February 2015, allowing Alaskans age 21 and older to possess up to an ounce of cannabis and six plants.</td>
</tr>
<tr>
<td>Maine</td>
<td>The Marijuana Legalization Act, which was to take effect within 40 days of November 8, 2016 permits adults who are not participating in the state’s medical cannabis program to legally grow and to possess personal use quantities of cannabis while also licensing commercial cannabis production and retail sales. Retail sales will not begin until February 2018, in order to allow agencies to form regulations for the new industry.</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>In the November 8, 2016 election, Massachusetts voters passed a ballot initiative making recreational cannabis legal in the state. Governor Charles Baker signed legislation on 30 December 2016 extending the start date for recreational pot sales by six months, to July 2018. Some communities have since applied to the State Attorney General to delay sales.</td>
</tr>
<tr>
<td>Nevada</td>
<td>Cannabis in Nevada became legal for recreational use effective January 1, 2017, having been legalized by ballot initiative in 2016.</td>
</tr>
</tbody>
</table>

Source: Government data

**Colorado**

In 2000 Colorado legalised medical cannabis and in 2012 recreational cannabis was legalised, it can be considered the ‘ground zero’ of cannabis. The Colorado Medical Marijuana Registry allows patients with qualifying, debilitated medical conditions to receive an identification card for legal access to medical marijuana. The registry is managed by the Colorado Department of Public Health and Environment.

Colorado has the largest number of medical marijuana patients in the United States, with 19.8 patients per 1,000 state residents (1.98%). Furthermore, the recreational and medical marijuana sales in 2016 for Colorado alone amounted to $1.3 billion indicating significant demand and potential.

The medical industry can be a tremendous asset to a state wanting to expand into the recreational space. Colorado was right by offering the first recreational licenses to medical operators who have the knowledge and experience to ensure a successful recreational roll out.
Oregon

In 1998 the Oregon Medical Marijuana Act was established, which allowed the cultivation, possession, and use of marijuana by doctor recommendation for patients with specific medical conditions. Marijuana for recreational use was legalised in 2014 and took effect on Jul 1st, 2015.

The Oregon Medical Marijuana Program is administered by the Oregon Department of Health Services (DHS) and is responsible for processing all medical marijuana card applications.

In 2016 there was 77,620 (19.2 per 1,000 residents - 1.92%) registered medical marijuana patients.

Oregon's 350 retail outlets selling cannabis to adult shoppers generated $238 million in sales and Oregon's 381 medical dispensaries experienced average sales per location of $294,000 in 2016.

Washington

Medical usage was legalised in Washington in 1998 and recreational use was legalised in 2012. For a patient to obtain medical marijuana in Washington they must get a Medical Marijuana Authorization from a marijuana authorised healthcare practitioner and join the medical marijuana authorization database to get a medical marijuana card.

Healthcare practitioners who are allowed to authorize the use of marijuana for medicinal purposes must complete a Washington State Department of Health Medical Marijuana Authorization form.

Licensed marijuana producers must follow the Washington State Liquor and Cannabis Board traceability system process and ensure all required testing is complete

In 2016 there were 138,056 (19.2 for every 1,000 state residents – 1.92%) medical marijuana patients in Washington.

In Washington state where medical dispensaries were shut down in favour of the adult-use market, the 357 remaining retailers averaged $1.55 million in sales.

California

California pioneered the modern cannabis policy reform movement in 1996 when voters passed Proposition 215, the Compassionate Care Act. Though voters failed to approve recreational in 2010, they voted overwhelmingly in 2016. Cannabis for recreational use will be legalised in California starting January 2018.

As of March 1st 2016 there were 758,607 (19.4 per 1,000 state residents – 1.94%) legal medical marijuana patients in California.
Israel

In Israel cannabis producing, manufacturing and use is regulated and licenced by the Ministry of Health.

In 1999, Medical marijuana was approved for use in Israel if a person has a permit or licence for medical marijuana from the country’s Ministry of Health. In 2009 lawmakers in Israel ordered the Ministry of Health to expand the country’s medical program and in that year the first hospital was authorized to treat its patients with cannabis.

In 2011, the Israeli Government officially recognised marijuana’s therapeutic uses, while also amending production and distribution of medical cannabis to Israeli patients. This amendment saw the number of patients supplied with cannabis increase from 6,000 patients in 2011 to around 20,000 patients in 2016.

Israel is a world leader for pioneering medical cannabis research and development. An example includes Dr. Adi Aran recently obtaining government permits for the first-ever formal clinical trial of medicinal cannabis with autistic children and adults. The end goal of this research is to obtain approval from the US Federal Drug Administration to classify this treatment as an experimental treatment. In classifying the formulation as an FDA-recognised drug would mean it’s no longer covered by the federal ban on U.S. imports of marijuana, a key step in solidifying Israel’s reputation as a global centre for medical cannabis research, development and exports.

Additionally, Tikun Olam is one of the largest medical cannabis companies in Israel and has been operating under a license from the Israeli government for nearly a decade. The private company claims to have one of the most extensive medical cannabis patient databases in the world. It has also initiated several research programs, including an ongoing survey on how cannabis affects children with cancer — and what it describes as “the world’s first randomized, placebo-controlled, double-blinded study” of the effect of cannabis on patients with Crohn’s disease.

Israel, currently, does not import medical cannabis as the price is much lower in Israel. The world price is between $5 and $15 a gram whereas the average price in Israel is $5.20 a gram.

Currently, it is illegal in Israel to export marijuana products.

