

THE GLOBAL CANNABIS REPORT

3RD EDITION

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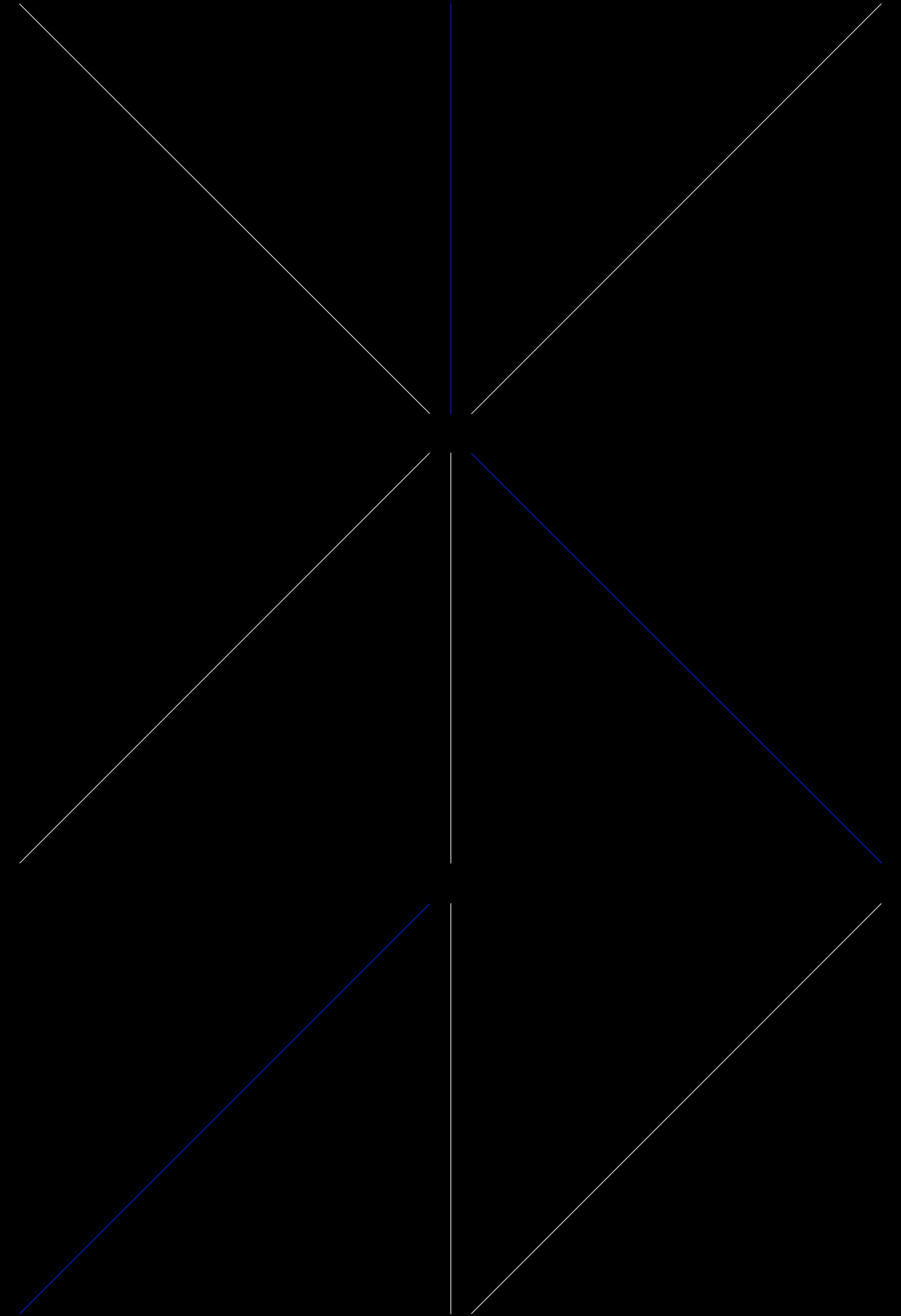
A: 31 New Inn Yard, Shoreditch,
London, EC2A 3EY, United Kingdom
T: +44 20 3928 2814

BERLIN

A: Rudi-Dutschke-Straße 23, Berlin,
10969, Germany

BARCELONA

A: C/ de Bailèn, 11,
08010 Barcelona, Spain



Our reports are the leading source of data and insights for the global cannabis industry.

The Strategy & Data team provide cutting edge intelligence to help business leaders, investors and policy makers understand and engage with the nascent cannabis markets across the world.

PROHIBITION PARTNERS TEAM



Stephen Murphy
CEO & Co-Founder



Barbara Pastori
Director of Strategy & Data



Conor O'Brien
Lead Analyst & Writer



Max Hardisty
Junior Analyst

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Will Sloane
Head of Growth

Prohibition Partners is the number one source for data and information on established and burgeoning cannabis and psychedelics markets. Read by over 150,000 global cannabis investors and entrepreneurs, and creating more than six million social impressions annually, Prohibition Partners produces thought-leading industry reports. If you would like to partner with us and support independent data and research please contact our Head of Growth will.sloane@prohibitionpartners.com

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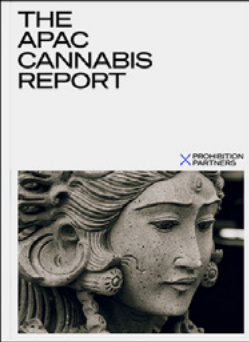


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Key Takeaways



Overview

Prohibition Partners estimates that, in 2022, the global sales of CBD, medical and adult-use cannabis amounted to US\$44.2 billion and could be worth more than US\$100.4 billion by 2026.

Cannabis liberalisation is accelerating, with an increasing number of States and countries legalising cannabis for adult-use and medical purposes.

The financial climate for cannabis operators remains tough, as impacts from the COVID pandemic and Russia-Ukraine war slow the flow of capital to the industry.

Legalisation

Legalisation of adult-use cannabis is accelerating across the world. Only Canada and Uruguay allow for fully legal sales but they will soon be joined by others.

Several countries are in the process of implementing legalisation including Mexico, the Netherlands and Switzerland, with governments in several other countries stating a clear intention to legalise and who have just begun their preparations including Germany, the Czech Republic, Costa Rica and Colombia.

Costa Rica and Panama introduced their medical cannabis regulations during the year. In Europe, Spain legalised the use of magistral cannabis while the Ukrainian government stated their intention to legalise. The Malaysian government has similarly stated their intention to legalise in the same manner as Thailand.

Supply Chain

The supply chain for high-thc cannabis continues to diversify away from the strongholds of Canada and the Netherlands. The main importing markets in the world are currently Israel, Germany and Australia, despite increasing domestic cultivation in each.

Wholesale prices for cannabis products continue to be highly volatile, and regionally dependent. Prices of exports from Canada to

Europe fell 20% from US\$2,762 to \$2,301 per kg from 2020 to 2022 presumably due to an increase in global supply.

Retail prices in the US are also declining drastically due to increasing supply. In Michigan for example, retail prices have decline to a fifth of their 2020 levels as of Q3 2022.

Social Issues

Programs for restorative justice are progressing in most regions where cannabis is being liberalised. Expungement programmes for crimes of possession of cannabis are being implemented at the Federal level in the US but also globally, in Thailand and as planned in Germany, for example

- The issue of protectionism vs free global trade of cannabis is becoming more important, as governments balance control of supply, capitalising on the fiscal opportunity in their own country while respecting International sentiment in favour of free trade
- Data suggests that cannabis cultivation has a high environmental impact., requiring large quantities of energy and water. Many industry groups are now developing programmes to guide the industry towards a more sustainable future.

Finance

Overall 2022 was a bad year for cannabis finance, with over a 50% reduction in the Alternative Harvest cannabis ETF stock price.

Up to October 2022, capital raises are down over 65% from 2021 levels and M&A volumes are down 80%.

Some of these declines have to do with right-sizing and a financial environment squeezed both by the COVID pandemic and Russia-Ukraine war. Still, many cannabis companies continue to be severely undervalued in Prohibition Partners' opinion.

EXPERT INSIGHT



Yves Antoniazzi
Managing Director
Astrasana Holding AG

The recently revised Narcotics Act will enable a combination of two Swiss traditions: Pharma and Cannabis

Switzerland has already been able to establish itself as a leader in the European pharmaceutical industry thanks both to its location and its host of prestigious universities, seeing many of the world's largest pharmaceutical companies base their headquarters in the country. This is also true of many of Europe's leading cannabis companies, who have chosen to headquarter their companies in Switzerland due to its long-standing tradition of exploring the different uses of hemp. Not only is the distinct agricultural industry of the Swiss mountain landscape perfectly suited for growing hemp, but Switzerland currently has the highest legal level of THC for industrial hemp (1%), significantly expanding the range of strains that can be grown.

The recent amendment to the Swiss Narcotics Act allows companies to sell cannabis-based medicines in Swiss pharmacies without special permits from the Federal Government, a development which will act as a cornerstone for the expansion of the Swiss pharmaceutical and cannabis market. It has also enabled Astrasana to distribute its medical cannabis products to pharmacies, hospitals and clinics throughout Switzerland via a joint venture with Solumedics AG and Rosengarten Pharmacy AG.

Export of Swiss medical cannabis

Alongside the distribution and cultivation of medical cannabis, the new Swiss legislation will also allow for the export of pharmaceutical cannabis products.

Once again, this will enable Astrasana's Czech branch in Prague, which is managed by veteran medical cannabis expert and researcher Dr Tomas Ryska, to begin importing our products from Switzerland. Through an agreement with one of the country's leading pharmaceutical distribution companies, we plan to import medical cannabis products from Astrasana and Solumedica AG and distribute them to a network of local partners, with the first delivery of flowers expected to take place as soon as Q3 next year.

New market opportunities in Japan

Outside of the EU, Astrasana also plans to take advantage of the upcoming changes to the Cannabis Control Law in Japan, which is likely to expand available products in the country beyond CBD vapes, cosmetics and food products. Through our operations in Japan, which are managed by former United Nations Office on Drugs and Crime (UNODC) Programme Specialist Ms. Yoshida Chikako, one of the first people to successfully import CBD products into Japan in 2019, Astrasana plans to initiate the export and distribution of pharmaceutical-grade cannabis extracts to the country.

International research project regarding medical cannabis

Professor Tomas Ryska, who has been conducting research on medical cannabis for more than 20 years, will also launch a new international research project for Astrasana in the near future. This will explore the economic and social potential of the medical cannabis industry, which is gaining acceptance among both the general population and businesses in Europe and could soon become a major employer, in line with the US industry. It will also explore the conflicts and passages between biomedicine and alternative health practices, with a specific focus on cannabis, documenting the everyday experiences of cannabis patients, health professionals, pharmacists as well as cannabis producers and distributors. Astrasana plans to release more detailed information on the research project soon.

About the Astrasana Group

The Swiss cannabis company Astrasana Holding distributes its products in over 20 countries worldwide and currently employs around 30 people across its locations in the Czech Republic, Belgium, Germany and Japan. The group's network includes key people and companies from all relevant fields such as medicine, law, research, and distribution. All raw materials in its portfolio originate from Switzerland.



A Medical Cannabis Company



Astrasana Holding distributes its products in over 20 countries worldwide and currently employs around 30 people across its subsidiaries in the Czech Republic, Belgium, Germany and Japan.

Our network includes key people and companies from all relevant fields such as medicine, law, research, tobacco and distribution.

All raw materials in our portfolio originate from Switzerland.

<https://astrasana.com/en>



Definitions



Adult-use or recreational cannabis

Adult-use cannabis refers to the use of cannabis for reasons other than medicinal, i.e. recreational purposes. The term adult-use is used to emphasise the fact that where cannabis is legalised, it is intended for consumption by adults of legal age only and for reasons more broad than recreation, including, for example, increasing physical performance, engaging in creative activities and for spiritual purposes. For a full picture of the legalisation of adult-use cannabis in Europe, see Prohibition Partners mini report Adult Use Cannabis in Europe™.

Industrial hemp

Industrial hemp refers to cannabis plants cultivated for high yields of materials like seeds, fibre and oil, with low concentrations of psychoactive compounds. The common limit for Tetrahydrocannabinol (THC) content in hemp materials in Europe is 0.2% w/w but this varies and can be as high as 0.6% and 1% in Italy and Switzerland respectively.

Medical cannabis

Cannabinoid-based medicine not holding marketing authorisation and therefore sold as an unlicensed medicine that is supplied through health systems and prescribed by a doctor; or Active Pharmaceutical Ingredient (API) to be manipulated and/or compounded by a magistral pharmacy in order to prepare a cannabinoid-based medicine without marketing authorisation (unlicensed).

Medicinal cannabis

Term used to indicate all cannabinoid-based therapeutic products (medical and pharmaceutical).

Pharmaceutical cannabis

Formulated, processed or synthetic cannabis sold as a finished product, which has undergone full medical trials, and holds (in one or more geographical areas) a medical marketing authorisation e.g. Cesamet®, Marinol®, Syndros®, Sativex®, Epidiolex® and any derived generic medicines (such as dronabinol).

Over-the-counter (OTC) drugs

Medicines sold directly to a patient without the need for a prescription from a healthcare professional, as opposed to prescription drugs, which are supplied only to patients possessing a valid prescription.

Minor Cannabinoids

Cannabinoids found in low concentrations in the cannabis plant such as Cannabigerol (CBG) and Cannabinol (CBN). Many have been shown to be bio-active though evidence for their therapeutic benefits is, as yet, lacking. Many researchers hope these will provide a host of new ways of modulating the endocannabinoid system.

Cannabis 2.0

Cannabis 2.0 products are cannabis derivatives that include cannabis infused edibles, beverages, topicals, concentrates and vapes. They arrived on markets later than products like oils and flower and are anticipated by some to be the future of cannabis.

Cannabidiol (CBD)

Major cannabinoid extracted from cannabis sativa (mostly low-THC hemp). Claimed to provide wide-ranging properties useful for health and wellness including anti-anxiety, anti-inflammatory, anti-pain, anti-arthritic and neuroprotective effects. Recommended by some as treatment for conditions such as epilepsy as well as pain and insomnia.

Tetrahydrocannabinol (THC)

The other primary cannabinoid, and the main psychoactive cannabinoid of cannabis. THC is considered the primary source of the 'high' produced by ingesting cannabis. Evidence suggests that THC exhibits medicinal properties that are useful in treating chemotherapy-related nausea, pain and spasticity. THC can also be synthesised and, in general, is more widely controlled than CBD.

EXPERT INTERVIEWS



Susanne Caspar
CEO
Linnea

"The Importance of a Medical Cannabis Market as Recreational Markets Expand"

There has been a lot of talk lately about countries in Europe legalizing cannabis. As an API producer, how do you think this will affect the medical market and patients?

As some of Europe begins discussions toward adult-use legalization, ensuring continued care for patients who rely on medical cannabis is imperative. This mission is of utmost importance to Linnea SA.

It's important the emerging recreational market does not diminish or eliminate the vital medical cannabis market. The needs of these markets are inherently different and we believe it is essential for the cannabis medical market to grow and expand to serve the needs of patients, as recreational markets start and expand.

There have been discussions in Germany for example about holding adult-use cannabis to the same high GMP standards as medical cannabis, especially in regards to standardization and product tracing. We believe these high standards of production are most valuable for all consumers and patients as they ensure all consumers and patients get reliable consistent products. This achievement of high standard products and care should never be compromised.

Most importantly, patients using cannabis for medical purposes require effective, safe and controllable doses of cannabinoids, with stability data. Medical cannabis patients also require continued monitoring, medical direction and ongoing advice from their doctors to ensure the efficacy of their treatments. Recreational markets do not provide these types of products nor this type of patient support. Medical patients have needs that require reliable potency and dosing, something that is not offered in a recreational market. Further, medical cannabis products in many European countries are often partially covered by medical insurance. It is

vital to ensure medical patients can be offered some type of insurance coverage just as is the case for other types of medicine.

What do you think is the best way to ensure a medical market and a recreational market can coexist and thrive?

European lawmakers have the unique opportunity to create the first region to maintain a true medical market for patients and develop a recreational market for adult consumption, potentially existing and thriving simultaneously. European regulators can strengthen existing medical markets while also developing clear distinct recreational markets. The needs of the medical patient and the recreational customer are not interchangeable. Recreational consumers can use any cannabis products of their choosing, however medical patients require consistent standardized reliable pharmaceutical products, with administration forms that ensure safe therapy and they cannot get the same benefits from recreational products. Having an accurate consistent medical product is paramount to any medical treatment and care.

The best way to provide continued care for medical cannabis patients is to ensure Europe is the future home to a well regulated medical cannabis industry. At Linnea SA, we will do all we can to ensure the continued accessibility of pharmaceutical-grade medical cannabinoids and cannabis products to those who need them.

As you look ahead to 2023 what is on the global horizon for Linnea?

We are very excited that with the new Swiss regulation, we are allowed to develop standardized Pharma grade THC extracts for the global market. We expect to launch these products in Switzerland by the end of 2023 and globally in 2024. We think it's crucial for medical patients to have access to high-quality standardized GMP certified THC products. With our 40 years of experience producing trustworthy ingredients, we look forward to offering these cannabis extracts to our business partners for their finished products.



Methodology



Market research

Prohibition Partners conducts research with industry experts to provide further information on investment opportunities, technical detail, as well as market strategy and insider opinion on market challenges, opportunities and trends. Prohibition Partners conducts surveys at the international level, with tens of thousands of respondents internationally which then informs our writing generally and the results are reported on extensively in our consumer report series. Responses to recorded interviews are published in full and represent the opinions and views of the individuals concerned. They do not necessarily reflect views held by Prohibition Partners. Industry experts are selected in accordance with their company or brand's activity within the selected market on which the report is written. Desk research is also conducted to inform the research and support the findings from our own research. We strive to ensure that all data referenced from other published sources is accurate and is the latest available at the time of writing.

Market sizing

All the figures contained herein represent an attempt at estimating the most likely scenario of development in each covered market. Prohibition Partners' market sizing methodology for the European Report 2022™ involves calculations for the projected sales of cannabis products based on known data from existing markets which is used to form a model that is then adapted to project values for current and future markets which do not have such data. However, all the reported figures are very sensitive to the necessary assumptions of the model and there are several inevitable sources of uncertainty that come with such a modelling exercise in relation to: whether current markets will behave as they currently are, or

have done, in the past; when and how legalisation will occur and finally whether future markets will behave in a predictable manner based on known data points from established markets.

A major factor in the progress of sales in cannabis markets is the progress of legalisation of the plant across the globe. Predicting the evolution of such regulations is difficult. We analyse the news and connect with our extensive network to keep track of political and regulatory developments, but the model can be very sensitive to even slight changes in the time frame or scope of measures being currently discussed, as well as any unforeseen macroeconomic, political or global transformations. COVID-19 and any related delays to supply and regulatory progress have been incorporated into our most recent model.

The main sources of information which inform our forecasting exercise are:

- Official data obtained from regulators, insurance companies and monitoring institutions.
- Company financial reports and news releases.
- Reviews of current clinical trials and patents in the cannabis space and likely impact of new products and indications.
- Assessment of prevalence, eligibility and dosing through clinical studies, real-world data and literature reviews.
- Proprietary consumer research, public opinion and policy analysis.
- In-depth interviews with industry stakeholders and data-sharing agreements with key operators.

Medical cannabis sizing

Our calculations for the European Report 2022™ use data on disease prevalence and patient penetration to assess the eligible population in each region covered. Our medical market sizing model then incorporates known data and estimates from existing markets on the sales of medical cannabis, patient numbers, product formats, dosages and pricing to establish an estimated market size for sales of medical cannabis. This model is applied to all regions, with more region-specific modelling carried out for the larger markets. For a full picture of the legalisation of adult-use cannabis in Europe, see Prohibition Partners mini report Adult Use Cannabs in Europe™.

Adult-use sizing

Our recreational cannabis market sizes are based on comprehensive data made available by public bodies in regions with legalised adult-use cannabis sales. These are used as the basis of projections for these regions, and they also inform our models for countries we believe will legalise adult-use cannabis within the relevant timeline. Also taken into account are the United Nations Office on Drugs and Crime (UNODC) yearly prevalence figures of cannabis use in order to calculate the eligible population for a legal recreational scheme. Our assumption is that legal cannabis will increase its share of the market vis à vis the illicit market during the first few years, thereby following the observed trends in Canada, the US and Uruguay.

CBD Sizing

CBD sizing was calculated for each country and for several categories of CBD products. Prohibition Partners' CBD sizing is based on data gathered by extensive surveys of tens of thousands of respondents across Europe, North America and Asia on their usage of CBD products. The latest round of surveys included a sample of over 5,000 individuals responses gathered in Q2 2022. Prohibition Partner's CBD sizing modelling has been updated recently to include more data from the side of suppliers, to create a more wholistic model which better reflects the market as it stands.



SPONSORED CONTENT



How 2022 changed the cannabis industry globally and what a Swiss start-up has to do with it

Hearing daily news on cannabis decriminalisation or legalisation and seeing the number of cannabis trade shows globally it is difficult to believe that cannabis has been prohibited in most countries until not that long ago.

The year 2022 felt like a huge step forward for the cannabis industry – especially for the recreational section. Even though there have been some setbacks like a well known scheme that cast some doubt on our already prejudiced industry, the progress is greater than the small steps backwards.

Germany is attempting to expedite legalisation and overcome the obstacles of EU laws, Switzerland has legalised medical cannabis and has kicked off the pilot trials for recreational cannabis, similar to the Netherlands. Thailand has removed cannabis from the narcotics list so now there is a gateway into the Asian cannabis market. The Colombian government approved the export of flowers and is working on a bill for legalisation, Costa Rica and Mexico are on the same path. And Morocco's government has officially issued 10 licenses for cultivation. That is just a glimpse of the great industry news of this year.

A Swiss startup has positioned itself cleverly on four continents, growing alongside the industry movements happening in recent months and years. But not only that, the company has shaped the industry by introducing technology, professionalising the business through compliance and making supply chains transparent: Vigia AG with its compliance software suite Cannavigia is present globally at industry conventions, contributes at knowledge sharing forums or makes the software available at universities in different countries to train the growers of the future.

The startup, founded by Luc Richner, Philipp Hagenbach and Elias Galantay, in March 2020, has developed the seed to sale software Cannavigia to help and consult clients in documenting their processes while reducing the workload and bringing transparency to the ecosystem. Currently, the software is available in six languages, comes with an app, and has been installed with customers in 18 countries on four continents just this year. The team of more than 30 employees reflects a global organization - present where the current customers are and where the future customers will be.

"Our journey just started three years ago and I am humbled by what our young company and team was able to accomplish in this short time of period and especially in this past year", explains Luc Richner.

On a regulatory level, the hot topic in the industry is always which country will legalise next, how fast and in what way. Germany has made some big headlines this year as well as some African and South American countries have already been mentioned in this article, but let's focus on the examples of Switzerland and Thailand.

By changing the narcotics law in May 2021, Switzerland laid the foundation for cannabis pilot projects, a series of trials involving the dispensing of recreational cannabis that will run for a period of ten years. In need of a track and trace system for the projects and seeing that Vigia was approaching a new field for agricultural compliance, the Swiss government rewarded Vigia with a contract for the pilot trials. Cultivators, dispensaries, project leaders and the regulators can use the software to ensure that only approved participants in the trials receive the specified amounts of cannabis. Philipp Hagenbach who leads the project at Vigia explains: "The product is tracked from seed to sale, making the supply chain transparent and the cannabis high quality and safe. In addition, we help to ensure the reporting obligation and the consumer safety and create a basis for the future legal framework for legalisation in Switzerland."

Now to Thailand, the legalisation process is rather the opposite of that in Switzerland. The country surprised the industry and also everyone else by removing cannabis from the narcotics list and legalising cultivation and usage. Even though the official bill has not yet passed parliament, the market has opened up and Thailand is seen as a market leader and gateway for the Southeast Asian cannabis market. By having a business development manager and a team on the forefront in Thailand from the early on, Vigia has positioned themselves as the front runner in the market. Shortly following legalisation the Swiss startup has collaborated with the Kasetsart University and signed clients taking initiative in the ASEAN region.

Not only Asia has been on the map for Vigia this year, but also markets in Africa and South America were explored. "A big success is that we have a business development manager on every continent where we are currently active, so also in Africa and South America", explains Luc Richner. Elias Galantay adds: "They are actually similar in that the continents' countries slowly open up their market and realize that they have to become compliant, adhere to standards and want to have technological help in these processes – which of course plays into our hands. This motivates us to develop them further through consulting and our software, and therefore to grow with them".

What is to come for the global industry in 2023? Eyes are on Thailand, Morocco, Mexico and Germany. What happens in these countries will be important and may pave the way for other countries in their continent and globally. No one wants to be last and the industry is full of surprises. This is also true for Vigia and definitely worth watching what could be next.

