

# 2016

list of zero  
net energy  
buildings





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Cover: West Elevation of ZNE Emerging VanDusen Botanical Garden Visitor Centre | Vancouver, British Columbia  
 Above: Green Roof of ZNE Emerging VanDusen Botanical Garden Visitor Centre | Vancouver, British Columbia  
 Photos: Nic Lehoux / Architect: Perkins+Will

## Introduction

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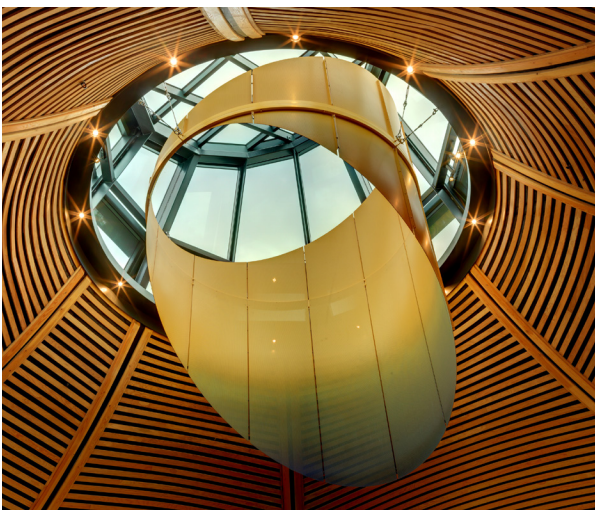
ZNE buildings are no longer solely demonstration projects and market outliers owned by public entities. Today's list includes a wide-range of mainstream building types and ownership that reflect a more universal trend of ZNE adoption.

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When a topic grows in importance so does the vocabulary associated with it. By that measure buildings with very low energy use and onsite renewables, and their utility grid interactions, are the hottest topics in our industry. The terminology and dialog around these buildings has exploded since we began our research on zero net energy (ZNE) buildings in 2009 and published our leading reports and lists in 2012 and 2014. NBI has engaged in nearly every facet of these discussions and debates, from government to designers to owners. And while the terminology and definitions vary by entity and organization, from zero net energy to net zero energy to zero energy buildings to zero net carbon buildings to living buildings, they share a common objective—to reduce environmental impacts associated with energy use in buildings.

**Getting to Zero** has been the moniker for this list and NBI's efforts to increase the presence of ZNE buildings. Today, what was a path to get to zero is now a clearly achieved route and destination for buildings of all types, sizes and climates. As the *2016 Getting to Zero List* shows, ZNE buildings are no longer solely demonstration projects and market outliers owned by public entities. Today's list includes a wide-range of mainstream building types and ownership that reflect a more universal trend of ZNE adoption. This list publication includes data and graphics on various trends in ZNE buildings.

To be on the list, a project—building or district—must have a target or outcome of ultra-low energy use that can be supplied through onsite renewable generation over the course of the year. The almost 400 buildings on our list are rigorously vetted for accuracy of their energy target and actual outcomes when performance data becomes available. The terms we use for buildings at various stages of **Getting to Zero** are identified below, and while many have not yet accomplished 12 consecutive months at or beyond ZNE performance, it is highly valuable to recognize their objective. This emerging set of buildings is a mirror to the market and will impact others to catch up to today's best practices.



Inside view of oculus of ZNE Emerging VanDusen Botanical Garden Visitor Centre  
Photo: Kent Kalberg  
Courtesy: Vancouver Parks Board

With the consensus and support of over 190 nations across the globe, the recent Paris agreement (COP21) provides new-found hope and commitment to reduce greenhouse gas emissions. The building sector offers the best near-term solution to combat climate change and market actors and policies are lining up to drive action. As the force of these factors increases, so will the size of our list and the pressure for ZNE to become an industry standard. ZNE as the next generation of code is happening now in Washington State, California and New York, and being considered in national model codes like ASHRAE standards and the International Energy Conservation Code. Yet the majority of locales still lack advanced energy codes<sup>1</sup> and examples of ZNE buildings. Those of you looking at this list are the change agents. This list is just a small sample of the tools and examples available to you to be a champion for buildings to **Get to Zero**.

Tap the strong information and resources of NBI and others to support your efforts to influence owners, occupants, design teams, government and your colleagues to go further and faster on the path to ZNE. We are now defining the future of the built environment and that future we believe is ZNE.

<sup>1</sup> The Building Codes Assistance Project tracks energy code adoption by state: <http://bcapcodes.org/code-status>.

## Definitions

Zero Net Energy (ZNE) Buildings are buildings with greatly reduced energy loads such that, totaled over a year, 100% of the building's energy use can be met with onsite renewable energy technologies. In this report "ZNE buildings" includes ZNE Verified Buildings, ZNE Emerging Buildings, and ZNE Districts.

- **Zero Net Energy Verified Buildings** have achieved ZNE for at least one full year. The total consumption of energy, from all sources, has been fully balanced by onsite renewable energy generation on an annual basis. NBI has verified performance data.
- **Zero Net Energy Emerging Buildings** have publically stated a goal of reaching ZNE but have not yet demonstrated achievement of that goal. These buildings may be in the planning or design phase, under construction, or have been in operation for less than 12 months. Others may have been operating for at least a year, but their measured energy either has yet to achieve ZNE, or the measured data to document ZNE performance was not available.
- **ZNE Districts** are groups of buildings such as a city district, community or campus with a stated goal of ZNE. They might be Verified or Emerging according to the definitions above and are counted as a single project for purposes of this study. The quantity of buildings in the districts was not known for this report.
- **Ultra-Low Energy Verified Buildings** have demonstrated significant technical progress toward goals of energy use reduction, even though they may not have pursued a ZNE energy path by investing in on-site renewables. The annual base (gross) energy consumption (including all sources: both energy delivered to the building and renewable energy produced onsite) must be lower than certain targets. The target is based on a Zero Energy Performance Index (zEPI)<sup>2</sup> score; the corresponding target EUI values vary by building type and climate zone. For buildings first occupied between 2015 and 2020, the target is based on a zEPI score of 39. This zEPI target level is 30% higher than the 2030 Challenge<sup>3</sup> energy performance targets in effect from 2015 to 2020. For more information see our **Getting to Zero FAQs**<sup>4</sup>.

## Introducing zEPI: A Simple, Versatile Scale for Measuring Commercial Building Energy Performance

The Zero Energy Performance Index (zEPI) scale represents a fundamental shift in measurement of building efficiency. zEPI sets energy targets for actual energy consumption rather than using a predictive energy model of building energy performance to calculate a "percent better than code" metric.

zEPI is calculated using a building's energy use intensity (EUI) and is adjusted based on building type and climate. zEPI is also the measure by which a building's energy efficiency is calculated once operational and occupied based on measured energy use data.

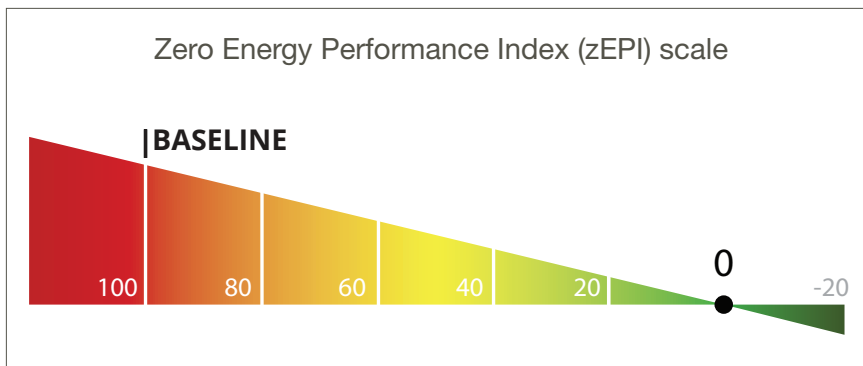
zEPI was created to address confusion caused by comparing the energy efficiency of buildings by referencing an ambiguous "percent savings beyond code."

<sup>2</sup> zEPI provides a scale for measuring commercial building energy performance and ranks a building's energy usage on a scale from 100 (average energy usage in the year 2000, based on the Commercial Buildings Energy Consumption Survey published in 2003) to 0 (net zero energy). A lower zEPI score indicates lower energy consumption. For more information on zEPI, including how to calculate scores, refer to: <http://newbuildings.org/zero-energy-performance-index-zepi>

<sup>3</sup> 2030 Challenge: [http://architecture2030.org/2030\\_challenges/2030-challenge](http://architecture2030.org/2030_challenges/2030-challenge)

<sup>4</sup> Accessible at <http://newbuildings.org/getting-to-zero-database-faqs>





zEPI sets a constant goal of ZNE and shifts the conversation from percent better than code to an index leading to zero, which is the kind of market shift that is required for buildings to achieve wide-scale ZNE and exemplary energy performance. One noteworthy function of the zEPI scale is that it allows key energy milestones including individual project consumption and energy policies to all be represented on one scale. It permits direct comparisons in order to

Fig. 1. zEPI: a simple metric for measuring building energy performance on the path to zero understand the relative performance of each of these elements in measurement of energy performance.

## Getting to Zero Update

The count of ZNE buildings has grown considerably since NBI's last published list in 2015. The total as of September 2016 is 53 ZNE Verified buildings, 279 ZNE Emerging buildings, and 62 Ultra-Low Energy (ULE) Verified buildings, with new buildings being added every month. The total count in 2015 was 191 (39 ZNE Verified and 152 ZNE Emerging). The total ZNE building population tracked by NBI has grown by 74% since just last year! By far, the largest growth is in the ZNE Emerging category. This influx of new projects setting these lofty goals is a reflection of both recent policy implementation and market effects of ZNE going more mainstream. Several states and cities have set aggressive targets for building energy use, which have encouraged architects and engineers to design for zero.