The agricultural sector is in favour of exporting the product however the police and executive branch of government are strictly against it. Israeli legislation to allow exports of qualified medical cannabis has passed preliminary reading in parliament and is expected to be completed early next year. The government team recommending export said Israeli companies must maintain high, medical-grade standards and be subject to strict supervision, with sales allowed only to countries that specifically approved Israel’s merchandise. Israel has a strong reputation for well-produced cannabis. Because of this, experts expect Israel to be at the forefront of the emerging cannabis market in Europe.

An inter-ministerial team said in August that sales abroad from countries already interested would add as much as 4 billion shekels ($1.1 billion) a year to the nation’s $320 billion economy. Still, there's a limited window of opportunity for Israel’s advantage in the market. As other countries begin producing for their own markets, the need for imports could fall. However, the low prices Israel offers may counteract this decrease in demand.

The Health Ministry plans to increase licenses for cannabis growers from eight to nearly 50 and has invested 100 million shekels in research and development. The Ministry of Health has approved 150 research proposals, 35 of them clinical trials. More than 50 U.S. companies are doing medical marijuana research in Israel and in 2016 invested more than $125 million in Israeli cannabis operations.

The $40 million per year medical marijuana industry in Israel has been thriving. Whereas, research efforts in the United States have been continually hindered by the National Institute on Drug Abuse and the Drug Enforcement Agency, the Israeli government is funding and supporting breakthrough research on the many healing potentials of the cannabis plant. As a result, Israel has become a world leader in cannabis research.

A recent survey conducted in the US states which legalised medical cannabis, concluded that 1.25% of the population consumed medical cannabis. Using this conclusion, in Israel there is possible potential for 100,000 consumers. However, this potential is unlikely to be realised due to imposed regulation.

Recreational cannabis use is not legal in Israel however there has been steps taken to decriminalise it. From this, there is likely little opportunity for a recreational market and therefore the main potential for Israel is medical use and research.
Europe

Figure 17 State of Regulation and Potential Market Sizes of European Countries

<table>
<thead>
<tr>
<th>Region</th>
<th>State of Regulation</th>
<th>Potential Market Size (Medical Cannabis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Legalised March 2017 for medical cannabis</td>
<td>€10.2b</td>
</tr>
<tr>
<td>France</td>
<td>Medical cannabis derivates legalised in 2013</td>
<td>€7.2b</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Second Bill reading scheduled February 2018</td>
<td>€5.3b</td>
</tr>
<tr>
<td>Italy</td>
<td>Legalised 2013 for medical cannabis</td>
<td>€4.7b</td>
</tr>
<tr>
<td>Spain</td>
<td>Not legalised</td>
<td>€3.3b</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Legal as prescription medication in 2003</td>
<td>€2.1b</td>
</tr>
<tr>
<td>Poland</td>
<td>Legal as prescription medication since 2017</td>
<td>€1.4b</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Cannabis containing less than 1% THC is legal for medicinal use</td>
<td>€1.3b</td>
</tr>
<tr>
<td>Ireland</td>
<td>Medicinal cannabis is legal</td>
<td>€0.58b</td>
</tr>
<tr>
<td>Greece</td>
<td>Legal as prescription medication since 2017 (awaiting regulation)</td>
<td>€0.56b</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Legalised April 2013 for medical cannabis</td>
<td>€0.5b</td>
</tr>
<tr>
<td>Scandinavia</td>
<td>Legislation is inconsistent</td>
<td>€3.24b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

Europe has been slow out of the blocks but is set to become one of the largest cannabis markets in the world within the next five years.

However there are some key considerations when it comes to how the industry develops and attracts investment.

The region’s population is twice the size of the US and Canada together but is centred around a relatively small geographical area. Its richness in diversity points to over 50 countries, 23 official languages and many cultural nuances. These factors are already contributing to a complex regulatory and business environment that will be significantly different from other progressive cannabis markets around the world. This is further reinforced by people’s passion for local brands and the integral societal bond between government and healthcare.

Figure 18 European Market Figures

Source: The European Cannabis Report™ 2nd Edition
Europe in general is an educated and informed part of the world so the debate will not be won over night. Yes, there has been a shift in attitudes but the reality is that a medical cannabis industry will have to be explored and developed properly before the conversation on recreational use can begin.

However the sheer size of a potential recreational market makes it an interesting and enticing proposition for government and business alike. It will be hard to ignore. As for Europe’s burgeoning medicinal cannabis industry, it represents an exciting green field opportunity.

**Medicinal**

With a market of over 739 million people, and total healthcare spend of €1.49t, Europe will be the largest medical cannabis market in the world. This will clearly make the European medical cannabis market a key target for pharmaceutical companies over the next 5-10 years.

The European medical cannabis market is expected to be valued at almost €50b once all markets have implemented legislation and market infrastructure. This does not include revenue that will be generated from the additional secondary market and ancillary services. EIHA, Nova-Institute and HempConsult estimate that the European market for CBD as a pharmaceutical product is already worth €2b alone.

Europe is undergoing a wave of regulatory and legislative changes that are moving faster than can be predicted. A legal version of Moore’s law is at play, with the past six months seeing several European countries introduce or announce future legislation to advance the legal cannabis agenda.

**Figure 19 Authorised Cannabis Medicines in Europe**

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Description</th>
<th>Indications</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sativex (Nabiximols)</td>
<td>Extract of cannabis (oil): THC and CBD</td>
<td>Multiple sclerosis</td>
<td>Sublingual spray</td>
</tr>
<tr>
<td>Marinol (Dronabinol)</td>
<td>Synthetic delta-9-THC</td>
<td>Cancer treatment, AIDS, multiple sclerosis</td>
<td>Gelatin capsule</td>
</tr>
<tr>
<td>Cesamet (Nabilone)</td>
<td>Synthetic cannabinoid similar to THC</td>
<td>Cancer treatment</td>
<td>Capsule</td>
</tr>
<tr>
<td>Bedrocan</td>
<td>Dried flower tips (sometimes powdered), five different strains available</td>
<td>Various</td>
<td>Plant material</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

**Recreational**

Cannabis accounts for the largest share of the €40b+ illegal drug market. New products, distribution and supply channels have further advanced cannabis consumption and presence throughout Europe over the last ten years.