For more information about the compliance software suite, visit the Cannavigia website: www.cannavigia.com

Trends



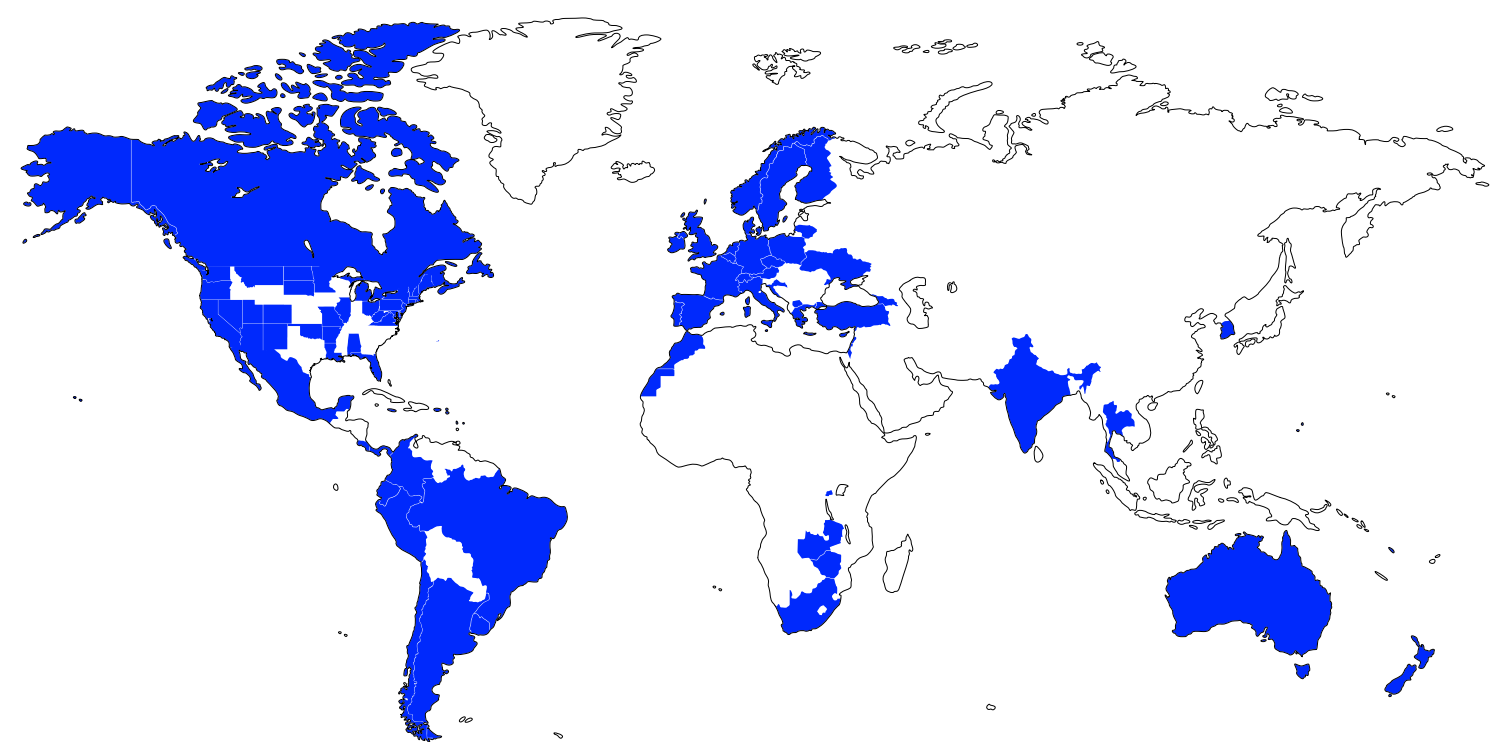
Legalisation to date

In terms of the progress of sensible drug policy relating to cannabis at the global level, 2022 has been another huge year. Legalisation of high THC cannabis for non-medical purposes will soon be a reality in several countries around the world, with some nations like Germany and Colombia recently announcing their intention to legalise. Decriminalisation of adult-use cannabis is also progressing globally, which may be a precursor to commercial legalisation in some regions. Conversely, the legalisation of medical cannabis did not progress as quickly in 2022 as in previous years, with just a few countries declaring their intention to legalise for medical purposes. Indeed some countries have taken a backward step and increased criminalisation procedures in terms of the possession of cannabis products.

Medical Cannabis

Several countries made progress on medical cannabis legalisation over the past year. In Latin America, both Costa Rica and Panama adopted their medical cannabis laws for the first time in 2022. In Europe, the Spanish government legalised the magistral use of medical cannabis for select conditions through the country's public health system in June 2022. In the same month, the Ukrainian Minister of Health, Viktor Liashko, expressed his intent to legalise cannabis for medical purposes as part of the country's efforts to treat trauma as a result of the war. In Asia, in August 2022, a spokesperson for the Malaysian Ministry of Health stated the country's intention to legalise medical cannabis, taking inspiration from the system previously set up in Thailand. Across in Japan, a select panel of the Health Ministry, recommended that the government allows for the importation and use of pharmaceutical cannabis products like Epidiolex and Sativex, as potential first steps towards broader reform in the coming years.

Countries where medical cannabis is legal



Source: Prohibition Partners

Decriminalisation

Great strides have been made over the past year in terms of the decriminalisation of cannabis. In October 2022, the US President, Joe Biden, announced an amnesty for people imprisoned for simple cannabis possession. This act will benefit thousands of individual prisoners, but its main purpose is that it is a symbolic act for the benefit of American states and the international community showing that the US now favours at least the decriminalisation of adult-use cannabis. As of April 2022, Israel considers cannabis possession and consumption only a minor offense which doesn't warrant a criminal record for the offender. Back in December 2021, Malta introduced the strongest legislative measures in Europe against the criminalisation of cannabis for personal use, following in the footsteps of countries like Portugal and Georgia. Several countries around the world are also taking this step, such as Thailand who introduced their law to decriminalise cannabis in June

2022. Many more countries are decriminalising cannabis as part of an overall effort to legalise the adult-use of cannabis and its commercial trade more generally.

Adult-use cannabis

As of late 2022, only Uruguay, Canada and a handful of states in the US have fully legalised the commercial sale of cannabis for adult-use, with more states soon to vote on adult-use legalisation measures. However, there is a strong feeling among many advocates and industry stakeholders that we are currently at the beginning of a zeitgeist when it comes to the commercial legalisation of adult-use cannabis globally. Indeed this year saw a relatively large number of countries taking concrete steps towards legalisation, or at least stating their intentions for the first time.

As with recent years, progress is being made rapidly across the US. For example, New Jersey began recreational sales in April 2022, and Rhode Island legalised recreational cannabis in May 2022. In early November 2022, the states of Maryland, Missouri voted in favor of adult-use legalisation within their state while Arkansas, North Dakota and South Dakota voted down such measures. Maryland and Missouri will now join the 19 states who have previously legalised. As such, the total value of sales in the US is climbing steadily every quarter.

The most anticipated event in the entire cannabis industry is likely the federal legalisation of cannabis in the US. This would encourage the opening of states to commercial adult-use cannabis sales in the US, which is home to the single largest population of cannabis consumers of any country. To date, legalisation has occurred on a state by state by state basis, with Missouri and Maryland joining the other 19 states to have legalised adult-use cannabis. However, the market is severely limited by government inaction at the federal level, which stymies growth e.g. by preventing cannabis companies from using banking services and listing on US stock exchanges, from trading across state lines and indeed from importing or exporting any products. The Biden administration has moved to federally decriminalise cannabis in line with his campaign promises. Crucially, he has also ordered the review of the legal status of cannabis, which suggests that rescheduling of cannabis to allow for commercial sales could be on the cards in the near future.

One of the most widely followed cannabis stories of the past year is the legalisation of adult-use cannabis in Germany. In December 2021, the incoming coalition government of Germany stated their intention to legalise cannabis commercially for adult-use purposes. As of October 2022, the government has released a 'key points paper' outlining their plan for the bill which is to be drafted and voted on in parliament. The plan includes several controversial points such as a ban on imports and an allowance of online sales. However, no single detail of the law is set in stone, and it remains to be seen whether legalisation will be rolled out across the country, at once, or as part of a pilot trial. More details on legal adult-use cannabis on the continent can be found in Prohibition Partners' Adult-Use Cannabis in Europe report.

Switzerland and the Netherlands are both undertaking pilot trials where access to adult-use cannabis is being made available for consumers in certain regions on a time-limited basis. Both schemes have hit delays relating to internal and external factors. In the Netherlands, October saw nine out of ten tendered cultivators stating that a delay on the beginning of sales would be

necessary, pushing the start date to at least the end of 2023. In Switzerland, trials were due to start in October 2022 but were also delayed, due to issues with testing and the compliance of some products. There is growing support for commercial legalisation in a number of European governments including in the Czech Republic and Portugal, and bills for legalisation are expected to be introduced in the next couple of years.

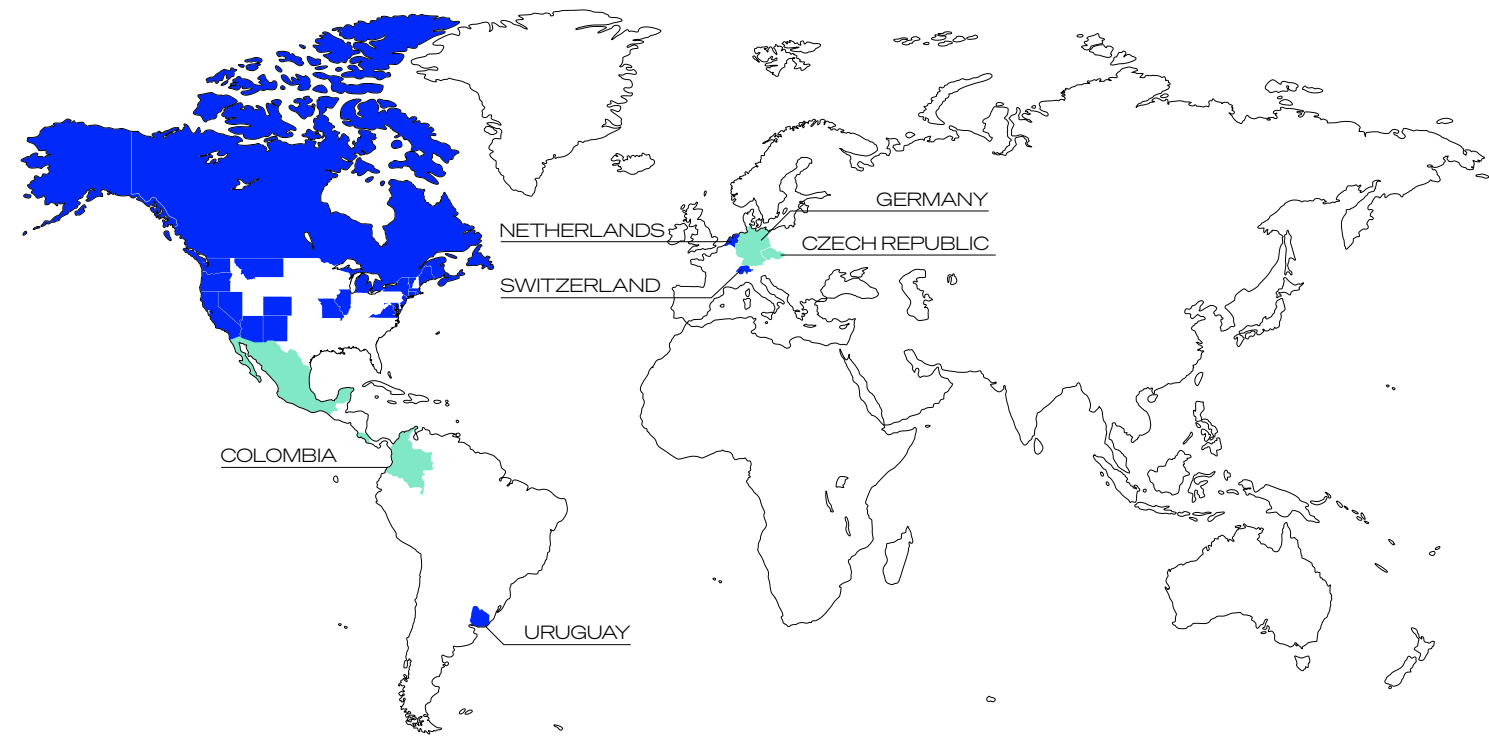
In Latin America, at least three countries are in the process of preparing for adult-use cannabis legalisation. Mexico is set to be the single largest country in the world to have legal adult-use cannabis sales, though the actual market value will not be larger than leading US states due to differences in consumption rates and disposable income. The country's Supreme Court ruled in late 2018 that the prohibition of cannabis was unconstitutional and ordered congress to legislate for a legal industry to be set up. There have been years of delay, mostly due to disagreements within the Mexican government as to how best to implement legal cannabis trade in the country. As of late 2022, government officials are indicating that the process is being prioritised.

October 2022 saw a bill for cannabis legalisation passing committee stage in the Colombian legislature. The sitting president in Colombia has stated his support for full commercial legalisation but he is yet to endorse any specific bill, as there are several on the table at the moment. In the same month, the president of Costa Rica sent a bill for the legalisation of adult-use cannabis to the country's Legislative Assembly. It is unclear how long it will take for the government in Costa Rica to debate and adopt this new legislation, which comes just seven months after the country adopted protections for medical cannabis usage.

Progress on adult-use legalisation is also being made in some Caribbean states. For example, in September 2022, the government of Grenada convened a Commission on Cannabis Legalisation & Regulation to design a policy which liberalises trade in adult-use cannabis. In Bermuda, the government had been preparing for full legalisation of cannabis, but it hit a roadblock in September as the UK government blocked the legislative process, something it rarely does for its overseas territories. The government of Bermuda has indicated that it will attempt to proceed, regardless of this.

Counties where adult-use cannabis is legal or where it soon will be

● Adult-use cannabis is legal ● Adult-use cannabis legalisation is expected soon



Source: Prohibition Partners

While most countries are moving towards a world with fully legalised cannabis, there are signs in several countries that they will not join this movement, and that they may in fact act inversely. In June, the Security Bureau of Hong Kong submitted a law to the legislature to effectively ban any CBD products in what was a developing hub for wellness products in Asia. This comes in the wake of a similar ban put in place in China the year before.

In November 2021, the supreme court of South Dakota ruled against the legality of the State's referendum in which the population had expressed support for adult-use legalisation. A subsequent referendum returned a negative vote for the measure in 2022.

In Brazil, the Federal Council of Medicine published in October 2022, a regulation banning doctors from prescribing medical cannabis, except in extremely limited circumstances. However, the Council has since placed a block on this new regulation due to a backlash from patients and advocacy groups. It is yet to be seen whether this will advance.

In the UK, a similar uproar was created among cannabis advocates as reports were made that the Home Secretary was considering upgrading cannabis in the classification system to a Class A substance on a par with cocaine. This has since been dismissed by the sitting Prime Minister, who has much more authority on the issue. It is possible that these incidents in Brazil and the UK are part of political manoeuvres specific to each country, but it does underline the fragility of the progress being made for patients and consumers everywhere and the need for this to be defended by advocates, regulators and industry players.

International legal barriers

There are several countries around the world currently preparing for the legalisation of adult-use cannabis, but international law poses a real challenge to efforts at the national level. The 1961 Single Convention on Narcotics largely represents the basis for the international control of cannabis along with other conventions of the UN. On the criminalisation of drug use and trade, Article 36 calls



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for criminal penalties for the, 'cultivation, production, manufacture, extraction, preparation, possession, offering, offering for sale, distribution, purchase, sale..' of drugs, including cannabis. The term 'possession' here has widely been interpreted to mean 'possession and use for the purposes of trade' rather than consumption and this has allowed many countries to reduce the criminalisation of the possession of cannabis for personal use. Regarding the regulation of 'drug supply', Article 4 calls on all signatories to 'subject to the provisions of this Convention, to limit exclusively to medical and sci-

entific purposes the production, manufacture, export, import, distribution, trade, use and possession of narcotics'. Many countries' national laws reference this and other United Nation (UN) conventions and this is also true of European Union (EU) law.

Several countries have proceeded to legalise adult-use cannabis in spite of having signed up to these conventions, with various explanations made to the International Narcotics Control Board (INCB), who enforce compliance with the conventions.

URUGUAY



Uruguay legalised adult-use cannabis in 2013, and it has argued that its legalisation is compliant with the overarching goals of the conventions to protect human health and welfare.

US



In the US, 21 states have legalised for recreational purposes. The US has maintained that the UN conventions apply only at the federal level, where cannabis remains illegal and so legalisation at the individual state level leaves the country, as a whole, compliant with international law.

CANADA



Canada is more open about their non-compliance with international law. The Canadian government was aware before legalising in 2018 that it may, 'result in Canada being in contravention of certain obligations relating to cannabis under the UN drug conventions.'

THE NETHERLANDS AND SWITZERLAND



The Netherlands and Switzerland justify their ongoing legalisation, in terms of pilot trials, on the basis that the projects fall under the definition of scientific use of cannabis, whereby limited legalisation produced useful data on issues such as the health and welfare of consumers.

To date, the International Narcotics Control Board (INCB) has not officially recognised any of these reasons for legalisation as being legitimate. The INCB does not have many ways it can force compliance from signatory countries, nor does it use those at its disposal often, other than 'naming and shaming' countries who contravene their obligations. Article 14 of the Single Convention does allow for the INCB to initiate a process which would restrict the trade of medicines to a non-compliant country but this is seen as a drastic measure and it is unlikely to be triggered over the legalisation of cannabis. However, the threat of being known as a country, that is breaking obligations set under treaties which they have signed, can cause reputational damage on the international stage which countries like Germany and Mexico would clearly like to avoid.

Legalisation of adult-use trade, within any country, is generally considered illegal under international law, but is not thought to be as serious a crime as trading such products across international borders. For this purpose, for example, there has been no sign of such trade between Canada and Uruguay to date. In the same vein, Germany's plans for legalisation leave out the issue of importing from other countries, on the basis that this is not possible under international law, despite the fact that any legalisation will quite probably contravene the conventions.

Possible paths forward

There are several possible solutions to address the obstacle that international laws present in terms of the legalisation of cannabis.

- Firstly, a country may withdraw from the 1961 Single Convention (which takes one year) and then reapply with a reservation on cannabis, as Bolivia did for coco leaf chewing or as Nepal did for traditional cannabis use. However, this process can be blocked by third parties which can, at the very least, delay legalisation.
- Secondly, countries who have all legalised adult-use cannabis could apply, 'inter se modification' based on Article 41 of the Vienna Convention on the Law of Treaties (VCLT) which allows for a sub-group of the signatories to enter into a new interpretation of the law while remaining bound to the Single Convention. Canada has in the past stated that they are, 'open to work[ing] with treaty partners to identify solutions that accommodate different approaches to cannabis within the international framework.' An alliance of governments including Germany, the Netherlands, Malta and Luxembourg have formed in Europe to promote legalisation in the Union. This may mean that the groundwork is now being laid for an 'inter-se modification' at the cross-continental level.
- A country could also reinterpret the Single Convention on Narcotic Drugs, and, as suggested by Kenzi Riboulet-Zemouli, apply the 'exemption from control' according to Article 2(9) for, 'drugs which are commonly used in industry for other than medical or scientific purposes', if appropriate measures are taken to limit abusive consumption and reports are sent to the International Narcotics Control Board (INCB) on consumption levels. This solution is highly contentious though and has been accused of not being a justifiable interpretation.
- Finally individual countries could wait until a consensus is reached on rescheduling or there is another group reinterpretation of the Single Convention.

Each solution is associated with a set of challenges and uncertainties which could prolong the time before legalisation is achieved. For this, and other reasons, in the European context Prohibition Partners thinks it is likely that the legislation introduced by Germany may initially allow for legalisation within a pilot project with scientific guiding principles.

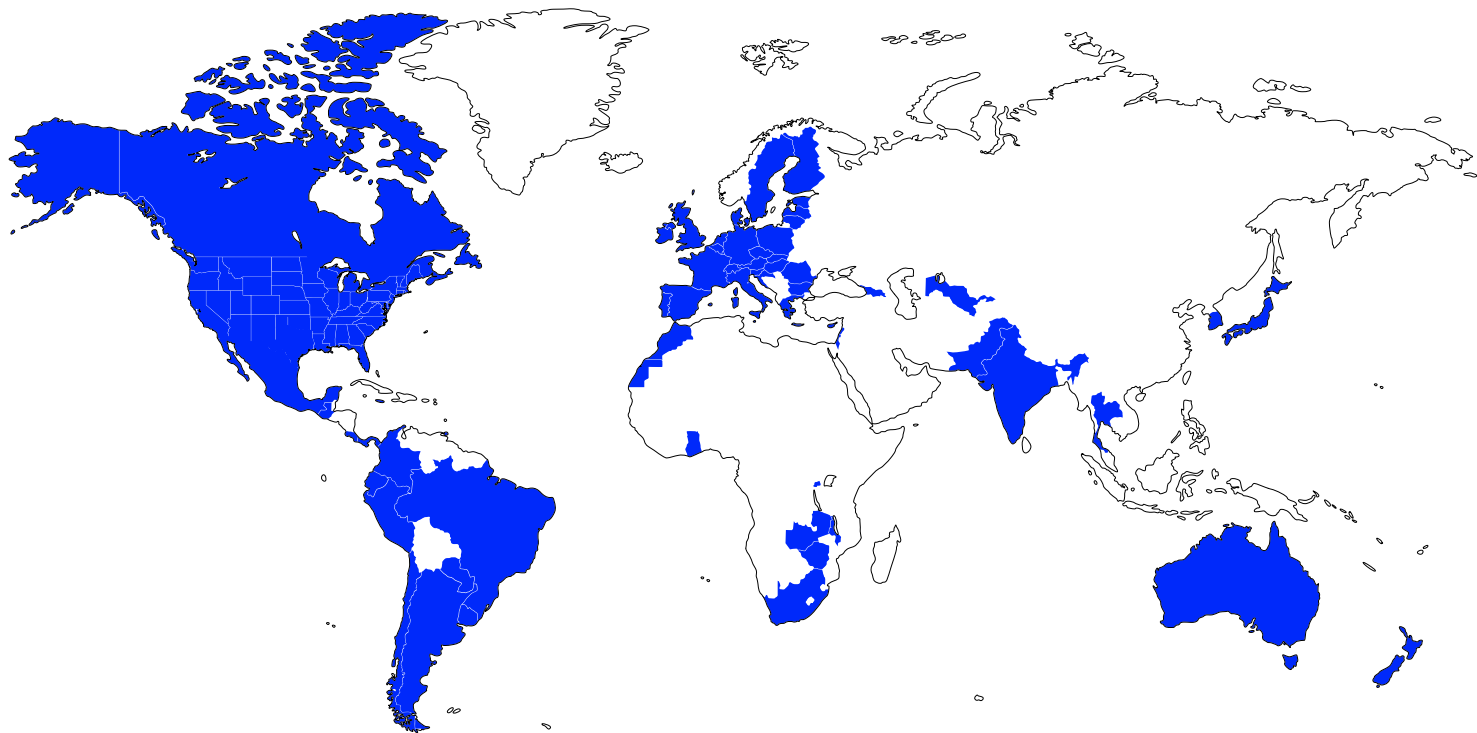
Cannabidiol (CBD)

While CBD products remain in a legal 'grey space' in many regions, the products are now available on mainstream marketing channels in several regions, especially in Europe and the US where there are specific legal protections for its trade. CBD is mainly marketed and used in the west as part of the health and wellness sector, with products being sold by the largest pharmacy chains in the world such as Walgreens in the US and Rossmann and Boots in Europe as well as the largest online marketplaces of Amazon and Alibaba. In the US, the popularity of CBD has been boosted by innovative marketing e.g. CBD being used as a workout supplement, where many National Football League (NFL) players have endorsed CBD products as workout-recovery products, and some institutions like the NFL and the Ultimate Fight Championship have also established CBD partnerships. Interestingly in Latin America, CBD is often maintained as a prescription-only substance rather than over-the-counter product.

CBD is centrally regulated in the EU via the Novel Foods process where products can be registered for marketing in the Union. As of late 2022, no single product has been fully approved at the EU level and so any products sold do fall into the legally 'grey' category, if not into the category of outright illicit trade. Hemp flowers have been under particularly stringent regulations in Europe and elsewhere owing to the specification of the Single Convention on Narcotic Substances that defines cannabis as: the flowering or fruiting tops of the cannabis plant. This has meant that for the most part, European regulators have been more accepting of CBD products including cosmetics and oils which have been produced from leaves, seeds and stems, rather than CBD flowers (to the extent that they can tell the difference in the starting material). CBD flowers have higher concentrations of CBD and other cannabinoids than the leaves or stem material, and are suitable for smoking, which adds another layer of complexity for regulators. Prohibition Partners expects that by 2024, CBD flowers may be included in the regulations for nicotine related products under the Tobacco Products Directive (TPD) and the Tobacco Excise Directive (TED). For more details, see the upcoming European CBD report by Prohibition Partners.

