USES OF
INNOVATIVE HORSEPOWER

Indoor agriculture, like this marijuana growing facility, often need cooling around the clock to remove the heat generated by the lighting, which has led to a growing opportunity for Tecogen and its Tecochill product line.

POT LUCK

Tecogen sees high opportunity in marijuana growing business, other indoor ag applications

BY JACK BURKE

While it may be green, cannabis — weed, pot, Mary Jane or any of a dozen so other euphemisms — is turning to gold for some in the power generation market.

Take Tecogen, the Waltham, Mass.-based maker of cogeneration products including natural gas engine-driven combined heat and power (CHP), air conditioning systems and high-efficiency water heaters for residential, commercial, recreational and industrial use.

Tecogen is expanding its reach into the indoor agriculture industry, and more specifically cannabis, said Steve Lafaille, a project manager who has been at the center of Tecogen's move into indoor agriculture. Lafaille said Tecogen's chiller business has already doubled in the last two years due in large part to the indoor cannabis industry, which is legal in the U.S. now in 29 states, the District of Columbia, Guam and Puerto Rico.

"I think when more and more states get on board with this, both medicinally and recreationally, we are going to see a major increase in our business," Lafaille said. "We are ready for it, we haven't even maxed out our first shift and can still add a second, so we are getting prepared. We see the writing on the wall."

The company recently announced the sale of three of its Tecochill STx Series natural gas-powered chillers to an indoor cannabis growing operation near Tampa, Fla. That sale followed a recent deal in Massachusetts. The company did its first cannabis project in early 2016 and has 30 projects in various stages nationwide currently, Lafaille said. Three are in operation with a few more under construction.

Lafaille said marijuana growers typically come to Tecogen looking for a power fix. While other companies that are interested in Tecogen products usually are looking at ways to either cut utility bills or reduce emissions, most marijuana growers simply need more capacity, he said.

"They either can't get the power they need from the utility, can't get it fast enough — time is money — or it will cost too much or a combination of the latter two," Lafaille said. "So, the first thing we are doing is helping to solve a problem, which is shifting load from the overloaded and taxed electric grid onto natural gas."

According to the company, growing pot requires an

Tecogen is expanding its reach into the indoor agriculture industry, and more specifically cannabis. The company's Techochill's cooling helps remove the heat generated by the thousands of lights that are needed to grow the crops, while the recovered waste heat can be utilized to dehumidify the air. Tecochill units are powered by TecoDrive 7400 engines, which are industrial versions of the GM Mark V 7.4L V8, modified to Tecogen specifications.

enormous amount of energy. A 5000 sq.ft. indoor cannabis facility will use on average 29,000 kWh monthly.

"What is new is indoor cultivation (warehouse), where every element is completely controlled from temperature, humidity, artificial lighting, nothing is left up to Mother Nature," Lafaille said. "This is of course much more energy intensive, but it is about dollars. A grower can in many cases get much more yield and many more harvests a year when they can completely control their own conditions."

Tecogen's chillers enable growers to replace electricity with less expensive natural gas, and at the same time make use of the waste heat. This greatly boosts a facility's overall energy efficiency and consequently lowers operating costs.

The Tecochill units in Florida will provide 450 refrigeration tons of cooling for a 40,000 sq.ft. growing facility, which is being retrofitted out of an existing site. The three Massachusetts units are going to a new 30,000 sq.ft. growing facility. They will provide 450 refrigeration tons of year-round cooling.

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Several growers are also going to be utilizing Tecogen's Ultera (ultraclean tailpipe emissions) technology to provide free CO_2 enrichment for the cultivation facility. Lafaille said that currently, most growers spend quite a bit of money on bottled CO_2. This allows growers to truly utilize all the outputs from the CHP system, he said.

Lafaille said the company's mechanical CHP product, Tecochill, is its biggest advantage in the cannabis market. The Tecochill' s cooling helps remove the heat generated by the thousands of lights that are needed to grow the plants, while the recovered waste heat can be utilized to dehumidify the air, Lafaille said.

"There are a lot of people, including Tecogen, who manufacture traditional electrical CHP systems, but they typically have a higher upfront cost and a more complex installation, and the customers would still need to purchase a separate cooling system," he said. "The Tecochill product gives an incredible bang for the buck because it essentially lets you kill two birds with one stone — that is you get a brand-new chilling system and the benefits of a CHP system all in one."

Lafaille said indoor growers need cooling around the clock to remove the heat generated by the lighting, which makes the Tecochill approach very attractive.

"It is much more efficient to connect the shaft of the prime mover to the refrigeration compressor versus a traditional electrical CHP approach, or a tri-gen approach (waste heat from an electrical CHP system driving an absorption chiller)," Lafaille said.

While cannabis is a big part of the ag market for Tecogen, the company is starting to see traction in other types of indoor growing, anything from cucumbers to leafy greens, Lafaille said. He cited AeroFarms of Newark, N.J., a commercial indoor farming company that grows plants aeroponically.

"Just look at what companies like AeroFarms are doing. A lot of people claim that is the future of large-scale food production," Lafaille said. "And I think there's quite a few people who believe that eventually cannabis prices will fall and you may see some of these cultivation facilities switch to growing Belgian endives for high-end supermarkets like Whole Foods, if it ends up being more lucrative.

"That is speculation, but one thing is for sure — the price for cannabis will drop over time in these new markets and this is another reason why so many growers are looking at our systems, to help reduce their operating costs so they can gain an edge over their competition.

"We are actually already starting to do some retrofitting into existing cultivation facilities that are solely utilizing electricity for their energy needs and are struggling with their utility bills. This is actually a common conundrum — they didn't have a lot of cash to start so maybe they couldn't afford the higher first cost and lower operating cost systems, but now that they have some revenue coming in the door, they are quickly looking to make an investment in the right equipment for the long haul." **dp**