This potential market of over 140m active cannabis consumers remains on the wrong side of the law. However Europe is solely focused on legislation for medical and industrial cannabis - with the exception perhaps of Catalonia.

Factors such as new employment opportunities, additional tax income, reduction in crime and greater clinical research are going to become key driving forces for the establishment of a legal recreational cannabis market in Europe.
German

The German Federal Ministry of Health initiated a new medical cannabis bill and is currently awaiting approval from the German Bundestag, the country’s national parliament.

Headed by the current Federal Health Minister Hermann Groehe, the objective of the measure is to make medicinal cannabis flower and extracts available to seriously ill patients from local drug stores throughout the country. In addition, the program will ensure that the medical marijuana will be cultivated in Germany at the highest quality possible, and will also be covered under the country’s health insurance.

The German cabinet unanimously approved a medical cannabis law in 2016, which came into effect March 2017. The drug is available to “seriously ill” patients on a case-by-case basis.

Germany’s nascent medical marijuana market is already leading the way among European countries with a market value of €10.2 billion ($11.9 billion), according to (The European Cannabis Report™ 2nd Edition).

Add recreational marijuana and industrial hemp to the mix, the total potential market value of commercial cannabis in the country is €14.7 billion ($17.14 billion).

It is also possible to obtain a special permission by the "Federal Institute for Drugs and Medical Devices" to obtain, possess and consume cannabis as a part of medically supervised and accompanied self-therapy. As of January 2015, 382 patients have obtained such a permission. Furthermore, cannabis cultivation and possession can be permitted to scientific institutions or administrative bodies.

Medicinal cannabis is legal with special permission from the Federal Institute for Drugs and Medical Devices. As for recreational, the legislation is inconsistent. Consumption is legal. Possession is illegal, however amounts up to 6 - 15 grams (depending on region) are tolerated.

Germany is the largest regulated medical market in Europe, thus it leads the way in terms of actual market valuation. It is anticipated that medical cannabis will relax attitudes towards the plant in general which will eventually lead to a fully regulated recreational market.

Germany will, in 2019, create a state-regulated program to cultivate the crop for its medicinal use in the future and to ensure its quality. Until then, plants will be imported. Ten licences were on offer in 2017 for national/international producers but more licenses can be expected once the application process is re-evaluated in 2018.

Until domestic supply can keep up with demand, the country is turning to Canadian companies to import marijuana products for patients. Aurora Cannabis, a Canadian licensed producer, shipped its first 50 kilograms of marijuana to Germany in September. And earlier this month, two other Canadian cannabis companies inked deals to distribute their products in German pharmacies.
France

France is the world’s leader in hemp seed production, currently responsible for 59% of the total seeds globally. The country also dominates the fibre application market, accounting for over 50% of hemp based pulp and paper production in Europe.

France is among the world leaders with regards to the percentage of its population using cannabis recreationally. This has generated a black market worth an estimated €8.3 billion per annum. This underlying marketplace, although currently illegal, demonstrates great potential for a future legal cannabis economy in France.

Medicinal cannabis is legal as a prescribed medication since June 2013. As for recreational usage, it is illegal.

Legislation permitting the sale of medications containing cannabis derivatives was enacted in June 2013. It is possible to get an authorisation from the French Security Agency for Health Products to use health products that are not authorised on the French market. 74 such authorisations have been delivered for Marinol (dronabinol) for a range of different diseases, including pain, appetite loss, nausea, Tourette’s syndrome, dystonia and inflammatory diseases of the nervous system.

The size and scale of France makes this market one of Europe’s key markets for economic opportunity. Current medical cannabis legislation is under review with the announcement of legal cannabis industry trial pending. Rivalled only by China and US, the French hemp industry is going through a resurgence in production volume and new product development.
United Kingdom

At present, the UK is in the unfortunate position of having a confrontational and conservative government in power.

As such, current legislation is in keeping with a law first introduced in 1971. On the 10th October 2017, a new bill calling for the legalisation of cannabis for medicinal purposes was introduced to parliament with the next debate and outcome expected in late February 2018. There is increasing optimism that this bill could become the catalyst of the UK’s move towards legalisation.

The cannabis investment sector is beginning to gain traction in the capital, at present. In addition, the pharmaceutical and cosmetic industries have begun to embrace and capitalise on the myriad of applications cannabis has to offer.

The estimated number of active cannabis users in the UK currently resides between 1.7 million - 3.6 million, contributing to an estimated black market value of €6b per annum. This demonstrates the volume of the consumer base that awaits a reform in legislation, indicating that the UK could still capitalise and flourish within the legal cannabis industry.

Medicinal cannabis is illegal - with the exception of the rarely prescribed (NASDAQ-listed GW Pharma’s) Sativex. For recreational usage, it is illegal with cannabis classed as a Schedule 1, Class B drug in the UK.