Many countries are only offering CBD under prescription, such as Singapore which offers pharmaceuticals and Brazil which offers pharmaceuticals and medical CBD. Until recently, China allowed for sales of CBD only in cosmetics but as of June 2021, even this is no longer permitted, despite the growing hemp industry in provinces like Yunnan and Heilongjiang. Similarly, August 2022 saw Hong Kong begin its crackdown on its unregulated CBD sector, banning the compound from February 2023, with penalties matching those of cocaine and heroin possession.

Countries where CBD is legal



Source: Prohibition Partners

Evolution of supply chain of high THC cannabis

As with Global Report 2nd Edition, the cannabis supply chain is still under a considerable degree of flux, and it is not expected to settle down any time soon. In the long-term, it is still expected that production costs, which are lower in regions like the Mediterranean and South America, will end up supplying a majority of the cannabis that is traded internationally. However, these export markets are developing production capacity slower than expected in many cases and importing countries are ramping up domestic production. For now, markets are increasingly at the whim of local government regulations rather than free-market influences and so relatively costly cultivation in northerly countries remains common.

Importing hubs

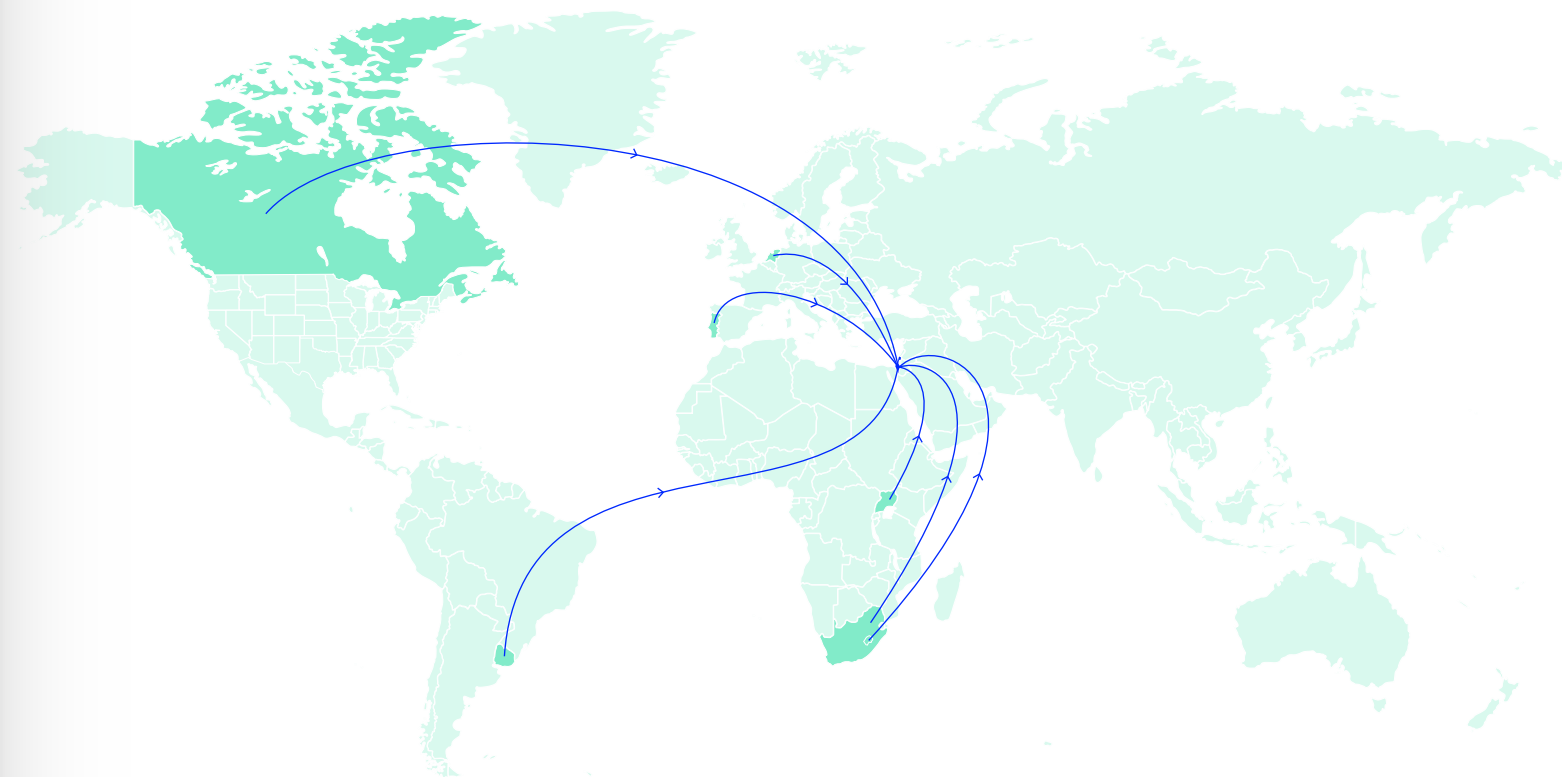
The majority of regions who have legalised medical cannabis have historically grown their own cannabis e.g. in Canada, the US, the

Netherlands etc.. Some countries like Israel and Germany have opted to rely more on imports than domestic cultivation, and are now the focus of many operators and politicians who hope to obtain market share in these potentially lucrative markets.

As of 2022, imports into Israel come from four main countries, with small amounts coming from others. These main countries are: Canada, Portugal, Uganda and Uruguay. Germany imports from a wider array of countries, although both Israel and Germany imported approximately the same amount of cannabis in 2021, 22 tonnes and just under 21 tonnes respectively. In terms of growth rate, Germany saw an approximate doubling of imports between 2020 and 2021, from 9.3 to 20.7 tonnes. Israel saw a slower, albeit still a large growth rate of 50%, in the same time period.

Canada continues to maintain its presence as the dominant exporter to Israel and Germany, though in Germany, their share of the export market is getting smaller each year. Canada's exports are expected to increase approximately 50% by weight in 2022 as compared to 2021, while only increasing by 32% in terms of value.

Israel's 2021 medical cannabis imports (kilograms)



Canada	16,000	Uganda	1,700	Netherlands	30	Lesotho	2
Portugal	3,500	Uruguay	600	South Africa	3.5		

Source: Prohibition Partners, Israel Cannabis Magazine

Germany’s 2021 medical cannabis imports (kilograms)



Canada	6,493	Uruguay	848	Lesotho	127	Malta	3
Denmark	3,726	Spain	705	Poland	109	New Zealand	1
Netherlands	3,724	Uganda	439	Israel	92		
Portugal	2,413	Austria	288	Jamaica	79		
Australia	1,566	Colombia	149	North Macedonia	8		

Source: German Ministry of Health, Prohibition Partners

As cannabis cultivation becomes more global, and countries with lower land and labour costs move and expand into the industry, we can expect to see decreasing import volumes from countries such as Canada and the Netherlands, to the benefit of countries such as Portugal and Denmark but also international exporters like Colombia, Uruguay and Uganda.

As we near the end of 2022, Israel is on track to hit the same 50% yearly growth rate in imports as we saw in 2020-2021. Germany’s growth in imports, however, is expected to slow down and see only a slight increase of 2-6% as compared to 2021. This could be

partially a result of domestic cultivation in Germany which is being supplied at a rate of ~2.6 tonnes per year. It is more likely a case of importers recognising that current supply is meeting demand, and at this point, no drastic increase in imports is necessary. While it may seem that the recent adult-use legislation would reignite imports, the ‘key points paper’ detailing the plan for German legalisation suggests that all recreational cannabis is set to be grown within Germany, as importing for recreational use contravenes international law. See sections on International Legal Barriers, and Protectionism vs Globalism for a further discussion.



BUSINESS OF CANNABIS:
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SECURE YOUR SEAT

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Recreational Wholesale Pricing

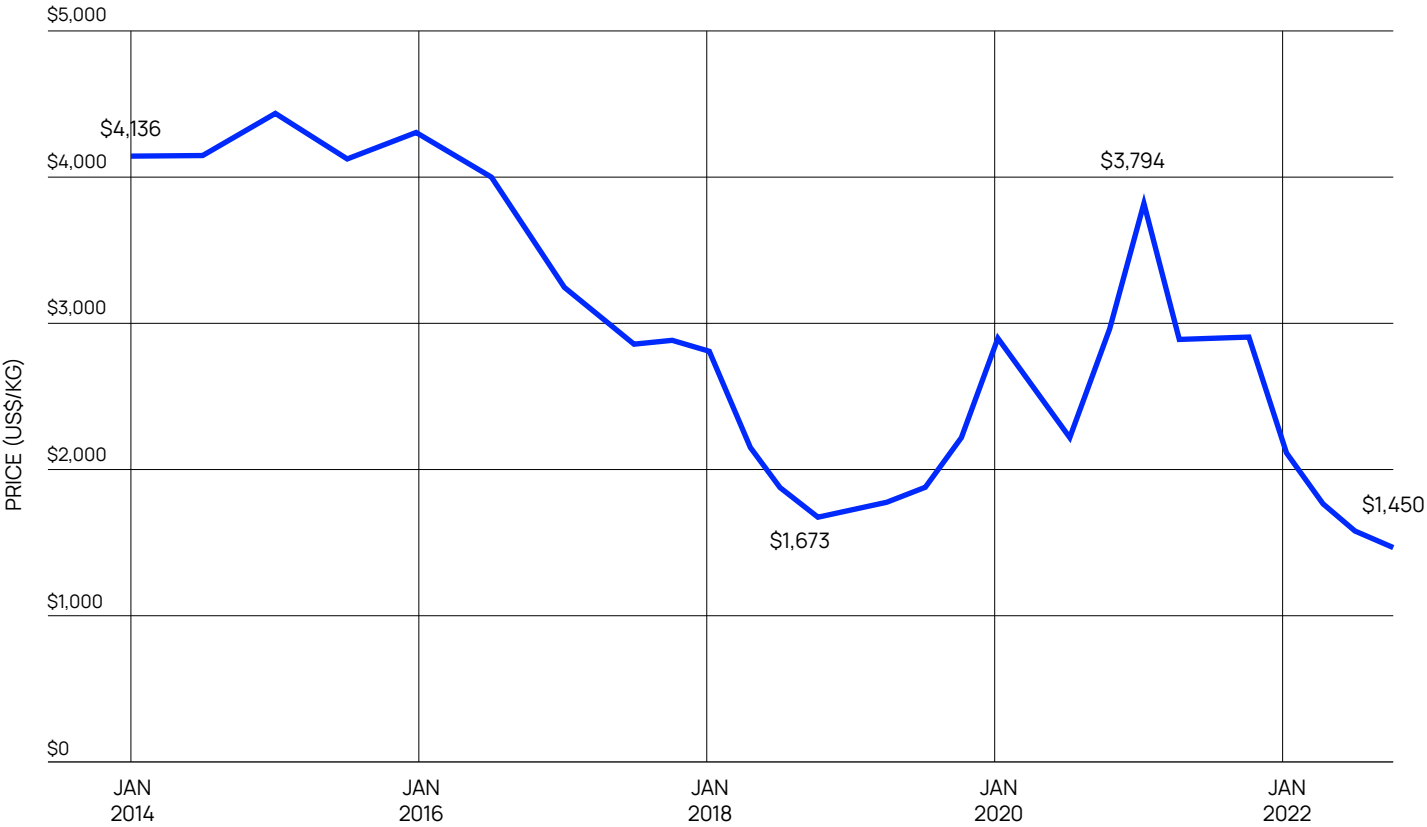
Across North America, recreational wholesale prices are extremely variable depending on time and locale. In mature markets such as in Canada, Colorado and California, prices have been significantly reduced due to oversupply in recent years. In Canada, mid-range tetrahydrocannabinol (THC) products saw a 20% decline in whole-sale price in 2021 (US\$0.075 per %THC to US\$0.06 per %THC), with fluctuations from US\$0.045 at its lowest to US\$0.1 at its highest.

The US Spot Index also revealed that in June 2022, average whole-sale prices were at their lowest level in over three years, and were down 20% year on year. Additionally, in the same month, there were five states where the average wholesale price per kilogram was below US\$2,200, an unprecedented milestone. Michigan saw a 58% decrease in wholesale price which began in late 2021, and was still hovering around that level as of August 2022.

This shrinking of wholesale prices in North America has contributed to the need for right-sizing, i.e. the attenuation of activities to match consumer demand. Quebec-based HEXO Corp. for example, shut down three cultivation facilities in 2021 in an effort to streamline production.

Prices vary significantly within the US. For 2021, in Oregon, the price was US\$2,296.34 per kilogram, while on the other side of the country, the Massachusetts equivalent ran at US\$8,144.42 per kilogram. Reasons for Massachusetts's high wholesale price included its high cannabis tax, variable climate (meaning local cultivation takes place indoors) and its arduous business licensing process.

Colorado retail wholesale bud price (median market price) (US\$/kg)



Source: Prohibition Partners

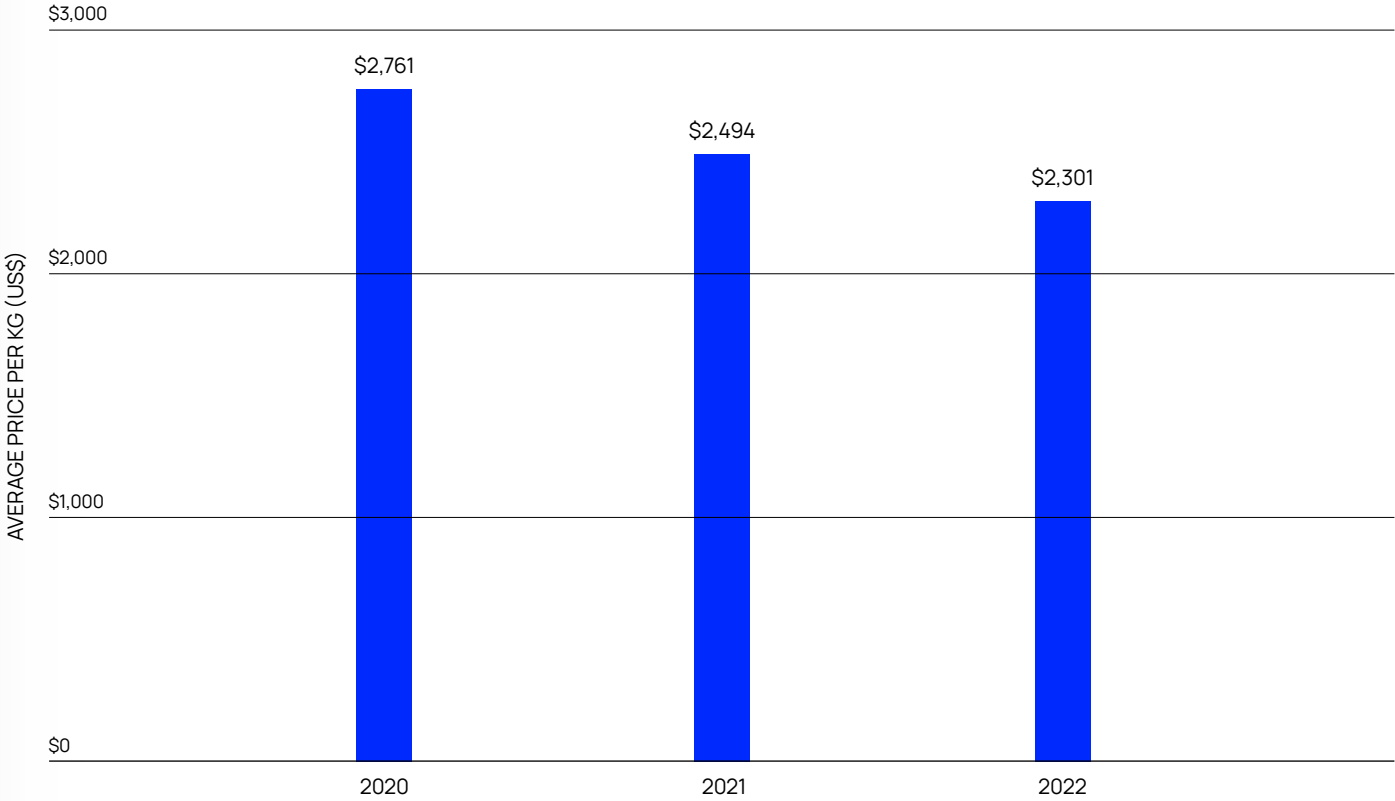
Medical Wholesale Pricing

Medical cannabis prices in Europe are a little less elastic than those in North America primarily because the markets are much more tightly regulated. The effect of this is that many governments set the price for wholesale cannabis which producers must abide by but also, stringent regulations like the European Union's good manufacturing practice (EU-GMP) certified process means that the floor price is more firmly set than in less regulated markets.

Prohibition Partners has secured exclusive data from Canadian customs authorities on the quantity and value of exports from Canada by region which is instructive about the price trends across Europe. Our data shows that from January 2020 to October 2022, the average wholesale price of medical cannabis flower being sent from Canada to Germany fell 20% from US\$2761 per ki-

logram to US\$2301. To see all the export details of cannabis from Canada by format and country, see the Real World Data Package available alongside this report.

Declining price of Canadian medical cannabis flower exports to Germany



Source: Exclusive Canadian Customs data made available to Prohibition Partners

Several countries centrally control the price of cannabis in Europe. The German domestically cultivated medical cannabis has a market price of US\$2.40 per gram, or US\$2,400 per kilogram. This price is set by the German Federal Institute for Drugs and Medical Devices, and is a low price for high quality medical grade cannabis. Wholesale cannabis produced in the Netherlands costs more than double the German rate at US\$5,288.8 per kilogram.

Some deals have been struck with producers in low-cost countries which could undercut suppliers from the Northern hemisphere. Uruguay, the first country in South America to legalise adult-use cannabis, has, in the past, seen exports sent to Germany from Fotmer Life Sciences, via Tilray Portugal, at a price of US\$3.20 per gram, with subsequent shipments at roughly US\$2 per gram (equivalent to US\$1,995.78 per pound) though this needed further processing at EU-GMP facilities to make it compliant for sales in Europe.

Production costs have a large bearing on the price which wholesale cannabis can be offered at. As mentioned, it can be considerably cheaper to cultivate cannabis in warmer climates with cheaper land than in northern countries. For example, Pharma-Cielo, a Canadian company with cultivation activities in Colombia, have been growing its crops at a cost of US\$ 0.03 to US\$0.04 per gram. This is, orders of magnitude, lower than growers such as Tilray, who have reported production costs in the range of US\$0.72 per gram in 2022 though differences in reporting methods and level of compliance (e.g. EU-gmp vs not, adult-use cannabis vs medical) may account for some of this difference. Another example is seen in Clever leaves who have been producing more cannabis in Portugal rather than their Colombian facilities and have seen their production costs increase to \$1.13 per gram in Q3 2022 vs US\$0.15 in 2021.

Retail pricing

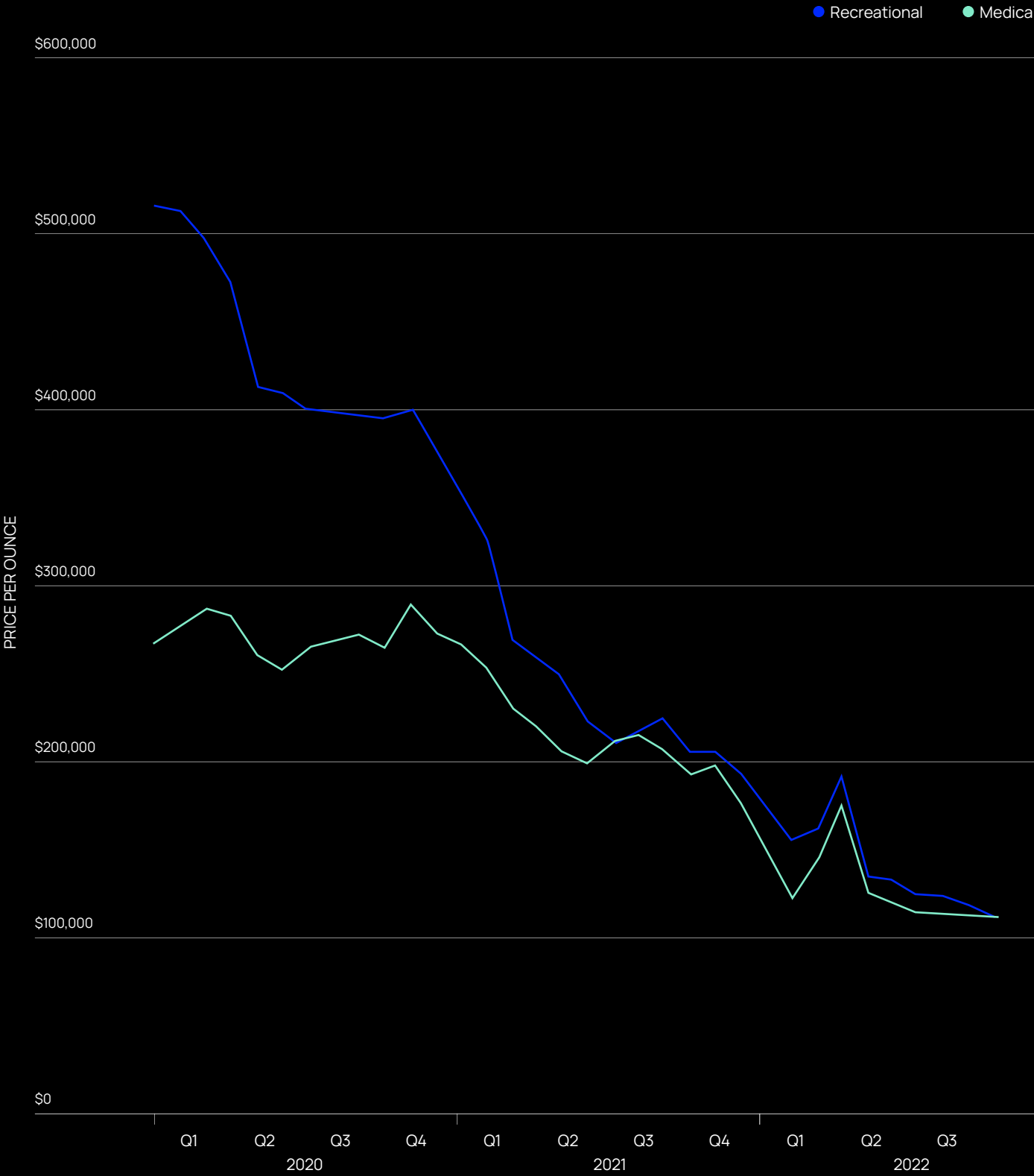
During a time where it seems that retail prices, for a multitude of goods, are increasing significantly, the retail cannabis industry is experiencing the opposite effect.

As the recreational markets in some US states are maturing, we are seeing the so-called 'race to the bottom' take place. Retail prices for recreational cannabis are plummeting to all-time lows, which is beneficial to the consumer, and detrimental to the suppliers, who are experiencing razor thin margins and significant losses.

The causes of the 'race to the bottom' come from both supply and demand pressures. On the demand side is the fact that brand loyalty does not play as big a role in terms of informing consumer decisions as in other industries. According to a survey conduct-

ed by Deloitte, the main influencing factor for a Canadian cannabis consumer seems to be price. In 2021, the brand name was not a top ten influencer for US consumers, although it is appearing to become more important in developed cannabis markets within North America.

Declining price of retail cannabis in Michigan



Source: Michigan Cannabis Regulatory Agency

Supply side pressures that contribute to this phenomenon can be seen clearly in states like Michigan. The state's recreational market has been operational for just under three years and has seen a large influx of licences, as well as brands available to consumers; the latter of which has increased 10-fold since the first year of recreational sales. With these factors present in an industry, price reductions are somewhat of an inevitability.

A common practise among brands is to discount their product to remain competitive with the other brands. Discounts on retail flower prices have been increasing steadily since hitting the market, with some states such as Washington, Nevada and Michigan seeing average discount rates around 20%.

Cookies has managed to rise to the top in part due to its marketing, and its cult following. It is the only cannabis brand to make AdAge's 2021 list of America's Hottest Brands, and has expanded into several countries; Canada, Spain and Israel with both products and storefronts via partnerships with licensed cultivators. The company has managed to deliver well-received products and dispensaries as well as a clothing brand that produces US\$50 million in sales per year and provides organic advertising for the brand.



