



ZERO NET ENERGY BUILDINGS

Zero Net Energy (ZNE) buildings combine renewable energy technologies and energy efficiency measures to minimize greenhouse gas emissions and improve the resiliency of our built environment.

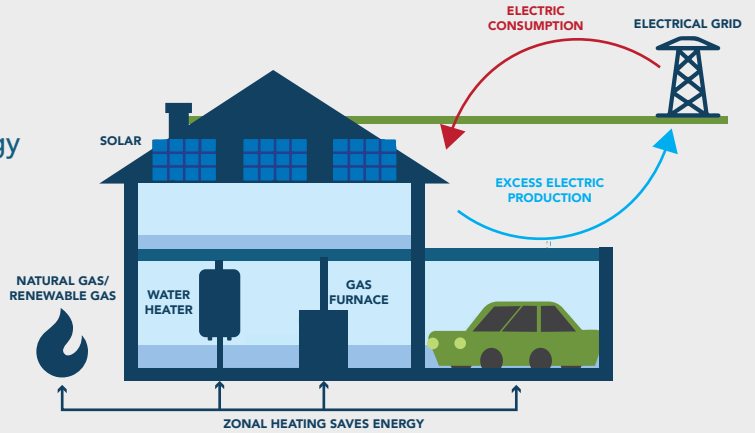


ZERO NET ENERGY HOMES

For a building to be classified as ZNE, it should produce enough renewable energy to offset the amount of energy that it consumes over the course of a year.



The global zero net energy buildings market is estimated to reach \$47.4 billion by 2026¹



WHAT ROLE CAN NATURAL GAS PLAY IN ZERO NET ENERGY BUILDINGS?

Efficient natural gas systems can be used in ZNE buildings, but the emissions associated with their combustion must be offset by onsite renewable energy production. For this reason, it is critical that natural gas systems in ZNE buildings be highly efficient to minimize the amount of non-renewable energy used. Renewable gas can also be used to further reduce emissions.

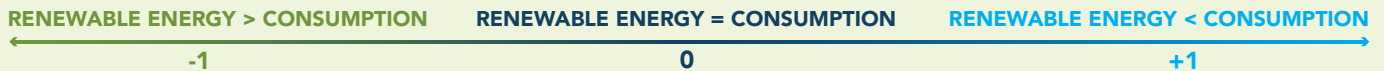


CHP systems have fuel efficiencies of around 80% compared to 52% for separate heat and power systems.²



ZERO NET ENERGY BUILDING CERTIFICATION

One way to meet certification is through the U.S. Green Building Council's LEED Zero certification. The LEED Zero certification requires that a building offsets its source energy using on-site renewable or through carbon offsets. ZNE certifications for residential buildings often factor in a Home Energy Rating System (HERS) score, which is determined by a nationally recognized system that assesses features like its building envelope and HVAC system to evaluate the home's energy performance.



HOW TO ACHIEVE ZERO NET ENERGY IN BUILDINGS

ZNE buildings often consume electricity from the utility grid, produce their own electricity via on-site renewable energy, and return any surplus renewable energy to the grid to be used by other buildings.

SOME FEATURES OF ZNE BUILDINGS INCLUDE:³

- EXTERIOR WALL INSULATION AND AIR SEALING
- RENEWABLE THERMAL AND SOLAR ENERGY
- DAYLIGHTING
- MONITORING PLUG LOADS WITH METERS
- GROUND-SOURCE HEAT PUMPS
- HIGHLY EFFICIENT ENERGY STAR APPLIANCES

1. Global Industry Analysts, Net-Zero Energy Buildings-Global Market Trajectory & Analytics, 2022
2. U.S. EPA, CHP Benefits, 2022
3. Whole Building Design Guide, Net Zero Energy Buildings, 2016