**Figure 23 United Kingdom’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Medical Cannabis Market Value</th>
<th>Recreational Cannabis Market Value</th>
<th>Industrial Cannabis Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market</td>
<td>€5.3b</td>
<td>€3.8b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Secondary Market</td>
<td>-</td>
<td>€2.2b</td>
<td>-</td>
</tr>
<tr>
<td>SubTotal</td>
<td>€5.3b</td>
<td>€6.0b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>€11.3b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

It can be expected that once the ‘Brexit’ business is concluded, the UK will turn its attention to the burgeoning cannabis industry and look at expanding the plant’s position in the market place. Already The Medicines & Healthcare Products Regulatory Agency (MHRA) classified CBD as a medicine opening up the product to the market.

The potential of a regulated recreational market still seems distant. However pressure is mounting as public support increases.

Italy

Due to a lack of domestic cultivation, cannabis was only available via import from the Netherlands. This resulted in a price range which was widely regarded to be too expensive for the majority of Italian patients.

However, in 2017, the Italian military was granted exclusivity of the country’s cannabis production and distribution – a move which could drastically open up the domestic market. In a development late last year, the Italian senate passed a law permitting the cultivation of cannabis without the need for authorisation in the food, cosmetics and energy sectors.

Although this doesn't directly relate to the country's medical cultivation of the plant, it does demonstrate a willingness of the Italian government to relinquish the army’s monopoly on domestic cannabis production. This indicates that there is likely to be a massive opportunity in 2018 for local entrepreneurs to get in on the ground floor.

Medicinal cannabis is legal as prescribed medication since 2013. As for recreational cannabis - possession, cultivation and consumption is illegal outside of cannabis social clubs. Cannabis social clubs can legally have up to 50 members and 250 plants at any one time.
Spain
Cannabis consumption and cultivation for recreational or medical use is decriminalised in Spain providing it is for personal use and in a private place. Although ‘Sale and importation’ and ‘purchase, possession and consumption’ of cannabis in a public place is illegal.

Medicinal and recreational cannabis legislation is inconsistent. Possession and consumption is legal in private areas. Public possession and consumption is decriminalised up to 70 - 100 grams (depending on region).

The country’s cannabis industry operates in a grey area. This has given rise to private cannabis clubs and a thriving micro production industry. These businesses could influence policy legislation which may in turn push out major operators.

The Netherlands
Due to current legislation, Amsterdam’s famous coffee shops have to rely on the ‘back door’ black market supply of cannabis. However, the future looks promising, with a new bill being submitted this year that will effectively allow the government to regulate the city’s cannabis supply, creating a regulated recreational marketplace, with an estimated value of €1 billion per annum.

Currently Bedrocan have a monopoly on the medical cannabis market and R&D licences and are capitalising on the emerging markets across Europe, through exportation. The Netherlands is also strengthening its position within the hemp industry. 2016 saw Holland become Europe’s third largest cultivator of hemp based materials, increasing its output by over 600 hectares compared to the previous year.

It seems inevitable that the decades of experience the Dutch possess in cultivation and R&D will place them in pole position in Europe, whether that be on the genetics side or as an exporter to neighbouring nations as laws are gradually reformed.
Medicinal cannabis is legal as a prescribed medication since June 2013. As for recreational cannabis legislation, it is inconsistent. Possession of less than 5 grams is decriminalised for public use and for use in cannabis ‘coffee shops’.

**Figure 26 Netherland’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Primary Market</th>
<th>Secondary Market</th>
<th>SubTotal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Netherlands</strong></td>
<td>€2.1b</td>
<td>€1.9b</td>
<td>€2.1b</td>
<td>€5.2b</td>
</tr>
<tr>
<td><strong>Medical Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recreational Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Industrial Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

The Netherlands has the local expertise to be the knowledge leaders of the European cannabis industry. With a deep understanding of genetics and enviable Crop IP, the Dutch are well positioned to champion innovation and product development in this space. Existing production and testing companies are set to significantly benefit from the European cannabis boom.

**Poland**

In the summer of 2017, Poland’s lower house of parliament (Sejm) voted overwhelmingly in favour of making medical cannabis legal “under certain circumstances”. The Bill which was backed by Poland’s own Health Care is a lot less restrictive than its predecessors - allowing doctors to offer prescriptions for any condition that can be treated with cannabis, if supported by research.

Medicinal cannabis is legal as a prescribed medication since 2017. As for recreational usage, it is illegal.

The cannabis testing and production industry is beginning to emerge on the back of a legal medical market. Licences are selectively allocated and local businesses look likely to be given preferences.

**Figure 27 Poland’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Primary Market</th>
<th>Secondary Market</th>
<th>SubTotal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poland</strong></td>
<td>€1.4b</td>
<td>€0.11b</td>
<td>€1.4b</td>
<td>€1.6b</td>
</tr>
<tr>
<td><strong>Medical Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recreational Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Industrial Cannabis Market Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

**Switzerland**

Switzerland already has in place cannabis laws which are far more relaxed than those seen throughout Europe. Cannabis and hemp based products can legally contain up to 1% THC (compared to the standard 0.2% seen across the rest of the continent).

This legal quirk led to the launch of cannabis infused cigarettes to hit Swiss supermarket shelves in 2017. A move which is expected to do wonders for Swiss tourism in the years to come.
Cannabis is a major contributor to the Swiss economy, with the annual sales of legal cannabis and hemp products in Switzerland totalling around €87.9 million annually (roughly 1.5% of the Swiss GDP). This is not including the current recreational black market, which has an estimated value of €84 million per annum.

The number of shops applying for licenses to sell low THC cannabis has increased rapidly in recent years, in keeping with the tide of cannabis reform that is gaining traction across Europe. If this trend continues, cannabis could become an even greater contributor to the Swiss economy, exponentially, for years to come.

Medicinal cannabis is illegal, however cannabis containing less than 1% THC is perfectly legal and can therefore be used for medicinal purposes. As for recreational legislation, it is inconsistent. Possession and consumption are decriminalised. Cannabis containing less than 1% THC is completely legal.