Canada has seen discounts, but on average at a smaller level. The prevailing reason for this is that the wholesale prices are set by the government in most Canadian provinces. This pricing system means the retailers can draw in most of the discount.

Brand development

Many operators are using price reductions as their main strategy to try and win over consumers. However, some brands have rejected this notion, and have been able to establish memorable brands which cultivate market share in an industry that is oversaturated on many fronts. Two good examples are Cookies and Wana Brands.

Wana brands, which announced it was being acquired by Canopy Growth in 2021, is the number one brand of edibles in the US and Canada, where it commands ~30% of the edible market. The Colorado-based company was named as one of America's fastest-growing private companies by Inc. Magazine in August 2021. By licensing its intellectual property (IP) to trusted partners in various regions across North America, their products are available in Arizona, California, Colorado, Florida, Illinois, Maryland, Michigan, Missouri, Nevada, Ohio, Oregon, Oklahoma and Massachusetts. In Canada, its Ontario-based licensing partner Indiva, has renewed its contract with Wana in 2021 after its Sour Gummies earned one of the top three spots among edible stock keeping units (SKUs) in the country and won several awards. Their early entry into the Colorado recreational market helped the company discover what kind of products and marketing strategies build loyalty across North America. Moreover, their focus on edibles has allowed them to avoid the significant downturns in unprocessed flower prices.



EXPERT INTERVIEWS



Boris Moshkovits

Co-Founder and Managing Director
alephSana

alephSana is a European pharmaceutical wholesale, distribution and marketing company, established in Berlin in 2019. Ever since, alephSana has been pursuing the mission to provide patients with targeted cannabinoid therapies. The company is enabling pharmacists and doctors to prescribe to and provide for patients in need of cannabis, such as dried flower, extracts, formulations and APIs, ensuring standardized pharmaceutical quality.

As a fully licensed wholesaler and well-established cannabis supplier, alephSana is dedicated to source its products of consistent high quality only from EU-GMP certified manufacturers from around the globe, including South Africa, New Zealand, Portugal, Denmark and Canada.

In order to guarantee an individual and regular supply, we give pharmacists access to the ever-increasing range of alephSana's high-quality cannabis products, as well as products of other leading producers via our exclusive online platform. Our online platform also provides know-how, certificates and medical information.

Furthermore, alephSana is a reliable partner for licensed manufacturers who are eager to export their cannabis products to Germany and Europe. As a thought-leader and medicinal cannabis pioneer alephSana continues to explore new markets, new products and new digital platforms for doctors, pharmacists and patients and is looking to build further strategic partnerships globally.

Germany continues to dominate much of the discourse surrounding cannabis in Europe, and this is reflected in the recent deals and investments made throughout the market. Is there a danger that expectations for the market could outpace reality?

In a highly regulated market, you are always dependent on legislation and actual regulatory framework. Currently, the legalisation of cannabis for adult-use in Germany is underway, without a guarantee that it will come to fruition. German lawmakers are presenting the case in Brussels, to convince the European authorities that the German approach is actually fighting drug abuse and strengthening protection of youth, and providing better quality control.

Of course, some start-ups will start betting on a quick legalisation; some will emphasise local cultivation; other companies will base their business case on building a platform or hub for imports from around the world.

As nobody knows for sure what the law will look like in the end, companies are investing in building brands and designing services and products that may never see the light of day. So, in a sense there is a high probability of over-promising and under-delivering on their part. At the same time, there are market aspects that are being neglected, and the right approach can outperform high business-plan expectations as well. For example, the medicinal cannabis market in Europe is growing steadily, even though it is being threatened by tighter prescription rules and a limited product range. These attacks are geared towards dried flower as a medicine. The German government insurance are examining how and what will be reimbursed. A stronger R&D approach can differentiate a company very well or a strong pharmaceutical marketing business can thrive in such an environment.

Personally, I'm focussed on building a pharmaceutical company which has a wide portfolio of therapy options and, at the same time, provides education to the medical community. As long as the full potential of the plant and the needs of the patient are the driver of the business, I am certain we are building a sustainable business model.

Following a difficult year for cannabis investors, many are hoping the launch of Germany's adult-use market could turn the tide. Do you think this is likely?

As I laid out, it will depend on the business cases of the start-ups, how they can best benefit a potential recreational market. We know from the Canadian rec-market that it took at least six months from having a regulatory framework to the opening of the first dispensaries. And then it took another couple of years for a consolidation of the market, where only a few companies are profitable now, while the rest are struggling with low prices, strict regulations and massive taxation.

Taking all of this into account, start-ups and their investors must make wise decisions on where in the value chain they want to position themselves. Investing in a full vertical integration may prove cost-intensive and not produce the expected return on investment. Copying the Canadian model will most likely not lead to the desired success stories. Rather, it looks like start-ups are rushing in the same direction of megalomaniac global dreams.

On the other hand, the German adult-use market will be a beacon for development in Europe, and the potential to build European brands is enormous once we have actual products and not only investment stories out. It is also important to point out that all European legalisation projects, like Luxembourg and Malta, are being stalled after the initial hype and hope.

The recent publication of Germany's 'key points paper' showed that it was likely Germany will initially rely exclu-

sively on domestically produced cannabis to supply its recreational market. What does this mean for businesses and the launch of the market?

The key point paper was drafted as a general layout for the future law of a recreational market that does not violate international treaties. Yet, the reality is, if you want to replace the anticipated 400 tons of the illicit market through legal products, you either must find workarounds for import or ramp up domestic cultivation. Still, alone, big production capacities will not be able to fight the legacy market. Currently, a myriad of businesses are launching dispensary-like franchise enterprises to distribute the product to the customers. As we know from the difficult start in New York, a lack of points-of-sale can also lead to a frustrating business environment.

So, only if Germany manages to avoid all mistakes of all existing legal markets and projects worldwide, it may turn out better. Otherwise, it will be like in any other new market, we will see consolidation of companies and business models that could only survive with the famous hockey-stick growth.

What impact do you think the launch of a recreational market will have on Germany's expensive medical cannabis market, and what needs to be done to ensure it continues to flourish?

At alephSana we understand the potential of the recreational market and yet focus on supplying pharmacies to give patients a choice of strains and extracts from around the world. Also, researching new modes of delivery and working on market access, marketing and distribution of innovative formulations carries enough potential for a successful business. As the recreational hype grows, the medical market matures and profits are rolling in. Those companies that have invested in know-how, team and processes will flourish. Some local assets will prove to be a burden and cost-intensive. We focus on building strategic partnerships with companies that have strength in sourcing and market access, or research and product development.

The launch of the recreational market may take away a certain patient-base that will buy from dispensaries. But only if the choices are equally international, well grown and well crafted. And while the dried flower share in the medical market will decrease eventually, new forms of medicines and formulations will take its place, as new patient groups are being introduced to the potential of cannabis. alephSana is a knowledge-based company. We believe in empowering everybody, from doctor, pharmacist, and assistant, to patients and their caring friends and family, to better comprehend and communicate the full potential of phyto-cannabinoid therapies. With more acceptance, we will see increased prescriptions and eventually more patient data, which can help in creating the next generation of cannabis medicines.

With the prospect of adult-use encouraging a host of new businesses to enter the market, how can they hope to innovate and differentiate themselves in the cannabis market?

Of course, looking beyond the Atlantic Ocean to North America, European companies get euphoric with the prospect of a wide range of products that on this side of the pond are only seen in the black market. The first companies to present legal vapes, pre-rolls, edibles, or other consumer-friendly products will be able to gain consumer loyalty. The effects of the first mover will, however, fast evaporate as companies enter with products at scale and gain market share by price alone.

The biggest learning from the current Canadian market is 'Most Bud for the buck'. Still, there are opportunities for new businesses that carefully examine the current situation, including the legacy market, and present choices to the consumer that are welcome, and not invent services that never had a place in the customer journey in the first place.

How do you plan to continue to set yourself apart from the growing number of competitors in the German market? What impact will the development of other European markets have on your approach?

From the beginning, alephSana has been a lean company, with digital processes and assets. We work decentrally, cloud-based with a global team and international strategic partnerships. Our main mission is to continue finding those partners that bring true value, smart funds and innovation to our eco-system. These partnerships range from seeking out the right investor, who understands our journey and who is interested in a sustainable success story, to working with data-driven companies and their services and products.

Germany holds a lot of promise, but as the legalisation movement ramps up and the stigmatisation for medical use diminishes, other

European markets continue to grow and present new commercial potential. We are currently building bridges to all continents for sourcing and development, and with a sales focus on Europe. Besides Germany, we will expand our activities in Poland, the Czech Republic, Switzerland and the UK.

We understand the hurdles of the market and financial limitations and operate cost-effectively and cost-consciously. Aligning ourselves with other smart partners from around the globe will give us the edge to thrive in this challenging environment.



Point of sale innovations

At the global level, legal cannabis is becoming increasingly more accessible for consumers and patients. The major challenge for the legalisation of cannabis is, in some senses, to move the trade from unregulated illicit markets to regulated ones. A challenge arises in that illicit cannabis is already ubiquitous and can be obtained as easily and as quickly as takeaway food in most western countries. Regulators have the challenge of introducing licensing which achieves goals like the protection of youth and quality assurance at the point of sale, while also convincing consumers that making an extra effort to obtain legal products is worth the trade off. As we leave prohibition behind, most regulators have opted to err on the side of caution in this respect, choosing tighter controls at the expense of consumer convenience. However, as the industry matures and fears allay, cannabis sales are becoming more and more accessible to consumers and patients, with delivery becoming more common and 'point of sale' regulations more flexible.

Novel consumable products are sometimes sold in product-specific stores when released, as it is deemed necessary that shops and staff require specific knowledge or training to provide a proper service. This has been true, for example, for protein supplements and more recently in vaporiser shops. However, as these products become more recognised, and more in-demand, larger stores and chains begin to stock them, making it easier and cheaper for consumers to reach the products. This is, of course, more complicated for a product like intoxicating high-THC cannabis. However, given the safety of cannabis compared with other substances like cigarettes and alcohol, and declining taboos around cannabis, Prohibition Partners sees the natural trend being towards the integration of cannabis into more generalised stores where licensing permits this. This trend is already established in North America, with the first gas station and cannabis dispensary opening in Colorado in 2015. In 2022, Circle K announced a partnership with Green Thumb Industries for co-located stores with separate entry points (as dictated by regulations). The opening up of popular convenience stores to sell cannabis products is the beginning of a new chapter in cannabis retail.

Accessibility to CBD is racing ahead in this regard. Since the Farm Bill in 2018, CBD has flooded the shelves of convenience stores, and is now available in shops like Walgreens and Walmart. Similarly in Europe, CBD is now available in popular convenience stores like Boots and Rossmann. CBD-specific stores are now ubiquitous in Europe and are increasing in popularity in Latin America as well as in certain Asian countries like Thailand and India. In many countries in Europe, CBD flower products are now also commonly available in convenience stores.

Delivery of both medical cannabis prescriptions and recreational cannabis is becoming more common, especially in North America. The pandemic solidified some of the more flexible distribution channels that had first been introduced in 2020 after stores were deemed essential in many North American jurisdictions. In Toronto, as of October 2022, cannabis delivery can be fulfilled through UberEats in partnership with Leafly. From data collected through its purchasing portal, Weedmaps reported that 60% of orders in the first half of 2021 were for delivery — an increase of 97% as compared to the first half of 2020. The company also reported that the average delivery time decreased to just over five and a half hours in 2021 as compared to just over seven and a half hours in 2020, signalling that delivery services have become more efficient.

Many important international markets for medical cannabis allow for home delivery such as the UK, Germany, Israel and Australia. In the UK and Germany, in particular, clinics which allow for a tele-consultation with doctors and the delivery of products to patients' homes are becoming increasingly popular and are driving patient access forward. In the key points paper released by the German government, they envisage online sales being permitted, as well as on-site consumption and sales in licensed shops beyond dispensaries. This is important information as Germany is currently setting the standard which may be applied to new adult-use markets in Europe in the near future.

Social Issues

The liberalisation of cannabis through the efforts of advocates, patients, consumers, politicians and businesses is at its heart an extremely socially relevant movement. Cannabis is the most widely consumed illicit substance on the planet despite its relatively low potential for harm amongst intoxicants and its clear therapeutic value. As such, its prohibition is perhaps one of the largest causes of unnecessary criminalisation in the world. The movement for its legalisation then has major social impacts, via the improvement in lives of patients and consumers and anyone harmed by the war on drugs. Legal cannabis is already a multi-billion dollar industry, and the ceiling for growth is tremendously high. As the new industry is growing, so too are its social responsibilities. Below we consider a few issues which are in the spotlight at the moment.

Social Equity

Many countries are now reversing the decades long trend of criminalising cannabis users and patients. In admitting that previous policies on cannabis control were in error, governments also admit the need to heal the damages caused by these policies. There is widespread acknowledgment among advocates, scholars and politicians that cannabis prohibition disproportionately affected lower income communities and communities of colour especially but not exclusively in the US. According to one study by the American Civil Liberties Union, black cannabis users are 3.6 times more likely to be arrested for cannabis possession than white users. States and countries are now dealing with the questions of how to make amends to people directly and indirectly who were harmed e.g. by incarceration or the disruption of communities under prohibition.

The US is perhaps the central example where governments are taking affirmative action to address past wrongs. Measures have been taken to alleviate the harm that previous cannabis legislation imposed on different communities, particularly impoverished communities of colour that saw higher rates of arrest and punishment for minor drug offences. A mainstay of policies in this regard are those which invite impacted communities to participate in the new cannabis industry. One such example of this is Michigan's Cannabis Regulatory Agency, and its social equity programme. The programme aims to, 'promote and encourage participation in the cannabis industry by people from communities that have been disproportionately impacted by marijuana prohibition and enforcement and to positively impact those communities'. For the most part, these types of programmes offer reductions in business, licensing, and the other fees that come with setting up a cannabis-related establishment. Similarly, New York is giving pri-

ority to people with prior cannabis offences in the distribution of dispensary licences. Many states are also directing cannabis-derived taxes to socially regenerative programmes in communities harmed by the war on drugs.

A large database of the social equity programmes is curated by the National Association of Cannabis Businesses and can be found at the following address: <https://nacb.com/social-equity/> Perhaps the largest symbolic event around restorative justice and cannabis came in late 2022 when President Joe Biden announced the expungement of simple federal cannabis offences. This is the furthest the US government has gone in advancing the cause of cannabis liberalisation, and in righting the wrongs caused by the war on drugs. While this move was certainly welcomed, the majority of offences are at the state level, which the Federal government cannot directly address. Advocates were also disappointed that the announcement was addressed to citizens only and does not necessarily protect vulnerable migrant communities. However, the message from the government remains clear: that criminalisation of cannabis is no longer considered the most sensible policy. The most powerful country in the world, which largely powered the war on drugs, has sent the signal that prohibition should be reconsidered, and harms caused by these policies should be healed.

‘During the last decade, the lack of favourable public policies – limited only to repressive law enforcement, sustained counter-narcotic approaches, and crop-eradication – have caused the rights to the enjoyment of ownership and economic resources to be stripped away from vulnerable populations involved in cannabis cultivation or production.’

Excerpt from: 'Cannabis and Sustainable Development: Paving the way for the next decade in Cannabis and hemp policies.' FAAAT, international drug policy non-profit organisation.

Latin America

The war on drugs has affected communities across the world, and Latin America is no exception. In Mexico, criminalisation of cannabis has kept the prison system bloated, and drug cartels well funded. Mexico's recent recreational legislation is a significant move that will remove unnecessary convictions, and empower law abiding citizens instead of cartels.

As Stuart Titus, CEO and President of Medical Marijuana Inc., put it: 'Much of Mexico's cannabis has been black market and the resulting war on drugs has proven to be a huge failure. The right solution: legalise, tax and regulate this market.'

Similarly, in Uruguay, a large factor that contributed to recreational legalisation was the goal of undermining the illicit drug trade controlled by cartels which brought violence and increased crime into the country. In the same vein, Colombia's recent decision to move towards adult legalisation was fuelled by this similar crime-reduction motive. Liberal rep Carlos Ardila said of the recent approval that it would : 'chang[e] a purely criminal approach for one of harm reduction and public health.'

Thailand

Following Thailand's decriminalisation and legalisation of cannabis, a freeing of inmates that had been sentenced to jail for cannabis-related offences occurred. As of June 2022, more than 3,000 inmates have been released, and other inmates who had multiple felonies have had the cannabis-related ones dropped.

EXPERT INTERVIEWS



Kieran Tracey
President
RQC Partners

Why are we seeing more focus on GMP and regulation, even as recreational cannabis markets open further?

In short: legal precedents, controlled drug treaties and medicine quality expectations. In Canada, regulations and licensing are based upon case law—a focus on material tracking and medical cannabis quality was established and continues. However, Canada didn't treat cannabis as part of the International Medicinal Product framework.

Why did Europe mandate differently?

Europe has an established Herbal Medicines and Pharmaceutical drug framework extending to the supply and quality of unlicensed Medicinal Products, including cannabis product monographs and clear manufacturing and distribution quality expectations using Good Manufacturing Practices (GMP). European regulators still see cannabis—with psychotropic effects—as controlled drugs.

Do you think GMP guidelines will continue holding sway?

We do. The recent MHRA (UK) comments regarding provision of GMP production sites reduced the potential transport of Good Agricultural Collection Practices (GACP) materials internationally.

How serious must external European supply sites need to be about quality and GMP?

Very. We're seeing increasingly strong oversight of GMP licensed sites across the supply chain—especially during reinspection and analytical testing. Ongoing quality commitment is an expectation, and that requires licenced product importation using GMP concepts, conditions, and applied sustainability.



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Protectionism vs globalism

Cannabis is a brand new industry, and it has been commonly promoted as a fount of opportunity for many otherwise disadvantaged individuals and regions. Where the opportunities arise in reality is dictated not so much by the market as by regulations set by the countries where demand for imports is high. The main countries for consumption are currently in the Northern Hemisphere, like the US, Canada and Europe with governments in regions like Latin America and Africa sometimes focusing more on exports than domestic sales. The issue of protectionism from importing countries is now threatening the ability of domestic markets in lower-income nations to participate in the new industry.

Canada and the Netherlands are the leading examples of countries employing protectionist policies for their local cannabis markets. These countries have the longest standing laws for the production and consumption of medical cannabis and therefore, have had a significant head start in developing their industries and currently export many tonnes of cannabis each year (see above). Canada and the Netherlands are both part of the G20 and therefore committed to their pledges to refrain from protectionist policies which benefit domestic business at the expense of foreign competition.

As such, neither country has specific public policies against importing cannabis, but neither are allowing imports in any real quantities. This issue has caused discontent among many industry players but also regulators. In Israel, industry groups are currently pressuring the government to restrict Canadian imports as they complain they have no access to the domestic market in Canada. Audley Shaw, Jamaica's Minister of Industry, Commerce, Agriculture and Fisheries, said in a statement to MJBizDaily:

'It appears manifestly clear that the refusal of the Canadian government to allow the importation of commercial quantities of marijuana from Jamaica is putting the investment of several Canadian investors in Jamaica at risk.'

In response to a query from Prohibition Partners, a representative from the Dutch Office of Medical Cannabis stated that their organisation is not currently considering importing any quantities for commercial purpose in the country, citing the need to control quality as the main reason for this. While these unofficial policies contravene international sentiment on free markets, there is a sense in which import policies which inadvertently cause protectionism could be warranted in the cannabis industry in that governments may want to protect consumers, by only allowing for products which they have direct oversight of. Furthermore, governments do need to implement compliance regimes like the Good

Manufacturing Practices which are more attainable for companies in high income regions like Europe, where it is also more straightforward to obtain EU-GMP certification. GMP certification does create a price barrier to market entry which can, and does, exclude producers in lower income regions, and there does not appear to be a simple solution to this issue. See further work on this topic by authors such as Dr Kojo Koram - Birkbeck, University of London.

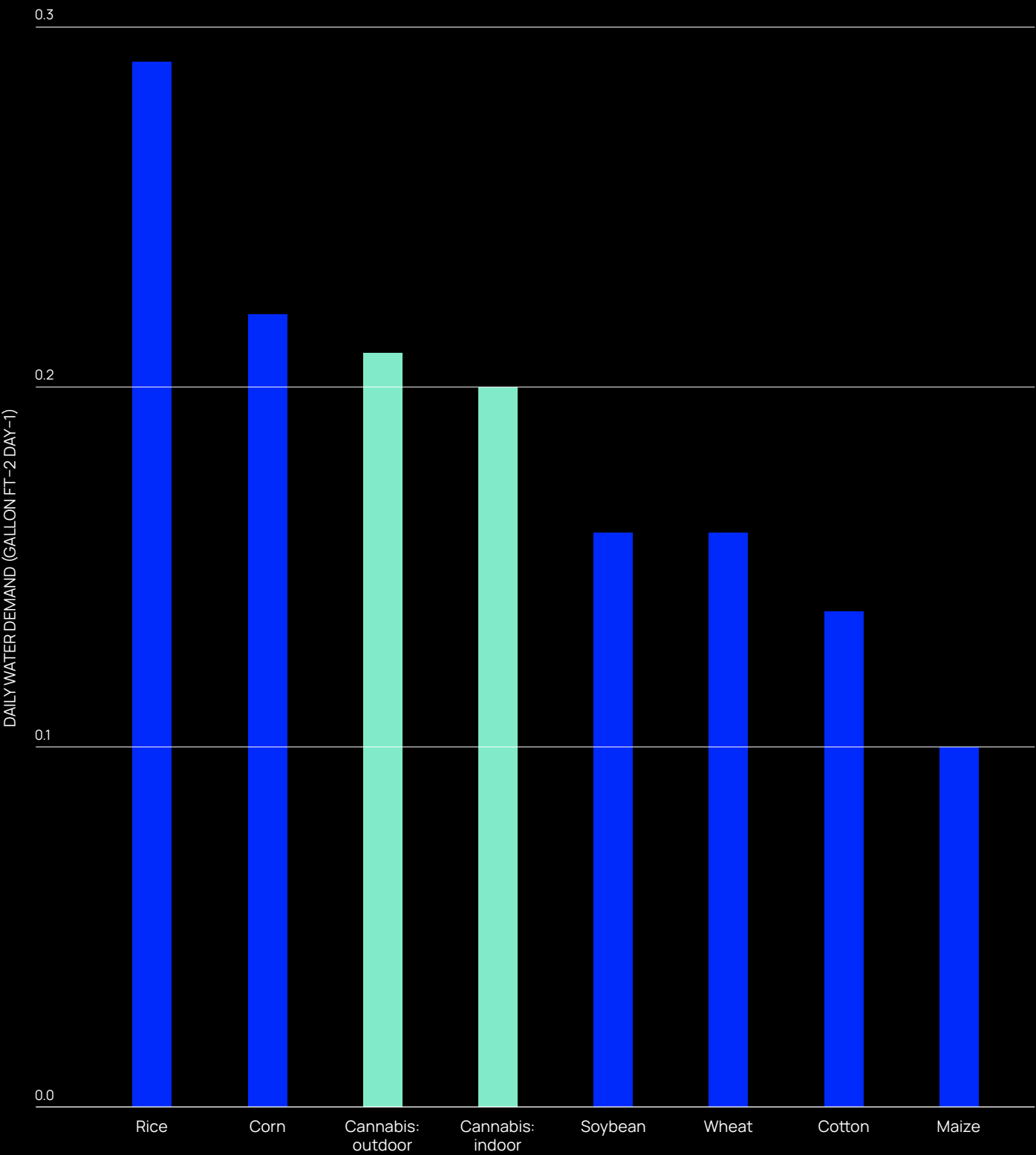
In the case of imports of adult-use cannabis the issue is more to do with international law than domestic policy. UN convention clearly outlaws the international trade of non-medical cannabis, meaning no exports are possible e.g. from Canada to Uruguay for this reason. As such, countries who are currently setting up their adult-use markets are allowing for only domestically grown products. This seems to be the case for Germany's future market and is standing policy in the pilot trials of the Netherlands and Switzerland. The ability of lower income countries and, in fact, any countries who produce cannabis to tap the full potential for cannabis exports will depend, in the future, on the restating or reinterpreting of UN convention to allow for exports.

Environmentalism

As of late 2022, the cannabis industry is generally considered to be non-environmentally friendly. The effect that the cannabis supply chain has on the environment is becoming much clearer as legal growing practices sprout up across the world. It should be noted that global prohibition has stymied research efforts in terms of understanding the potential climate impact of cannabis cultivation. For example, due to the lack of federal legalisation in the US, the Department of Energy and other federal governing bodies cannot fund research into energy efficiency, CO₂ emissions and other sustainability metrics. However, the responsibility for cleaning up the considerable environmental impact of the cannabis industry now rests with the industry and those regulators responsible for it.

