

How To Redesign Your Indoor Grow For Sustainability

The move may cost more money upfront, but it will end up saving you money, energy, and time.

January 14, 2020 6 min read

Opinions expressed by *Entrepreneur* contributors are their own.

For many cannabis cultivators, the strongest impetus to redesign their indoor facility is to ensure sustainability and reduce their carbon footprint. And for good reason: Growing cannabis indoors can be an energy-intensive endeavor and bad for the environment. Cultivating a single crop from seed to harvest is accompanied by literal tons of carbon emissions – not to mention high energy costs.

But before jumping into a project like this, you should be aware that designing a grow facility can be a complex process that shouldn't be rushed. Many small yet critical details need to be considered otherwise you may be on the path to serious complications down the road.

RELATED: These Entrepreneurs Are Letting the Sun Shine on Indoor Cannabis Cultivation

Questions To Ask

Prior to knocking down any walls, ask yourself these key questions:

- **Do you have financial support?** A successful redesign requires funding. Facility owners and operators should

investigate financing options to pay for construction or needed equipment. Some manufacturers offer leasing programs and, depending on your location, energy rebates may be available.

- **What is your production schedule?** What will happen to your current crops as you embark on a redesign? Plants can be easily harmed or exposed to contaminants during the construction process. You may choose to move your plants to a room that will not be affected or wait to germinate seeds for the next cycle until your facility is back in working condition. It's better to protect your plants or hold off on planting a new crop than risk wasting money when your plants are contaminated or shocked.
- **What are your future goals?** Align your redesign with your long-term goals. For example, do you see yourself expanding your facility soon? Introducing new crops, such as hemp? Or, perhaps, you'd like to add an extractions lab. Keep these milestones in mind as you prioritize and make certain changes.

After laying the groundwork for your redesign – allocating funds, setting a schedule and identifying goals – environmentally conscious growers can begin to explore additional equipment and design considerations.

Lighting

Lights are a pivotal aspect of your indoor grow facility. If you're currently using fluorescent or HPS fixtures, consider making the switch over to more energy-efficient LED options. The Department of Energy's 2018 study on LEDs for indoor horticulture found that LED lighting offers 24 to 30 percent reduction in electricity consumption per square foot across vertically racked farms, non-stacked indoor farms, and as supplemental lighting in greenhouses. Sure, they're more expensive at first, but they pay off in reduced electricity

costs and benefits such as spectral tuning and lower operating temperatures.

The LED platform is also hardier and less disposable in comparison to other lighting technologies. Metal halide lamps, HPS, and fluorescent have shorter shelf-lives and are full of toxic heavy metals, making disposal more complex and potentially dangerous.

Already committed to LED lights? It might be time to upgrade to even more sophisticated fixtures, such as newer models utilizing automation or artificial intelligence (AI), Bluetooth control, or more advanced diodes.

RELATED: How Big Data Is Driving Precision Cannabis Cultivation

Watering Systems

Eco-conscious growers – especially those living in arid climates such as Arizona and California – will want to examine their current setups for water efficiency. You may be wasting water currently due to outdated equipment or excessive evaporation. Some valuable conservation techniques that are popular among indoor growers include aquaponics and hydroponics. Hydroponic gardens grow plants without soil, instead of cultivating them in water or an inert media and nutrient mixture.

Hydroponic gardens are extremely efficient, using 10 times less water than other agricultural methods, according to a case study completed by the Global Sustainability Institute. Hydroponically-grown plants also need less space to grow.

Growers who are interested in producing fish as an additional revenue source may investigate aquaponics, which uses fish effluence as fertilizer for the plants. Because it's a closed system, it also reduces water usage. The catch: Due to the

extra space and resources needed for a pond, it may not be the right option for every business.

Growers in water-scarce areas – or areas where water costs increase during peak times – may want to establish water catchment systems that collect runoff from rooftops and store the water for future use. Utilizing rainfall is cost-effective and provides a useful supplemental water source for irrigation needs during drier times.

Environmental Controls

Investing in the latest equipment for environmental control, such as HVAC, lighting, monitoring, and air conditioning – can help growers maintain an ideal balance among humidity, light and temperature to keep cannabis plants happy and healthy. Of course, cannabis businesses will want to protect their equipment and upgrade when needed to ensure their tools are performing at the highest potential.

In addition, recent technological advancements are another impetus to invest in new equipment. For example, AI is increasingly prevalent in controllers, whether for your fertigation, temperature, or lighting system, taking real-time conditions and counter-judging them against a deep data pool. This allows your team to make more informed choices and for more subtlety in adjustments, which both lead to vast energy savings and improved quality.

AI offers great potential across many growing contexts. In greenhouses, where conditions change constantly – not only as the sun moves across the sky, but also as clouds and wind affect your daily light integral – new sensors can trigger automated adjustments to maintain optimal conditions for your crop, rendering the delay (and human error) with hands-on adjustments obsolete.

Vertical layouts

Rather than thinking bigger, think smarter. Adding to your facility's square footage can quickly spike your energy bills, as there's simply more air to control and monitor. Smart design options, such as vertical racking, reduce the square footage needed to grow crops – taking advantage of the vertical space that is so often ignored. Recent advancements in LED lighting allow them to be vertically racked while maintaining performance and keeping ambient heat low.

It Just Makes Sense

The cannabis industry isn't going anywhere – but neither is climate change. Cannabusinesses have a responsibility to examine their own practices, use resources responsibly, and integrate sustainable measures to reduce their carbon footprint.

But it's not only about the morality of going green. Sustainability can have a positive impact on cannabusiness' profit margin, as well. Cultivators who redesign with efficiency and the environment in mind end up saving money, energy, and time. With fluctuations in the price of cannabis, the business that embraces efficiency to lower their operating costs will find more stability and savings as the industry matures. Improving a facility's sustainability can assist in the long-term success of any cultivation – and push the industry toward a smarter and more efficient direction.

<https://www.greenentrepreneur.com/article/344228>