



# A GREENER RUSH

THE ENVIRONMENTAL IMPACT OF THE LEGAL INDUSTRY

*by DJ Reetz | photos by Samuel Farley*



**B**y most measurements, the rollout of the legal cannabis industry has been a success. The green is rolling into local economies and tax coffers rather than the pockets of drug dealers, law enforcement is free from obligations to police victimless crimes and regulation has introduced levels of consumer safety that were impossible in a black market. The industry is thriving in states like Colorado, Washington and Oregon, but that success has brought its own host of issues. In particular, the legal industry has drawn attention for the way in which it is driving the green out. Over the past several years, the legal industry has gained some notoriety for its environmental impact, specifically its high energy consumption — which carries a large carbon footprint — and lavish water usage.

A 2011 report from Lawrence Berkeley National Laboratory indicated that as much as one percent of the nation's energy supply was being used by legal cannabis operations. In Denver, a 2013 analysis indicated that marijuana grows were using 1.85 percent of the city's total electricity. That number predates the start of legal adult-use cannabis sales in Colorado, and subsequent figures show that the growing industry accounted for 45 percent of the increase in the city's energy usage during the same year. Current projections indicate that cannabis growing facilities are using upward of 2 percent of the city's energy.

With an industry largely dominated by secure, indoor growing facilities, it's not hard to see just where this energy drain is going. High-intensity 1000-watt lights bathe plants in artificial sunlight, generating heat that must be mitigated with equally energy intensive air conditioning units. The growing practices of the industry may still be holding on to sensibilities established by underground growers, whose need for discretion drove techniques indoors in the first place and who had little concern for the environmental impact of such techniques. With the advent of the legal market, regulators begrudgingly continued such practices, glad to further the discreet nature of cannabis growing while encouraging the added security indoor farming afforded.

"People started growing cannabis inside because it was illegal," says Ketch DeGabrielle, the operations manager of Los Sueños Farm in Pueblo, Colorado. "There's no reason to hide in your basement or your closet anymore. A lot of the mentality of how to grow cannabis is still stuck in that closet." >>>

Michael & Bryce of Los Sueños



At Los Sueños, the old techniques of clandestine growing have been shaken loose. Here, in the sun-drenched plains of southern Colorado, an area referred to as the state's banana belt, growers are honing the rather novel technique of farming cannabis. Los Sueños' 36-acre farm is one of several outdoor cannabis farms in the area, though it may be the largest. Rows of cannabis plants stretch across the property, basking in the powerful Colorado sun, fed by subterranean drip irrigation systems. DeGabrielle's industrial design pedigree carries a heavy emphasis on environmental sustainability, and it's something that Los Sueños has attempted to work into every aspect of this large-scale cannabis production facility.

When it comes to the practice of growing cannabis indoors on a commercial scale, DeGabrielle doesn't mince words. "Indoor grow for the mass market is not a sustainable model," he says. Rather, he sees the industry moving toward a model like the one here, with only high-end boutique cannabis produced indoors and the majority of material used for concentrates, edibles and the most consumer cannabis coming from outdoor production facilities.

"The main thing that you're fighting with indoor grows is you're trying to replicate the sun, which is impossible," says DeGabrielle. "All of that stuff takes energy and most of the energy comes from coal-fired power plants."

In Colorado, 60 percent of generated energy comes from coal, according to a 2014 analysis by the U.S. Energy Information Administration, with 22 percent coming from natural gas and only 18 percent coming from renewable sources. It means that the massive warehouse grows that have so far dominated the growing scene farther north in cannabis-friendly Denver are not just burdening the grid, they're causing more fossil fuels to be burned leading to more carbon dioxide in the atmosphere.

"For 20 years we couldn't give away warehouse space in Denver," says Michael Cadwell, Los Sueños' director of sales. "That all went away. We have basically 100 percent occupancy in all our warehouse spaces in Denver, and that's huge."

Cadwell's experience in the early days of the industry in Denver, and in property development before that, provided him with a well-developed understanding of the thought process that guided the fledgling industry. "When they started implementing regulations it kind of made sense," he says. In those days, the scale of investment was influenced by the fear that the federal government would at any moment make the arbitrary decision to enforce federal law and put an end to the cannabis industry, and those willing to take that risk were mostly small-scale carryovers from the black market. "Building out a 4-5,000 square-foot warehouse was pretty cost effective back in the early days," he says.