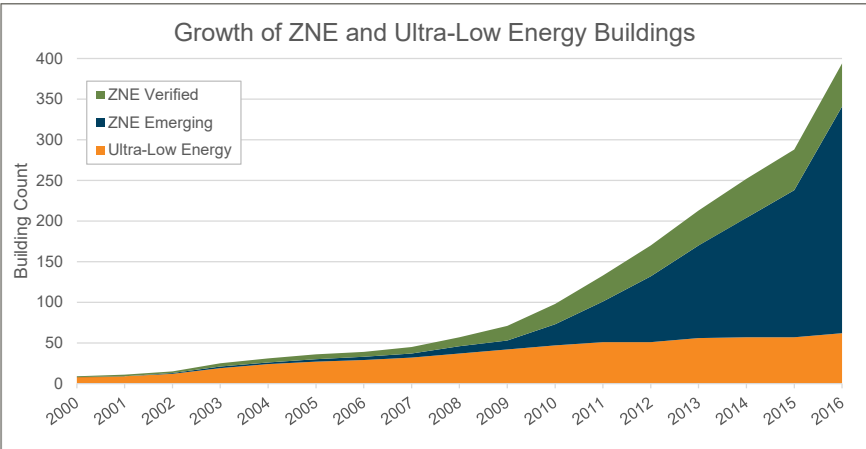
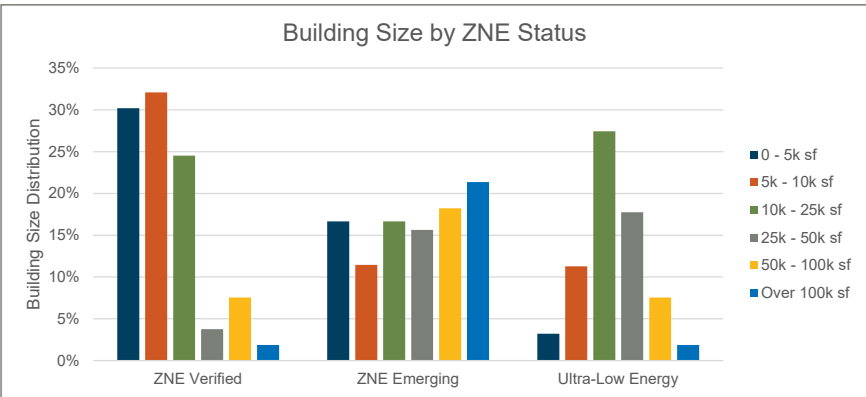


Fig. 2. (above) The total ZNE buildings population tracked by NBI has grown 74% since 2015.

Fig. 3. (below) ZNE Emerging projects shows a growing diversity of building size.



## Building Size

ZNE buildings are being built across a range of sizes. In the early days of ZNE most projects were small, demonstration-scale buildings, but today large buildings are represented, too.

The great majority (nearly 80%) of ZNE Verified buildings are smaller than 25,000 square feet. However, the ZNE Emerging category—which includes both new buildings and buildings that have not yet achieved ZNE—is more evenly distributed in building size. This suggests that not only are more diverse projects pursuing ZNE, but that large ZNE buildings are coming into the market following the growth of successful ULE energy buildings larger than 50,000 square feet.

## Building Type

ZNE Buildings can be found across nearly all building types. Even high-intensity building types such as hospitals and restaurants are finding innovative ways to pursue ZNE. As in years past, the most common building type in 2016 is education. This includes K-12 schools, higher education, and general education

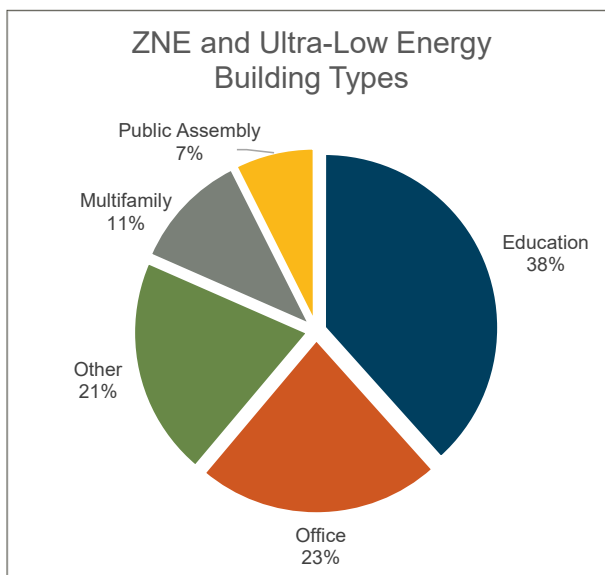


Fig 4. Educational buildings continue to lead the ZNE market with 38% of projects.

buildings. Schools continue to have the largest share of ZNE Verified buildings due to the early adoption of ZNE design by some public school districts, but also make up the largest share of ZNE Emerging buildings. That suggests that this trend will continue. Offices, another common ZNE building type, make up nearly a quarter of all buildings in the list. The building type distribution is broadly consistent across ZNE Verified, ZNE Emerging, and Ultra-Low Energy buildings.

## Building Locations

Tracked zero net energy projects, emerging and verified, are occurring in nearly all states in the U.S. and in parts of Canada.

California is by the far the front-runner in ZNE activity, with the San Diego and Los Angeles areas being the densest clusters in the state. San Francisco and the surrounding municipalities create another large cluster, followed by Portland, Oregon, and the north Atlantic coast.

The top five states for ZNE buildings account for 56% of all ZNE buildings across the U.S. and Canada. California energy policies and ambitious energy reduction goals are clearly driving a rapid uptake in

State	Ultralow Verified	ZNE Emerging	ZNE Verified	Grand Total
CA	17	119	18	154
OR	4	14	2	20
NY	0	11	3	14
MA	3	11	0	14
FL	2	6	5	13

zero net energy buildings. The north Atlantic coast also has six states ranked in the top 10 of the 2015 ACEEE State Energy Efficiency Scorecard (the west coast occupies three of the remaining four ranks). This suggests that advanced energy efficiency policies are helping propel zero net energy buildings in these leading states.

## Zero Net Energy School Sandy Grove Middle School | Lumber Bridge, NC



**Building Size:** 76,000 SF  
**Construction Type:** New  
**Construction Year:** 2013  
**Building Type:** K-12 Education  
**ASHRAE Climate Zone:** 3A

After struggling to meet the operational budget with its proposed average school design, Sandy Grove Middle School and SfL+a Architects developed a new strategy: ZNE design. Photovoltaic panels on the roof and unique tree-like photovoltaic sculptures generate 30% more energy than the building uses each year. Careful commissioning reduced energy demand by 40% and consumption by 20%, particularly during peak demand hours. Along with an energy-efficient design, these savings result in an estimated energy cost savings of \$16 million over 40 years.

The building consists of three wings of eight classrooms, a dining hall and kitchen, gymnasium, technology rooms, science labs and a kiln. A building dashboard reports energy consumption for each grade level's wing of the school. Teachers encourage students to use the dashboard to monitor their behavior and compete with other grades to conserve energy, as well as share the online dashboard with their families to facilitate discussion about energy-reducing behaviors. The building and dashboard also inspired the 20 hours of sustainability education which teachers now incorporate into their classes each year.

Sandy Grove Middle School not only engages its 650 students in sustainability but also provides a healthy learning environment for them. Students benefit from good daylighting and thermal comfort – each classroom features a large window supplemented by efficient LED lights, as well as an adjustable thermostat that allows for a four degree temperature range to reduce frequent cycling of the HVAC system. These thermostats connect to an efficient geothermal heat pump system to manage heating and cooling loads. When local temperature setpoints are met, the heat pumps cycle off and a separate dedicated outdoor air system delivers neutral air to the space in response to CO<sub>2</sub> sensors that monitor air quality. The building is detailed to optimize air-tightness, with particular attention given to the roof to wall connection as well as windows and doors.

# ZNE Building Locations in North America

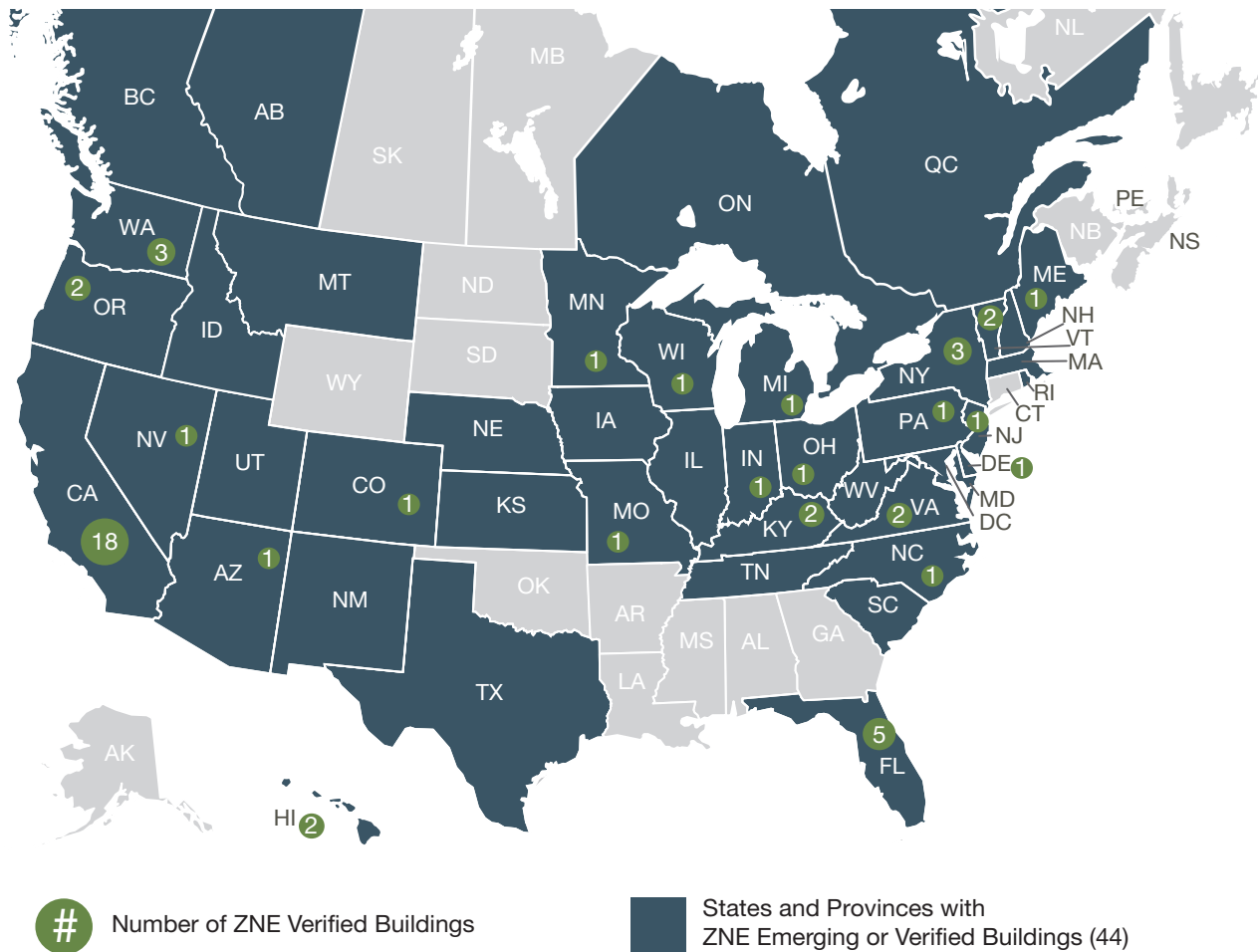


Fig. 5. ZNE projects can be found across North America in a growing number of building types and climates.

