

SI Position Paper

# Our approach to investing in cannabis

Sustainable Investing Expertise by  
**ROBECOSAM**



White paper  
For professional investors  
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'Medical use of cannabis is a clear win-win-win for patients, investors and society'



# Highlights

Increasing social acceptance of cannabis is driving up the value of retail cannabis producers and is most apparent in two segments: health and wellness as well as food and beverages.

**Robeco takes a positive view towards the development of cannabis-related medical products.**

- Medical cannabis is legal in 33 states in the US, as well as in Canada and most EU member states.
- Scientific evidence for the medical use of cannabinoids (active chemical compounds within the cannabis plant) varies from “conclusive” (e.g., for the treatment of pain, chemotherapy-induced nausea and vomiting, and multiple sclerosis spasticity) to “insufficient” (e.g., for the treatment of cancer and irritable bowel syndrome).
- A surge in the development of cannabis-related treatments has led to an increasing amount of alternative ingestion methods like oils, tinctures (or extracts) and vaporizer pens.
- Potential side effects of medicinal cannabis appear similar to those of other commonly used medicines.

**Robeco takes a neutral stance towards the development of recreational cannabis products.**

- In October 2018, Canada legalized the recreational use of cannabis.
- Recreational use of cannabis is also legal in 18 states and territories in the US, and another 16 have decriminalized it.
- However, the US federal government continues to list cannabis as a “Schedule I” drug, making it illegal to cultivate, distribute, use, or possess.
- In the EU, most countries have relaxed rules on cannabis usage.
- Legalizing cannabis for recreational use in retail products has several health, environmental and social benefits:
  - higher quality and safer end-product
  - health impacts can be monitored and mitigated
  - environmental impacts can be monitored and mitigated
  - enhanced social impacts (massive reduction in resources for criminal enterprises that tend to corrupt governments
  - reduced negative impacts on minority groups (who tend to be prosecuted at much higher rates than their peers)
- Acute health effects of recreational use raise concerns including increased risk of schizophrenia and other psychoses and injury or death from motor vehicle or other accidents.
- Long-term health effects of recreational use include dependence, neurocognitive impairment, respiratory diseases, myocardial infarctions and cancer.
- The potential health risks of cannabis use are lower than for alcohol.



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# Background: the history, science and politics of cannabis

Cannabis has a long history of commercial and medicinal uses. Political maneuvering in the early 70s accelerated federal policies towards criminalization. The cannabis plant contains hundreds of underlying chemical compounds (cannabinoids) that can be intoxicating or non-intoxicating.

## Commercial appeal

Cannabis has a long history of both medical and non-medical use dating back to 8000 B.C. when hemp (one variety of the cannabis plant) was domesticated from a wild weed into a cultivated crop. The plant was valued for its medicinal and commercial uses. Hemp was grown for textiles and rope while its seeds were used for food. Long after its first use as a fiber, cannabis became a major component of medicinal practices and was praised for its anesthetic, diuretic, anti-epileptic, anti-inflammatory and anti-emetic (soothing nausea and vomiting) properties.<sup>1</sup>

## Legal history

In the early 1900s, following thousands of years of legal cannabis use, governments began to criminalize various drugs, including cannabis. Much of the global shift in policy was driven by the United States. The efforts to criminalize cannabis accelerated in the 1970s following the radical social movements and rampant drug use of the 1960s. However, criminalization has had limited effect on reducing consumption or improving health and safety. In fact, criminalization has created more problems than it solved. A clear historical analogy is the failure of alcohol "Prohibition" in the US between 1920-1933.

## Policy and politics

Decades of academic and government research suggest legalization is a smart social policy. Indeed, the Nixon administration and the US Congress created the *National Commission on Marihuana and Drug Abuse* in 1970 to investigate. The committee

recommended that all criminal penalties for the private use and possession of cannabis be eliminated, recognizing that 1) total prohibition is functionally inappropriate 2) it carries significant institutional costs and, more importantly, 3) it contributes very little to the achievement of US social policy." Moreover, the committee added that "in some ways, [cannabis prohibition] actually *inhibits* the success of that policy."<sup>2</sup>

Despite convincing evidence, President Nixon ultimately ignored the recommendation of the commission and marijuana (or marihuana, as it was known to the 1970 commission) remained an illegal substance in the US.

