CONSTRUCTION EXECUTIVE, "ZERO-ENERGY COMMERCIAL BUILDINGS INCREASE AS CONTRACTORS FOCUS ON SUSTAINABILITY"

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By: Jeffrey S. Wertman

Construction Executive

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Imagine a functional, low energy commercial building that annually consumes only as much power as the building creates with on-site, clean, renewable resources. From coast to coast, there is considerable momentum for zero-energy (ZE) buildings, also known as ZEB's or net-zero energy buildings (NZEBs). Although still an emerging market, the growth trend for ZEBs is steep.

The world's net-zero energy market for commercial and residential projects is expected to exceed $1.4 trillion by 2035. The number of ZEBs across North America has dramatically increased since 2010 which encompasses about 80 million square feet of commercial building space. ZE has captured the attention of building owners, developers, architects, engineers, contractors, designers, policymakers and others who see its potential to efficiently use clean energy resources to reduce the substantial carbon footprint of buildings.

Real Applications of Net Zero

From 2012 to 2019, the number of ZE projects has increased ten-fold. According to the "2019 Getting to Zero Project List" released in May 2019 by the New Buildings Institute, a nonprofit organization striving to achieve better energy performance in commercial buildings, the total number of certified, verified and emerging ZE projects grew to 607 in 2019. New projects continue to appear regularly. Today, hundreds of ZE buildings, including commercial buildings of all types (including retail, office, warehouse, hotel, educational and government) are being developed.

The first commercial-scale net-zero building was a center for environmental studies built at Oberlin College in Ohio in 2000. The Oberlin College building employs a passive solar design, natural ventilation, and geothermal heat pumps for heating and cooling—all to reduce its energy demand. It also uses rooftop solar power for its electricity. In 2014, Walgreens built the world's first net-zero energy retail store in Evanston, Ill. The Walgreens net-zero retail store uses two wind turbines, nearly 850 solar panels and a geothermal system burrowed 550 feet into the ground. More recently, on Aug. 12, 2019, Florida's first net-zero K-12 school opened. The building, distinguished by its rooftop solar array and its air-tight envelope, is designed and built to use 76% less energy than a regular school, and to save $115,000 per year in energy costs.

Achieve Net Zero

To make a building zero energy, design professionals seek to minimize the building's energy use. This can be achieved in several ways including: using building efficiency improvements; thermal insulation, including air-tight building envelopes with high-performance glazing; lighting equipment; plug and process loads; HVAC components; and employing passive strategies, such as daylighting, natural ventilation, passive solar heating

and passive solar avoidance.
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The remaining load is met with on-site renewable energy, typically a photovoltaic system and vertical axis wind turbine provide on-site renewable energy production.

Net-zero energy is a target for many commercial buildings today, but it will be a requirement tomorrow. An increasing number of states and cities are including zero-energy and zero-carbon building goals in their policymaking and for their buildings because buildings are a major source of greenhouse gas emissions.

Legislatures are passing bills to require zero-energy, and increasingly zero-carbon, performance outcomes for commercial buildings. California is the front runner in zero-energy building activity; the California Public Utility Commission has set net-zero energy goals for all new commercial buildings by 2030. Other cities have followed: For example, Burlington, Vt., seeks to accomplish its goal to become a net-zero energy city by 2030. The Boston will require all new city-owned buildings to be net-zero for carbon emissions by 2050.

Although decision-makers often cite high costs as the primary barrier to ZE buildings, the U.S. Green Building Council reports that many types of ZEBs can be built with no added upfront cost and some commercial buildings can see a return on investment in as little as one year. Total energy costs can easily add up to hundreds of thousands of dollars over time. For commercial property owners, savings from ZEBs translates into higher profit and higher net operating income.

On the litigation front, there has only been only one reported case involving zero-energy issues. In that case, homeowners in Maryland alleged their homebuilder misrepresented the two homes they purchased were to be “net-zero” energy efficient. The homebuilder’s website advertised, “[a]s a Zero Energy Ready Home Partner, High-Performance Homes offers homes that are so energy efficient, most of their annual energy consumption can be offset with renewable energy.” As the number of ZEB projects increase, and as more states and cities pass and implement ZE legislation, the number of lawsuits is expected to grow.

Commercial zero-energy construction has steadily increased over the years and the growth of this construction is forecast to steadily rise. Owners, construction participants, and local leaders are working to curb emissions and reduce energy use, dependence on fossil fuels, and carbon dioxide emissions to create a sustainable future.

In addition to improving the environment, net-zero energy construction offers economic or financial benefits, including cost savings on energy, higher property values for building owners, and potentially increased occupancy rates.

Related Team Member(s)

Jeffrey S. Wertman