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# Making Greenhouses

## Ideal for Cannabis



*When a cannabis grower buys a greenhouse, they might be getting more than they bargained for. Enertec Engineering has helped produce superior plants in greenhouses for years – now the company is creating innovative ways to grow better cannabis.*

**Written by Karen Hawthorne**

**N**ow that Canada has become the first G7 country in the world to legalize the recreational use of cannabis there is an intense focus on producing high-quality products for consumers. Revenue generated by the North American cannabis market is predicted to grow by \$28 billion, from \$12 billion in 2018 to \$40 billion in 2023. Right now there are product shortages, a backlog in online orders, and there have been public mold issues.

When it comes to producing higher quality cannabis to meet that booming demand, it's the control factor that is key.

Producers can create an environment that is most suitable for the plants by regulating the temperature, humidity, the amount of light, the amount of water they get, and they can protect the plants against adverse elements and pests. Growing in greenhouses is all about control of the conditions and protection against the risks that can threaten a crop.

It's not surprising to see more producers take a big interest in greenhouses to grow their plants. The challenge is that most of the existing greenhouses in Canada are set up to grow vegetables or bedding plants that require a different environment than cannabis. That leaves growers faced with retrofitting an existing greenhouse or designing a new one that can produce superior quality cannabis. ▶▶

▶ That's why Enertec Engineering, a firm specializing in energy consulting, hydronic heating, commercial HVAC, and process piping, is in demand across the country. In fact, the company has increased its revenue by 50 percent and it has nearly 20 projects on the go by way of customer referrals alone.

What separates Enertec from other engineering firms is that its team knows greenhouses. While other firms will come in and look at the mechanical challenges of working on greenhouses, Enertec has a certified agrologist on its team – an expert in commercial and native plant production with a focus on improving yields through sustainable methods. A chemical EIT and other specialists are also on staff, looking at creating the best outcomes for plants that grow in a greenhouse. That's a very different starting point from the competition, founders Kevin VanWingerden and John Lelie are proud to say.

VanWingerden and Lelie combine more than 45 years of experience developing facilities and hydronic systems that are needed to grow crops in a greenhouse. Together, the two have spent a lot of time in and around greenhouses, even having their office located in a greenhouse boiler room for a time.

"John and I were working for another greenhouse manufacturer and we decided that it was time to branch out so that we could do things that we felt were more appropriate for the industry," VanWingerden says. "In 2003, we started our new company in the basement of John's house. We moved on to house our office in a greenhouse, doing an energy retrofit, and basically increased the greenhouse size by 30 percent but managed to keep the energy bills the same."

What the two really liked about having their own company was developing deeper relationships with their clients and working with them directly to develop large-scale greenhouse projects.

"We have clients who are probably the biggest greenhouse growers in North America. They have questions about their operations and we bring the expertise so we are able to consult as a trusted advisor," VanWingerden says. VanWingerden is a mechanical engineer and Lelie is an agrologist, a winning combination when it comes to greenhouse growing and the new frontier of cannabis.

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There are a lot of questions out there right now as many new cannabis growers buy properties with greenhouses hoping for a fast start and an abundant yield. One of the biggest questions for growers is how much work and equipment will it take to retrofit one of these existing greenhouses? The amount of light, heat, and humidity all need to be managed, for example.

When you grow cannabis on a commercial scale, there is a large requirement for light intensity throughout the greenhouse structure. This results in a buildup of heat in the greenhouse, and when the lights go off to simulate night conditions, the climate in the greenhouse rapidly changes, creating a whole different set of challenges.

To regulate the internal environment, greenhouses are vented by opening panels, usually on the roof; however, this is a passive solution and creates other problems. The most significant is the potential for odour and light pollution, both not good for neighbourly relations.



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“Because we don’t have the ability to cool a greenhouse the way we would from a traditional indoor grow, we use a system of windows that open up to vent,” Lelie says. “But to open the windows you have to open what’s called a blackout curtain which simulates night-time in the day and acts as an energy curtain. When you ventilate, you need to open the curtain and you not only let the air out, you let the light out. The light [can be] very intense and neighbours can complain.”

Another significant challenge that comes with trying to grow cannabis in a greenhouse is the humidity. To VanWingerden and Lelie, the solutions for humidity revolve around dehumidification and refrigeration. Enertec is working with a company from Europe on active ventilation systems, a solution which is similar to the heat recovery ventilation (HRV) systems that you find in your house, but on a commercial scale.

With tie-ins to technology such as absorption chillers, it is possible to use some of the heat produced by machines like a cogen generator to provide cooling for a greenhouse. “It is possible to control the temperature,” says VanWingerden, “and with the combined heat and power solutions, you can start making your air cool enough to work with.”

Enertec has also developed an irrigation water heat treating system for the plants so that the water can be cleaned and recycled back through the greenhouse with a greatly mitigated risk of infecting traditional greenhouse plants, pasteurizing the water for a more efficient, cost saving, and environmentally friendly approach. The pasteurizing system also has an application for the cannabis industry.

These are trailblazing days for cannabis and the industry is trying to introduce different technologies to get a product to market, all based on the best knowledge available at the time. There is no established methodology and best practices

are rapidly changing as people are literally learning from their mistakes as they go.

As a team of engineers who works with growers on greenhouses, Enertec is very much aware of how important it is to be flexible working in an industry where plans, layouts, and knowledge are seemingly changing by the day. “We kind of roll with the change,” says VanWingerden. “We have our engineers working on a project and then the very next day somebody comes up with an entirely different layout for their greenhouse. So you have to be able to adapt to it.”

They are also seeing an increase in the design work they are doing for growers, especially in the western provinces where people are looking to develop modern greenhouse designs specific to growing cannabis. This is really the ideal situation where Enertec can offer its full value to customers.

A lot of growers don’t have experience with greenhouses so they don’t have the big picture on how they will expand their operations. Enertec works with them to create a plan that will allow them to expand without having to rebuild their climate control system all over again. This is a different skill set than what a lot of larger HVAC companies offer.

Looking ahead to how greenhouses will change to grow cannabis crops, VanWingerden talks about the importance of developing specific equipment to meet the challenges for the industry.

“For us, one of the biggest challenges is finding the equipment that will do what we want it to do, and that’s going to evolve over time. Right now we are trying to adapt the equipment that’s out there, but due to advancing technology, in five years you may no longer see [the same equipment that] is going into a building today.” ■

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