## The chemicals of cannabis

'Cannabis' or 'marijuana' are synonyms for the psychoactive (mind-altering) portions of the cannabis plant associated with medicinal and recreational uses, while 'hemp' refers to the parts of the plant that are used for industrial products such as textiles, foods, building materials and fuel.

The critical difference between cannabis and hemp is the level of the psychoactive chemical, tetrahydrocannabinol (THC). The average concentrations of THC in marijuana range from 10-30% while hemp naturally contains almost no THC (legally specified as 0.3% or less). As a result, marijuana is intoxicating, hemp is not.

Another important distinction between hemp and marijuana compounds are the extraction of cannabidiol, or CBD. CBD is another active chemical found in the cannabis plant that is not psychoactive

and is predominantly used for health and medicinal products. It can be harvested from hemp or cannabis but since hemp has a higher level of naturally occurring CBD it is the preferred source.

The psychoactive THC and non-psychoactive CBD are just two active chemicals (cannabinoids) of more than 545 known compounds found in cannabis plants. Of more than 100 cannabinoids that have been isolated to date, research has focused primarily on these two.

THC attaches to sites called cannabinoid receptors (CB1, CB2) on nerve cells in the brain, affecting the way they function. In sharp contrast, CBD shows little ability to bind to either CB1 or CB2 which vastly diminishes its mind-altering capacities on the brain. It can however alter mood and perception.

According to a new report released by the World Health Organization (WHO), CBD exhibits no effects indicative of any abuse or dependence potential and is generally well tolerated with a good safety profile. Moreover, it has shown to be an effective treatment of epilepsy and related medical conditions.<sup>3</sup>

# Opportunities and challenges

Medical applications are significant and likely to increase with more clinical studies. There are negative impacts from recreational use, but they have been exaggerated for political reasons.

## Legalization for medicinal use

Thanks to a growing body of research, the medical benefits of cannabis chemical compounds, particularly THC and CBD, are increasingly clear. As a result, a new wave of legalizations has been unleashed in the past few decades. In the US, the legalization of cannabis for medicinal use that gained impetus in the mid-1990s has now expanded to 33 states.

US legalization trends are being mirrored worldwide. Countries that allow medicinal use of cannabis include Canada (2000), Israel (2001) and the Netherlands (2003), Switzerland (2011), Czechia (2013), Australia (2016) and Germany (2017). At present, most EU countries either allow or are considering allowing the medical use of cannabis or cannabis-related compounds like THC and CBD.<sup>4</sup>

## Medical applications

The most common medical use of cannabis is for pain control. It is particularly desirable compared to opiates (another commonly prescribed class of painkillers) because it is much safer (overdose is impossible) and less addictive. In addition to anesthesia, cannabis is also used to treat a myriad of other medical conditions including neurological disorders like multiple sclerosis and Parkinson's disease as well as the nausea and weight loss experienced by patients undergoing chemotherapy<sup>5</sup> (see Figure 1).

Figure 1 | Medicinal uses of cannabis compounds

Category	Cannabinoid	Ailment
Pain/ Sleep	CBD, THC	Cramps, Migraine
	CBC, CBD, CBN, THC	Insomnia
	CBC, CBD, CBN, THC, THCV	Pain
	CBC, CBD, CBDa, CBG, CBN, THC, THCa	Arthritis, Inflammation
Gastro-Intestinal	THC	Appetite loss
	CBD, THC	Nausea
	CBD, THCV	Diabetes
	CBD, THC, THCa	Crohn's disease
Mood/ Behavior	CBD, CBG	Anxiety
	CBD, THC	ADD/ADHD, Stress
	CBD, CBG, THC	Bipolar disorder, OCD, PTSD
	CBC, CBD, CBG, CBN, THC	Depression
Neurological	CBC, CBD, CBG, CBN, THC, THCa	Amyotrophic Lateral Sclerosis (ALS)
	CBC, CBD, CBG, THC, THCa	Parkinson's, Alzheimer's
	CBD, CBN, THC, THCa	Multiple Sclerosis
	CBD, CBN, THCa, THCV	Epilepsy, Seizures
Other	CBC, CBD, CBDa, CBG, THC, THCa	Cancer
	THC	Fatigue

Source: Robeco research.