As cannabis cultivation ramps up worldwide, so too will the inevitable 'externalities' that come along with this growth. Cannabis is a resource-intensive crop, especially so when grown indoors. One of the main issues facing cannabis cultivators is the water-intensive nature of the plant. For example, cannabis requires considerably more water than common crops such as wheat, soy and maize. The issue of how much water is required depends on many environmental factors such as weather, soil type, time of year etc. With a warming climate, many regions, including those centres of cannabis consumption like California will be water-scarce and a more efficient industry will soon become a necessity rather than a nicety.

Water demand of cannabis vs other crops



Source: Zheng et al (2021) Brouwer and Heibloem (1986), Humbot growers Association (2010), Rogers et al. (2017), Intaboot (2017), Wilson et al. (2019), Hussain et al. (2020). Values were averaged out between different sources.

As well as being water-demanding, cannabis cultivation is also extremely energy demanding. Cannabis cultivation currently accounts for 3% of California's energy consumption according to research carried out by the Illinois State University. Indoor cultivation facilities are the main reason this proportion is as high as it is. Artificial climate conditions (temperature and humidity) are quite difficult to achieve, and so the associated energy costs are high. The machinery required for indoor cultivation must be constantly operating upwards of 16 hours a day. From lighting, to heating, to air conditioning, to drying etc., indoor cultivation is associated with a significant environmental burden. According to the Resource Innovation Institute, a nonprofit organisation focused on creating industry standards for agricultural cultivation, outdoor cultivation is significantly less energy-intensive, using around 2 1/2 % of the energy required for indoor growing. Greenhouse cultivation lands somewhere in the middle of these two extremes, using 45% of the energy needed for indoor cultivation.

The discarding of waste products is another area of concern for environmentalists within the cannabis industry. To dispose of cannabis plant material that is not part of the final product, US cultivators are required to make the waste unrecognisable, so as to not reroute this waste into illicit markets. To accomplish this, cannabis waste is required to be mixed with non-cannabis waste. This mixture can often not be disposed of cleanly, and so ends up in landfills. In Canada, 425 tonnes of cannabis were destroyed by licensed producers in Canada in 2021, with a large amount presumably ending up in landfill. This is clearly a non-sustainable practise which needs closer attention as the industry matures.

Many in the industry acknowledge the growing impact of cannabis on the environment and the need to deal with this sooner, rather than later. Several large multinational cannabis companies, including, but not limited to Aurora and Tilray, have laid out their environmental commitments. For the most part, these commitments focus on being as energy efficient as possible, diverting waste from landfills and using sustainable packaging materials where possible. As the industry matures, it is expected that more companies will develop and publicise detailed environmental policies.



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Solutions

While many cannabis businesses are keen to reduce their environmental impact, there are few clear guidelines on how to do this cost-effectively in such a young market. One survey (McNabb et al. 2021) of 66 business owners found that 65% of owners in the US believed that finding ways to save money through energy and environmental sustainability was key, with 60% hoping to see more case studies on energy and water-efficient cultivation as well as educational webinars regarding the future and ongoing effects of climate change on cultivation. In terms of figures; 50% were interested in web-based energy performance evaluation tools and related best practice guides, 33% were interested in in-person workshops to demonstrate sustainable cultivation techniques and technologies and 28% expressed an interest in potentially using professional consulting services in this area.

The high energy costs for indoor cultivation has led to an uptake of solar panel usage. Incorporating solar panels into an indoor growing operation has many benefits for the grower and other external parties. Solar panels offer a way to offset the cost of demanding energy requirements, and can even offer the opportunity to sell excess energy to the grid if it is not needed. Grants and tax credits from the government are also common for implementing solar energy into one's home or company. Massachusetts based, Solar Cannabis Co., are a leading company with 70,000 square feet of solar panels, an on site microgrid and liquid chillers that naturally cool grow rooms and are a water storage solution. Solar Cannabis is certainly a sustainable figurehead in a relatively unsustainable industry. It has given them natural brand differentiation, and a sustainable outlook towards the future. Usage of solar panels is a way to capture the natural solar energy achieved in outdoor cultivation, while maintaining the precision and quality of indoor cultivation.

While heavily regulated cannabis production is currently quite environmentally taxing, the production of industrial hemp has a growing reputation as an environmentally friendly process. Hemp has been shown to be regenerative of soils, absorbing heavy metals and clearing away smaller non-crop plants that compete with crops. Using hemp as a building material can also lead to a net absorption of carbon e.g. a wall built using hempcrete can absorb 35 kilograms of CO₂ over 100 years vs a cement wall which releases 52 kilograms of CO₂ over the same timespan (See 'Hemp as a potential raw material toward a sustainable world: A review' for more details). Hempcrete is a biocomposite material made of hemp shives, the woody part of the stalk, and is a building material. The main downside is that it has 1/20 of the compressive strength as concrete, and can't be used for foundations or weight bearing functions. This means that hempcrete can only be used for applications such as dividing walls, and non-weight bearing construction.

For a good overview of cannabis and sustainability, see 'Cannabis & Sustainable Development Riboulet-Zemouli et. al 2019'.

According to some, indoor cultivation may not deserve all the criticism it receives, and may in fact have some environmental benefits over outdoor growing. Regennabis, a company advising the cannabis industry, has dispelled some myths and half truths about indoor cultivation, and has outlined benefits of indoor growing in their, 'Resource Use Efficiency in the Cannabis Industry' report.

Firstly, indoor cultivation is more efficient due to the fact that it isn't dependent on natural phenomena such as weather patterns for crop yield. Indoor growing means lower risk of pests, as well as less pesticide use and nutrient runoff in turn. Water demand is lower when it is compared to outdoor cultivation and water capture is easier with water reclamation systems. Lastly, environmental control with indoor facilities increases the quality of the product, and cultivation can be carried out year round. This is especially important for growers with a variable climate such as Canada, Europe, and a considerable part of the US. Within these facilities, the use of water reclamation systems, along with energy efficient LED lights can use 20% less energy than regular systems.

As mentioned earlier, research into this area of the cannabis industry is sparse. On top of this, many statistics about cannabis and its energy usage are from studies in areas before recreational legalisation began. One such instance is the often quoted 2012 paper 'The carbon footprint of indoor Cannabis' production by Evan Mills. A statistic that is floated around a great deal is that indoor cultivation requires 2000 watts per square metre of grow space. Regennabis explains that the California facilities of 2012 analysed in this paper simply do not compare to modern day state of the art spaces, and that the current usage level is somewhere in the range of 670-1,100 watts per square metre. In other words: still energy intensive, but much less so than a decade ago.

In order to move forward towards a sustainable future for cannabis cultivation, data collection should become the norm, and in turn this data can drive policymakers to set regulations and incentives for growers to incorporate sustainable practices into their operations. Regennabis notes that three important metrics to report are 1) energy use 2) horticulture lighting inventory, and 3) water and wastewater use disclosures.

See our interview with Regennabis below for more information.

Russia Ukraine conflict

The Russia Ukraine conflict is the most serious political development in the world in 2022, with far reaching consequences for the global community and particularly heavy burdens on those directly affected.

The advance of cannabis liberalisation is also being affected as the conflict develops. The increasing price of many resources caused by the inflation and disruption to supply chains is creating an issue for many operators. Russia is a supplier of many crucial natural resources and products that are essential for the basic function of the world, cannabis being no exception. As a result of sanctions imposed on the country, shortages that directly affect the cannabis industry are rising such as solvents for cannabis extraction, fertiliser for cultivation and steel for production equipment. Global prices of common fertilisers are up over 100% in the past year on average. In agriculture as a whole, this lack of supply and increased cost will lead to decreased profit margins for producers.

Reconciling this fact with the pre-existing oversupply of cannabis in established markets might mean that overall supply levels will not fall below demand. Nevertheless, these shortages will squeeze operators and in places may urge cultivators to establish more sustainable farming techniques, and attenuate the growing process until they establish the minimum amount of fertiliser, energy, water etc. that can be used without sacrificing quality. Growers elsewhere are feeling the effects already. In the Netherlands growers that have been selected for the Dutch cannabis trial have reported difficulties with increased energy costs, increased prices, and longer delivery times of building materials. Raising the costs of an already energy intensive crop will no doubt have a strong impact on cannabis cultivators.

The ongoing conflict has resulted in an acceleration in medical cannabis legalisation in Ukraine. The prospect of using medical cannabis to treat post traumatic stress disorders is an important consideration. In June 2022, the cabinet approved a bill that outlined the regulations for the circulation of cannabis plants for medical, scientific and industrial purposes. This move, backed by evidence that cannabis use can reduce symptoms of PTSD, and even put the condition in remission, is an anticipatory one as Ukraine prepares to deal with the long-term catastrophic damage from this war. The proposed qualifying indications for medical cannabis treatment are; PTSD, neurological diseases, digestive tract diseases and chronic pain of neuropathic origin.

As happens in many political spheres, cannabis has become somewhat of a political tool in tensions between different powers. In

March 2022, US athlete and Olympic Gold Medalist Britney Griner was arrested in Russia and faces nine years of imprisonment for the possession of less than a gram of cannabis oil. While cannabis is illegal in Russia, the harsh penalty is seen as a political move in a time of great tension with NATO and the US in particular, where citizens are getting caught in the crossfire. This highly unfortunate event underscores the fact that the prohibition of cannabis leaves the door open to the misuse of the law against individuals.

Finance

Stock markets

The cannabis industry has been the subject of much speculative stock trading historically and 2022 is no different, with large swings occurring frequently. From the beginning of 2022 until mid October, cannabis stocks have continued to decline, having peaked in early 2021 due to the victory of the Democrats in the US House and Senate. A general decline in the price of stock has seen a US\$27.6 billion decline in the market cap of the top 20 cannabis companies by revenue from January to late October 2022.

Prohibition Partners uses two exchange-traded funds (ETFs) as a proxy for the cannabis market and the general stock market. Alternative Harvest Fund holds assets in many of the leading cannabis related companies, while the Vanguard Total Stock Index (VTI) holds a balance of stocks across markets of all types in so far as is possible. The global stock market is on a general decline mostly due to the on-going invasion of Ukraine by Russia mixed with delayed effects from the COVID-19 pandemic. However, while the general market is down about 25%, cannabis stocks have fallen around 60% since the start of the year. Cannabis stocks were almost four times as volatile as the general stock market over 2022 as measured by the coefficient of variation in stock price. Prohibition Partners believes this is due to the ongoing re-appraisal of stocks which were overhyped in the early days of the industry, but also believes that the current trends in stock reflect a pessimistic outlook on the cannabis industry which does not fully consider the improving financial results and future potential of the space.

Cannabis stock vs general market in 2022



Source: Prohibition Parnters, EODdata.com

- Q1**

The VTI opened up the year riding at the highest level ever seen for the index. The market as a whole was optimistic about the post-COVID future. However, the collateral damage from COVID restrictions began to manifest, with inflation rising across the globe, reducing the purchasing power of major currencies. The Alternative Harvest (AH) index continued its slump that began in March 2021.

As can be expected for the foreseeable future, the cannabis stock market largely reflects the movements of the US government towards or away from federal legislation, with hype and rumour around specific bills playing a larger role in fluctuations than well considered analyses.

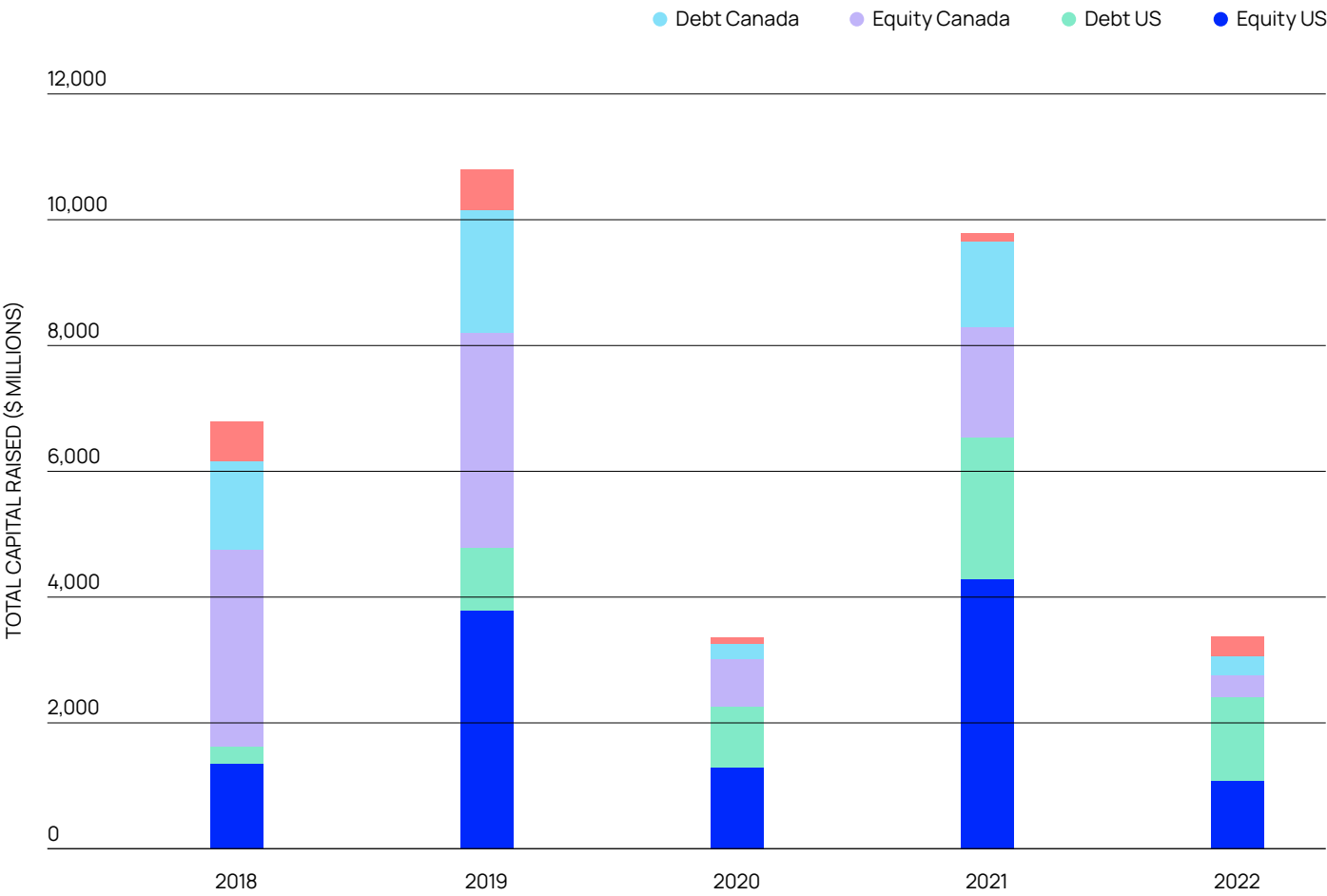
Spikes were seen early in February when the Secure and Fair Enforcement (SAFE) Banking Act passed the House of Representatives, and again when Chuck Schumer's Marijuana Opportunity Reinvestment and Expungement (MORE) Act passed the Senate on 1 April 2022. However, neither of these events produced long-lasting changes in the market's evaluation of stock companies and were instead a rallying point for investors essentially betting against each other.
- Q2**

The continuation and looming escalation of the war in Ukraine, along with the confirmation that inflation was nearing or at double digits in most developed countries, led to an 18% slump in the VTI, and further contributed to the near 50% decline of the Alternative Harvest fund. Confidence in legislative reform in the US probably contributed to this, as outlook towards federal legalisation still remained hazy at best. This coincided with a reduction in wholesale cannabis prices and profit margins. Market sentiment was negative overall despite continued state-by-state legalisation and rapidly growing sales.
- Q3**

The Alternative Harvest index remained at an all time low around this period. While Alternative Harvest plateaued, the VTI saw a considerable rally over the summer months, regaining around 10% of its value from the low that was seen in June. This increase was fuelled, in part, by strong earnings from leading companies, and indications that inflation may have peaked, potentially slowing further interest rate hikes.
- Q4**

September to October dip: both indices dipped due to inflation increasing at historic levels, with both funds experiencing the same movements in tandem. In October, US President Biden pardoned simple cannabis offences at the federal level, causing a brief 16% gain in the AH index. The index fell rather quickly back to its previous low, possibly an indication that investors were realising that state governors have no obligation to expunge state-prosecuted cannabis offences.

Decline in Cannabis Raises in 2022 up until October



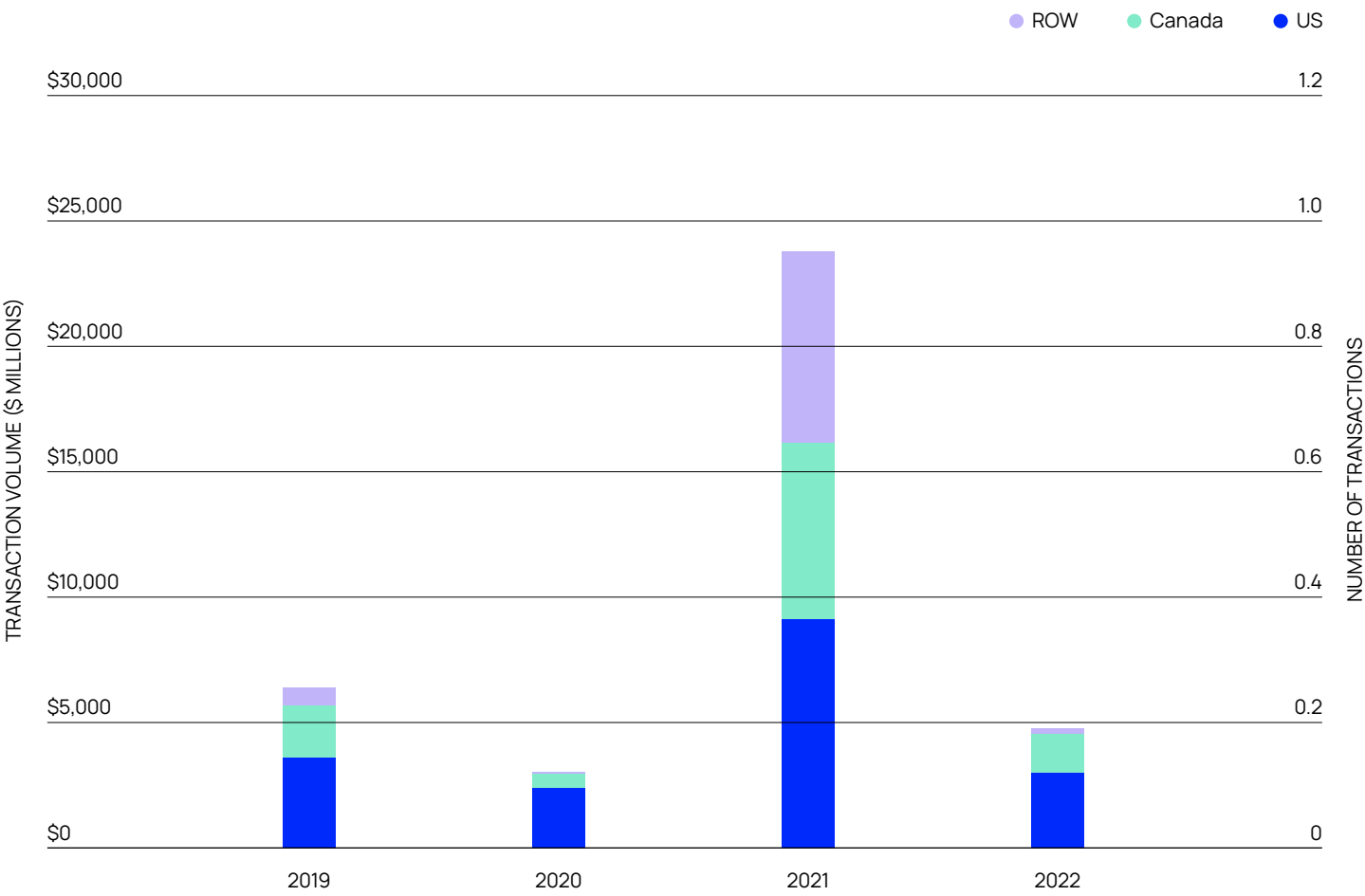
Source: Viridian Capital Advisors

It has been a difficult year for cannabis companies seeking to raise funds across the globe. In 2021, cannabis capital raises rebounded from the slump seen in 2020. This comeback was not replicated in 2022 however. The US cultivation and retail sector has seen significant changes in capital raises. Capital raises in 2022 have been declining by 69.9% when compared to the previous year. Debt raises are down 39.5%, however they are accounting for a higher proportion of the money being raised and they were responsible for 93% of capital raises this year. There have been no equity raises above US\$25 million, which has never happened in a comparable period. Equity raises are down 96% in 2022.

The main questions from these insights are: 1) Why are capital raises down overall, and 2) Why are we seeing a shift in favour of debt raises as opposed to capital raises? Negative industry trends, as well as a general negative market sentiment have meant a tougher climate for founders seeking to raise capital for what is seen as a high-potential, but volatile business.



Decline in M&A deals up to October 2022



Source: Viridian Capital Advisors

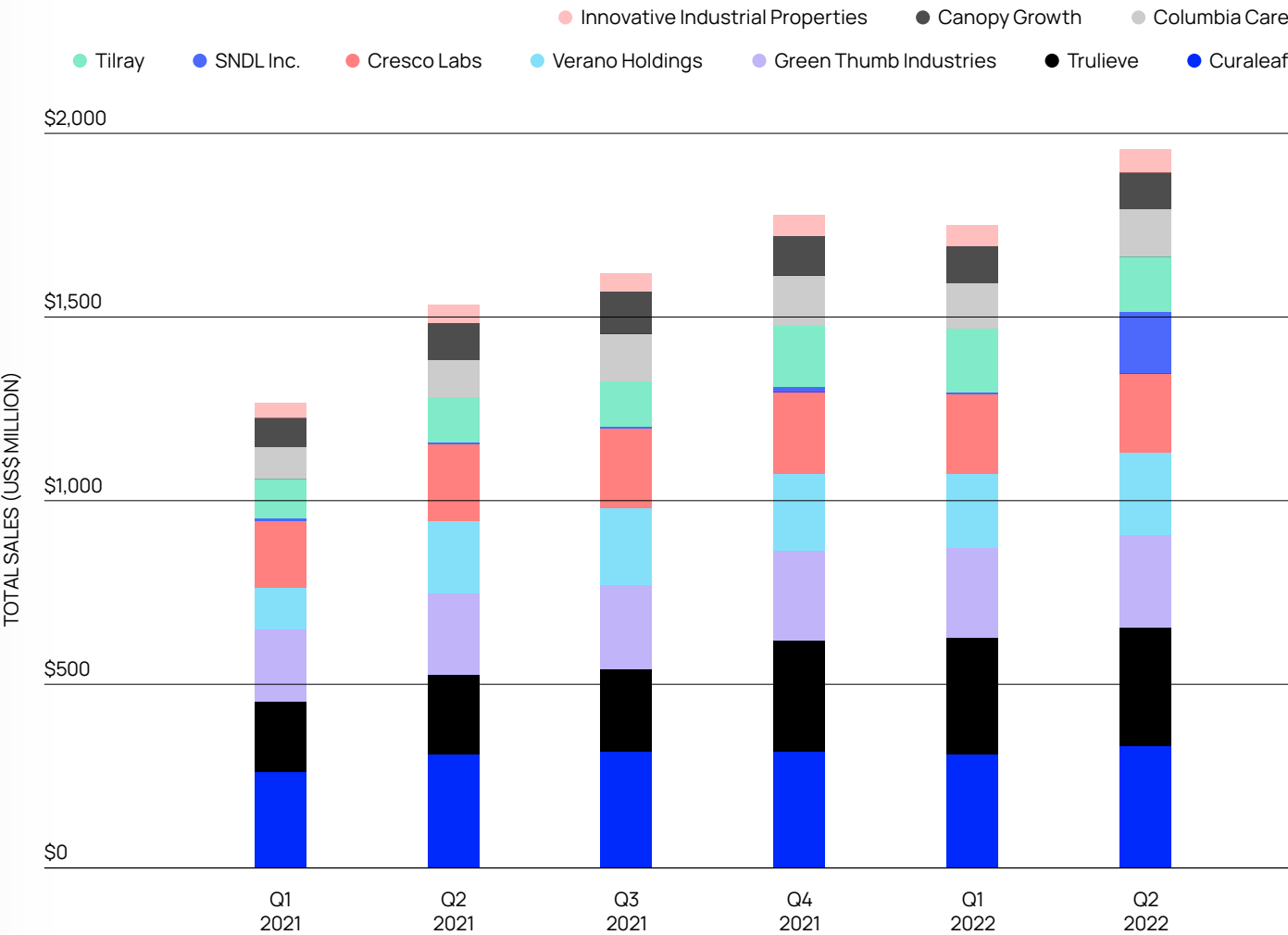
As with capital raises, the volume of M&A transactions and total value in 2021 was noticeably larger than in previous years, and subsequently 2022 as well. One of the contributing factors to 2021's large volume was the two blockbuster mergers that took place. One being the Tilray US\$4.5 billion acquisition of Aphria, and the other being the US\$7.2 billion Jazz Pharmaceutical acquisition of GW Pharmaceuticals. However, even taking these two M&A deals out of the comparison, the YTD volume for 2022 is down 61.3%. The sharp decline should not necessarily be viewed as a strictly bad omen for the industry. The volume is higher than in 2020, and does not take into account large deals that are set to be executed including Cresco Labs US\$2 billion acquisition of

Columbia Care. The trend of consolidation is still very much alive across North America, and more and more players are now making investments by acquiring assets in Europe.