**Figure 28 Switzerland’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Medical Cannabis Market Value</th>
<th>Recreational Cannabis Market Value</th>
<th>Industrial Cannabis Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market</td>
<td>€1.3b</td>
<td>€0.04b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Secondary Market</td>
<td>-</td>
<td>€0.03b</td>
<td>-</td>
</tr>
<tr>
<td>SubTotal</td>
<td>€1.3b</td>
<td>€0.07b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>€1.37b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

Home to some of the biggest pharmaceutical companies in the world along with major financial institutions, we would expect Switzerland to be pivotal for the growth of the European cannabis industry from an investment and IP perspective. However domestically, Switzerland will continue to operate independent to the rest of Europe.

**Ireland**

Medical cannabis has been legal in Ireland since 2013, specifically prescribing Sativex to patients suffering with multiple sclerosis. However, due to a lack of agreement on pricing and distribution between Sativex manufacturer, GW Pharmaceuticals and the Irish Department of Health, Ireland is yet to see its first prescription.

There was an attempt in 2017 to expand Ireland’s medical cannabis marketplace, with a bill calling for legislative change. However, it was rejected by the Oireachtas Health Committee over fears the language in the bill might lead to the decriminalisation of recreational cannabis use. The positive news is that a redrafting is underway at present with submission expected by the end of 2017.

Medicinal cannabis is legal but difficult to acquire. As for recreational usage, it is illegal.

Due to Brexit, it looks like Ireland could be the only English speaking country in Europe within 18 months which in itself presents interesting opportunities as a European HQ.

There is also major opportunities for first movers within the domestic market. A number of companies in the Irish agricultural industry have already turned their attention to hemp production this year. Medical legislation is expected in the next six months.
Greece

Medicinal cannabis use was legalised in Greece in June 2017, although regulatory laws are yet to be implemented. This decision was the latest in Greece’s recent history of anti-prohibition stances including the decision to legalise and reintroduce hemp in May 2016.

It’s likely the country will rely on imported cannabis as there is no domestic cultivation system currently in place. This will probably come from nations that already have an established infrastructure and experience in cannabis production.

Greece is seeking to follow the Canadian model and benefit from a predominantly export cannabis industry which could mean an injection of up to €1b into the recovering economy.

Medicinal cannabis is legal as a prescribed medication since June 2017 (although regulation is yet to be implemented). As for recreational usage it is illegal.

Czech Republic

The Czech Republic has had a complex relationship with cannabis. When the country was founded in 1993, the government implemented a revolutionary set of progressive drug laws, outlawing the production and sale of drugs, but legalising their possession and consumption. This position has moved back and forth in the years that have followed and, at present, recreational use is decriminalised, with consumption for medical purposes being made fully legal in 2013.

The Czech medical cannabis market has been characterised since its founding by supply shortages and a lack of competitive suppliers. However, the leader of ANO (the centrist party that won the Czech parliamentary
elections -2017) has said earlier this summer that patient access to medical cannabis must be significantly increased and insurers need to cover costs.

At present, hemp is regulated as an industrial commodity and therefore has more relaxed limits on cultivation and processing than neighbouring countries. As a result, the Czech Republic is currently a world-leader in cannabis-infused products such as cosmetics and dietary supplements. Numerous Czech products are currently on sale in the UK, Spain, Germany and many other European markets. With the popularity of hemp-based cosmetics on the rise, there could be a bright future ahead for the cannabis industry in the Czech Republic.

Medicinal cannabis is legal as prescribed medication since 2013. As for recreational, legislation is Inconsistent. Technically, cannabis consumption and cultivation are illegal. However, possession of less than 15 grams/cultivation of less than 5 plants is treated as a misdemeanour.

**Figure 31 Czech Republic’s Commercial Opportunities**

<table>
<thead>
<tr>
<th>Czech Republic</th>
<th>Medical Cannabis Market Value</th>
<th>Recreational Cannabis Market Value</th>
<th>Industrial Cannabis Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market</td>
<td>€0.5b</td>
<td>€0.16b</td>
<td>€0.82m</td>
</tr>
<tr>
<td>Secondary Market</td>
<td>-</td>
<td>€0.09b</td>
<td>-</td>
</tr>
<tr>
<td>SubTotal</td>
<td>€0.5b</td>
<td>€0.25b</td>
<td>€0.82m</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>€0.81b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

Already a haven for cannabis companies, the Czech Republic’s pro-business government and favourable land and employment rates make it a frontrunner to become one of Europe’s leading production and processing nations.

**Portugal**

Portugal decriminalised cannabis, along with all other drugs, in 2001. However, in the years that have followed, very little progress has been made. Even as the rest of Europe shifts towards medical reform, Portugal maintains its ‘illegal yet tolerated’ stance on cannabis.

This stance results in an unregulated, black market that has the cultivation and distribution of cannabis monopolised throughout the country. Meaning the Portuguese government is currently missing out on a market with an estimated value of €106 million per annum.

The current Portuguese government has shown no interest in a change in reform, despite the enormous potential a regulated cannabis market holds. However, with the emerging success stories currently underway in the nascent German medical cannabis market, as well as that of the US and Canadian medical and recreational cannabis industries, a country with as liberal a history as Portugal could witness a change in legislation within a matter of years.

Medicinal and recreational cannabis legislation is Inconsistent. Although technically illegal, all drugs were decriminalised in 2001. As a result, consumers are not penalised for medical use.
Scandinavia

Cannabis laws throughout Scandinavia are among the most regressive in Europe - although there are varying levels of tolerance.

