

ZNE Facts for Commercial Building Operators & Owners



Brentwood Apartments | Edmonton, Alberta, Canada
Photo: David Dodge

Fact 1 ZERO NET ENERGY STANDARDS FOR BUILDINGS ARE COMING IN CALIFORNIA.

California has set a course to achieve zero net energy (ZNE) for all new construction and half of the existing building stock in the next two decades. Owners should begin to prepare for this change and can put themselves in a leading position by moving to a ZNE performance goal now.

Fact 2 ZNE BUILDINGS FOR A NUMBER OF BUILDING TYPES ARE FEASIBLE TODAY.

While the market share of ZNE buildings is still small, it's growing. ZNE is currently feasible in most multi- and single-family homes, schools, smaller office buildings, libraries and other public assembly-type buildings. There are numerous examples around the country, built by a variety of design teams and developers.

Zero net energy building projects are located in most U.S. climates. While mild climates—like California—certainly help make zero energy buildings more easily achievable, projects have also been successfully completed in the harsher climates of Minnesota, Massachusetts and New York.

A ZNE building produces as much energy as it consumes over the course of a year

Fact 3 INVESTING IN ZNE BUILDING OFFERS MULTIPLE BENEFITS.

Beyond the environmental benefits of reduced carbon and greenhouse gas emissions, ZNE buildings provide substantive business advantages. ZNE performance helps reduce exposure to risk by ensuring that an asset is more resilient, has higher employee and tenant retention, and enjoys higher rents.

ZNE buildings typically rely on more passive strategies such as natural ventilation and daylighting, which means they can be kept cool and interior spaces can be illuminated even when the power is out. They have also demonstrated reduced operating and equipment replacement costs, which can grow the bottom line while providing valuable brand recognition in a competitive building market.

Fact 4 THE COST OF ZNE BUILDINGS IS IN LINE WITH THE COST OF GREEN BUILDINGS.

Commercial buildings cover a broad array of building types, and information on costs is based on a limited number of buildings. However, some commercial buildings have achieved ZNE within typical construction costs for their building type. Achieving ZNE is based on a careful integrated design process focused on a clear energy performance goal. Most reported examples range from 0% to 10% additional costs.

Fact 5 ZNE BUILDINGS ARE THE MARKET'S BEST ENERGY PERFORMERS.

Energy efficiency is the most important step to achieving ZNE energy performance. These buildings use about one-third of the total energy of typical existing commercial buildings—about 30 kBtu or less per square foot. The best examples are closer to 20 kBtu per square feet, with numbers varying by building type and climate.

PROJECT PROFILE

Bullitt Center | Seattle, WA



Denis Hayes, President and CEO of the Bullitt Foundation in front of its ZNE headquarters in Seattle, WA
Photo: Seattle Magazine

The Bullitt Center is a six-story, 50,000-square-foot building in Seattle, and serves as a new model for the way urban buildings are designed, built and operated. A solar array will generate as much electricity as the building uses and rain will supply all necessary water. Wastewater is treated onsite. Other notable features include:

- Energy efficiency 83% greater than a typical Seattle office building
- 242kW photovoltaic array
- Ground-source geothermal heat exchange system
- Radiant floor heating and cooling system
- Retractable external blinds to block heat before it can warm the building

Key Strategies to Designing a ZNE Building

1 MAKE A ZNE COMMITMENT

Establish ZNE as a key project objective and ensure that this goal is explicit in all project documents (RFQ's and RFP's).

2 WORK AN INTEGRATED PROCESS

A successful ZNE outcome requires a design team that is committed to the fundamentals of the integrated design process from the earliest design phase.

3 SET PERFORMANCE TARGETS

A ZNE building necessitates the establishment of performance targets and requirements through every phase of the design process in order to verify the impact of key design decisions.

4 SIGNIFICANTLY REDUCE LOADS

The most critical factor in creating a ZNE building is the maximum reduction of all building loads through the use of passive design strategies and highly efficient technologies.

5 OPTIMIZE OPERATIONS

Ensure low-energy building operation by implementing monitoring and verification strategies, management of plug loads and engaging tenants in energy efficient behavior through the use of tenant guidelines, green purchasing policies (e.g., for appliances) and or green leases. This increased attention to operations requires a sustained focus and expertise on the part of the building management staff, but it is a critical aspect of achieving ZNE performance.

Resources for more information:

California Public Utilities Commission
www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Zero+Net+Energy+Buildings.htm

New Buildings Institute ZNE Resources
<http://newbuildings.org/zero-net-energy-resources>