Revenue and profits

This year, 2022, has been another very significant year in the evolution of the cannabis industry. Sales are growing steadily both on the North American and international stages thanks to more states and countries opening up to sales of medical and adult-use cannabis. Likewise progress is being made within states and countries to broaden access to consumers already living in places with legal access. As detailed above, this success is not being reflected by investor confidence, though Prohibition Partners expects this trend to reverse in the not too distant future.

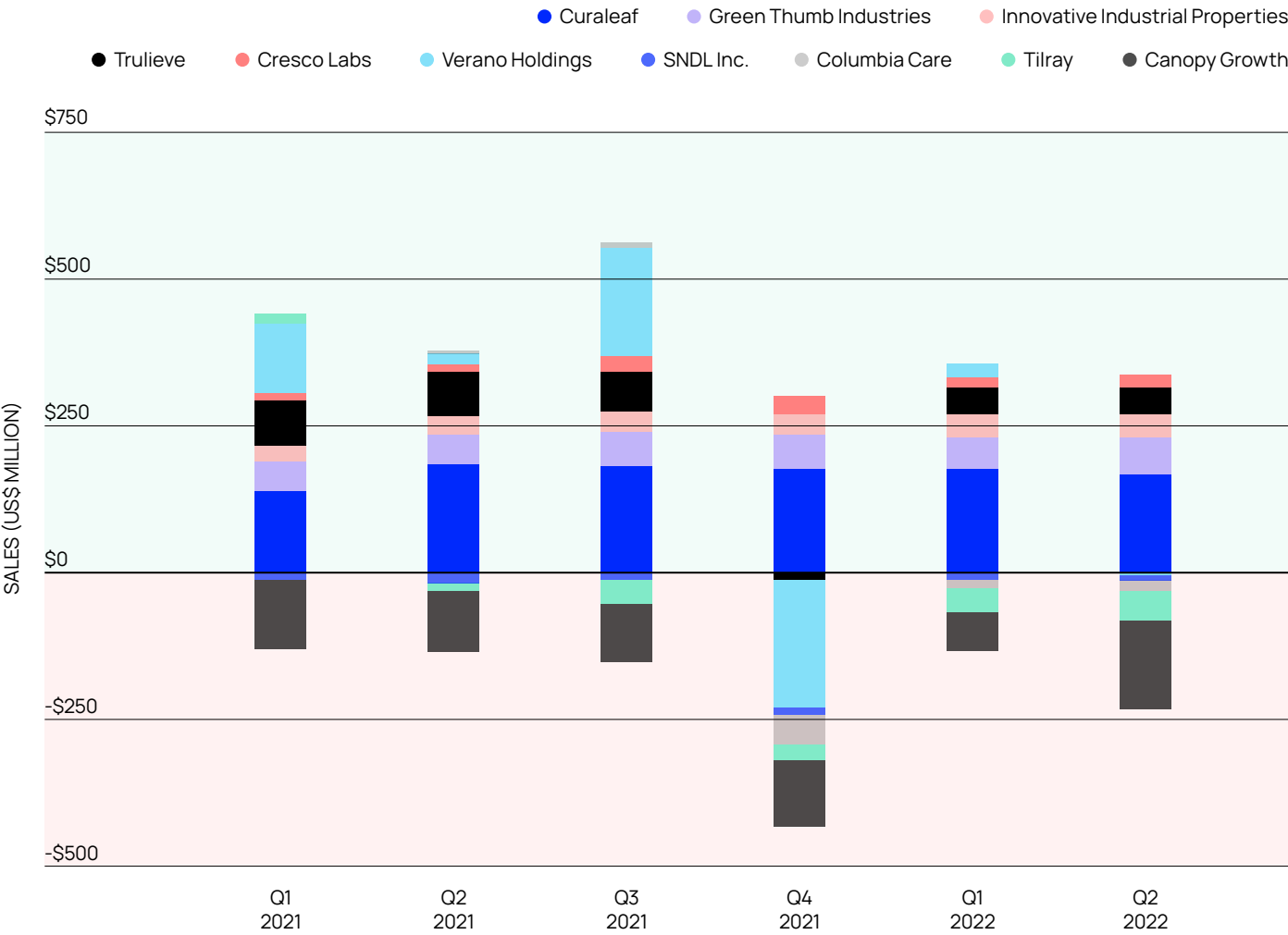
Quarterly revenue of 10 highest earning cannabis companies



Source: Prohibition Partners, annual reports

For these analyses we have grouped the top 10 cannabis-focused companies by their quarterly revenue in 2022. The quarterly revenues of these 10 cannabis companies show a steady increase from Q1 2021 to Q2 2022. The increasing sales of both recreational and medical cannabis have been a driving force for this, including the US states who began sales of adult-use cannabis this year. On average, the largest US multi-system operators (MSOs) increased their revenue by 22% from Q2 2021 to 2022. While in Canada Tilray enjoyed a 27% increase, Canopy Growth actually saw declining sales as competition in Canada and Europe ate into their market share. In Q2 2022, just these top 10 companies saw a combined revenue of almost US\$2 billion.

Quarterly income of 10 highest earning cannabis companies



Source: Prohibition Partners, Company annual filings

Despite these overall increases, operating income varied considerably between companies. There are some notable trends among these companies. Verano Holdings saw a highly variable operating income from month to month, moving into negative territory in Q4 of 2021. This was due to depreciation and amortisation costs the company suffered, as well as capital expenditure for expansion activities.

We can also see Canopy Growth's consistent negative operating income throughout this time. Canopy Growth completed the acquisition of Wana Brands, where they executed an upfront cash payment of US\$298 million, as well as the acquisition of Supreme Cannabis, and Ace Valley, while simultaneously shifting their company's focus to premium, high quality brands and refocusing on their domestic Canadian market. Inventory write-downs in Q2 of the 2022 fiscal year amounted to CA\$87 million and primarily relates to excess Canadian cannabis inventory resulting from lower sales, relative to forecasts, as well as declines in expected near-term demand.

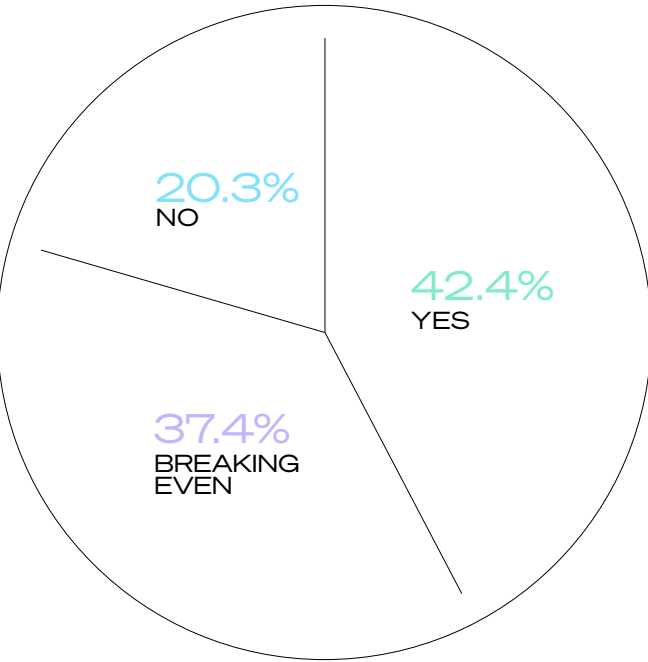
On the other hand, US-based Curaleaf posted a consistent, relatively uniform quarterly operating income. Curaleaf is a prominent player in the US and in Europe. The company saw a 92% increase in revenue between FY2020 and FY2021, reflecting continued organic growth driven by new retail store openings, the addition of new wholesale partner accounts and product launches. All told, Curaleaf still weathered a loss for this period, owing to a decrease in the fair value of biological assets and increased operating expenses. Part of this loss is attributable to the declining wholesale price of flower, as well as increased selling, general and administrative (SG&A) expenses, higher R&D expenses, as well as increased sales and marketing costs.

Operating at a loss is still the norm for large cannabis companies. This is especially true for the US; the lack of federal legislation means products can't be moved between state lines, which is significantly raising costs. Moreover, the expanding activities of many of these companies due to increased optimism about federal legislation have been met with high costs to complete these activities, as well as record low prices for the raw material, resulting in thinner margins.

Profitability

US cannabis companies experienced various levels of profitability in 2021. The outlook for operators is mixed, with many in North America struggling to break-even against stiff competition. While competition is a key factor in this, of course other factors are at play such as; lack of banking, market volatility and state and federal taxes.

Are US cannabis companies making a profit?
N=396 businesses

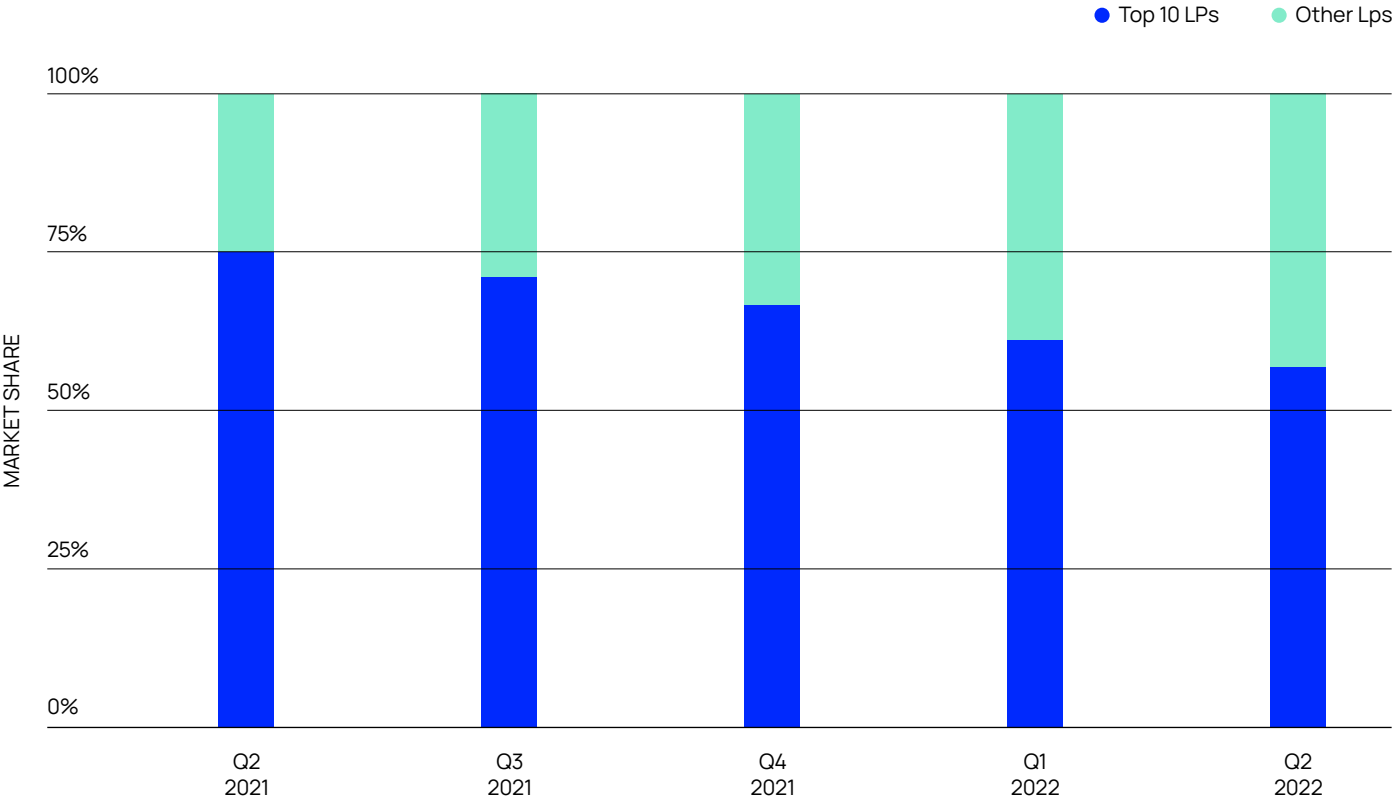


Source: Whitney Economics US Cannabis Business Conditions, 2022

In the 2022 Whitney Economics US Cannabis Business Conditions survey, 28% of cultivators surveyed said, when asked about their business confidence over the next year, that they hoped they would still be in business while others were more sure of this. Cultivation is the sector within the cannabis industry with the least amount of confidence in the future. Understandably, cultivators are hit hard when there is an oversupply in the market, creating a hyper competitive space that is hard to stand out in. The Whitney Economics Report goes on to explain that the oversaturation of cultivation licences means that cultivators are subjected to the greatest pricing variability and, due to the agricultural nature of their work, some of the greatest risk.

Market share

Market share of companies in Canada

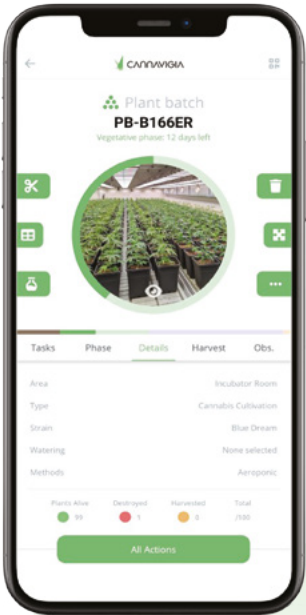


Based on: work from Cantor Fitzgerald Research & Hifyre company reports

The above graph illustrates the steadily declining market share of the top ten licensed cannabis producers in Canada. Starting Q2 2021 off with 75% of the market share, that proportion is now down to around 60%. The main reason for this decrease is that Canada's smaller craft cultivators and producers are becoming more prominent and are growing market share by attracting consumers with premium cannabis products. There are now more than 250 micro-producers competing for market share, with the majority of them being located in Ontario, British Columbia and Quebec. According to the wealth management and investment banking group, Stifel, more than 40% of the market share was held by companies outside of the top ten largest operators by the end of 2021, and there are no signs of this decreasing.

Currently these smaller companies are streamlining, finding synergies, and focusing on R&D, developing premium products and increasing quality. New Brunswick-based Organigram Holdings

is one such company creating a name for itself with its premium products. In 2021, the company saw its market share increase from 4% at the beginning of the year to 7% by October. Toronto-based Auxly is also increasing its market share steadily with its diversified brand portfolio consisting of Kolab Project, Foray and Back Forty. It kicked off the year with a 5% market share. By October, its portfolio of brands had hit the 10% mark, according to Hifyre. Notably, Auxly also surpassed Canopy Growth in all four provinces measured by Hifyre: Alberta, British Columbia, Ontario and Saskatchewan, despite Canopy's efforts to grow market share through its acquisitions of Supreme Cannabis and Ace Valley. Auxly's management team attributed its success to its Cannabis 2.0 products, leading the vapes category in October with 25.6% of national vape sales in October, according to Headset Canadian Insights. The company released a total of 52 new products in 2021, expanding into the Cannabis 1.0 category.



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Continents



North America

Due to it being the most mature cannabis market in the world, the North American cannabis landscape is a realistic prediction about what the future could hold for other regions around the world who are just starting to reappraise decades of ill-informed drug policies. With high sales volume, lower margins, lower prices, new legislation, excess inventory and copious M&A deals, we are seeing a maturation of the North American cannabis industry, as of late 2022.

USA

A wealth of optimism was created for full cannabis legalisation in the United States after President Joe Biden was elected and the Democrats took control of the Senate. However, there has been very little movement by both House Representatives and Senators to pass new laws that would create a clearer path for the industry at the federal level. President Biden reiterated his administration's commitment to pursuing cannabis decriminalisation and expungements for those with non-violent cannabis convictions in February 2021, eventually coming to fruition on 6 October 2022. These issues were not prioritised by the newly elected government. Even progress on the more limited Secure and Fair Enforcement Act (SAFE Banking Act) fizzled once again. The SAFE Act would protect financial institutions who want to work with the legal cannabis industry. This would make raising capital easier and transactions in cannabis stores smoother and safer. The patchwork approach to cannabis regulation in the US, where every state has its own unique cannabis laws, is an opportunity to test out and discover many important answers to looming questions: What are the appropriate excise tax rates for cannabis? How many retail and cultivation licences should be available to the industry, and should they be limited or unlimited? What are the best steps required to reduce illicit cannabis sales and assist unregulated sellers and cultivators to join the new legal framework?

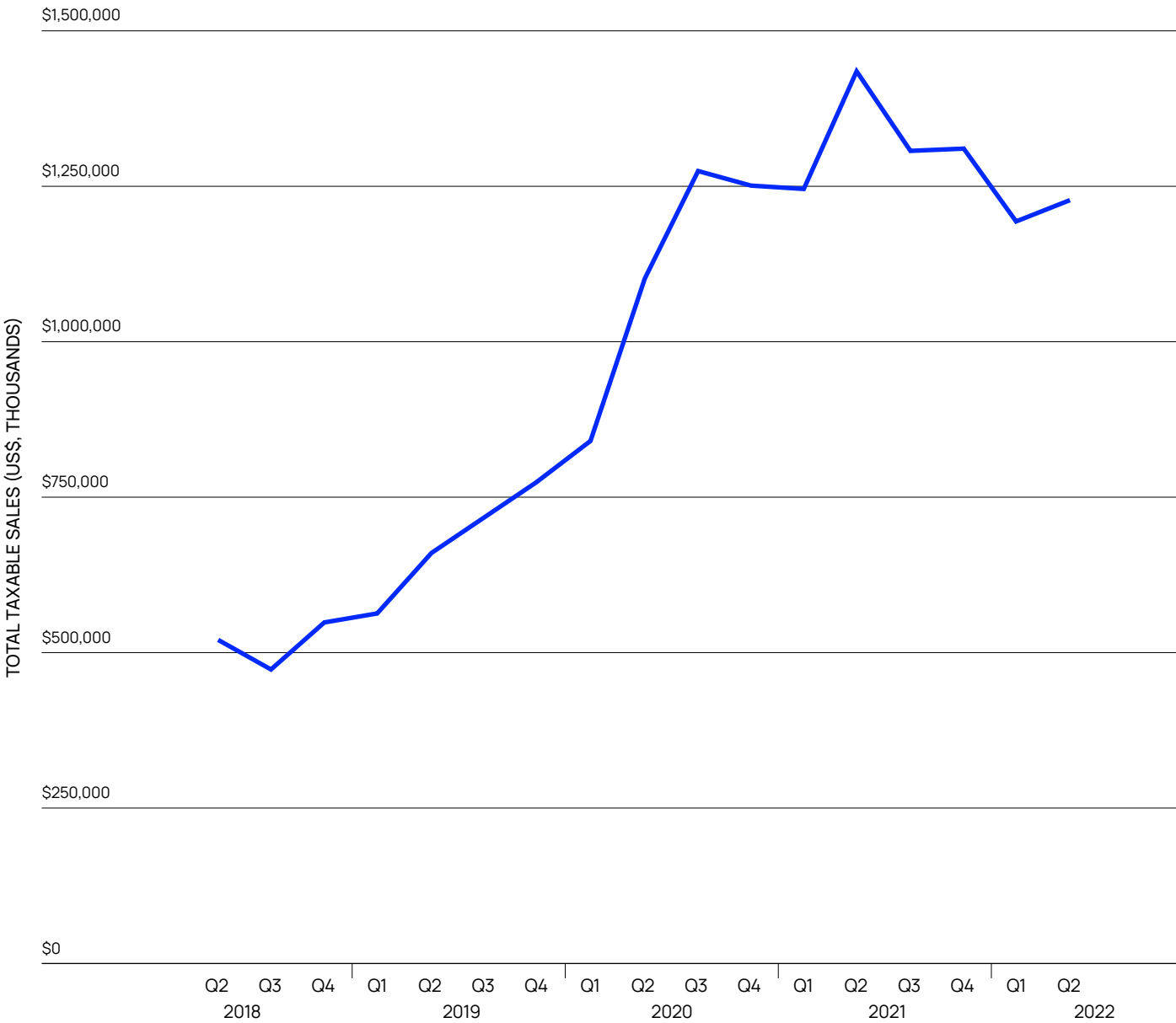
The major issues being debated are; rates of taxation, criminal record expungement, equitable economic opportunities for communities impacted by the war on drugs and banking reform. State

cannabis legislation has thus far implemented a wide variety of approaches to these issues, as well as; licensing availability, lab-testing standards, products available to medical cannabis consumers as well as what conditions qualify for access to medical cannabis.

State-by-state, legalisation efforts are growing, particularly in the Northeastern United States, where massive economic opportunities are emerging in the near future. While there is bipartisan

support for federal reform, there is a lack of consensus on how it should be implemented. The American cannabis industry continued to grow as New York, New Jersey, Montana, Virginia, Rhode Island, New Mexico and Connecticut all enacted, amended, or passed adult-use legislation. This state-by-state approach to legalising adult-use cannabis has especially benefited America's larger multi-state operators, who are gradually expanding into emerging state markets, acquiring licences and establishing cultivation facilities and distribution channels as new laws are implemented.

California cannabis sales



Source: Prohibition Partners, California Department of Tax and Fee Administration



Canada

Canada continues to develop as an example to the rest of the world, showing the considerable benefits which can be wrought from cannabis legalisation in terms of health, justice and economics. A common pattern has emerged in newly legalised adult-use cannabis markets; an initial undersupplied market, with long line-ups, high demand and high prices. That short-lived period is followed by; an oversupplied market, low prices, layoffs and a contraction in the number of cultivators, processors, brands and distribution channels. Three years into legalisation, Canada is firmly in the right-sizing phase, with larger consolidated cultivators continuing to shutter facilities, terminate employees and streamline production in 2021, as well as focusing on increasing quality and innovation.

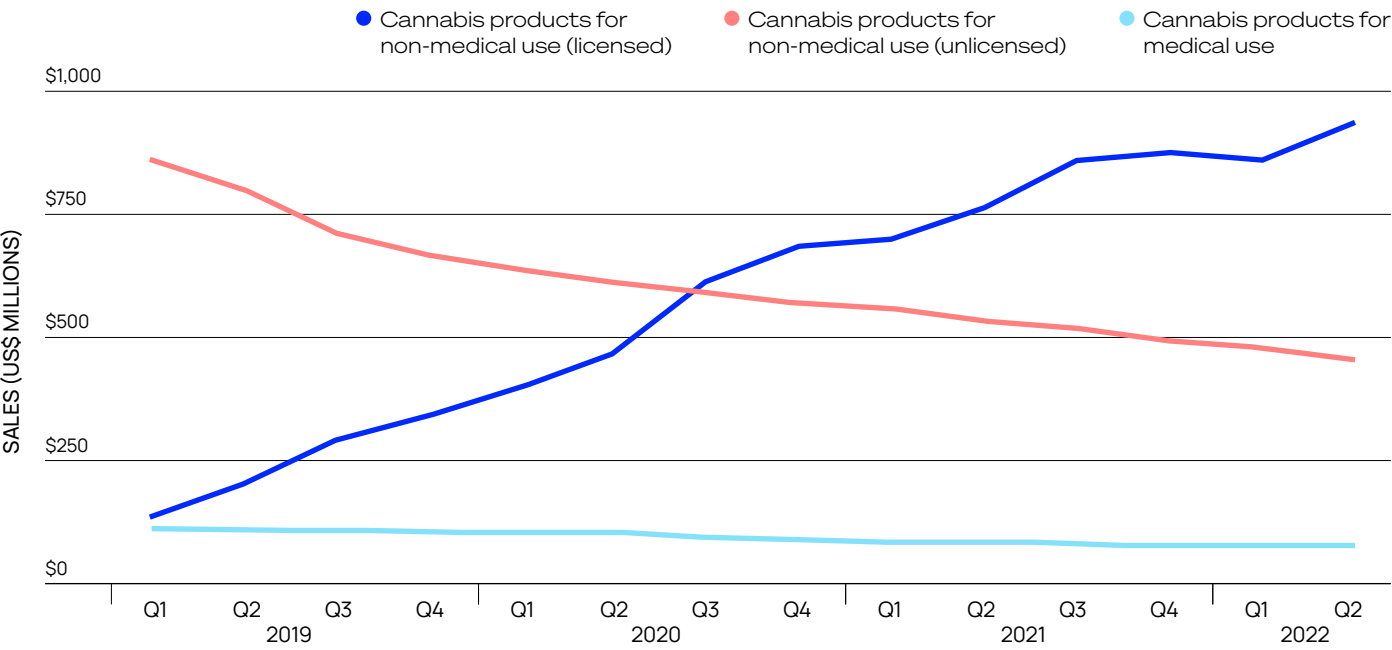
Canada's smaller craft cultivators and producers have become more prominent, growing market share with premium cannabis products. Many of the country's largest LPs are downsizing and struggling to retain market share. In Canada, inventory vastly outweighs sales, with a considerable amount of raw cannabis material needing to be disposed of in recent times; data from Health Canada estimates that in 2021, 26% of dried cannabis produced in Ontario was destroyed. The private cannabis retail space took off in 2021, with the province licensing over 1,200 stores. However, it already

appears that many of these stores will have to cease business as margins slim, and sales decrease due to increased competition.