Cannabinoids are chemical compounds found in the cannabis plant. CBD= cannabidiol, THC = tetrahydrocannabinol, CBN=cannabinol, CBC=cannabichromene, CBG=cannabigerol

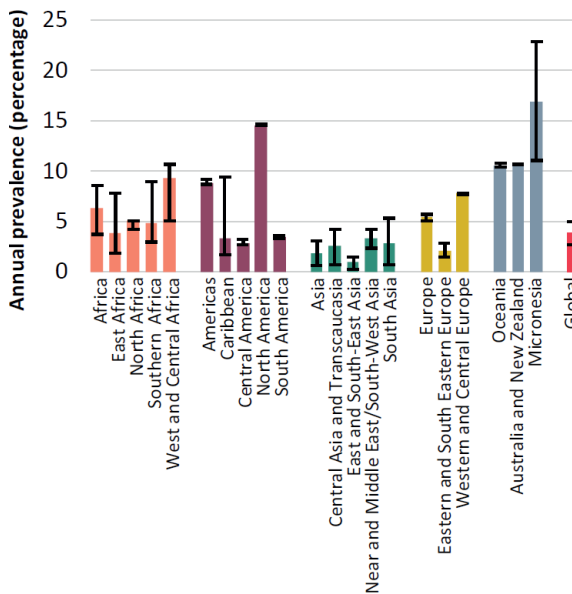
## Cannabis use statistics

There are strong indications that cannabis is the most commonly produced and used illicit substance worldwide, with an estimated 192 million annual users in 2018 (circa 4% of the global population aged 15-64).<sup>6</sup>

The United Nations Office on Drugs and Crime's (UNODC) World Drug Report 2020 shows that while cannabis use has remained relatively stable in Western and Central Europe, it has increased in North America, Africa and Asia.



**Figure 2 | Cannabis Use by world region and subregion**



Source: UNODC Drug Report 2020 (based on 2018 country survey data)

### Increased legalization, increased consumption

In October 2018, Canada was the most notable country to legalize recreational marijuana use; as a result many cannabis producers are based there. However, 14 US states and territories have now legalized marijuana, and another 16 have decriminalized it. We expect this trend to continue as states acknowledge the ineffectiveness of prohibition efforts.

Indeed, expected trends are already apparent in the UNODC's latest data which reports that use has risen in countries like Canada and Uruguay and in the 11 US states that have legally authorized the manufacture and sale of recreational cannabis.

Cowen equity research expects the Canadian cannabis market to grow from less than USD 1 billion in 2018 to USD 13 billion by 2025. More importantly, it expects the US market to grow from USD 50 billion in 2018 to USD \$80 billion by 2030 as consumption among users 18 and over increases from 10% (2018) to 15% (2030).<sup>7</sup>

### Growth of the cannabis drinks market

According to a recent survey of New Frontier data, 74% of cannabis users who also drink, believe cannabis to be safer than alcohol<sup>8</sup> – in line with research suggesting cannabis is less of a health risk than alcohol. Another survey showed that as a result of using cannabis recreationally, 63% of millennials curbed their alcohol consumption.<sup>9</sup>

In future, beverages containing THC could replace alcohol for recreational drinkers while CBD-laced drinks could offer a potable alternative to cannabis consumers seeking medical relief. The US cannabis beverage market is expected to expand by ten-fold to \$374 million by 2022.<sup>10</sup>

Eager to gain a foothold in an expanding cannabis market, beverage companies are forming partnerships with producers to develop cannabis-containing drinks.

### Legal barriers

Despite growing social popularity and financial potential, cannabis faces legal hurdles that threaten its development prospects. Currently, retail products containing THC are banned for sale in most countries. Moreover, authorities have not relaxed standards and are still enforcing bans. As late as 2019, the US Federal Drug Administration (FDA) sent warning letters to several companies for illegally marketing CBD products.

Another risk is product quality. In the US, CBD is generally marketed as a supplement, and supplements are not regulated or tested by the FDA. Reports issued by the FDA and other concerned parties call into question the purity and quality of some CBD products sold. Claims range from sub-standard CBD content levels to contamination with heavy metals, pesticides and even THC.<sup>11,12</sup>

Addressing the quality problem could be an opportunity for established companies with the resources to secure high quality supplies and the know-how to ensure the safe manufacturing of cannabis products.

### Adverse health effects

As public support of marijuana continues to grow, it is important to consider the adverse implications for human health. The short-term effects (after a single-use) depend on a number of factors including: the dose received, the mode of administration, the user's prior experience with cannabis, concurrent drug use, and the 'set and setting.'<sup>1</sup> The most obvious short-term effect is intoxication marked by disturbances in the level of consciousness, cognition, perception, behaviour, and other psycho-physiological functions and responses.