In Sweden, for example, drug policy is based on the conviction that all drugs are extremely dangerous and the punishments for possession and consumption reflect this. This attitude is echoed in their Norwegian neighbours.

In Denmark, however, there has at least been an attempt at progress in recent years. In 2011, Copenhagen City Council actually passed a motion allowing the regulated sale of cannabis within the city. However, the proposal was rejected at the national level and any further attempts at reform have yet to materialise.

There is presently a medical cannabis market in Scandinavia, with Denmark again leading the charge. GW Pharmaceuticals’ cannabis-based Sativex is among the drugs available via prescription.

Norway and Sweden also have cannabis available for medical purposes, although the qualifying conditions are a lot more restrictive than Denmark, or any other country with a medical cannabis industry for that matter. Cannabis laws in Norway are so regressive that even hemp cultivation is illegal.

Denmark, Finland and Sweden, however, all have active hemp industries, with the latter utilising the plant in pioneering bioenergy research & development.

Iceland, although not technically part of Scandinavia, is Europe’s most sparsely populated country. It also could overnight become the most progressive cannabis market. The Icelandic Reform Party recently proposed a bill for the legalisation of adult-use so it will be interesting to hear how it is debated in parliament.

Scandinavia is renowned for leading the world on progressive and liberal thinking and policies, this has yet to extend to cannabis. Scandinavia might be slower to adopt a legal stance on cannabis than other European states, but with some of the world’s leading public healthcare sectors we would expect the region to be one of

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**Figure 32 Portugal’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Medical Cannabis Market Value</th>
<th>Recreational Cannabis Market Value</th>
<th>Industrial Cannabis Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market</td>
<td>€0.66b</td>
<td>€0.13b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Secondary Market</td>
<td>-</td>
<td>€0.08b</td>
<td>-</td>
</tr>
<tr>
<td>SubTotal</td>
<td>€0.66</td>
<td>€0.21b</td>
<td>€0.59m</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>€0.87b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition

**Figure 33 Scandinavia’s commercial opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Medical Cannabis Market Value</th>
<th>Recreational Cannabis Market Value</th>
<th>Industrial Cannabis Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market</td>
<td>€3.24</td>
<td>€0.51b</td>
<td>€1.19m</td>
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<tr>
<td>Secondary Market</td>
<td>-</td>
<td>€0.30b</td>
<td>-</td>
</tr>
<tr>
<td>SubTotal</td>
<td>€3.24</td>
<td>€0.81b</td>
<td>€1.19</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>€4.05b</td>
</tr>
</tbody>
</table>

Source: The European Cannabis Report™ 2nd Edition
the most efficient markets in which to operate. The legalisation of recreational cannabis is complex as attitudes vary country by country.

**Romania**

Though medicinal and recreational use of the drug itself remain prohibited, derivatives of the plant can now be used to treat certain medical conditions, such as epilepsy, cancer and multiple sclerosis. Manufacturers will also be able to apply to the National Agency for Medicines for approval to market drugs that contain marijuana by-products like resins or plant fragments.

**Belgium**

Medical cannabis usage is allowed in Belgium to treat glaucoma, spasticity in multiple sclerosis, AIDS and chronic pain in cases where conventional medication doesn’t satisfy. If conventional methods fail, the use of Dronabinol and Nabilone is permitted. As for recreational cannabis, it is illegal.

**Croatia**

As of 15 October 2015, the Croatian Ministry of Health has officially legalized the use of cannabis-based drugs for medical purposes for patients with illnesses such as cancer, multiple sclerosis or AIDS. As for recreational cannabis, it remains illegal.

**Austria**

Hemp production is allowed for industrial and medical purposes. Hemp products can be purchased legally, except for psychoactive cannabis containing THC. While production of Cannabis for medical use is theoretically allowed, the sale of the natural remedy itself is prohibited under Austrian drug laws.

Austria allows the sale of synthetical Cannabis pharmaceuticals such as Dronabinol (containing THC) and Sativex (containing Cannabidiol CBD) with a prescription from a licensed physician.

While it is illegal to grow cannabis with the intent to produce the psychoactive cannabinoid THC, Austrians can purchase cannabis seeds and seedlings legally. Cannabis is considered a drug if it contains more than 0.3% of THC, if less, it’s legal. According to law, only THC is prohibited, but none of the other hundreds of Cannabinoids.

**Slovenia**

While medicinal and recreational cannabis in Slovenia is illegal, the use of certain cannabinoid drugs is permitted.

**Baltics**

At present, cannabis for recreational and medical purposes is illegal throughout the Baltic states. Although it is decriminalised in Estonia, with possession of up to 7.5 grams being considered an amount for personal use. Cannabis laws have been so strict throughout this region, that even the cultivation of hemp was outlawed in Lithuania until 2014.

However, this region is showing signs of positive reform with Lithuanian MPs moving to legalise cannabis for medical use late in 2017. In addition, industrial hemp production is now fully legal throughout the region and a major source of economic growth.
Jamaica
Cannabis (ganja) was introduced to Jamaica in the mid-1850s. Cannabis was banned in Jamaica under Ganja Law 1913, supported by the Council of Evangelical Churches. Cannabis in Jamaica is illegal, but possession of small amounts (up to 2 ounces) was reduced to a petty offense in 2015. It is also permitted the cultivation of five or fewer plants and allowed medicinal and religious uses of the drug, including tourist with a prescription may apply for to purchase up to 2 ounces during their stay.

The Dangerous Drug (Amendment) Act 2015 provides for the creation of the Cannabis Licensing Authority, which will be responsible for developing the regulations governing the medical marijuana industry.