Nevertheless, consumption is still hovering around its highest levels, but it saw a slight drop from 2020 to 2021. The 2021 Canadian cannabis survey revealed that 25% of people reported having used cannabis in the last 12 months, which was slightly lower than the previous year (27%). On the other hand, 29% of Canadians aged 20-24, and 26% of people over 25, reported using cannabis daily or almost daily. These figures are slightly higher than the 2020 survey.

The federal Cannabis Act is scheduled for a review, and there are high hopes for a change to the rates of taxation, marketing restrictions and more representation of visible minorities in the workforce. The lengthy 18-month review process was scheduled to coincide with the adult-use anniversary in October 2021. This review process was recently launched on 22 September of this year. In addition to equity, there is a long list of tweaks to the Cannabis Act that stakeholders would like to see. A major hurdle to the industry which isn't shared by most legally conformist states in the US is the tough marketing and packaging restrictions on cannabis, which critics say creates bland brands that can't compete with the illicit market.

Recreational sales in Canada



Source: Statistics Canada, Prohibition Partners



Europe

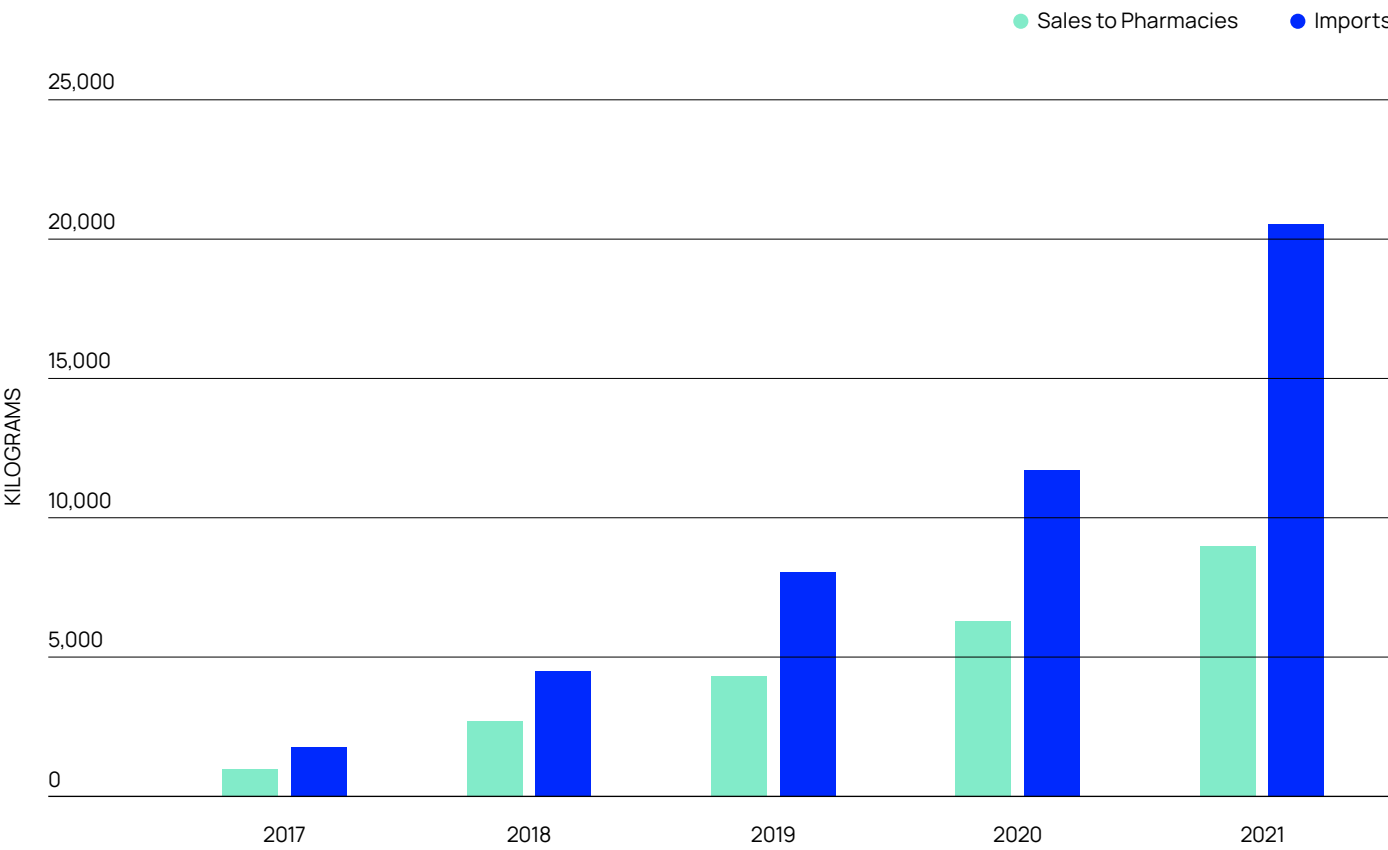
Medical Cannabis Continues to Grow in Europe

As of 2022, the majority of people living in Europe now live in countries who have some form of access to unlicensed medical cannabis products (e.g. flower and oil). However, the reality remains that most find it impossible to reach, either because of bureaucratic or economic hurdles. This situation is improving every year, be it through the introduction of new access schemes, the development of pilot programmes or gradually evolving patient access; a result of education in healthcare, public awareness raising and lobbying of European regulators.

Only a few countries have really begun to open up access to legal cannabis medications for their domestic patient population while millions of patients continue to use homegrown or street-bought products instead.

Germany remains, by a distance, the leader in terms of legal patient numbers, followed by countries such as Italy, the Netherlands, the UK, Poland, Denmark and Czechia. Many more countries have begun early efforts to increase access, either through compassionate access or via pilot programmes, such as in France and Ireland. Some countries such as Portugal and Greece have formally legalised medical cannabis but few patients are actively being prescribed to, as the regulatory framework is not yet robustly established. The tight control of production and supply present in the cannabis framework in certain countries like Italy and Poland means that limited numbers of producers and distributors can operate in the field, therefore supplying a more limited number of products which means shortages and high prices are common.

Supply of medical cannabis in Germany



Source: German Bundestag, BfArM, Prohibition Partners

One of the most concrete data sources on the growth of medical cannabis sales in Europe is the data released by the German government detailing the amount of medical cannabis imported and sold in Germany each year. The amount of cannabis being imported into the country continues to increase, with 10,487 kilograms being imported in H1 of 2022, a modest 5% increase on H1 2021. However, it is clear that the increase in sales to pharmacies is not keeping pace with imports. This implies that supply in Germany is now adequate to meet the demand of the medical market and will be for the foreseeable future, especially considering the addition of ~ 2.6 tonnes of locally produced cannabis being supplied by Aurora, Demecan and Tilray.

CBD is en route for full legitimisation

As opposed to medical cannabis, CBD has an official, centralised route towards legality in the EU. As of October 2022, the European Commission has listed 12 valid applications for plant-derived CBD as Novel Foods, with more expected in the very near future which will lead to the first legally protected ingestible products on the continent. This process is being paused while the European Food Safety Authority requests more toxicological information from applicants. Specifically, they have asked applicants to address issues such as: 'the effect of CBD on the liver, gastrointestinal tract, endocrine system, nervous system and on people's psychological well-being.' It is understood that no party has submitted this data to date and this may take several more months.

The current European CBD market remains fragmented and will remain so for some time. If regulations such as the Novel Foods Act are enforced and the many small producers are put under legal pressure, this could trigger the closure of many operations and the beginning of a long-predicted consolidation. The proliferation of CBD brands continues in Europe, with certain brands and CBD retailers becoming established in the more developed national CBD markets (e.g. the UK, Germany, Italy, Switzerland, the Netherlands), while the earlier stage markets (e.g. France, Spain, Portugal, Ireland) still have many independent operators, with small CBD-focused stores selling own-brand products, or smaller (often local) brands. The UK remains, for now, the only market where CBD products are stocked by multiple mainstream non CBD-focused high street retailers. Established brands seen across multiple markets in Europe include Endoca, Reakiro, Nordic Oil and Cibdol.

Adult-use is on the horizon for some countries

One of the most promising areas of development of cannabis drug policies over the past year has been the movement of several European countries towards the full liberalisation of commercial adult-use cannabis. The three countries which have taken this the furthest are the Netherlands, Switzerland and Germany. The former

two countries are in the process of launching their pilot trials for adult-use cannabis sales while the German government looks set to have a draft cannabis law available for discussion by the end of the year, with the launch of their adult-use market looking likely by 2024. Malta and Luxembourg have also made accommodations for the decriminalised possession and consumption of adult-use cannabis but without allowing for commercial sales and dispensaries.

The Czech Republic have announced their intention to follow Germany in their path toward full legalisation.

In July 2022, five members of the European parliament from different member states formed a cross-party group and penned a letter to the 705 members of the European parliament calling for a fact-based discussion on the personal use of cannabis. The members of this group are from Malta, Luxembourg, Czechia, the Netherlands and Germany. The group calls for a pragmatic look at the current legislation on adult-use cannabis, and a consideration of how the continent can discuss a coherent approach to legislation at an EU level. This may be crucial, as it may take a group of countries to apply an 'inter-se' modification to the Single Convention on Narcotic Drugs, 1961, before any single one can proceed with full commercial legalisation. See Adult-Use Cannabis in Europe™ Report for more details.

Latin America

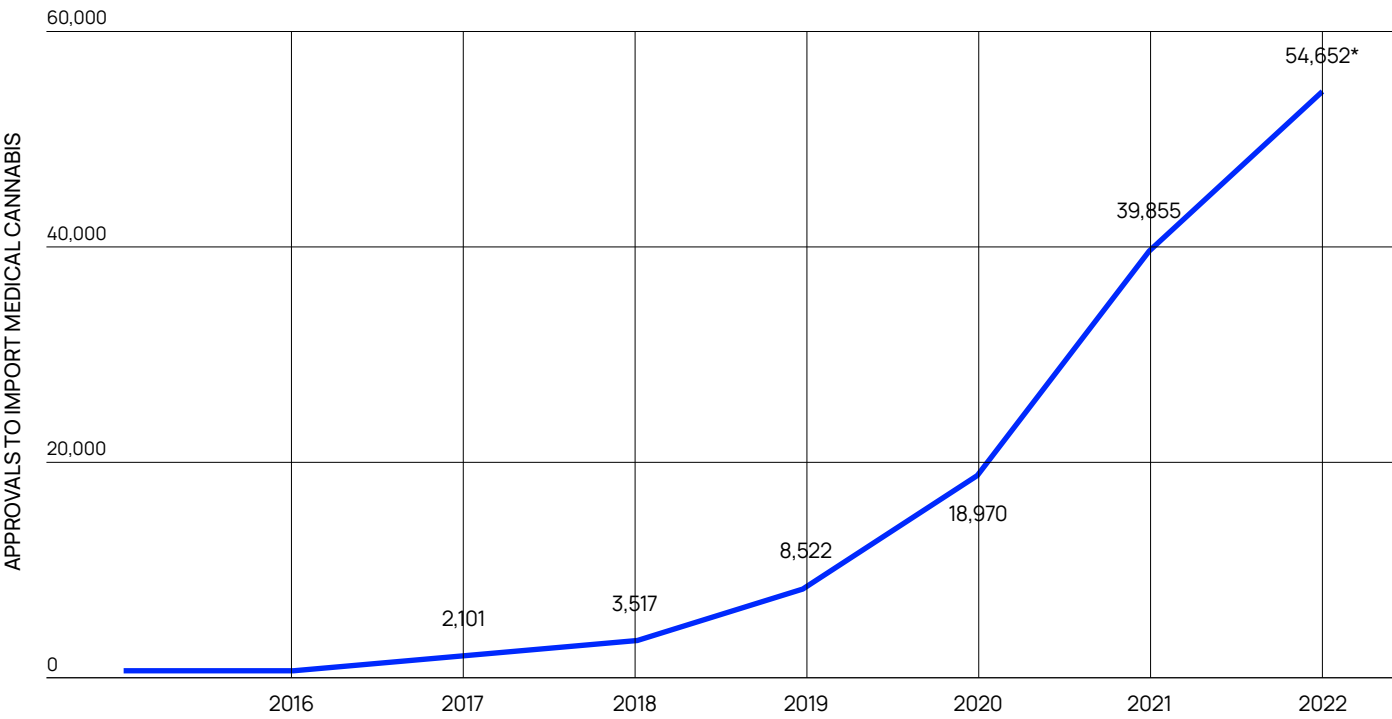
The most significant current event in the cannabis space in Latin America is the legalisation of adult-use cannabis in Mexico, following on from Uruguay. In 2018, the Supreme Court ruled for the fifth time that the law banning the recreational use of cannabis was unconstitutional, setting a binding mandate on the government to change the laws to reflect this decision. Mexico will soon represent the largest single country for adult-use cannabis in terms of the size of the population, offering countless justice, economic and public health benefits, as well as relief for the penal system.

As of 2022, Brazil remains the largest market for consumption of medical cannabis on the continent. Access to medical cannabis in Brazil has been spreading, thanks in part, to the work of the national cannabis ecosystem. The patient population grew by 64% between 2020 and 2021, bringing the patient population up to

69,000. Additionally, specialised clinics have been sprouting up across the country's main urban centres. Moreover, R&D projects, university courses, and specialised media are joining the ecosystem, together with local producers overcoming the many technical requirements made by the Brazilian Health Regulatory Agency (ANVISA) to import active pharmaceutical ingredients (APIs). There are currently 14 ANVISA-approved cannabis products available for prescription in pharmacies.

However, in October 2022, the Federal Council of Medicine of Brazil (CFM) published Resolution 2,324/2022 which massively restricts the ability of doctors to prescribe medical cannabis to patients, limiting this to CBD-only drugs and for use only in childhood cases of intractable epilepsy. This motion has since been suspended after a large backlash from patients and advocates

Medical cannabis approvals in Brazil



Source: ANVISA, Prohibition Partners
* Estimated from data for Q1-Q3 2022

Uruguay, Colombia and Jamaica are all now commercially exporting to Europe. According to the country's Investment, Export and Country Brand Promotion Agency, Uruguay XXI, Uruguay had 456 hectares of open field farming for low-THC cannabis. The country's exports are projected to grow 25% for 2022, which would amount to US\$10.2 million in total exports.

In July 2021, after the ban on dry flower use and exports was lifted, the groundwork for Colombia to become a prominent exporter was set. The country is already exporting to European countries such as the UK, Germany, the Czech Republic and Switzerland

Similarly, Jamaica is poised to see an increase in the export of cannabis for medicinal and therapeutic purposes during the 2022/2023 fiscal year, according to the country's Cannabis Licensing Authority (CLA). Of the 156 export authorisations granted since 2018, 107 occurred during the last financial year alone. The European countries that Jamaica exports to include; Germany, Portugal and the United Kingdom.

Cannabidiol (CBD) is being treated strictly as a medicine by many Latin American countries. While CBD remains under tight control

in most Latin American countries, as either a banned substance or a prescription medication, a 'grey' market has still sprung up, as is the case for many regions across the world. However, contrary to North America, we predict the CBD industry in Latin America will continue to grow for some time.



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Asia

Asia is on the cusp of a cannabis revolution. Whilst regulatory challenges and varying legislative laws remain complex, and are likely to overshadow certain commercial opportunities and mass adoption, the industry at large is on the move. With shifting public perceptions and more stakeholders, government units and businesses are starting to recognise the potential of the cannabis industry.

Across Asia, legislative progress will probably remain fluid, with Thailand's progress in legalising cannabis plants and encouraging industrial opportunities, paving the way for other countries to follow in time.

Thailand, as well as India, are certainly leading the awakening of the growing giant that is Asia when it comes to cannabis reform. Thailand legalised medical cannabis in 2018 and later decriminalised cannabis plant parts in a push towards commercialisation in June 2022. As of now, households in Thailand are allowed to register and grow cannabis at home for medical purposes. In September 2022, the Marijuana Bill, which laid out guidelines concerning recreational legalisation, was shot down by MPs from two major parties: the Democrats and Pheu Thai. Additionally, they have also suggested reconsidering whether cannabis should be removed from the list of illegal narcotics.

Medical cannabis in Thailand has been skyrocketing. The medical cannabis system is split in two: modern medicine and Thai traditional medicine. Modern medical cannabis focuses on the applications of CBD and THC to treat illnesses and side effects such as cancer and chronic pain respectively. Use of cannabis in Thai traditional medicine however, combines cannabis parts or CBD oil with ingredients like other herbs or natural oils, and has been a part of Thai history for centuries. Both approaches are still used to this day.

In high-income countries like Japan and South Korea, where unlicensed medical and recreational cannabis products are illegal, there are early signs of legislative change. Epidiolex is the only form of cannabis-based medicine sanctioned by the Japanese government for clinical trials which may lay the groundwork for future developments. Likewise, in Korea, only a limited number of fully licensed pharmaceutical cannabis products like Epidiolex and Sativex can be used. These are likely to be precursors to a growing appreciation of medical cannabis in the next five to ten years.

CBD is on the rise across Asia, and high income countries like Japan and China have the potential to become large centres of trade for CBD products in the near future. The CBD sector in Japan is flourishing, thanks to some regulatory loopholes which

allow for the sale of cannabis stalks and seeds that do not contain any THC. As of now, there are over 100 brands offering CBD products across beauty, food and beverage, with the segment only getting larger and there is room for more players to add to the market's variety. Beyond local brands, products from global names such as PharmaHemp, Elixinol and Endoca are also widely available to buy in the country. As for South Korea, CBD products are illegal, except in medical circumstances.

China is nurturing a very young CBD industry, which is currently struggling to grow into a mature export market. Current regulations ban the consumption of any products containing CBD in China, but production for export is allowed. Tight control over production and permissible THC levels means that exporters struggle to compete with producers in more liberal countries like the US and in Europe. Hong Kong is carving its own path on this topic, by allowing for import and consumption of CBD, with several businesses such as dispensaries and cafés popping up in recent years.

Demand for CBD products, and availability in India is increasing, particularly in the prominent cities. The country is seeing a rise in CBD oil brands that can be readily sold and are available online; these products are broad-spectrum oils derived from hemp plants. Currently, only CBD products that come with a Lab Report and a Certificate of Analysis from a certified third party lab are legal to buy. In India, hemp operates under its own legal framework, with a different set of laws as compared with cannabis. Thailand's CBD food landscape has flourished considerably in the past couple of years, and especially so this year following the unlocking of cannabis laws in June 2022.

Despite the growth of CBD in Asia, it has not all been positive. In August 2022 Hong Kong began its crackdown on its unregulated CBD sector, banning the compound from February 2023, with penalties matching those of cocaine and heroin possession.



Oceania

Medical cannabis is progressing at pace in the two most populous countries of Oceania, namely Australia and New Zealand. Alongside this, decriminalisation and legalisation of adult-use cannabis is progressing on other Pacific islands like Guam and the Northern Mariana Islands. On the latter islands, an adult-use industry is currently being developed, with licensed dispensaries and consumption lounges, which are unique on the continent.

Australia Overview

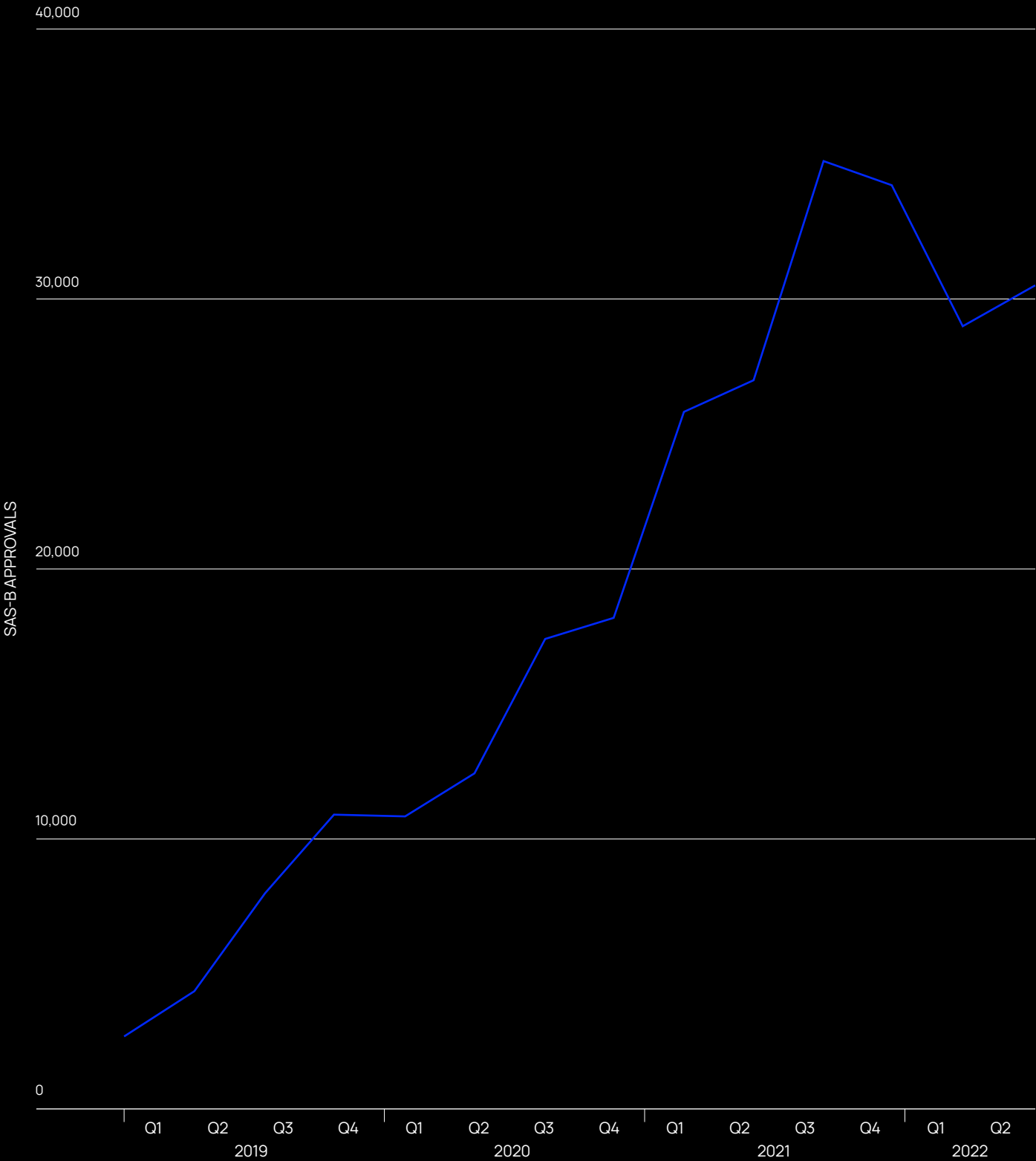
The Australian cannabis market is still in its infancy. With minimal prospect of recreational legalisation any time soon, and a tightly regulated medical system, both markets have ample room to grow, if favourable legislation continues to pass.