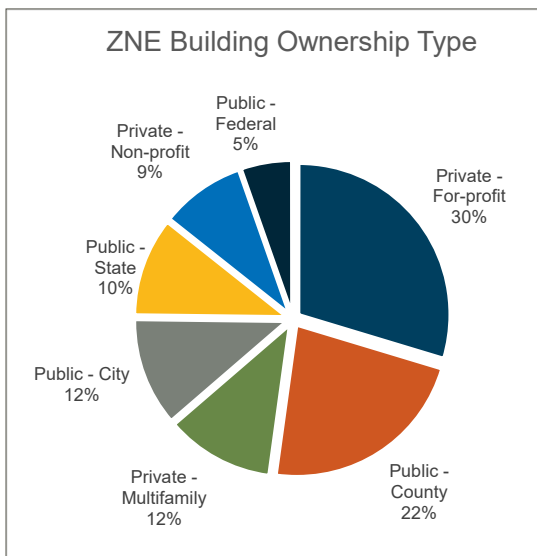


Fig. 6. Private ownership of ZNE projects has doubled in two years now comprising 50% of all buildings.

## Building Ownership

Evaluating building ownership patterns as they relate to public and private organizations reveals that ZNE buildings are being adopted more quickly for specific building types. Public and private organizations each own roughly 50% of ZNE buildings. In our *2014 Getting to Zero Status Update* we noted that only one-quarter of all ZNE buildings were privately owned. That proportion has nearly doubled in two years—an encouraging trend.

The majority of building types that are owned by private, for-profit organizations are offices and private schools. Offices represent 50% of all for-profit-owned sites while private schools represent 20% of sites. The remaining 30% varies but is mostly composed of retail services and lodging.

Publicly owned ZNE buildings are mostly composed of educational facilities (64% of all publicly owned sites). At the county level, K-12 education represents 74% of all county-owned facilities. Higher education sites are the majority of state-owned facilities at 64%. The remaining sites at the state level are public assembly and offices; typically government offices, visitor centers, museums and zoo buildings.

## Common Technologies

The ZNE building dataset reflects a trend in technology utilization that is fairly unique to high performance buildings—the application of multiple or ‘layered’

### Characterizing Monitoring and Control System in Zero Net Energy (ZNE) Buildings

This commercial building research project was conducted by New Buildings Institute and led by the Continental Automated Buildings Association (CABA). The objective was to characterize monitoring and control systems in zero net energy (ZNE) buildings focused on three key areas from the designer and user experience: The Design, Selection and the System, The Energy Impact, and The Use and User Experience.

The research approach was based on utilization of existing lists of ZNE buildings in the NBI Getting to Zero Database and the findings in the *2014 Getting to Zero Status Update*. The final

research sample included design team surveys of 23 buildings, operator surveys of six buildings, and 130 occupant surveys from seven buildings.



### Conclusions

- Controls are at the Nexus of Performance
- There are Solutions in New Roles and Old Relationships
- Zero Net Energy is Driven by Good Design, High Performance Systems and Shading
- Occupants are the New Operator
- Industry Game Changers Include Integration, Engagement and a New Utility World

Download the report at:  
[newbuildings.org/zne-controls-report/](http://newbuildings.org/zne-controls-report/)

systems to achieve optimum HVAC efficiency. As found in the recent ASHRAE assessment of 90 case studies of high performance buildings<sup>5</sup> 82% of their case studies reviewed have more than one HVAC system with over half having more than three different systems working together. This means there is not a single winning technology but rather increased applications and combinations of HVAC methods that dominate these buildings. In addition to utilizing traditional VAV and air-source heat pumps, these buildings have a high ratio of ground source heat pumps, radiant heating and cooling, dedicated outside air systems (due to separation of thermal conditioning from ventilation), natural ventilation, and both direct and indirect evaporative cooling.

### Lighting

Electric lighting in these ZNE buildings is commonly controlled through a triage approach: a) occupancy, b) hours, and c) daylighting presence. Lights are off when space is empty and always secondary to daylighting to meet visual needs. Lamp types vary widely by space and the full use of LEDs is still nascent, even in this advanced group of buildings, but LEDs are certainly emerging as an increasing part of design. As lighting load decreases due to the increase efficiency of the lamp/ballast technologies and the reduction in operating time due to controls, the importance of the occupant-driven roles in getting to zero increase and dominate the proportion of energy use.

### Plug Loads

Plug and miscellaneous electric loads (MELs) management is a common strategy for most ZNE building designers and operators. At the design stage, some buildings apply embedded plug load controls at the outlet and in operations. NBI found in recent research into controls in ZNE buildings (see sidebar) that almost 65% of ZNE buildings are addressing plug loads through these methods: software (power management at the device or through the network), hardware (plug strips, sensors, controls), and/or people (prompts, campaigns, displays and competitions).

### Metering

You can't manage what you don't measure. It is critical that projects install energy metering equipment and track how much energy their building consumes, not just the net-metered running total. Whole-building submetering is the gold standard and is a key strategy in some of the most successful ZNE buildings.

<sup>5</sup> ASHRAE *High Performance Magazine*, Fall 2016



## Policy Driving ZNE Buildings

Policy goals have been a primary driver for ZNE. This section describes some of the key policy drivers for ZNE buildings today.

### Federal Policy

Building policies for the federal government and within agencies have made large strides in acknowledging and working towards ZNE facilities. President Obama's Executive Order 13693 signed on March 15, 2015 ordered the federal government to: *Achieve energy net zero (and water or waste net zero, where feasible) by FY 2030 in all new construction of federal buildings greater than 5,000 gross square feet that enter the planning process in FY 2020 or later.*

The Government Services Administration (GSA) has already completed several successful new construction and retrofit projects and is increasing its emphasis on the ZNE Challenge going forward. The U.S. Army has adopted ZNE objectives at its facilities worldwide for both environmental and readiness purposes. The Army's approach embraces reducing overall energy use, implementing energy recovery & cogeneration, and then meeting the remaining demand with the production of renewable energy from on-site sources.

### National Model Codes – ASHRAE 90.1 and IECC

ASHRAE's Board of Directors has approved energy use targets for its code-intended standards that achieve ZNE in 2031 and the International Energy Conservation Code (IECC) is tracking a path to ZNE by 2050. Both the IECC

## Zero Net Energy Multifamily zHome | Issaquah, WA



**Building Size:** 13,400 SF  
**Construction Type:** New  
**Construction Year:** 2011  
**Building Type:** Multifamily  
**ASHRAE Climate Zone:** 4C  
**Number of Units:** 10

When the City of Issaquah first conceptualized zHome it immediately took on the challenge of developing the first ZNE multifamily project in the country. The project team recognized that production homes are a common new construction type and aimed to create a widely replicable, affordable ZNE model. This proved a success, with dozens of multifamily projects currently pursuing or having achieved ZNE since zHome was completed. A key element was the clear goals established early on in the design phase, which were achieved through an integrated design process involving architect, builder, engineer, owner and the public.

Unpredictable tenant behavior led to difficulties in modeling building energy use, as is often the case in multifamily projects. To address this, the design team focused its efforts on energy conservation. The effects of occupant behavior were mitigated through daylighting and LED lighting, high-performance appliances, efficient insulation and tight framing, passive ventilation, ground-source heat pumps for heating and hot water, and smart switches to eliminate standby power loads. Occupants are educated in sustainable behaviors and can track their progress using energy feedback monitors. Many occupants have decreased their energy consumption since move-in by refining their energy-saving habits. With collaboration from the design team and occupants, zHome uses 78% less energy than the city average for homes. Photovoltaic systems individually sized to each unit cover most available roof area and produce enough energy to completely offset energy consumption.



Top: zHomes Exterior  
Bottom: zHomes Interior  
Images Courtesy: Ichijo USA

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ZNE policies and regulations are now being implemented at an increasing pace across North America and beyond.

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model codes and ASHRAE 90.1 have made significant inroads toward those goals in the past 15 years. However, there are no mandates that these ZNE goals be achieved in model codes, and reaching national consensus on how to achieve these goals will likely be challenging.

### State and Local Policies

States and cities are taking the lead on implementing mandatory ZNE policies. The State of California was the first major jurisdiction in the U.S. to set policy goals favoring ZNE and remains a leader in ZNE policy. Washington State has emerged more recently as the only state to have successfully set targets and passed ZNE legislation (in the Washington State energy code). Other state-level leaders in ZNE policy, such as New York, Massachusetts, Vermont and California, have developed code roadmaps to set long-term goals for ZNE via updated energy codes and are engaging utilities and incentive programs to align with these goals. The California Public Utilities Commission and other regulators have begun to acknowledge these goals when evaluating utility incentive programs to achieve ZNE policy objectives.

These leading jurisdictions are prime examples of the positive trend toward ZNE policies being more widely adopted. More and more states, provinces and especially cities are undertaking efforts to implement ZNE roadmaps and regulations.

### Conclusion

Clearly zero net energy buildings are a fast-growing trend today. Since NBI began tracking ZNE buildings in 2009 there has been dramatic growth in this trend across North America, with successful ZNE buildings in every climate zone in the continental U.S. and a wide variety of building types and sizes represented. The

movement has come a long way since the original demonstration-scale educational buildings and ZNE is now growing with private sector adoption. Investors have started constructing speculative offices and other buildings to take advantage of the market advantages conferred by the ZNE cachet. Policy goals have been adopted in leading cities and states across the continent. The World Green Building Council is embarking on a certification program with nine member countries. The combination of these market and policy drivers is bringing ZNE into the mainstream.