This legislation change does not allow complete freedom for cannabis growers and distributors. The security forces will continue to rigorously enforce Jamaican law consistent without international treaty obligations.

Jamaica already has a history of local scientists developing marijuana-derived products, such as “Canasol”, which helps relieve pressure in the eyes of glaucoma patients. By decriminalizing marijuana, the Jamaican Government hopes to further promote research for medical marijuana.

Jamaica has an approximate population of 2.5 million people and of that it is estimated that 60-70 per cent of the population (approximately 15-17 million), occasionally use cannabis. The vast majority of the population is poor and Jamaica is under a huge burden of debt, which makes it one of the largest debtor countries of the Third World. Cannabis is a widely-consumed substance in Jamaica, especially among the lower classes.

Rastafarians are a religious movement that have a particular code of behaviours which can include the smoking of cannabis. The Rastafarian population forms an estimated 5 per cent of the population, however not all smoke cannabis.

In 2012, Jamaica had 3.3 million tourists, up 7.4 per cent from previous year. In order to Jamaican airports have recently installed kiosks which provide incoming visitors with up to 2 ounces of weed, either by providing a prescription or “self-declaring”.
South America

Uruguay
The South American country became the first country ever to legalise the sale of cannabis in May 2014 for recreational and medical use; however, the slow pace of market activation has meant that regulatory bodies, police, and pharmacies have yet to catch up with home growers and their steady clientele.

Chile
Chile legalized the use of medical marijuana in 2015 and is among a number of Latin American countries gradually loosening laws prohibiting the cultivation, distribution and consumption of cannabis. Cultivation of medicinal cannabis can be undertaken as long as the person/entity has the relevant authorisation, restricted to location, purpose and time, from the Agricultural and Livestock National Service (SAG). The production and manufacture of products containing cannabis must be expressly authorised by the Public Health Institute (ISP), subject to compliance with stipulated procedures. Clinical trials may be undertaken in Chile using products containing cannabis as long as all requirements of Supreme Degree Number 404 are met and the activity is authorised by the ISP and the Ethics-Scientific Committee. Distribution of phytopharmaceuticals is possible with the relevant sanitary registration granted by the ISP.

Colombia
The Colombian government issued a decree, through the Ministry of Health, which regulates the production of medical marijuana, after the law that legalized this economic activity was approved in Congress on May 25th, 2016. Under the decree, growers will apply for licences from the National Narcotics Council, while those seeking to manufacture cannabis-based drugs will apply for permits from the health ministry. The health ministry will also grant permits to export such drugs to countries where they are legal.
APPENDICES

Appendix 1 Market capitalisation of ASX-listed cannabis company

Market Capitalisation of ASX-Listed Cannabis Companies

Source: FactSet
Appendix 2 Australia’s Narcotic Drugs Amendment Bill 2016 – Explanatory Memorandum Outline

The Narcotic Drugs Amendment Bill 2016 will provide a legislative framework that will enable cannabis cultivation in Australia and provide Australian patients in need with access to medicinal cannabis for therapeutic purposes. These amendments will also ensure that when cultivation and production of cannabis and manufacture of cannabis products for medicinal purposes begin, Australia will remain compliant with its international treaty obligations as defined in the United Nations Single Convention on Narcotic Drugs, 1961 (the Single Convention).

The Commonwealth currently has laws to regulate the import, export and manufacture of cannabinoids and cannabis raw material, but these do not allow the cultivation in Australia of cannabis plants for medicinal purposes. The manufacturing provisions in the Narcotic Drugs Act 1967 are considered inadequate to properly manage the risks associated with the potential for diversion of medicinal cannabis products and other narcotic drugs.

The Commonwealth is unable to grant licences for the production of locally cultivated cannabis for medical use and remain compliant with the obligations contained in the Single Convention. As a signatory to the Single Convention, Australia agrees that the licit use of narcotic drugs must be tightly regulated to ensure that public health is protected from the risks of diversion into illicit markets.

Cannabis sativa (cannabis) is a narcotic drug that is tightly controlled in Australia. The cultivation, production, manufacture, import, export, distribution, trade, possession, use and supply of cannabis and cannabis derived products are regulated by a number of Commonwealth laws, including the Narcotic Drugs Act 1967, which addresses the manufacture of narcotic substances (including cannabis).

The amendments to the Narcotic Drugs Act 1967 will ensure that any therapeutic product, including medicinal cannabis, also meets Australia’s strict international obligations safe-guarding its production, manufacture and distribution for medical and scientific purposes only.

The amendments will establish a licensing scheme for the cultivation of cannabis for medicinal and related scientific purposes. The key features of the cannabis cultivation licence scheme include:

- Two cannabis licences, one that authorises the cultivation of cannabis for manufacture into medicinal cannabis products; the second that authorises research into the cannabis plant that is to be used for medicinal purposes. This could include research into growing conditions, cannabinoid yields from different strains, ensuring consistency in yields and other matters related to ensuring a safe, predictable raw material.
- A strict ‘fit and proper person’ test that will be applied to the applicant and relevant business associates and involve consideration of a range of matters including criminal history, connections, associates and family, financial status, 2 business history and capacity to comply with licensing requirements. Licence holders will also be expected to remain ‘fit and proper’. This test is explicitly designed to ensure the exclusion of criminal elements, including organised crime, which may be tempted to use the licence scheme as cover for illegal activities.
- A need to demonstrate a supply arrangement exists with a licensed manufacturer, in order to get a licence.
- A permit system for controlling how much cannabis can be produced. This will assist in meeting a key obligation of the Single Convention to prevent overproduction. Other than in the case of research, a permit will not be granted for production unless a contract exists between the licence holder and a licensed manufacturer.
- Conditions applying to the licence that ensures security of the crop so that it is not diverted to illicit uses.
- Substantial penalties for offences for breaches of conditions and for undertaking unauthorised activities.
- A comprehensive suite of regulatory controls including: powers to give directions to licence holders; of inspection, monitoring and investigation; to issue infringement notices and seek civil penalties; to accept enforceable undertakings and to seek injunctions – all to assist in ensuring the integrity of the system.