Long-term health effects arise from regular use over periods of months, years or decades. Although studies are limited, research has shown that long-term use of marijuana may cause a variety of chronic illnesses as well as increase the risk of injury (see Figure 3).

**Figure 3 – Effects related to long-term marijuana use**

Drug dependence - Long term users may become dependent. Withdrawal syndrome is well documented in cannabis dependence. However, intermittent users develop little or no dependence. Cannabis use increases likelihood of experimentation with other substances, but only rarely does this lead to abuse.
Neurocognitive impairment - The most enduring and detectable neurocognitive deficits are seen in heavy cannabis users in the realms of decision-making, concept formation and planning, which involve various mechanisms of attention and memory processes.
Mental health problems - Cannabis is likely to increase the risk of developing schizophrenia and other psychoses. The risk is higher among the most frequent users.
Respiratory disease - Smoking cannabis on a regular basis leads to symptoms such as chronic cough, phlegm and acute bronchitis.
Cardiovascular disease - Long-term heavy cannabis smoking can potentially trigger myocardial infarctions and strokes in young cannabis users
Cancer - The evidence suggests that smoking cannabis does not increase the risk for certain cancers (i.e., lung, head and neck) in adults, but there is modest evidence that heavy cannabis use is associated with testicular cancer incidence. <sup>13</sup>

<sup>1</sup> Set and setting refer to a user's expectations and attitudes towards the effects of cannabis, mood state, and the social setting in which it is used.

**Injury - Cannabis use prior to driving increases the risk of being involved in a motor vehicle accident.**

## Cannabis, much less risky than alcohol

At present there is surprisingly little conclusive research that compares the long-term health effects of cannabis and alcohol. What is clear from substantial research is that alcohol is highly toxic and directly contributes to disease.<sup>14</sup>

A 2015 study published in the scientific journal, *Nature*, described a novel approach to measuring risks associated with drug use called MOE (Margin of Exposure) which measures the minimal threshold required for a drug to be considered toxic upon intake. Using MOE values, alcohol was associated with the highest toxicity of all drugs included in the study, while THC, the psychoactive substance in marijuana, was associated with the lowest levels of toxicity.<sup>15</sup>

Further support of the toxicity of alcohol on the human body is provided by a study in the British journal, the *Lancet*, which found that in 2016 alcohol was the leading risk factor for risk-attributable disease burden among people age 15-49, and the 7<sup>th</sup> leading factor for all ages.<sup>16</sup>

Moreover, there is insufficient evidence linking cannabis use to death, and only moderate evidence of an association between cannabis use and increased risk of injuries.<sup>17</sup>

# Our position on cannabis

Medical use of cannabis is a clear win-win-win for patients, society, and investors. The risks associated with recreational use are, however, more complicated. Overall, we see the legalization of cannabis as a positive development.

## Positive outcomes with limited side effects

The scientific evidence substantiating the medical uses of cannabinoids vary from “insufficient” to “conclusive.”<sup>18</sup> However, rigorous clinical studies have only just begun. The increasing legal and social acceptance of cannabis has prompted more R&D from pharmaceutical companies and enabled more effective cannabis-related treatments to hit the market (e.g., Marinol®, Cesamet® and Sativex®). Thanks to these developments, clinically prescribed cannabinoids no longer need to be smoked but can be ingested via oils, tinctures, or vaporizer pens (more palatable options for a wide swath of consumers). As the patient pool expands, larger clinical trials should confirm the effectiveness of cannabis as a viable option for treating many medical conditions.<sup>19</sup>

Some might worry about the negative side effects of medicinal treatments. Research shows the short-term as well as the long-term health risks associated with the medical use of cannabis and cannabinoids are similar to those of other commonly used medicines and include dizziness, dry mouth, disorientation, nausea, euphoria, confusion and drowsiness.<sup>20</sup>

Research studying more serious long-term health effects is limited. Some research has been conducted comparing the side effects of cannabis to the other standards of care being used today. What is clear is from this research is that marijuana is safer and less addictive than many commonly prescribed pain medications including opioids and opiates, a class of drugs frequently prescribed to treat pain.