It has been said, “that which exists must be possible,” and this list of leading projects shows that ZNE buildings can, and should, be a core component of climate and energy policies and best practice for building design and construction going forward.

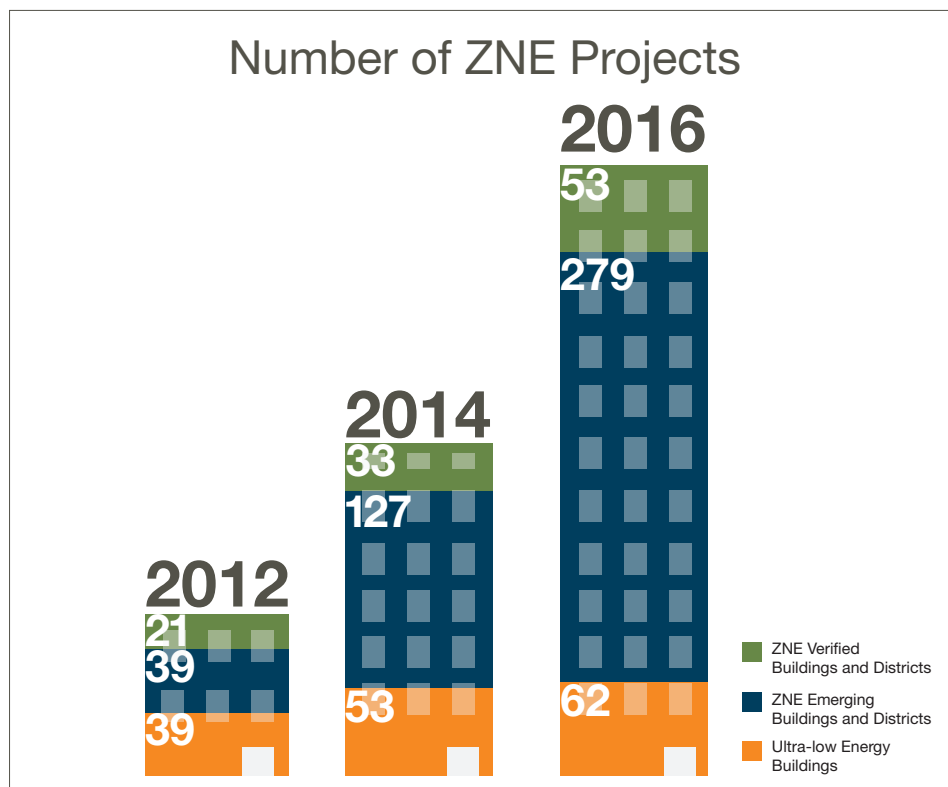


Fig 7. While still a nascent market, growth in ZNE projects is notable.

# 2016 List of Zero Energy Buildings

## ZNE Verified Buildings

Zero Net Energy Verified Buildings have achieved ZNE for at least one full year. The total consumption of energy, from all sources, has been fully balanced by onsite renewable energy generation on an annual basis. NBI has verified performance data.

Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2000	Oberlin College Lewis Center	Oberlin	OH	Education	13,600	31.4	98.8	36.9	116.2	-5.5	-17.4	-5
2001	Environmental Tech. Center Sonoma State	Rohnert Park	CA	Education	2,200	2.3	7.3	3.8	11.9	-1.5	-4.6	-2
2003	Audubon Center at Debs Park (off grid)	Los Angeles	CA	Other	5,020	17.1	53.9	17.1	53.9	0.0	0	0
	Science House	St. Paul	MN	Other	1,532	18.0	56.7	18.0	56.7	0.0	0	0
2004	Challengers Tennis Club	Los Angeles	CA	Other	3,500	9.0	28.4	9.0	28.4	0.0	0	0
2005	Hawaii Gateway Energy Center	Kailua-Kona	HI	Other	5,600	28.0	88.2	31.0	97.7	-3.0	-9.5	-4
2007	Aldo Leopold Legacy Center	Baraboo	WI	Office	11,900	16.0	50.4	18.0	56.7	-2.0	-6.3	-2
	IDeAs Z2 Design Facility <sup>L</sup>	San Jose	CA	Office <sup>R</sup>	6,557	22.6	71.2	23.2	73	-0.6	-1.8	-1
2008	Camden Friends Meeting Social Hall	Camden	DE	Public Assembly	3,121	17.9	56.3	19.7	62	-1.8	-5.7	-2
	Environmental Nature Center	Newport Beach	CA	Public Assembly	8,535	17.6	55.4	27.7	87.3	-10.1	-31.9	-12
	Hudson Valley Clean Energy HQ	Rhinebeck	NY	Other	5,470	9.8	30.7	10.4	32.6	-0.6	-1.9	-1
2009	Bacon St. Offices	San Diego	CA	Office <sup>R</sup>	4,500	12.7	40	22.2	69.9	-9.5	-29.9	-13
	Chrisney Library	Chrisney	IN	Public Assembly	2,413	16.7	52.6	17.4	55	-0.8	-2.4	-1
	Living Learning Center at Tyson Research Center <sup>L</sup>	Eureka	MO	Education	2,968	24.5	77.1	26.4	83.2	-1.9	-6.1	-2
	Omega Center for Sustainable Living	Rhinebeck	NY	Other	6,200	13.2	41.6	21.5	67.6	-8.3	-26	-7
	Pringle Creek Painter's Hall	Salem	OR	Public Assembly <sup>R</sup>	3,595	11.1	35	15.4	48.4	-4.3	-13.4	-5
	Putney Field House	Putney	VT	Education	16,800	9.7	30.6	10.4	32.9	-0.7	-2.3	-1
	Watsonville Water Resources Center Admin Building	Watsonville	CA	Office	16,000	51.4	161.9	117.8	371.1	-66.4	-209.2	-101
2010	Bertschi School Science Wing	Seattle	WA	Education	1,425	48.0	151.2	48.4	152.5	-0.4	-1.3	0
	Dovetail Construction HQ Barn	Richmond	VA	Office <sup>R</sup>	6,800	UA	UA	UA	UA	0.0	0.0	0
	DPR Construction San Diego Net Zero Office	San Diego	CA	Office <sup>R</sup>	24,000	14.8	46.1	17.1	53.9	-2.4	-7.8	-3
	Energy Lab at Hawaii Preparatory Academy <sup>L</sup>	Kamuela	HI	Education	5,902	11.0	34.8	28.0	88.2	-17.0	-53.4	-15
	Hood River Middle School Net-Zero Addition <sup>L</sup>	Hood River	OR	Education	5,331	26.8	84.3	27.1	85.4	-0.4	-1.1	0
	NREL Research Support Facility	Golden	CO	Office	222,000	46.1	145.2	46.1	145.2	0.0	0.0	0
	Richardsville Elementary School	Bowling Green	KY	Education	72,285	19.0	59.9	21.6	68	-2.6	-8.1	-3
	Anna Maria Historic Green Village	Anna Maria	FL	Mixed Use <sup>R</sup>	District	28.2	88.8	34.8	109.6	-6.6	-20.8	-7
	<i>Coastal Maine Botanical Gardens Bosarge Family Education Center</i>	Boothbay	ME	Education	8,200	19.2	60.3	23.5	73.9	-4.3	-13.6	-4

L- Building is either Living Building Certified or Net Zero Energy Certified by the International Living Future Institute

R-Indicates a retrofit project

Buildings in ***Bold Italics*** are new to the list



Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2011	<i>Diamond X Ranch Student Intern Center-Malibu</i>	Calabasas	CA	Other	3,500	31.5	99.3	35.1	110.5	-3.6	-11.2	-4
	<i>EcoCenter at Heron's Head Park (off grid)</i>	San Francisco	CA	Education	2,400	UA	UA	UA	UA	0.0	0.0	0
	<i>Locust Trace AgriScience Campus (High School)</i>	Lexington	KY	Education	70,000	9.9	31	10.6	33.3	-0.7	-2.3	-1
	TD Bank Branch	Fort Lauderdale	FL	Office	3,970	91.8	289.3	95.6	301.1	-3.8	-11.8	-4
	zHome - Issaquah <sup>L</sup>	Issaquah	WA	Multifamily	5,813	21.0	66.2	22.0	69.3	-1.0	-3.1	-2
2012	Bullitt Foundation Cascadia Center for Sustainable Design and Construction <sup>L</sup>	Seattle	WA	Office	51,800	9.7	30.6	16.6	52.4	-6.9	-21.8	-10
	David and Lucile Packard Foundation	Los Altos	CA	Office	49,161	24.4	76.8	29.0	91.4	-4.6	-14.6	-7
	DPR Construction Phoenix Net Zero Office <sup>L</sup>	Phoenix	AZ	Office <sup>R</sup>	16,533	26.8	84.3	29.5	92.9	-2.7	-8.6	-3
	Leon County Cooperative Extension	Tallahassee	FL	Office <sup>R</sup>	13,000	19.4	61.1	19.6	61.7	-0.2	-0.6	0
	<i>Phipps Center for Sustainable Landscapes</i> <sup>L</sup>	Pittsburgh	PA	Public Assembly	24,350	18.2	57.3	18.7	58.8	-0.5	-1.5	0
	Sacred Heart Schools Stevens Family Library <sup>L</sup>	Atherton	CA	Education	6,300	16.9	53.2	29.1	91.7	-12.2	-38.5	-15
2013	<i>IBEW Local 595 Zero Net Energy Center</i>	San Leandro	CA	Education	45,001	15.0	47.3	21.0	66.2	-6.0	-18.9	-7
	<i>Lenawee Intermediate School District Center for a Sustainable Future</i>	Adrian Township	MI	Education	8,750	7.7	24.3	10.1	31.8	-2.4	-7.5	-2
	<i>PNC Net-Zero Branch</i> <sup>L</sup>	Ft Lauderdale	FL	Mercantile (Enclosed and Strip Malls)	4,900	59.1	186.0	64.4	203.0	-5.4	-16.9	-5
	Sandy Grove Middle School	Lumber Bridge	NC	Education	74,000	20.6	64.9	35.7	112.6	-15.1	-47.7	-15
	West Berkeley Public Library	Berkeley	CA	Public Assembly	9,399	21.7	68.3	25.5	80.4	-3.8	-12.1	-5
2014	<i>Brock Environmental Center</i> <sup>L</sup>	Virginia Beach	VA	Education	10,500	14.6	45.9	28.6	90.1	-14.0	-44.2	-14
	<i>DPR San Francisco Office</i> <sup>L</sup>	San Francisco	CA	Office <sup>R</sup>	24,010	144.1	453.9	147.5	464.7	-3.4	-10.8	-5
	<i>Jess Jackson Sustainable Winery Building</i>	Davis	CA	Warehouse and Storage	8,500	1.4	4.4	2.7	8.5	-1.3	-4.1	-5
	<i>Pahranagat National Wildlife Refuge Administrative Office and Visitor Contact Station</i>	Alamo	NV	Public Assembly	5,000	27.8	87.7	39.9	125.5	-12.0	-37.8	-12
	<i>Willow School</i>	Gladstone	NJ	Education	20,000	21.8	68.8	35.0	110.2	-13.1	-41.4	-12
2015	<i>231 Main Street</i>	New Paltz	NY	Office	5,400	45.2	142.3	52.6	165.8	-7.5	-23.5	-9
	<i>AP+I Design</i>	Mountain View	CA	Office	14,300	17.9	56.3	18.4	57.8	-0.5	-1.5	-1
	<i>DMV Fresno Field Office</i>	Fresno	CA	Public Assembly	19,908	12.4	39	19.9	62.7	-7.5	-23.7	-9
	<i>Maclay Architects' Office</i>	Waitsfield	VT	Office	2,568	22.1	69.5	25.0	78.6	-2.9	-9.1	-3
	<i>Suncoast Credit Union</i>	Bushnell	FL	Office	3,743	6.8	21.4	8.4	26.5	-1.6	-5.1	-2

