GROWERTALKS

Features

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Touching Base on Title 24

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Two years ago, we reported on California's new requirements for greenhouses. With a goal of increasing energy efficiency and reducing energy use, Title 24 (Part 6) requires ALL new greenhouse construction in the state to have two layers (or more) of glazing. This doesn't include energy curtains in lieu of that second layer of glass because you can open and close them as you desire.

Another part of the rule requires that all heating, cooling and ventilation equipment must comply with all application requirements for equipment associated with HVAC systems. This hasn't been as much of an issue, as most all commercial equipment already meets such requirements. Greenhouse lighting was also addressed in the new code, and most current HPS lighting and all LED lighting should meet the requirements.

The increased scrutiny isn't targeted to just greenhouse growers—it's been speculated that the increase in cannabis production in the state during the last 10 years has put all growers on legislators' radars.

At the time, Chris Beytes spoke with Nadia "Dr. Greenhouse" Sabeh for her take on the new regulations. She said that California was looking at the energy use of EVERY industry, so ornamentals and indoor controlled environment production was included.

We checked in with Nadia to get an update on these regulations and to get a feel for what we can expect moving forward—in California and elsewhere in the country.

GrowerTalks: What's the latest with Title 24?

Nadia Sabeh: When the California Energy Code (CEnC) requirements for controlled environment horticulture (CEH) were first introduced, industry stakeholders expressed concern about the cost and practicality of some of the initial measures proposed. The code developers listened, scaling back the threshold of the adopted energy efficiency measures and eliminating others altogether for both greenhouse and indoor growing facilities.

The CEnC is focused on three areas of greenhouse energy use: horticultural lighting, envelope losses and HVAC efficiency. The first version (effective January 1, 2023) denied the use of single-layer glazing of any kind, allowed the

use of High Pressure Sodium (HPS) lights (as long as they met a photosynthetic photon efficacy (PPE) threshold of 1.7 umol/J), and heating and air conditioning systems needed to comply with HVAC equipment efficiency requirements.

The 2025 CEnC (to be effective January 1, 2026) is expected to focus only on lighting. For greenhouses the PPE threshold is expected to increase to 1.9 umol/J, effectively forcing the use of LED lighting. Other than that, no other changes are expected in the next code cycle.

***GT*: Since it's been in effect for a couple of years, how have growers and greenhouse manufacturers been handling the new requirements?**

NS: They've had a lot of questions, from general to specific. Some of the questions I've fielded from both growers and vendors include:

■ What is included and excluded in the energy code?

■ Is my system or greenhouse exempt from the requirements?

■ What is defined as a "conditioned greenhouse"?

■ Does a snowmelt heating system count as a heating system that needs to meet the HVAC energy efficiency requirements?

■ Can I count a shade screen or thermal curtain as one of the layers of glazing?

We've been able to get clarification on many of these questions by reaching out directly to our contacts at the Energy Commission. They've been pretty receptive to these questions and are open to our insights and feedback.

***GT*: Since this is for new builds only, are you finding that it's preventing some growers from building new structures?**

NS: I haven't heard of any growers choosing not to build greenhouses in California because of the energy code. I think that's because the established thresholds have been fairly minimal and not outside the bounds of what growers would have implemented anyway. For example, double-layer polyethylene and twin-wall polycarbonate are pretty common already. However, what was originally proposed—three-layer glazing—was shot down pretty quickly by the industry. I even co-wrote a letter with Dr. Gene Giacomelli at the University of Arizona to the Energy Commission decrying the impacts this requirement would have on the industry. Collectively, the feedback on this measure from several stakeholders helped to scale back the requirements to what is already an industry standard.

***GT*: We've read that there's a chance there will be rules banning the use of propane or natural gas for new GH builds, that you'll be required to only use electric heat. Is this true and how would this be considered more sustainable? Wouldn't that compromise an already-strained electrical grid?**

NS: Unfortunately, this rumor is true. California's current energy code forbids the use of combustion-based boilers in new construction. Compounding this challenge, they also limit the use of electric boilers to 20% of the heating needs. Basically, this is forcing both residential and commercial buildings to use electric heat pumps. Technically, these requirements extend to all of agriculture, but when I talk to utilities and regulators, they admit that this is a hard ask for farmers. Many of them don't have the electrical infrastructure to power electric heating and sanitation systems, nor the space to put them.

California has a pretty aggressive goal of decarbonizing the economy through the electrification of everything from cars to heating systems. The state is generating more electricity through renewable sources—solar and wind—and relying less on power generation from gas turbines and coal-fired plants, which are big contributors to GHG

emissions. Theoretically, equipment efficiency should free up capacity in the existing grid, allowing more equipment and appliances to be connected. But demand exceeding supply is definitely a concern.

***GT*: What do you think the future holds? Will there be (more) adjustments to Title 24? And what is the likelihood that similar requirements would be implemented in other states?**

NS: California's Energy Commission is eyeing several new energy-efficiency measures for both indoor and greenhouses in the 2028 code cycle. The process of studying the environmental and economic impacts of these measures is expected to begin this year. I encourage greenhouse growers, equipment vendors, researchers and other interested parties to follow the process, attend public stakeholder meetings, and offer feedback and insights to guide the conversation and code adoption.

If the adage holds true, "As California goes, so goes the nation," then yes, similar requirements will be implemented in other states. Right now, ASHRAE (American Society for Heating, Refrigeration & Air Conditioning Engineers) is using California's energy code as their starting point for establishing the minimum requirements in their Energy Efficiency Standard 90.1, which is used by all state building codes and some international building codes. The challenge is that California's greenhouse industry is pretty limited to our idyllic Mediterranean climate, where other states have to contend with sub-freezing temperatures, high humidity or low sunlight levels, all of which affect the needs for energy-consuming heating, dehumidification and lighting systems. With that in mind, there should be nuance to the energy-efficiency requirements based on the greenhouse location and climate.

Necessity: The Mother of Invention

Plato said (according to a Google search), "Our need will be the real creator," and the requirements enacted by Title 24 have created new avenues for some greenhouse manufacturers to look at different ways to upgrade their products and the service they provide to their customers.

"We're seeing it as an opportunity to advance some of our products, and we are modifying existing greenhouse designs, which will lend themselves to meet the requirements the state has put in place," explained Adam Pound, president and CEO of Agra Tech Greenhouse Manufacturers based in Pittsburg, California.

Adam said that Agra Tech is working to provide a greenhouse that has a lower operational cost and meets the requirements enacted by Title 24.

"If we are really trying to reduce the amount of energy we're using there are improvements that can be made for anybody who has an existing greenhouse," he said. "Right now everything from implementing another heat retention curtain system, a shade system, improving the electrical systems, adding variable frequency drives—all of it reduces the power consumption for these growers and actually provides a better house for them." **GT**

For more information and resources, and to listen to Dr. Nadia's podcasts, visit doctorgreenhouse.com.