

Are container farms a sustainable food production system?

Container farms in colder areas show greater energy-saving potential. Container farms (CFs), integrating plant factories into mobile prefabricated buildings, are emerging as a novel decentralized food production system to fortify sustainable urban development. However, the high energy demand needs to be optimized to promote wider CF application.

Are container farms energy efficient?

The energy efficiency of container farms, a novel production system, is studied. Crop loads related to daily growth are factored in building energy modeling. 2 active and 2 passive energy-saving strategies are assessed under 8 climates. Container farms in colder areas show greater energy-saving potential.

What is a container farm?

Container farms (CFs) are a moveable type of plant factories that are housed within retrofitted metal shipping containers (Liebman-Pelaez et al., 2021; Jordan, 2023). Due to their specific structure, CFs present unique advantages over other CEA applications. The primary advantage is easy transportation.

How to develop a plant energy sub-model?

First, the plant energy sub-model was developed by four steps: programming the mathematical model (Section 2.1) in Python, obtaining unknown variables through crop growth experiments (Section 2.2), processing experimental data (Section 3.1) and feeding dynamic plant loads into EnergyPlus (Section 2.3.2).

Are energy-saving methods effective in plant factories?

Some effective energy-saving methods have been evaluated in plant factories, but not in CFs. Kikuchi et al. (2018) evaluated active measures such as solar photovoltaic power and recycling unused heat in real plant factories.

Can Container Building Energy Modeling be used to evaluate thermal bridging?

Existing container building energy modeling has little focused on this perspective. However, as a standardized structure with typical envelope design, container buildings might be better suited for developing a generic mechanism to evaluate thermal bridging.

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Container farms, a kind of container suitable for both indoor hydroponic farming and open-air that carries hydroponic grow systems. Different sizes, the largest of which is the shipping ...

Container farming is a vertical farming system that uses modified shipping containers for growing food inside without the need for power, water, sunlight or nutrients. Essentially, the container ...

The Quad Cities Community Foundation is awarding Tapestry Farms a \$300,000 Transformation Grant to expand their services over the next three years. ... But instead of solar panels or antennae, it has flexible arms with bright LED lamps that fold over. ... Near the entrance of a 40-foot container farm installed at New Mexico State University's ...

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models for operating container farms have been developed, though these do not include energy optimization strategies with renewable energy systems [25]. Other tools have been designed around the food-energy-water nexus, but optimize the size of a greenhouse--not a container farm or individual loads--with a solar PV array [26].

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