L- Building is either Living Building Certified or Net Zero Energy Certified by the International Living Future Institute

R-Indicates a retrofit project

Buildings in ***Bold Italics*** are new to the list

# ZNE Emerging Buildings

Zero Net Energy Emerging Buildings have publicly stated a goal of reaching ZNE but have not yet demonstrated achievement of that goal. These buildings may be in the planning or design phase, under construction, or have been in operation for less than 12 months. Others may have been operating for at least a year, but their measured energy either has yet to achieve ZNE, or the measured data to document ZNE performance was not available.

Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2002	NREL Wind Site Entrance Building (SEB)	Golden	CO	Other	160	70.3	221.3	24.0	75.7	46.2	145.6	45
2003	<b>Woods Hole Research Center</b>	Falmouth	MA	Office	19,200	16.0	50.4	5.0	15.8	11.0	34.6	13
2005	Melink Corporation Headquarters	Milford	OH	Office	30,000	12.2	38.3	5.4	16.9	6.8	21.4	9
2006	<b>Prospect Sierra Founders Art Center</b>	El Cerrito	CA	Education	5,000							
2007	Prairie Hill Learning Center	Roca	NE	Education	2,940							
2008	Aquarium of the Pacific Watershed Addition	Long Beach	CA	Education	2,500							
	Bagatelos Architectural Glass Solutions	Sacramento	CA	Warehouse and Storage	63,000	10.4	32.8	8.1	25.5	2.3	7.3	9
	Mills River Elementary School	Mills River	NC	Education	80,820	30.4	95.8	0.0	0	30.4	95.8	30
	<b>Woodburn Success High School</b>	Woodburn	OR	Education								
2009	da Vinci School High Performance Classroom	Portland	OR	Education	1,485	27.1	85.4	25.0	78.8	2.1	6.6	2
	Oak Ridge National Lab Office Building 3156	Oak Ridge	TN	Office	6,900							
2010	Bagley Classroom University of Minnesota Duluth	Duluth	MN	Education	2,000							
	Center for Energy Efficient Design	Rocky Mount	VA	Education	3,600							
	Charlotte-Douglas Airport - Fire Rescue and Fire Facility	Charlotte	NC	Public Order and Safety								
	Evie Garrett Dennis E12 Campus (Denver Schools)	Denver	CO	Education	184,769	99.0	311.9	71.0	223.7	28.0	88.2	29
	<b>Green Phoenix Learning Center</b>	Phoenix	AZ	Education								
	Greensburg Kansas Net Zero Community	Greensburg	KS	Multifamily	District							
	Harmony House for Cats	Chicago	IL	Other	7,095	50.0	157.5			50.0		43
	Lowell Trial Court	Lowell	MA	Other	245,000							
	Magnify Credit Union	Lakeland	FL	Mercantile (Enclosed and Strip Malls)	4,151	75.0	236.3	68.0	214.2	7.0	22.1	7
	<b>MEC Aviation Campus</b>	Glendale	AZ	Education	85,000	99.0	311.9	69.0	217.4	30.0	94.5	31
	<b>New Bristow Elementary School</b>	Bowling Green	KY	Education	79,817	23.8	75	0.0	0	23.8	75	23
	New Century Elementary School	Fayetteville	NC	Education	109,758							
	Palmetto Bay Municipal Center	Palmetto Bay	FL	Office	25,000							
	<b>The Andrew</b>	New York City	NY	Multifamily								
	Turkey Foot Middle school	Edgewood	KY	Education	133,000	22.0	69.2	11.0	34.7	11.0	34.5	11

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Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2011	<b><i>Broadway High School</i></b>	San Jose	CA	Education								
	<b><i>Butte Glenn Community College</i></b>	Oroville	CA	Education	800,000	38.9	122.6	27.2	85.7	11.7	36.9	13
	Centre for Interactive Research on Sustainability (CIRS)	Vancouver	BC	Education	76,223							
	Desert Research Institute Renewable Energy Experimental Facility	Reno	NV	Other	1,400							
	EcoFlats Building	Portland	OR	Multifamily	19,860							
	Frito-Lay Casa Grande Snack Factory	Casa Grande	AZ	Other	188,000							
	George V Leyva Middle School Admin Bldg - San Jose	San Jose	CA	Office	9,200							
	Glenn York Elementary School	Pearland	TX	Education	96,297							
	<b><i>Highland Chevron ExtraMile Gas Station</i></b>	Beaverton	OR	Mercantile (Retail Other than Mall)	6,000							
	June Key Delta Community Center	Portland	OR	Public Assembly	2,700							
	Lady Bird Johnson Middle School	Irving	TX	Education	152,000							
	McCormick Spice Net Zero Warehouse	Belcamp	MD	Warehouse and Storage	369,000	38.3	120.6	20.0	63	18.3	57.6	50
	<b><i>Mokelumne Watershed Headquarters</i></b>	Campo seco	CA	Office	5,675	10.4	32.8	9.8	30.9	0.6	1.9	1
	<b><i>Mutual Housing at the Highlands</i></b>	Sacramento	CA	Multifamily								
	NASA Propellants Facility at Kennedy Space Center	Titusville	FL	Office	9,540	43.6	137.3	34.0	107.1	9.6	30.2	12
	<b><i>Parris Island Child Development Center</i></b>	Parris Island	SC	Education	25,775	58.0	182.6	58.0	182.6	0.0	0	0
	Pierce College Maintenance & Operations Facility and Net-Zero Central Plant	Los Angeles	CA	Other	42,000	16.0	50.4	8.0	25.2	8.0	25.2	10
	Portland Community College Newberg Center	Newberg	OR	Education	13,000							
	Redding School for the Arts	Redding	CA	Education	77,091	16.0	50.4	8.0	25.2	8.0	25.2	9
	Rice Fergus Miller Office & Studio	Bremerton	WA	Office	39,000	21.0	66.2	3.0	9.5	18.0	56.7	25
2012	Sangre de Cristo PK-12 School	Mosca	CO	Education	8,000	26.0	81.9	0.0	0	26.0	81.9	25
	VanDusen Botanical Garden Visitor Centre	Vancouver	BC	Public Assembly	19,000							
	West Irving Library	Irving	TX	Public Assembly	25,876							
	<b><i>Wilson Air Center - Chattanooga Airport - West Side Aviation Development</i></b>	Chattanooga	TN	Other	9,015							
	Abondance - Montreal Multi-Family Net Zero	Montreal	QC	Multifamily	3,048							
	<b><i>Aster Place</i></b>	Eureka	CA	Multifamily								
	<b><i>Clos du Bois Winery</i></b>	Sonoma	CA	Office								
2012	Colonel Smith Middle School	Fort Huachuca	AZ	Education	88,693							
	Conrad N. Hilton Foundation	Agoura Hills	CA	Office	22,240	22.0	69.3	24.0	75.6	-2.0	-6.3	-3
	<b><i>Fireside Elementary</i></b>	Phoenix	AZ	Education	88,664	51.0	160.7	41.1	129.5	9.9	31.2	10

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						Site	Source	Site	Source	Site	Source	
2012	Franklin Regional Transit Center	Greenfield	MA	Other	24,000							
	<b>High Tech Middle North County</b>	San Diego	CA	Education	27,058							
	Kaupuni Village	Aiea	HI	Multifamily								
	La Valentina North	Sacramento	CA	Multifamily	19,875	31.0	97.7	6.0	18.9	25.0	78.8	39
	Maharishi University of Management Sustainable Living Center	Fairfield	IA	Education	6,900	9.9	31.2	10.4	32.8	-0.5	-1.6	0
	McGrory Glass Facility	Paulsboro	NJ	Warehouse and Storage	108,000							
	Morphosis Architecture Studio	Culver City	CA	Office	11,600	24.0	75.6	20.0	63	4.0	12.6	6
	<b>NASA Sustainability Base</b>	Mountain View	CA	Office	50,000							
	North Shore Community College Health and Student Services Building	Danvers	MA	Education	58,000							
	<b>Orangewood Middle School and Studio Project</b>	Phoenix	AZ	Education								
	Paisano Green Community	El Paso	TX	Multifamily	55,202							
	<b>Plaza Point</b>	Arcata	CA	Multifamily								
	Sail Lofts	Thomaston	ME	Multifamily								
	San Luis National Wildlife Refuge Complex HQ and Visitor Ctr.	Los Banos	CA	Education	16,500							
	Skaneateles Village Hall	Skaneateles	NY	Office	3,723	47.0	148.1	0.0	0	47.0	148.1	57
	Smith College Bechtel Environmental Classroom	Northampton	MA	Education	2,500	13.2	41.6	0.0	0	13.2	41.6	12
	St Petersburg Net Zero Office (Sierra Club)	St Petersburg	FL	Office	5,000							
	Student Services Center at Mesa College	San Diego	CA	Education	85,000							
	<b>Sweetwater Spectrum Community</b>	Sonoma	CA	Multifamily	15,990	9.4	29.6	4.4	13.7	5.1	15.9	9
	UC Davis West Village (eco district)	Davis	CA	Education	District	50.0	157.5	0.0	0	50.0	157.5	58
2013	UniverCity Childcare Centre	Burnaby	BC	Service	5,690							
	<b>Valatie Free Library</b>	Hudson River Valley	NY	Public Assembly	750							
	<b>William S Hart High School District</b>	Santa Clarita	CA	Education	District							
	Zero Energy Research Lab at University of North Texas	Denton	TX	Education	1,200							
	435 Indio Way	Sunnyvale	CA	Office	31,800	21.5	67.7	18.0	56.7	3.5	11	5
	64 Catherine Street	Boston	MA	Multifamily	1,416							
2013	Beckstoffers Mill Senior Housing Complex	Richmond	VA	Multifamily	8,000							
	Blackford School Multi-Use Building	San Jose	CA	Education								
	<b>Boy Scouts of America The Summit Bechtel Reserve Treehouse</b>	Glen Jean	WV	Public Assembly								
	Bright 'n Green 'Sandy Resistant' Mixed Use Project	Brooklyn	NY	Multifamily								