These days the possibility of federal enforcement seems farther from reality than it once did, and it's attracting larger investments; the kind that allow for a massive undertaking like what can be seen at Los Sueños. Still though, whether it's because of outdated techniques, environmental

control, the desire to harvest year round or the prejudices of local lawmakers, much of those larger grows are staying indoors.

Forcing an agricultural industry out of the sun would be preposterous with most crops, but when it comes to cannabis, that realization is largely absent. In Colorado, few municipalities allow this kind of outdoor growing, and while both Washington and Oregon have crafted regulation allowing for it, the dominant practice remains to grow indoors. Producing legal cannabis outdoors requires not just a favorable climate in terms of precipitation, temperature and sunlight, but a favorable political climate as well. "You need to have those two factors," says Cadwell.

None of the justifications for forcing cannabis indoors seem particularly cogent to DeGabrielle, who clearly feels the benefits outweigh the costs. "There's absolutely no reason to be inefficient when you don't have to be," he says.

While for people like DeGabrielle, energy efficient cannabis growing is more of a moral obligation, there is another component, a reduced cost of operation.

"In my mind, it's more of how do we let the market recognize that sustainability and give those growers that are committing to that a competitive advantage," says John Morris, one of the founders of the Research Innovation Institute based in Portland, Oregon. The RII is working to establish energy efficient cannabis growing techniques and to create a third-party certification that will help identify producers using environmentally friendly practices. For Morris, the need for energy consciousness in the cannabis industry makes good business sense as much as it makes good environmental sense. "Right now, you can kind of grow it any way you want and the market will bear the price. But as more growers come in and flood the market with product and prices go down, the margin starts to evaporate. The growers that have adopted the efficiency standpoint will be the ones that survive long term," he says.

Some may see outdoor growing as the obvious solution to cutting energy usage in cannabis production, but Morris, whose background is in indoor agriculture, says that there may be other avenues.

"We only water these plants about once every eight days or so," he explains. "Each plant consumes approximately five to ten gallons of water in a given eight-day cycle, requiring roughly half of the water of a similar sized alfalfa crop"

"We're very agnostic," he says. "Whatever methodology a company decides to use to grow their product, we're very supportive." Both indoor and outdoor growing practices carry certain benefits and pitfalls. As an example, Morris points to the strict pesticides regulations that are being implemented in Washington. Outdoor growers in the state risk having their crops jeopardized by pesticides sprayed on neighboring farms, whether those pesticides drift over on the wind or contaminate the water supply, potentially leading to an unsellable crop under the strict rules.

"People are pretty fascinated with the concept of indoor. You can control the environment year round, you can get a larger number of yields per year; [but] you're paying on the other end with your energy bill," says Morris. Energy can account for as much as 48 percent of a cannabis grower's total costs, he says. The best way to cut down on this may be to utilize more energy efficient LED lights in place of the incandescent fixtures that have become synonymous with indoor growing. Such lights generally draw less power and generate less heat, leading to lower cooling costs. The problem with these, however, is that they often utilize a smaller portion of the light spectrum, and not all varieties do well under them.

Developing these best practices is one of the goals of the RII, and in order to do that the group is going to have to utilize a mixture of what



Morris calls “black market wisdom” and the hard data that can only come from studying the legal industry. “There’s a lot to be learned from growers that have been doing this stuff for 30, 40, 50 years. How do we take that knowledge, expose them to some technology that can really help their practices? How can we learn from them too?” he says.

In order to develop the kind of guidelines that Morris has in mind, more research is needed to establish baselines so that excessive energy consumption can be identified. “We need more research,” says Morris. “Right now, nobody can tell you what an average watt per gram looks like, or average watts per square foot in a grow facility looks like.”

What the RII is trying to accomplish will be a collaborative effort, relying on members to update a collective wiki, something that can be hard with cannabis growers who often covet their process. “There are vestiges of the market before it became regulated,” says Morris. “There are some of those threads of the DNA historically with this market where there’s not a lot of sharing going on. That’s what we’re trying to do is open up a platform for dialogue and engagement.”