The Australian government legalised access to medical cannabis in 2016, with the supply being regulated by the Therapeutic Goods Administration (TGA). The details of what products are available for prescription, and for what conditions, vary slightly between the states/territories. By and large, the regions require doctors to obtain approval from the TGA, and in some cases approval from their respective health authorities. Exceptions include Queensland’s legislation that allows for Schedule 4 CBD products, and Schedule 8 CBD and THC products to be prescribed without approval from health authorities. In addition, terminally ill and elderly patients do not need approval under the South Australian Controlled Substances legislation. Most products available for prescription are unregistered, which is why prescription often requires approval from the TGA. Some products are on the register of therapeutic goods; these are Sativex and Epidiolex which are treated like any other prescription medicine.

Obtaining cannabis for a medical use that is not listed on the register is done through the special access scheme (SAS). The scheme is classed into three categories: SAS-A, SAS-B and SAS-C. SAS-B is how the majority of medical cannabis is prescribed in Australia, with treatment indications including, but not limited to; chronic pain, insomnia, cancer pain, epilepsy and neuropathic pain. Through SAS-B, 307,603 prescriptions have been approved since legalisation up until October 2022; 122,490 of which occurred in 2021 alone, along with 99,420 so far in 2022. This acceleration in uptake bodes well for the future of medical cannabis in Australia. Conversely, the pharmaceutical benefit scheme in Australia does not cover medical cannabis, and so patients often spend anywhere from US\$ 100 to US\$ 2,433 on medical cannabis products which presents a barrier to patient access.



Medical cannabis approvals in Australia



Source: Prohibition Partners

Many products are available on prescription in Australia; all of which are classed into five categories depending on cannabidiol content compared with total cannabinoid content of the medicine. Available products come in many forms, with solutions and oils accounting for the majority of product types, with dry cannabis flower comprising 10% of the share.

Two years after medical cannabis became legal, Australia legalised the export of medicinal cannabis products. This excludes the export of the cannabis plant itself, its flowers, as well as cannabis resin. Moreover, companies wishing to export can only do so if they have fulfilled their domestic supply obligations. Australia is currently exporting to the UK, Germany and South Africa. One example of an export deal is Australian Natural Therapeutics Group's US\$60 million 10-year export agreement with Germany that will see numerous tonnes of dried cannabis flowers shipped over to the country each year. Australian imports are growing each year, and now the country is one of the top importers of medical cannabis globally.

It is unclear if, and when, recreational cannabis will be legal in Australia. Drug reform group Unharm found that half of Australians were in favour of legalising cannabis. One of the furthest steps taken towards the easing of regulation for recreational cannabis was when the Australian Capital Territory passed a bill in 2020 that legalised the possession of 50 grams of dry cannabis/150 grams of wet material, and the growth of two plants per person/ four per household. Federal legislation seems unlikely any time soon. The Green Party is the only party pushing for recreational legalisation, while the Liberal and Labour parties only favour medical cannabis legality at a federal level. The newest push by the Greens involves a loophole of sorts where the Commonwealth would regulate cannabis plant strains as legal plant varieties. This would allow the Commonwealth to regulate all measures required to set up a national market. These new rules on recreational use would cause the regional laws to become inert. This measure will be up for critique by the public later this year.

New Zealand

Before New Zealand's Medicinal Cannabis scheme came into effect in April 2020, medical cannabis was effectively impossible to obtain legally in the country. The scheme's intention was to make medicinal cannabis both easier to access and to ensure it was of higher quality. It also allowed for the commercial cultivation of cannabis for medicinal use and the manufacture and supply of cannabis-based ingredients, starting material and medicinal cannabis products. Any medicinal cannabis product that is approved as medicine, or follows the minimum quality standard (MQS) can be prescribed by a doctor without any extra permits or approvals. A doctor may prescribe a product that has not been verified to meet the MQS if approval has been granted by the Minister of Health following an application from a relevant medical specialist or the Chief Medical Officer of a District Health Board.

According to the New Zealand Medicinal Cannabis Council, the current regulations are too strict, and are limiting access to the medicinal cannabis industry for both consumers and manufacturers. This strictness is reflected in the fact that 94% of patients in New Zealand still access medicinal cannabis through illegal channels, according to the New Zealand Drug Foundation. New Zealand-based cannabis companies have high valuations, but are effectively making nothing from sales, and thus are primarily reliant on external capital raises due to their future potential. After receiving copious comments and inquiries from individuals and institutions, the Ministry of Health is reviewing the scheme's current parameters. Thus far, New Zealand's medical cannabis agency has granted licences for activities related to the cultivation, manufacture, or supply of medical cannabis products to roughly 40 companies.



Expert Interview



Oren Lebovitch
Founder, CEO and Editor in Chief
The Israeli Cannabis Magazine

Israel has a new government under a coalition headed by Likud. How does the current government composition affect the chances of full legalisation in the foreseeable future?

The new government is indeed led by Likud, which is a liberal right-wing party, but its coalition partners this time are both ultra-orthodox and religious - the most conservative. This is in contrast to the previous Likud government, in power from 2020 which consisted of Likud together with a centre-left party and it was the first government in Israel ever to promote a Bill for legalisation. In the interim, there was a left-wing government for a period of one and a half years in 2021-22, but it included an Arab party which was even more conservative than the right-wing parties. Legalisation was not promoted during this period either, not even in terms of the expansion of medical cannabis reform. However, this government did approve the true decriminalisation of the use of cannabis, albeit under pressure and as a result of a petition to the High Court that I submitted.

This means that, as of today, there is probably no majority in favour of legalisation in the coalition, and even if there is, it is very narrow. However, there is a majority in favour of legalisation in the entire Knesset, so theoretically there is a chance to promote it. On the one hand, there are those who claim that Likud will not be able to promote legalisation due to the opposition of their coalition partners, and as evidence - the party did not even commit to promoting this during the last election campaign, unlike the previous campaigns, when an explicit commitment was given, including that by Prime Minister Benjamin Netanyahu himself. However, on the other hand, there are those who are optimistic - including some members of the Knesset serving in Likud who spoke to Cannabis Magazine about this matter. They voiced the opinion that even if the right-wing parties were to oppose such a move, it would not be sufficient reason for them to overthrow the government. Therefore, if Likud chooses to promote it anyway, and it receives support from the left-centre parties in the opposition, it will

have a majority. If I had to guess, it is not going to happen under the new government, which means it won't happen for the next couple of years. In terms of the bottom line, the chance of legalisation in the foreseeable future has significantly decreased when it is compared to the chances of the government that promoted it in 2020-21. It is now much lower and is below 50%. However, in practice, there is a fairly extensive 'medical cannabis' market in Israel with more than 120,000 licence holders (that is, more than 1% of the total population and almost 2% of the adult population). The assessment is that the new government might approve a new model for the medical cannabis branch for which there is a consensus today: moving from the current model of 'licences' for the use of cannabis to a model of 'prescriptions' for the use of cannabis. If this happens, as many estimate, this figure of 120,000 will increase significantly.

There seems to be a large legally 'grey' market for cannabis use in Israel e.g. illicit sales over Telegram bought by consumers who can now smoke in public, how do you see this situation? Will it persist, is it a precursor to full legalisation?

As of April 2022, possession of cannabis for personal use is an offence carrying with it a fine of 500 NIS (about 145 US dollars), but it is not true that consumers are allowed to smoke in public. Smoking cannabis (or possession in an amount for personal use, usually up to about 15 grams maximum) is not a criminal offence, but it is still considered such an administrative offence. Unfortunately, the police are not currently disclosing official data on the amount of fines, which they have done in the past year, since the implementation of the new decriminalisation regulation. This is, according to them, because the procedure for implementing the new systems that oversee the new fines model has not yet been completed. However, from what we hear, the use of cannabis is indeed expanding, and is more visible, since users no longer fear the threat of the criminal justice system. There is no doubt that this is one more step towards full legalisation and one that shows

that the Israeli legislator has recognised that it is impossible to conduct a criminal prosecution of adult citizens who use cannabis for recreation or personal treatment. In my personal opinion, the current situation transfers the main interest in promoting legalisation from the consumers and the 'legalisation activists' if you will, to the local cannabis companies. This is accentuated because in the 'medical' cannabis market the Israeli producers have to deal with huge imports from abroad and they are in fact in competition with producers from all over the world, while in the recreational market the day after legalisation, it will only be allowed to market produce from local cultivation. This is because the UN Narcotics Convention prohibits the importation of cannabis other than for medical purposes. In other words, legalisation is today of primary interest to the industrialists, as well as to the state itself, which today transfers billions of shekels a year to criminal and terrorist organisations that manage the illegal trade in cannabis. Little by little they will understand it and promote it themselves. For the consumer, cannabis is easily accessible at the push of a button, half an hour away and by using home delivery through the Telegram app or SMS offers that are regularly being sent to everyone's phones here. It is also possible to obtain a medical licence (whether it is a 100% legitimate licence or one that was given by a 'friendly' doctor).

The Israel cannabis market is setting the standard for international cannabis markets in terms of patient access and sales per capita. Are companies feeling the financial benefit or is the competition keeping margins slim?

As I mentioned in the previous section, theoretically, there is a market here that can support quite an industry. However, according to estimates, about 50% of the cannabis sold in pharmacies originates from imports from abroad, while exports from Israel are almost non-existent. Until recently, we only heard warnings about it, but now we are already seeing the results on the ground, with quite a few cannabis companies collapsing. For example, of the 12 or so public cannabis companies that operate in cultivation/production branches and that are being traded on the stock exchange (so their information is visible) almost 50% have already exited the market or announced their intention to exit the market or introduce real estate or other activities along with cannabis. However, it should be noted that the same companies pay their management very high salaries and are bound by multiple expenses, since the days of the 'bubble' of 2018-2020, when expectations were sky high and companies thought they were going to make big profits. In practice, only in retrospect did it become clear to the controlling owners of these companies, most of whom did not come from a cannabis background, that cannabis is not a regular 'commodity', and not like a medicine where each product is the same as the other, but rather something that is more similar to

a fruit. You can have two tonnes of cannabis that in the books will be worth X amount of money, but in practice, it is low quality cannabis that no one will buy. This is without mentioning the fact that it is a product with relatively short validity. All of this has created a situation where, these days, the market is 'crushed' and it is probably headed for a significant consolidation that will eventually lead to there being 5-6 large companies. Big companies that are successful in Israel, after all, are those that do not only operate in cultivation and production, but also in retail. Those who realised early that it was worth buying pharmacies at discounted prices before their value increased, earned an efficient revenue channel. There still can be successful small-scale companies, for example a very efficient small indoor facility which grows high quality produce and not paying high salaries to too many "managers".

How much of the legal medical cannabis in Israel is domestically grown at the moment?

Unfortunately, this is data that is not officially visible or even known. Even the Ministry of Health is unable to get this information accurately from the companies. According to estimates, as mentioned, about 50% of the cannabis marketed in pharmacies originates from local cultivation, and 50% from imports. According to official information, as of today, about 3.5 tonnes of cannabis are purchased in pharmacies in Israel per month, that is a rate of about 42 tonnes per year, while the import rate is about 33 tonnes per year. Theoretically, imports can cover almost the entire market, but as mentioned, the share is probably 50-50. It should be noted that due to the excess of cannabis in the last year, the average price of medical cannabis in Israel has decreased and today cannabis inflorescences are available in stock even at floor prices of one dollar per gram, while the highest prices are as high as ~10 dollars per gram.

Do you see opportunities for companies to increase exports to Israel or to set up domestic operations? Are the regulations on compliance for imports still quite changeable in Israel?

Excellent question. Following on from the previous section, it is indeed very difficult to determine unequivocal data because the regulations are changing. For example, in the last four months (between 22 July and 22 November) it was almost impossible to get permits to import cannabis from abroad; this was after the regulator added (again) names of additional substances to the list of prohibited pesticides - which forced the laboratories to start work on locating and matching new 'kits' for testing these substances. A similar thing also happened last year and led to a temporary halt in imports. As of today, the leading laboratory in Israel in the field of cannabis, succeeded in completing the missing kits and as of today, imports have opened again. Some claim that

these updated definitions on the part of the regulator are an attempt to balance the quantities from imports and 'save' the local market, but there is no unequivocal evidence for this. There is certainly room for continued imports to Israel in terms of quality, and we see that the goods that come mainly from Canada are getting better, shipment by shipment. Today, there are some top-level craft products from the Canadian market that arrive into Israel, more and more from relatively small boutique companies and less from the giant companies that were almost exclusively responsible for exports to Israel until now. However, if we return to the political issue, there is a chance that, unlike the current government, which advocated free imports without restrictions, the position of the next Minister of Economy will be assigned to a party that takes a different approach. I hear talk in the industry, and attempts by companies, to convince the government ministries to set some kind of maximum limit for imports, some are talking about a complete stop to imports as is done in Canada, others are talking about allowing only 25% imports and others about 50% imports. In the meantime, as of today and in my understanding, mainly because of bilateral agreements (which is incomprehensible how Canada ignores them), there cannot be a limit on imports - at least that's what the officials and the professionals in the government ministries, claim.

What would you like to see change in the regulations for cannabis patients and operators in Israel in 2023?

In my opinion, the next step, as I have detailed, is a transition from a model of licences for the use of medical cannabis to a model of prescriptions. Any doctor (even if they'll agree it will only be a specialist and not any "regular" family doctor) will be able to issue a prescription for medical cannabis just as he/she issues a prescription for various opioids. There is a good chance that this will happen, and it will also be good for those in the industry who long for an increase in sales. However, first and foremost, it will also allow those who suffer from back pain or sleep problems or migraines for example and those who suffer from many kinds of health effects that are not included in the list of indications that currently qualify for a licence, to at least experiment with the use of cannabis and test if it is any good for them. This will be the last step before full legalisation. I must mention however that it won't be easy to implement. The doctors' organisations and the health maintenance organisations (HMOs) are against it fiercely, arguing that it is 'backdoor legalisation', something like the California model between 1996 and 2018. In my opinion there is more good than bad in this model, and the odds are average-to-good, but surely better chances than full legalisation.



Patrick McCartan
CEO and Co-Founder
Regennabis

Regennabis

Regennabis is a Professional Services Company centered in the Cannabis Industry. The three business verticals –Technology, Advisory & Convening – are designed to help companies deliver to their Strategic, Financial and Operational goals through the successful build-out and implementation of an Environmental, Social & Governance [ESG] framework.

ESG Excel

Regennabis' SaaS Platform delivers the 'de facto' industry standards for measuring, monitoring and reporting an organisation's ESG Performance. Subsequently mapped to the United Nations Sustainable Development Goals (SDGs) to provide an appropriate link to a sustainability / corporate social responsibility (CSR) narrative. Data is collected and managed on our proprietary platform to provide uniformity and scalability. Standardised 'ESG Report' templates are generated for the cannabis and hemp industry.

Cannabis is often described as an extremely water and energy intensive crop. How does it compare to other agricultural practices and what improvements are being made towards sustainability?

Real progress is being made when it comes to sustainability and energy efficiency in indoor cultivation. This progress meets an increasing demand from growers who are looking for ways to be more efficient. Some are already investing in their own resource-efficient equipment, alternative practices and design in an effort to maximise energy efficiency and increase their bottom line. Companies such as Hawthorne Gardening Company have invested heavily in new product development and R&D to make a meaningful impact on water and energy efficiency.

Indoor cannabis cultivation consumes less water than many other manufacturing and cultivation industries. Water use by ranching, mining, fruit, nut and outdoor vegetable production is magnitudes greater than that of cannabis cultivation. Nonetheless, opportu-

nities exist to create more efficient water filtration, dehumidification and heating, ventilation and air conditioning (HVAC) systems.

Can you highlight the need and opportunity for greater regulation and consistent standards?

The need for regulation and consistent standards cannot be overstated; however, we do not have to start from scratch. Already, there are examples of states, cities and companies that have taken a leading role in advancing sustainability in indoor cultivation; these can be used to inform policy and practices.

There is a unique and exciting opportunity to help share a resource-efficient cannabis industry as it develops. As with other industries, it is difficult to change course once well-intended but uninformed policies are in place, locking sectors into resource-intensive infrastructures and processes. In short, policymakers have a chance to get this right, and in doing so, pave the way for resource-efficient models for indoor growing; not only of cannabis but of food as well. With increased challenges brought on by the effects of climate change, indoor agriculture, of which cannabis is a subset, demands critical attention. Identifying standards across the sector, requiring resource disclosures among facilities, then gathering the data to establish incentives, certifications and policies can create a pathway toward sustainability. But this must be done both comprehensively and methodically.

<https://www.hawthorne-gardening.com/education/cannabis-cultivation-sustainability-report/>

What can cultivators and growers do to drive sustainable models?

- Choose to grow legally
- Install energy efficient light fixtures, mainly light-emitting diodes (LEDs), above a 1.9 photosynthetic photon efficacy (PPE) when measured at the lamp
- Install energy efficient HVAC and dehumidification equipment
- Use the most efficient reverse osmosis systems for inbound water
- Capture wastewater/ leachate and reclaim water for reuse
- Participate in data collection and reporting programmes including; voluntary disclosure of resource usage
- Build retrofits
- Select responsible inputs such as:
 - Integrated pest management plans
 - Efficient fertilisers
 - Optimal irrigation practices

How will business operators know where to begin?

We can look to precedent. Certification systems such as Leadership in Energy and Environmental Design (LEED) and ENERGY STAR have been helpful in providing a roadmap for industries to add sustainability features to their operations. Empowering cannabis business operators and encouraging the adoption of efficient technologies is not only a programme that creates action but it would also help educate everyone.

How can the cannabis industry impact the United Nations Sustainable Development Goals?

The United Nations Sustainable Development Goals (SDGs) will serve as an overarching framework in the nascent cannabis and hemp industry – and with a laser-focus on Environmental, Social & Governance issues – purpose-led players in this industry will be well placed to help solve some of the biggest challenges facing humanity in this 'Decade of Action'. A flourishing industry can help reduce poverty, eradicate hunger, improve health and well-being, drive in-

dustry, innovation and infrastructure, reduce inequalities, improve life below water and life on land and drive restorative justice.

Further to this normalisation and regulation, standardisation of cultivation processes – no matter if the grow process takes place outdoors, indoors or in a greenhouse – would substantially impact many of the remaining SDGs – specifically clean water and sanitation, affordable and clean energy, responsible consumption and production and climate action.

Can you highlight the importance of Supply Chain Management in the cannabis industry?

Shifting regulations, evolving distribution models, product quality testing and labelling pressures mean that supply chain risks are more complex, and breakdown is increasingly more probable.

Cannabis companies must optimise supply chain engagement, collaboration and oversight to reduce these risks as the cannabis market expands globally. To manage the complexity inherent in engaging environmental, social and governance (ESG) issues across an enterprise, the composition of the Board and Management Team, and their associated experiences, credentials and effectiveness, can have a profound impact on ensuring ESG becomes a source of competitive advantage.

How can cannabis organisations formulate an ESG programme?

Cannabis organisations should follow a series of specific steps when developing an effective ESG programme.

- These include:
- Understanding why ESG is critical to commercial success
 - Mapping an ESG journey that leads to desired business outcomes
 - Gauging how an organisation is being perceived
 - Developing an ESG Strategy

- Communicating and disclosing identified methodologies and progress

Sustainability and purpose will be critical to the success of cannabis organisations

Tying this all together is 'purpose' – the 'why' of a business. Purpose-centricity, in essence ensuring that the, 'Why we do what we do' statement is understood by all stakeholders and is the central tenet of an organisation (which then flows throughout the business), will further ensure that the organisation builds from the inside out, but first needs to understand what the issues are that are material to the business from the outside in. Organisationally, purpose and ESG go 'hand-in-hand' – this is the start point of any transformational journey (or the bedrock of any organisation that bakes purpose and ESG into their corporate DNA), from which a narrative that vocalises an organisation's sustainability 'intent' can be created and provides an insight into the intentions from the inside out – and most importantly, ensures that the organisation is embracing 'context-based' sustainability.

What is the desired end-result of ESG?

Investors are increasingly demanding to see evidence of ESG Frameworks and robust implementation. Yet there is another parameter of value that has been often overlooked in the cannabis industry, that of brand value. And herein lies one of the industry's greatest opportunities.





Crystal Millican
Head of Retail
Cookies

What makes the Cookies brand special, why has it caught on so well in North America?

It all starts with Berner. Berner created this company and is involved in every aspect of the business. He handpicks what strains we sell, what packaging gets created, and what stores we open and where. Berner cares deeply about every step of the process, from seed to sale, and his fans are unlike any others you have seen. People wait in line, overnight, sleep on the street just to be first in line to meet Berner at store openings, and experience a Cookies store and buy a Cookies product. Cookies brings people together to make them feel good, and Berner is all about connecting people and making them feel good.

Is there something about the Cookies products themselves that stands out from competitors?

We value quality over everything. Our quality standards are very high and incredibly hard to meet. Above all, the quality of our product is what we care about most and that sets us apart from others. In addition to quality, we care about the flavor profiles and experiences our customers and patients are seeking. We work with breeders that are passionate about finding the perfect pheno or cross to unlock the next flavor or experience we can share with the Cookies family.

What makes the Cookies points of sale so successful? How were these developed?

At Cookies, much more important than the POS system itself is the customer journey that the POS system makes possible. We want the Cookies experience to stay true to the legacy of cannabis and how people see, smell and share stories about their experiences. In our customer journey, a budtender will be your guide and support you in selecting the right product for the experience you are seeking that day. We selected POS systems that enable our customer journey as well as provide quick transaction times once the right product is selected, ease with track and trace re-

porting requirements, online ordering optionality and last, but not least, reporting/analytics to support customer insights that we can incorporate into our journey.

Cookies are launching international locations such as in Austria and Thailand, do you have other locations in your sights?

We want to open Cookies doors everywhere we are legally able to, and have hopes of having Cookies stores in every state in the U.S. and every country in the world. We currently have partnerships in the following countries where we will be opening Cookies stores in the future: United Kingdom, Germany, Australia, Portugal and Switzerland.

What are the key values of Cookies as a company?

Quality and genetics is where it all starts. Quality genetics above all. We respect the power of the plant and its ability to bring people together and have a duty to ensure our products are of the highest quality you can purchase. We are passionate about the plant and its ability to heal and bring people together.



Conclusion



Liberalisation of cannabis across the world is proceeding at what seems like an unstoppable pace. The two leading western countries in the world are now taking concrete steps towards liberalisation of adult-use cannabis with the pro-legalisation message being heard by governments the world over. In the birthplace of the war on drugs, the US government is now formally recognising that prohibition is not a viable policy for the control of cannabis, and this is being echoed in the Bundestag in Germany. Stepwise progress was made during 2022 in every corner of the globe. Colombia and Costa Rica are now moving towards adult-use legalisation, the first licences for cultivation are being granted in Morocco, the Ukraine is legalising cannabis for the treatment of trauma, Malaysia is now beginning the process of legalisation following in Thailand's footsteps. However, progress is not guaranteed, and there is still significant pushback on liberalisation from groups the world over, as seen by recent events in Hong Kong, the Uk and Brazil. The ability of cannabis patients to use safe and regulated products, the freedom of nonviolent consumers to return home from prison and the opportunity for societies at large to benefit from these developments continues to depend on the work being done by patients, academics advocates and industry groups and regulators in developing and defending these rights These pioneers deserve every support the industry can offer them. Prohibition Partners will continue to report on these developments and inform all stakeholders how best to navigate the opportunities and risks in this most exciting period for cannabis reform.

Acronyms



AH	Alternative Harvest	MQS	minimum quality standard
ANVISA	Brazilian Health Regulatory Agency	MSOs	multi-system operators
APIs	active pharmaceutical ingredients	NFL	National Football League
CBD	Cannabidiol	OTC	over-the-counter
CBG	Cannabigerol	SAFE	Secure and Fair Enforcement Banking Act
CBN	Cannabinol	SAS	special access scheme
CFM	Federal Council of Medicine of Brazil	SG&A	selling, general and administrative
CLA	Cannabis Licensing Authority	SKUs	stock keeping units
CPGs	consumer packaged goods	TED	Tobacco Excise Directive
ETFs	exchange-traded funds	TGA	Therapeutic Goods Administration
EU	European Union	THC	tetrahydrocannabinol
EU-GMP	European Union's good manufacturing practice	TPD	Tobacco Products Directive
IESO	Independent Electricity System Operator	UN	United Nations
INCB	International Narcotics Control Board	VCLT	Vienna Convention on the Law of Treaties
IP	intellectual property	VTI	Vanguard Total Stock In
M&A	Mergers and Acquisitions		
MORE	Marijuana Opportunity Reinvestment and Expungement Act		

LONDON

A: 31 New Inn Yard, Shoreditch,
London, EC2A 3EY, United Kingdom
T: +44 20 3928 2814

BERLIN

A: Rudi-Dutschke-Straße 23, Berlin,
10969, Germany

BARCELONA

A: C/ de Bailèn, 11,
08010 Barcelona, Spain

info@prohibitionpartners.com
@prohibition_p
prohibitionpartners.com

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