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						Site	Source	Site	Source	Site	Source	
2013	Centre of Excellence at Okanagan College	Kelowna	BC	Education	61,100							
	<b>Church Hill Townhomes</b>	Fortuna	CA	Multifamily								
	College of the Desert West Valley Campus - Phase 1	Palm Springs	CA	Education	50,000	22.0	69.3	24.0	75.6	-2.0	-6.3	-2
	Delta Building - NYC	Brooklyn	NY	Other	2,700							
	Ewa Elementary School Portable Classroom - Oahu	Aiea	HI	Education								
	Exploratorium Pier 15	San Francisco	CA	Other	330,000	45.0	141.8	37.0	116.6	8.0	25.2	10
	Forest Service's Technology and Development Center	San Dimas	CA	Office								
	<b>Foundry Court by Nexus Homes</b>	Philadelphia	PA	Multifamily								
	General Aviation Terminal	Appleton	WI	Other	8,000			13.0	41			
	<b>Green Leaf Inn</b>	Delavan	WI	Lodging								
	Keene State College Technology, Design and Safety Building	Keene	NH	Education	53,000							
	Lane Community College, Downtown Academic Center	Eugene	OR	Education	90,000	25.0	78.8	0.0	0	25.0	78.8	27
	Los Angeles Harbor College Sciences Complex	Los Angeles	CA	Education	99,570					-0.2		0
	Los Guilicos Correctional Facility	Santa Rosa	CA	Public Order and Safety	149,000	23.9	75.3	1.1	3.5	22.8	71.8	28
	Park Place	Missoula	MT	Other	4,295							
	Park Slope Brooklyn ZNE Brownstone	Brooklyn	NY	Multifamily	7,000							
	<b>Rohner Village</b>	Fortuna	CA	Multifamily								
	Salt Lake City Public Safety Building	Salt Lake City	UT	Public Order and Safety	175,480	70.1	220.9	34.8	109.7	35.3	111.2	34
	SMUD Net Zero Campus - East Campus-Operations Center	Sacramento	CA	Office	350,000							
	Sokol Blosser Winery Tasting Room	Dundee	OR	Mercantile (Enclosed and Strip Malls)	5,000	24.0	75.6	0.0	0	24.0	75.6	24
	Solterra EcoLuxury Apartments	San Diego	CA	Multifamily								
	Taliesin West Net Zero Retrofit - Frank Lloyd Wright	Scottsdale	AZ									
	UC San Diego J Craig Venter Institute	La Jolla	CA	Other	40,079	53.2	167.6	63.8	201.1	-10.6	-33.5	-13
	University of South Carolina Darla Moore School of Business	Columbia	SC	Education	250,000							
	VF Outdoor HQ	Alameda	CA	Office	160,000							
	Walgreens Evanston Store	Evanston	IL	Mercantile (Enclosed and Strip Malls)	14,000	48.7	153.4	54.0	170.1	-5.3	-16.7	-4
	Wayne Aspinall Federal Building and Courthouse	Grand Junction	CO	Public Order and Safety	41,562	21.0	66.2	15.0	47.3	6.0	18.9	6
2014	<b>California Department of Motor Vehicles</b>	Sacramento	CA	Office	520,000							
	<b>Camp Parks</b>	Dublin	CA	Other								
	Chatham University Eden Hall Campus	Richlandtown	PA	Education	District							

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						Site	Source	Site	Source	Site	Source	
2014	<b><i>Chemeketa Community College Health Science Complex</i></b>	Salem	OR	Education								
	<b><i>Clarum Homes Headquarters</i></b>	Palo Alto	CA	Office								
	<b><i>Cottages at Cypress</i></b>	Fort Bragg	CA	Multifamily								
	Craftsbury Outdoor Center Lodge	Craftsbury Common	VT	Lodging								
	<b><i>Dixon Valley Glen</i></b>	Dixon	CA	Multifamily								
	East Bay MET School	Newport	RI	Education	16,800							
	Electrical and Computer Engineering Building and University of Illinois	Champaign	IL	Education	250,000							
	Family Pet Hospital	Clovis	CA	Health Care (Outpatient)	8,700							
	First Housing Development Corp	Tampa	FL	Office	17,000							
	<b><i>Glumac Office Aon Center Floor 23</i></b>	Los Angeles	CA	Office	17,500							
	Gundersen Health System	La Crosse	WI	Health Care (Inpatient)	District							
	<b><i>Kaiser Permanente Antelope Valley Medical Office Building</i></b>	Lancaster	CA	Office	136,800	31.0	97.7	6.0	18.9	25.0	78.8	35
	Kalaeloa NZE Community	Honolulu	HI	Multifamily								
	La Escuelita Education Center	Oakland	CA	Education	123,000							
	LPL Financial Center at La Jolla Commons	San Diego	CA	Office	415,000							
	Market One	Des Moines	IA	Office	50,000							
	Massachusetts Division of Fisheries & Wildlife - Field Headquarters Building	Westborough	MA	Office	45,000	22.6	71.2	0.0	0	22.6	71.2	27
	<b><i>MEC Northeast Campus</i></b>	Phoenix	AZ	Education	101,081	71.5	225.2	48.1	151.5	23.4	73.7	24
	Monarch School Classroom	Houston	TX	Education	1,120							
	Oak Park High School	Oak Park	CA	Education	960							
	<b><i>Odyssey Elementary School</i></b>	Woods Cross	UT	Education	84,000							
	Pflugerville Elementary School	Pflugerville	TX	Education	93,000							
	Richard J. Lee Elementary School	Coppell	TX	Education	95,633	21.2	61.8	18.8	59.3	2.3	2.5	2
	<b><i>San Bernardino Community College District</i></b>	Garden Grove	CA	Education	District							
	SFO Airfield Operations Terminal - VIP Center	San Mateo	CA	Other	8,300							
	Solana Ranch Elementary School	San Diego	CA	Education	68,000							
	Student Success and Retention Center at East Los Angeles College	Los Angeles	CA	Education	136,000							
	<b><i>The Village at Beechwood</i></b>	Lancaster	CA	Multifamily	22,960							
	UC Santa Barbara Recreation Center	Santa Barbara	CA	Education	140,000							
	University of Minnesota Itasca Biological Station and Laboratories	Lake Itasca	MN	Education	10,900							

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						Site	Source	Site	Source	Site	Source	
2015	<b>415 Mathilda</b>	Sunnyvale	CA	Office	33,750							
	Ankeny Row Townhomes	Portland	OR	Multifamily								
	<b>Archimania Office</b>	Memphis	TN	Office	5,000							
	<b>Brinkmann True Value</b>	Miller Place	NY	Mercantile (Retail Other than Mall)								
	<b>CA Lottery District Office</b>	Santa Fe Springs	CA	Office	12,840	22.1	69.8	22.2	70.1	-0.1	-0.3	0
	<b>Cincinnati Police Department - District 3</b>	Cincinnati	OH	Public Order and Safety	39,000							
	<b>City of Hayward 21st Century Library</b>	Hayward	CA	Public Assembly	57,000	35.6	112.1	43.2	136.1	-7.6	-24	-7
	<b>Delta Americas Headquarters</b>	Fremont	CA	Office	200,000	50.1	157.7	36.7	115.6	13.4	42.1	19
	<b>Discovery Elementary School</b>	Arlington	VA	Education	98,000	23.0	72.5	0.0	0	23.0	72.5	22
	<b>Dr. Martin Luther King, Jr. School</b>	Cambridge	MA	Education	140,000							
	<b>Frick Environmental Center</b>	Pittsburgh	PA	Public Assembly	15,500							
	<b>Friends School of Portland</b>	Cumberland Foreside	ME	Education	15,000							
	<b>Graham Middle School</b>	Goldsboro	NC	Education	86,400							
	<b>Grass Education Center</b>	Washington DC	MD	Education	3,800							
	Hanover Page Mill Building	Palo Alto	CA	Office	86,253	30.1	85.8	25.8	81.3	4.3	4.5	7
	<b>Jody Richards Elementary School</b>	Bowling Green	KY	Education	80,904	20.0	63	0.0	0	20.0	63	20
	Langston Terrace Dwellings	Washington DC	DC	Multifamily								
	<b>Monterey Bay CSU - Academic Building 2</b>	Seaside	CA	Education	57,331							
	<b>Mosaic Centre for Conscious Community and Commerce</b>	Edmonton	AB	Public Assembly	30,000							
	<b>Muse School</b>	Calabasas	CA	Education								
	<b>Mutual Housing at Spring Lake</b>	Woodland	CA	Multifamily	64,600							
	Net Zero Plus Electrical Training Institute	Los Angeles	CA	Education	142,000							
	P.S. 62 (Kathleen Grimm School of Leadership and Sustainability)	Staten Island	NY	Education	68,680							
	<b>Phipps Conservatory SEED Classroom</b>	Pittsburgh	PA	Education								
	<b>R W Kern Center at Hampshire College</b>	Amherst	MA	Education	16,950	23.2	73.1	26.6	83.8	-3.4	-10.7	-3
	Rocky Mountain Institute Innovation Center	Basalt	CO	Office	15,610	17.0	53.6	20.0	63	-3.0	-9.4	-4
	Sierra Nevada Aquatic Research Lab & Multiuse Classroom	Mammoth Lakes	CA	Education	2,696							
	<b>Southern Distribution Center</b>	Rancho Cucamonga	CA	Office	60,600	12.0	37.8	0.0	0	12.0	37.8	17
	<b>Spring Creek Middle School</b>	Seven Springs	NC	Education	96,000							
	<b>Stanford Central Energy Facility Admin Building</b>	Stanford	CA	Office								
	<b>Sun Baths</b>	Ann Arbor	MI	Other	10,000							
	University of Hawaii at Manoa Net Zero Classrooms	Honolulu	HI	Education	1,500							