The opioid crisis in the US is well-documented. CDC statistics from 1999-2019 show that opioid overdoses from both illicit and legally prescribed sources have killed half a million Americans over the past two decades.<sup>21</sup> Moreover, opioid abuse is not restricted to the US and North America. The UN

ODCs Drug Report 2020 revealed that opioid and opiate use (synthetic and prescribed) was a major concern in many countries due to severe health consequences associated with their use. In 2017, worldwide opioid abuse accounted for nearly 80% of healthy life lost as a result of disability and premature death and more than 66% of all deaths attributed to drug-related disorders.<sup>22</sup>

Numerous studies of medicinal cannabis users report that cannabis can be an effective treatment for pain and that it is just as effective, if not more, than opioid-based medications. Moreover, cannabis as a substitute for opioids greatly reduced the chance of long-term dependence and overdose.<sup>23</sup>

In summary, given 1) cannabis is legal and approved for medical use in a large and growing number of countries, 2) the research to date shows efficacy in treating many conditions and its potential as an effective treatment for others; and 3) its minimal side effects, we are predominantly positive towards the development of cannabis-related medical products.

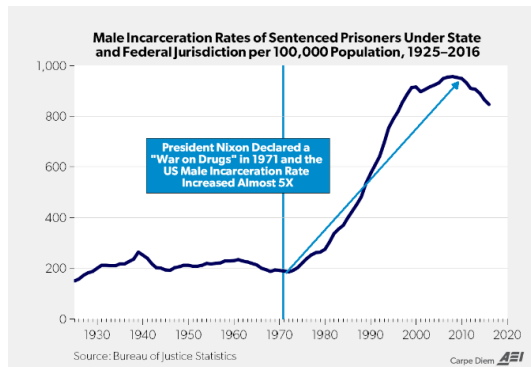
## Recreational cannabis: shifting to an evidence-based policy

The question is not whether recreational use of cannabis is good? Rather, we should ask whether policies that allow the recreational use of cannabis are better than total prohibition? To the latter, the answer is a resounding yes.

*The Report of the National Commission on Marijuana and Drug Abuse* commissioned by Nixon concluded that there was no major threat to public health, nor any threat to public safety. In addition, it found no evidence that cannabis causes or precipitates criminal, aggressive or delinquent behaviour. To the contrary, the report viewed criminalization itself as a problem. It recommended that all criminal laws related to personal use be eliminated.

The result was a massive increase in male incarceration rates in the US which only began to decline in the past decade as legalization and decriminalization increased (see Figure 4).

**Figure 4 | “War on Drugs” drives US incarcerations**



Source: AEI.org

Marijuana prohibition in the US has been a failure at best and counterproductive at worst, just as Nixon’s commission warned. Despite periods of increasing arrests, consumption rates were generally stable or increasing, with only short periods of small decline.<sup>24,25,26</sup>

### Criminalization’s negative impacts

If one accepts that cannabis is no worse than alcohol and that prohibition has been a failure, then criminalization is wrong and the incarceration that results should be considered a violation of human rights (arbitrary arrest, detention and interference with privacy). Indeed, Nixon’s commission stated, “application of the criminal law is constitutionally suspect.”

The cost to those incarcerated are innumerable. Beyond taking away their freedom, they may have been disenfranchised (in many US states one cannot vote after a felony conviction), and unable to provide for themselves and their families (felony convictions make it difficult to find work).

The costs to society are also substantial. From a purely financial perspective, billions of dollars are wasted annually on law enforcement, judicial infrastructure (courts, judges and lawyers) and jails.

Illegality also leads to organized crime and corruption. The black-market trade creates violence and powerful criminals that corrupt officials and

institutions at every level of government, from police forces and court officials all the way up to legislative bodies. Moreover, abusers are denied access to essential healthcare and treatment services.

Finally, there are environmental impacts from illegal plantations. They consume significant quantities of resources like energy to power operations and water for irrigation, pollute land and watersheds and damage wildlife habitats. Legalized industrial production will not completely eliminate these problems, but it will increase governments’ ability to monitor and regulate the industry.<sup>27</sup>

### Legalization concerns

There is some evidence that consumption will increase following legalization. However, the extent to which this is truly driven by recreational legalization is unclear. Arguably, a secular shift is already underway. Medical legalization has also had an impact, perhaps an even larger one.<sup>28</sup> Finally, the evidence is largely survey-based, and respondents may be more likely to admit to marijuana use when the stigma surrounding disclosure is lifted.