The existing manufacturing provisions are also to be updated to mirror the cannabis licence provisions. Where a cannabis licence holder must demonstrate a business relationship with a licensed manufacturer, the licensed manufacturer must be able to demonstrate a legitimate supply chain to patients consistent with provisions of the Therapeutic Goods Act 1989. In effect, this will limit production and supply to legitimate demand.

Demand will be determined by suitable medical practitioners, in accordance with provisions in the Therapeutic Goods Act, such as clinical trials, authorised prescribers and the Special Access Scheme. Importantly, the Secretary of the Department of Health will have the power to order the destruction of cannabis produced by a licence holder. This allows the Secretary to control the level of production and prevent accumulation (or rectify accumulation, if it has occurred).

The Bill confers decision-making powers on the Secretary (previously the Minister) so that an internal review provision, undertaken by the Minister, can be facilitated. This gives applicants and licence holders subject to adverse decisions a more timely and less expensive option than seeking review by the Administrative Appeals Tribunal directly.
Appendix 3 Understanding the New Access to Cannabis for Medical Purposes Regulation (ACMPR)
August 2016 – Health Canada

The way individuals access cannabis for medical purposes is changing. As of August 24, 2016, the Access to Cannabis for Medical Purposes Regulations (ACMPR) will replace the Marihuana for Medical Purposes Regulations (MMPR).

Legal access to dried marijuana for medical purposes was first provided in 1999 using unique section 56 exemptions under the Controlled Drugs and Substances Act (CDSA). The decision in R. v. Parker in 2000 held that individuals with a medical need had the right to possess marijuana for medical purposes. This led to the implementation of the Marihuana Medical Access Regulations (MMAR) in 2001. The MMAR enabled individuals with the authorization of their health care practitioner to access dried marijuana for medical purposes by producing their own marijuana plants, designating someone to produce for them or purchasing Health Canada supply.

Over time, court decisions resulted in a number of changes to the MMAR. In June 2013, the Government of Canada implemented the Marihuana for Medical Purposes Regulations (MMPR). The MMPR created conditions for a commercial industry responsible for the production and distribution of marijuana for medical purposes. Under the MMPR, individuals with a medical need could access quality-controlled dried marijuana produced under secure and sanitary conditions.

In June 2015, the Supreme Court of Canada, in R. v. Smith, decided that restricting legal access to only dried marijuana was unconstitutional. The Court decided that individuals with a medical need have the right to use and make other cannabis products. To eliminate uncertainty around a legal source of supply of cannabis, the Minister of Health issued section 56 class exemptions under the CDSA in July 2015, to allow, among other things, licensed producers to produce and sell cannabis oil and fresh marijuana buds and leaves in addition to dried marijuana, and to allow authorized users to possess and alter different forms of cannabis.

The ACMPR is Canada’s response to the Federal Court of Canada’s February 2016 decision in Allard v. Canada. This decision found that requiring individuals to get their marijuana only from licensed producers violated liberty and security rights protected by section 7 of the Canadian Charter of Rights and Freedoms. The Court found that individuals who require marijuana for medical purposes did not have “reasonable access”.

The ACMPR are designed to provide an immediate solution required to address the Court judgement. Moving forward, Health Canada will evaluate how a system of medical access to cannabis should function alongside the Government’s commitment to legalize, strictly regulate and restrict access to marijuana.

Overall, the ACMPR contain four parts.

Part 1 is similar to the framework under the MMPR. It sets out a framework for commercial production by licensed producers responsible for the production and distribution of quality-controlled fresh or dried marijuana or cannabis oil or starting materials (i.e., marijuana seeds and plants) in secure and sanitary conditions.

Part 2 is similar to the former MMAR regime. It sets out provisions for individuals to produce a limited amount of cannabis for their own medical purposes or to designate someone to produce it for them.

Parts 3 and 4 include:

Transitional provisions, which mainly relate to the continuation of MMPR activities by licensed producers
Consequential amendments to other regulations that referenced the MMPR (i.e., Narcotic Control Regulations, New Classes of Practitioners Regulations) to update definitions and broaden the scope of products beyond dried marijuana
Provisions repealing the MMPR and setting out the coming into force of the ACMPR on August 24, 2016

As of August 24, 2016, Health Canada will accept applications from individuals who wish to register to produce a limited amount of cannabis for their own medical purposes or to designate someone to produce cannabis for them.

Under the ACMPR, Health Canada will continue to accept and process applications to become a licensed producer that were submitted under the former MMPR. Further, all licences and security clearances granted under the MMPR will continue under the ACMPR, which means that licensed producers can continue to register and supply clients with cannabis for medical purposes. New applicants can continue to apply for licences under the ACMPR.

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**EverBlu Capital** provides research services to its client. Mr Wright is General Manager of Research and has over twenty (25) years’ experience in the financial services industry, particularly in financial analysis and research report writing. Mr Wright joined the EverBlu team in 2017 where he has been involved in the research and publication of reports. Prior to this Mr Wright worked at a number of entities where he held Director/Head of Research and General Manager of Research positions. Mr Wright holds a Bachelor of Mathematics (Honours) from Edinburgh University and has completed the SOIA Accreditation Program (RG146) through Deakin Prime.

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