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Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2015	Village in the Bosque Apartments	Bernalillo	NM	Multifamily								
	<b>Yarrow Village</b>	Fortuna	CA	Multifamily								
	Zero Energy Nanotechnology Building at SUNY Poly	Utica	NY	Education	356,000							
2016	<b>380 Pastoria Office</b>	Sunnyvale	CA	Office	30,000	25.7	80.8	31.0	97.8	-5.4	-17	-8
	<b>ARB Southern California Consolidation Project</b>	Riverside	CA		300,000							
	<b>Arch Nexus SAC Office</b>	Sacramento	CA	Office	8,252	36.3	114.4	39.7	125.1	-3.4	-10.7	-5
	<b>Bennington Superior Court &amp; State Office Building</b>	Bennington	VT	Office	65,000					26.1		31
	BEST Center at Laney College	Oakland	CA	Education								
	<b>Bishop O'Dowd High School, Environmental Science Center</b>	Oakland	CA	Education	9,500	6.2	19.5	6.4	20.2	-0.2	-0.7	0
	<b>Building Positive: Four in One Prototype</b>	Kansas City	MO	Other	40,000							
	<b>CA Air Resources Board ZNE Building</b>	Sacramento	CA	Other	300,000	102.9	324.1	102.9	324.1	0.0	0	0
	California DOT SFOBB Phase 2 Warehouse	Oakland	CA	Warehouse and Storage								
	<b>Carolina Forest Middle School</b>	Myrtle Beach	SC	Education								
	<b>Cowhorn Vineyard</b>	Jacksonville	OR	Other	2,200							
	<b>Creamery Row</b>	Arcata	CA	Multifamily								
	<b>Culver City Library</b>	Los Angeles	CA	Public Assembly								
	<b>Egan Junior High School</b>	Los Altos	CA	Education	17,000							
	<b>Fair Oaks Zero Net Energy Office</b>	Pasadena	CA	Office	12,000							
	<b>Foothill College Sunnyvale Center</b>	Los Altos	CA	Education	50,000							
	Fort Hunter Liggett	Jolon	CA	Other	District	23.9	75.3			23.9		30
	<b>Garfield Elementary School</b>	San Francisco	CA	Education	33,422							
	<b>Greenway Building</b>	Arcata	CA	Office	40,000							
	Grow community	Bainbridge Island	WA	Multifamily								
	<b>Imperial Beach Branch Library</b>	Imperial Beach	CA	Public Assembly	14,000							
	Indian Creek Nature Center	Cedar Rapids	IA	Other	12,000							
	<b>Indigo Hammond &amp; Playle Architects Office</b>	Davis	CA	Office	4,000	4.4	13.9					
	<b>Irvine High School Campus Center</b>	Irvine	CA	Education								
	<b>Kaiser Permanente San Jose Medical Office Building</b>	San Jose	CA	Office								
	<b>King County Housing Authority Administration Building</b>	Tukwila	WA	Office	36,000	28.0	88.2	0.0	0	28.0	88.2	40
	Lowry Redevelopment Multi-Family ZNE	Denver	CO	Multifamily								
	<b>McClellan Ranch</b>	Cupertino	CA	Other	3,265	26.8	84.3					
	<b>Memphis Welcome Center</b>	Memphis	TN	Public Assembly								
	<b>Meritage</b>	Coto De Caza	CA	Office								

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Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
2016	<i>Mt. San Antonio College</i>	Walnut	CA	Education	20,610							
	<i>Myrtle Beach Middle School</i>	Myrtle Beach	SC	Education								
	<i>Olympic &amp; Olive Apartments</i>	Los Angeles	CA	Multifamily								
	<i>Passive House Apartments</i>	Steamboat Springs	CO	Multifamily								
	<i>Potomac Watershed Center</i>	Accokeek	MD	Education	3,000							
	<i>San Ysidro Land Port of Entry</i>	San Diego	CA	Other	200,000							
	<i>Sarasota Audubon Nature Center</i>	Sarasota	FL	Education	2,500							
	<i>Sbrega Technology and Learning Center - Bristol Community College</i>	Fall River	MA	Education		50.0	157.5	0.0	0	50.0	157.5	46
	<i>SFO Firehouse #3</i>	San Mateo	CA	Public Order and Safety	20,000							
	<i>Socastee Elementary School</i>	Myrtle Beach	SC	Education								
	<i>Socastee Middle School</i>	Myrtle Beach	SC	Education								
	<i>Sol-Lux Alpha (685 Florida Street)</i>	San Francisco	CA	Multifamily	7,000							
	<i>St. James Intermediate School</i>	Myrtle Beach	SC	Education								
	<i>SunCommon Headquarters</i>	Waterbury	VT	Office	8,800	17.5	55.1	17.5	55.1	0.0	0	0
	<i>Sustainable Energy Fund</i>	Allentown	PA	Office	15,000							
	<i>Tesla Gigafactory</i>	Reno	NV	Other	10,000,000							
	<i>The Roosevelt</i>	Tempe	AZ	Multifamily								
	<i>Twenty Mile South Farm Administration and Maintenance Facility</i>	Boise	ID	Office	14,000	20.0	63					
	<i>University of Wisconsin Arlington Agricultural Research Station</i>	Arlington	WI	Education								
	<i>Vista Grande Elementary School</i>	Rancho Palos Verdes	CA	Education								
	<i>Waitsfield Town Offices</i>	Waitsfield	VT	Office	4,700	13.2	41.5	13.2	41.5	0.0	0	0
	<i>Walden Pond Visitor Center</i>		MA	Public Assembly	5,680							
	<i>West Hollywood City Hall Automated Parking Garage</i>	West Hollywood	CA	Other								
	<i>Whole Foods</i>	San Francisco	CA	Food Sales	25,187							
	<i>William Penn Hotel</i>	San Francisco	CA	Lodging	41,836							
	<i>Xilinx HQ Renovation</i>	San Jose	CA	Office	100,000	37.0	116.5	30.7	96.7	6.3	19.8	10
ZNE EMERGING IN PLANNING, DESIGN, CONSTRUCTION OR DATE UNKNOWN												
	<i>Boulder Commons</i>	Boulder	CO	Other	101,000							
	<i>Cornell Tech NYC Academic Building - Roosevelt Island</i>	New York City	NY	Education	158,000	31.9	100.5	0.0	0	31.9	100.5	31
	<i>Denver Water Headquarters Office</i>	Denver	CO	Office								
	<i>Housing and Community Development Office</i>	San Diego	CA	Office	29,408	26.1	82.1	30.2	95	-4.1	-12.9	-6
	<i>Kaiser Permanente Santa Rosa Medical Office</i>	Santa Rosa	CA	Office	87,300	30.0	94.6	30.1	94.8	-0.1	-0.2	0
	<i>Makers Quarter Block D</i>	San Diego	CA	Office	52,974	46.8	147.4	28.2	88.8	18.6	58.6	26
	<i>Mark Day School</i>	Marin	CA	Education	120,000	8.2	25.7	8.2	25.7	0.0	0	0

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Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
	<b><i>Ohlone Campus Core Replacement Project</i></b>	Fremont	CA	Education	District							
	<b><i>Oregon Zoo Ed Center</i></b>	Portland	OR	Public Assembly	20,000							
	<b><i>OUSD Madison High School</i></b>	Oakland	CA	Education	35,000	14.9	46.9	17.6	55.5	-2.7	-8.6	-3
	<b><i>Palomar Community College</i></b>	San Marcos	CA	Education	District							
	Salt Lake County District Attorney Office	Salt Lake City	UT	Office	86,000							
	<b><i>Santiago High School Science Building</i></b>	Garden Grove	CA	Education	8,000	26.0	81.9	0.0	0	26.0	81.9	30
	<b><i>SFO Ground Transportation Unit Facility</i></b>	San Mateo	CA	Other	14,000							
	<b><i>Sonoma Academy</i></b>	Santa Rosa	CA	Education	130,000							
	UC Santa Barbara Student Services Buildings	Santa Barbara	CA	Education	District							
	<b><i>American Geophysical Union HQ</i></b>	Washington DC	DC	Office	62,000							
	<b><i>CA State Poly Tech University</i></b>	Pomona	CA	Education	138,000	17.0	53.4	23.6	74.2	-6.6	-20.8	-8
	<b><i>Clackamas Community College ITC Building</i></b>	Clackamas	OR	Education	44,523							
	<b><i>Half Moon Bay Library</i></b>	Half Moon Bay	CA	Public Assembly	22,000							
	<b><i>Pastoria</i></b>		CA	Education	30,000							
	<b><i>Re Farm Café</i></b>	State College	PA	Food Service								
	<b><i>Rio Hondo Community College District</i></b>	Whittier	CA	Education	78,201							
	<b><i>Sonoma County Junior College District</i></b>	Sonoma	CA	Education	District							
	<b><i>United Therapeutics Unisphere</i></b>	Silver Spring	MD	Office	122,000							
	<b><i>Whisper Valley net zero community</i></b>	Austin	TX	Other								
	<b><i>Cal State Northridge</i></b>	Los Angeles	CA	Education	District							
	Fort Bliss	Fort Bliss	TX	Other	District							
	<b><i>Fort Carson</i></b>	Fort Carson	CO	Other	District							
	<b><i>Fort Detrick</i></b>	Frederick	MD	Other	District							
	Fremont High School	Oakland	CA	Education	140,000							
	<b><i>IKEA</i></b>	Multiple		Retail	District							
	LA Convention Center	Los Angeles	CA	Public Assembly	1,000,000							
	LinkedIn Building	Mountain View	CA	Office	40,000	30.0	94.5	35.0	110.3	-5.0	-15.8	-8
	Oregon National Guard	Multiple	OR	Other	District							
	<b><i>SFO Airport Campus</i></b>	San Mateo	CA	Other	District							
	<b><i>Sierra Army Depot</i></b>	Herlong	CA	Other	District							
	<b><i>UC Merced</i></b>	Merced	CA	Education	District							
	<b><i>West Point USMA</i></b>	West Point	NY	Other	District							
	<b><i>The Village at RiverBend</i></b>	London	ON	Multifamily	District							
	<b><i>Montpelier</i></b>	Montpelier	VT	Other	District							
	<b><i>Akron Zoo</i></b>	Akron	OH	Other								

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# Ultra-low Energy Verified Projects

Ultra-low energy buildings are comparable to ZNE buildings based on energy use, design strategies and technologies but do not have a stated goal of ZNE. They may or may not have onsite renewables; they may provide structure and wiring to easily incorporate photovoltaics at a later date. All ultra-low energy buildings in this report are verified in that they have shared, with NBI or publicly, 12 or more months of measured energy use data that documents energy performance dramatically better than the industry average.