Observed negative health consequences from increased use are supported by hard data. Effects include increased motor vehicle accidents, alcohol abuse, overdose injury<sup>29</sup> and increased incidence of psychosis.<sup>30</sup> For these reasons, medical associations tend to take a narrow view and largely remain against legalization.<sup>31</sup> But this is not a complete picture and overlooks relevant positive effects of legalization. Extant research shows cannabis is a substitute for opiates and has helped reduce opioid-related deaths.<sup>32</sup> Moreover, it may also be a substitute for alcohol and other illicit toxic substances.<sup>33</sup> A study of healthcare utilization in Colorado (2010-2014) found the net effect of legalization to be neutral.<sup>34</sup>

Finally, various studies have been conducted to understand legalization’s impact on crime. G. Wu, et. found an increase in property and violent crime in Oregon but provide a fairly comprehensive literature review which shows mixed results overall. Importantly, they note studies that demonstrate decreases in crime in Colorado and Washington State; the implication being that specific social contexts, policies and law enforcement practices play a role.<sup>35</sup>



## The main risk: schizophrenia and other psychoses

The risk that is most concerning regarding recreational use of cannabis is that it is “likely to increase the risk of developing schizophrenia and other psychoses; the higher the use, the greater the risk.”<sup>36</sup> Young individuals and those with a family history of schizophrenia are most at risk and may be the only people at risk.<sup>37</sup> Educational, psychological and social interventions are recommended to reduce the use of cannabis in these at-risk populations.<sup>38</sup>

The growing availability of edible cannabis in foodstuffs such as candies and cookies are for these cases of particular concern given the THC content may be unknown or the dose hard to monitor.

## Direct resources to more effective social policy solutions

Decriminalization is a start but only prevents the costs of enforcement and incarceration of users. It does not resolve the issues that arise from black market production and trade. Legalization is likely the most effective policy, particularly when combined with efforts to discourage consumption (e.g., excise taxes, regulation, and public health education) and to treat those in need (e.g., targeted healthcare services and treatment programs for abusers). As noted above, industrial production does have a substantial environmental footprint.

However, given that black-market production will continue regardless, we prefer that production be permitted and regulated.

Taking into account that legalization for recreational use leads to 1) higher quality and safer end-products; 2) the ability to monitor and mitigate negative health impacts; 3) the ability to monitor and reduce environmental impacts; 4) a reduction in funding for criminal enterprises that tend to corrupt governments; and 5) fewer negative impacts on minority groups who tend to be prosecuted at much higher rates than their peers,<sup>39</sup> we are in favor of legalization as a policy.

# Our approach in practice

Robeco acknowledges that cannabis is safer than alcohol and believes that legalization is preferable to criminalization. That said, in our impact funds, our view is that it is not desirable to invest in companies that have a significant exposure to recreational cannabis.

Medicinal cannabis has proven benefits, particularly in the treatment of pain, chemotherapy-induced nausea and vomiting, and neurological disorders like multiple sclerosis spasticity. That said, we acknowledge more long-term, clinical studies are required to improve our understanding of marijuana's costs and benefits, particularly for indications where evidence is currently inconclusive.

Regarding recreational cannabis, we believe civil society should focus its efforts on education and healthcare in order to discourage use and provide help for abusers. Although the risks are low, negative health impacts associated with use in certain groups (e.g., young people, those with schizophrenia risk and heavy long-term users) are particularly concerning.

processes, including ESG integration and monitoring of controversies. Other fundamental strategies will incorporate the findings of this paper in the ESG integration process.

The Active Ownership and Sustainable Investing (SI) Research teams will collaborate in reviewing cannabis cases within our SI company profiles.

## Robeco's approach to cannabis investments

- RobecoSAM impact strategies exclude companies that generate  $\geq 5\%$  of revenues from recreational cannabis production <sup>40</sup>
- RobecoSAM impact strategies exclude companies that generate 10% or more of their revenues from recreational cannabis retail products

**'For impact funds, it is not desirable to invest in companies that have a significant exposure to recreational cannabis production'**

Given these concerns, we conclude that it is not desirable for Robeco's impact funds to invest in companies that have a significant exposure to recreational cannabis.

We therefore exclude from RobecoSAM impact strategies companies that generate:

- 5% or more of their revenues from recreational cannabis production, and
- 10% or more of their revenues from recreational cannabis retail products

The Active Ownership team may engage with individual companies to address any shortcomings identified during our standard due diligence

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