So far, Morris says they’ve been successful in breaking through some of that, and many growers have shown a willingness to help develop conservation techniques for the industry as a whole. “That to me was an indicator that there is a culture or an ethos of sustainability that runs through the cannabis community, and we’re just trying to tap into that,” he says. “We believe that there is a deep commitment to sustainability within the growing community, we’re just trying to bring that more to light.”

The federal stance on cannabis may also hamper some efforts to make the industry more environmentally sound. Morris points to the situation with the Bonneville Power Administration, a federally operated power grid that draws hydroelectric power from a dam on the Columbia River and feeds it to the surrounding area. Because the BPA is federally administered and cannabis is classified at the height of federal illegality, the organization is barred from spending funds on incentive programs promoting sustainability in the cannabis industry as they would in other industries, says Morris. “If the feds had a different designation for cannabis, then [the BPA] could be involved and then we could have a much more direct conversation about how to incentivize growers to be more energy efficient,” he says. “That classification status today impacts how much we can achieve from an energy and water conservation standpoint.”

While cannabis’ federal designation may be an obstacle for sustainable practices, assessing the environmental impacts of the cannabis industry can also suffer from anti-cannabis bias. While there’s no denying that some cannabis growing techniques aren’t rooted in environmental stewardship, sometimes the negative aspects can be overblown by opponents of legalization, as is the case, says DeGabrielle, with some reports on the water consumption of the industry. Alarmist claims have been made that cannabis plants can require up to six gallons of water every day, something that DeGabrielle says just isn’t true when proper techniques are used.

“We only water these plants about once every eight days or so,” he explains. “Each plant consumes approximately five to ten gallons of water in a given eight-day cycle, requiring roughly half of the water of a similar

sized alfalfa crop,” he says. “We try to do our best to make sure that our water footprint is really small, and that is not really because we don’t have the water, it’s because we want to have a good impression on the farming community,” says DeGabrielle. “They all have this misconception that ‘Oh, the cannabis guys are using all the water,’ because there’s only so much water in the reservoir that’s allocated to farming each year.”

As for why these alarmist claims — which have become part of the local dialogue in Pueblo — persist, DeGabrielle sees it as the direct result of anti-cannabis bias. “I think a lot of it is just people looking for reasons not to like cannabis. Traditionally agricultural communities are quite conservative; we are in a conservative community that is full of a lot of people who farm for a living. There has to be some amount of resentment for people coming in and buying farmland and doing things like what we’re doing, so it’s going to be natural to throw things out there to protect your own livelihood,” he says. “Everything we can do to make the way the public perceives what we do better, we really try to do ... In the last 16 years, the Colorado River has only touched the ocean twice, and that’s not the way it’s supposed to be; we certainly don’t want to add to that any more than we have to.”

Both DeGabrielle and Morris also note that while energy consumption might be higher with indoor farms, hydroponic techniques can actually drastically reduce the amount of water required to grow crops, something that has widespread potential for adoption beyond cannabis growing.

Going even further, Morris says that singling out the cannabis industry as an energy hog might be going too far. “I wouldn’t say it’s an environmental hazard more or less than any other large industry,” he says. “You can look at the energy impact of a pulp paper mill, you can look at the energy impact of aluminum processing plants — data centers for that matter. Cannabis being grown indoors has a similar energy footprint to data centers ... This is an energy intensive industry and there’s opportunities to lower that intensity through emerging technologies. If donuts took this much energy to produce I’d be talking about donuts, but it just happens to be cannabis grown indoors.”

Creating an environmentally friendly industry in this new frontier may have served as more of an afterthought for activists and underground growers, eager to have any legal course at all; but the techniques now being developed are helping to bring the industry’s environmental impact more in line with the progressive ideologies at its root. In fact, the high profit margins provided by cannabis — at least for the time being — may allow the industry to incubate innovations that can be applied in other commercial crops once the associated costs have gone down. While some may see legal cannabis as a looming environmental catastrophe, for DeGabrielle it might be better described as a catalyst for progress. “We only have one planet and we only have one chance to not screw it up any more than we have. What we’re doing in Colorado with legal cannabis is bigger than just Colorado, it’s part of a social change that’s going to happen nation wide and worldwide. People are really starting to see the impact that our societies and our social infrastructure is having on the planet. Cannabis helps open people’s eyes and helps people ask questions they don’t necessarily feel comfortable asking. I think it can help us all be a little more aware and conscious of what we’re doing, and try to make the world a better place.” 🌱