Year	Project Name	City	State	Building Type	Size (sq ft)	Base (Gross) Energy Use (kBtu/sf/yr)		Onsite Renewable Production (kBtu/sf/yr)		Net Grid Energy Use (kBtu/sf/yr)		zEPI Score
						Site	Source	Site	Source	Site	Source	
<b>1994</b>	Wampanoag Headquarters	Gay Head	MA	Office	8,700	30.0	94.5	0.0	0	30.0	94.5	36
<b>1995</b>	Durant Road Middle School	Raleigh	NC	Education	148,500	25.0	78.8	0.0	0	25.0	78.8	24
	Ridgehaven Office Building	San Diego	CA	Office	78,000	24.0	75.6	0.0	0	24.0	75.6	33
<b>1996</b>	Claiborne & Churchill Winery	San Luis Obispo	CA	Office	2,585	20.0	63	0.0	0	20.0	63	30
<b>1998</b>	Vermont Law School Oakes Hall	South Royalton	VT	Education	23,500	37.0	116.6	0.0	0	37.0	116.6	34
<b>2000</b>	IAMU Office and Training Headquarters	Ankeny	IA	Office	12,500	21.6	67.9	6.9	21.8	14.7	46.1	18
	Takoma Village Cohousing	Washington	DC	Multifamily	51,000	26.0	81.9	0.0	0	26.0	81.9	36
	Zion Comfort Station	Springdale	UT	Other	2,400	20.0	63	0.0	0	20.0	63	24
<b>2001</b>	Navy Building 850	Port Hueneme	CA	Office	17,000	25.0	78.8	11.0	34.7	14.0	44.1	21
<b>2002</b>	Colorado Court Affordable Housing	Santa Monica	CA	Multifamily	29,900	39.0	122.9	2.0	6.3	37.0	116.6	58
	Georgina Blach Intermediate School	Los Altos	CA	Education	71,741	33.0	104	0.0	0	33.0	104	41
	Leslie Shao-Ming Sun Field Station	Redwood City	CA	Education	10,036	20.2	63.5	8.6	27.1	11.6	36.4	14
<b>2003</b>	Bazzani Associates Headquarters	Grand Rapids	MI	Office	9,480	31.3	98.5	0.0	0	31.3	98.5	38
	EcoDorm at Warren Wilson College	Swannanoa	NC	Multifamily	9,000	23.0	72.5	0.0	0	23.0	72.5	32
	Lower Windsor Township Community Center	Wrightsville	PA	Public Assembly	37,100	31.0	97.7	0.0	0	31.0	97.7	27
	Rinker Hall	Gainesville	FL	Education	47,470	30.0	94.5	0.0	0	30.0	94.5	29
	Schlitz Audubon Nature Center	Bayside	WI	Other	35,387	28.0	88.2	0.0	0	28.0	88.2	22
	South Rim Maintenance & Warehouse Facility	South Rim	AZ	Public Order and Safety	72,000	22.0	69.3	0.0	0	22.0	69.3	21
	Southern York County Library	Shrewsbury	PA	Public Assembly	10,095	32.0	100.8	0.0	0	32.0	100.8	31
<b>2004</b>	Doyle Conservation Center	Leominster	MA	Office	22,000	27.0	85.1	4.0	12.6	23.0	72.5	28
	Escalante Science Center	Escalante	UT	Education	21,101	31.0	97.7	0.0	0	31.0	97.7	32
	Lovejoy Opsis Building	Portland	OR	Office	20,000	33.0	104	0.0	0	33.0	104	47
	Renewable NRG Partners, LLC	Hinesburg	VT	Other	46,000	22.0	69.3	0.0	0	22.0	69.3	17
	Suwannee River Visitor Center	Fargo	GA	Public Assembly	7,015	26.0	81.9	0.0	0	26.0	81.9	27
<b>2005</b>	Denali Visitor Center	Denali National Park	AK	Public Assembly	13,991	17.0	53.6	0.0	0	17.0	53.6	12
	Jane D'Aza House of Formation	San Rafael	CA	Other	6,200	7.0	22.1	0.0	0	7.0	22.1	9
	Kirsch Center For Environmental Studies at De Anza College	San Jose	CA	Education	21,600	33.0	104	10.0	31.5	23.0	72.5	28

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						Site	Source	Site	Source	Site	Source	
2006	Kinard Junior High	Fort Collins	CO	Education	112,735	25.0	78.8	0.0	0	25.0	78.8	26
	Stoller Winery	Dayton	OR	Mercantile (Retail Other than Mall)	23,000	30.0	94.5	0.0	0	30.0	94.5	34
2007	Center for Children & Families-CSU San Marcos	San Marcos	CA	Education	20,200	28.0	88.2	0.0	0	28.0	88.2	32
	Garthwaite Center for Science & Art	Weston	MA	Education	22,000	27.0	85.1	0.0	0	27.0	85.1	25
	Plano Elementary School	Bowling Green	KY	Education	81,147	26.8	84.4	29.5	93	-2.8	-8.6	-3
2008	Carlton Hills Modernization	Santee	CA	Education	56,159	26.0	81.9	0.0	0	26.0	81.9	30
	Carlton Oaks Modernization	Santee	CA	Education	61,675	24.0	75.6	0.0	0	24.0	75.6	28
	Crockett & Gateway Elementary School	Borger	TX	Education	115,312	31.9	100.5	0.0	0	31.9	100.5	35
	Eco Office	Atlanta	GA	Office	10,100	24.0	75.6	2.0	6.3	22.0	69.3	28
	Sycamore Canyon Modernization	Santee	CA	Education	52,000	23.0	72.5	0.0	0	23.0	72.5	27
2009	CMTA Office Building	Louisville	KY	Office	20,000	18.0	56.7	2.0	6.3	16.0	50.4	20
	High Tech High - Chula Vista	Chula Vista	CA	Education	44,370	23.8	75	0.0	0	23.8	75	27
	Hillandale Elementary School	East Flat Rock	NC	Education	80,820	29.8	93.7			29.8		29
	Los Vecinos - Multifamily	Chula Vista	CA	Multifamily	51,000	19.0	59.9	9.0	28.4	10.0	31.5	16
	M.E.Group Omaha Office	Omaha	NE	Office	6,268	28.0	88.2	0.0	0	28.0	88.2	34
2010	Aventine	La Jolla	CA	Office	253,000	23.0	72.5	0.0	0	23.0	72.5	32
	Greensburg Kansas k-12 School (Kiowa County Schools)	Greensburg	KS	Education	123,405	29.0	91.4	2.0	6.3	27.0	85.1	26
	Northwest Maritime Center	Port Townsend	WA	Other	26,550	30.0	94.5	0.0	0	30.0	94.5	33
	<b><i>South Warren Middle School / High School</i></b>	Bowling Green	KY	Education	333,000	24.3	76.6	0.0	0	24.3	76.6	24
	Suzuki Public School	Windsor	ON	Education	58,482	25.0	78.8	3.0	9.5	22.0	69.3	20
2011	Alameda County Library	Castro Valley	CA	Public Assembly	34,537	64.0	201.6	47.0	148.1	17.0	53.5	21
	Iowa Utilities Board / Office of Consumer Advocate	Des Moines	IA	Office	44,640	22.0	69.3	4.0	12.6	18.0	56.7	22
	Ramona Apartments	Portland	OR	Multifamily	230,760	19.0	59.9	1.0	3.2	18.0	56.7	27
	<b><i>Stone34</i></b>	Seattle	WA	Other	132,293	27.7	87.3	0.0	0	27.7	87.3	30
2013	31 Tannery Road - Ferreira Construction HQ	Somerville	NJ	Office	41,508	28.0	88.2	19.0	59.9	9.0	28.3	11
	749 University Row	Madison	WI	Office	85,000	35.0	106.5	0.0	0	35.0	106.5	42
	Edith Green-Wendell Wyatt Federal Building	Portland	OR	Office	512,474	30.0	94.5	2.0	6.3	28.0	88.2	40
	Jeffrey Trail Middle School	Irvine	CA	Education	74,600	29.0	91.4	12.0	37.8	17.0	53.6	20
	Outagamie County Regional Airport General Aviation Terminal	Appleton	WI	Other	8,150	30.0	94.5	8.0	25.2	22.0	69.3	17
2014	Zellwood Elementary School	Zellwood	FL	Education	90,000	62.0	195.3	32.5	102.4	29.5	92.9	28
2015	<b><i>Alvaton Elementary School</i></b>	Alvaton	KY	Education	79,518	39.4	124	0.0	0	39.4	124	38
	<b><i>Bowling Green School District Transportation Building</i></b>	Bowling Green	KY	Education	22,020	25.0	78.6	0.0	0	25.0	78.6	24
	City of St. Louis Park Fire Station #2	St. Louis Park	MN	Public Order and Safety	47,455	194.0	611.1	155.1	488.6	38.9	122.5	30
	Everett Municipal Court Replacement	Everett	WA	Public Order and Safety	25,000	57.0	179.6	28.6	90.1	28.4	89.5	31
	Valhalla Elementary School	Auburn	WA	Education	56,079	40.0	126	3.4	10.7	36.6	115.3	39

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# GETTING TO Zero

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