

Ten Action Paths to Support Progress to Net Zero

New Buildings Institute has developed the following set of action paths for jurisdictions to support a long term commitment to Zero Net Energy (ZNE) Buildings. By assessing progress and capability for each of these key action paths, jurisdictions can systematically plan to make progress towards a successful ZNE policy. More information and resources on these recommendations can be found at newbuildings.org.

1. Energy Codes – Policy Goals and a ZNE Codes Roadmap.

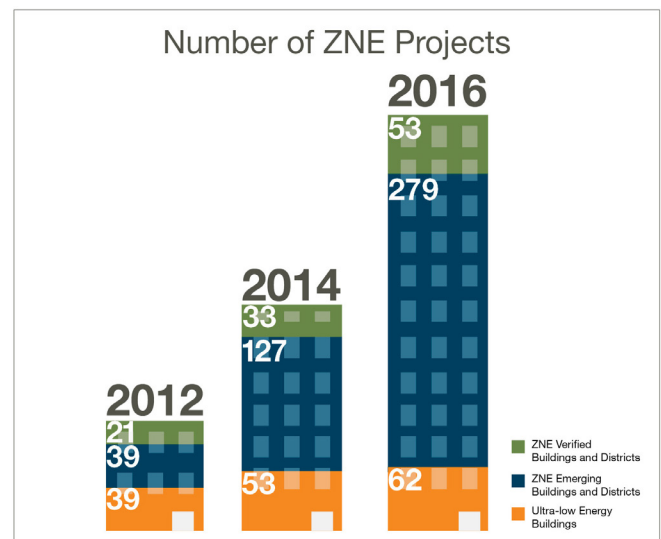
To achieve policy objectives for ZNE buildings, these goals ultimately must be supported and/or required by building codes. Many cities and states have voluntary or mandatory dates certain for implementing ZNE codes. A codes roadmap that identifies progressive updates to codes incrementally over time to achieve ZNE goals is an important policy step and a clear signal to the marketplace.

2. Building Disclosure and Performance Characterization.

A better understanding of how much energy buildings actually use provides an important foundation for setting meaningful targets to reduce energy consumption in individual buildings. This information allows jurisdictions to better understand sector energy use and policy effectiveness. When comparative building performance data is publicly available, market mechanisms can incorporate building performance metrics into building valuations, further encouraging building performance improvements. A number of cities have implemented mandatory benchmarking requirements, usually beginning with larger buildings. This policy typically evolves to incorporate a wider range of buildings and towards public disclosure of performance information. Widespread benchmarking and disclosure is a foundational element to achieve ZNE policy success.

3. Building Performance Targets and Improvement.

Continuous improvement of the existing building stock is critical to achieving long term ZNE goals for the building sector. There are many opportunities in a building's life cycle to significantly improve building performance. Key milestones include building sale or lease, tenant improvements, system upgrades, equipment replacement, and building alterations. There are many case studies of highly successful deep energy performance retrofits, as well as a substantial number of ZNE buildings that have been developed from existing buildings. To successfully encourage improvements in existing buildings towards the ZNE goal, policies and programs should identify increasingly aggressive performance targets, and leverage milestones in the building lifecycle to achieve deep retrofits during these key events. Energy codes and other policies can also be adapted to apply more broadly and deeply to existing building alterations.



Founded in 1997, New Buildings Institute (NBI) is a nonprofit organization working to improve the energy performance of commercial buildings. We work collaboratively with commercial building market players—governments, utilities, energy efficiency advocates and building professionals—to remove barriers to energy efficiency, including promoting advanced design practices, improved technologies, public policies and programs that improve energy efficiency. We also develop and offer guidance to individuals and organizations on designing and constructing energy-efficient buildings through our Advanced Buildings® suite of tools and resources.

To learn more, visit: newbuildings.org.

- 4. Utility (Municipal or IOU) Support for ZNE Buildings and Grid.** Utility incentive programs and technical assistance can reduce the risks inherent in new approaches to design and construction, including ZNE. Current utility programs offer incentives for new construction, and deep energy retrofits. Many new programs also explicitly target ZNE construction. In addition, utilities offer direct incentives for on-site renewable systems, plus a variety of modern rate structures can better address the real value of energy efficiency, demand reduction and renewable generation, while simultaneously recognizing the value of grid infrastructure. The transformation of the building sector toward ZNE can only occur if the grid is able to absorb net renewable energy production when it is generated (or released from storage) while still remaining reliable, safe, and affordable. A deeper penetration of ZNE buildings in a jurisdiction will require close integration with utility incentive programs, rate structures, and distribution network planning.
- 5. Low or Zero Carbon Grid-Based Electricity and Gas.** Many policies, such as Renewable Portfolio Standards, are leading to a measurable decarbonization of the electricity supply. Other policies can increase the supply of Renewable Gas that help lead to reduced carbon in natural gas supplies. With the increasing decarbonization of fuel supplies, the jurisdictional goals of ZNE become complimentary to Zero Net Carbon (ZNC) emission goals for the building sector. As both of these goals play prominent roles in jurisdictional policies, it becomes more important to establish clearly understood metrics and definitions for both ZNE and ZNC.
- 6. Financial and Regulatory Incentives for ZNE.** Some states and local jurisdictions are already providing tax and other incentives, such as waiving permit fees, for ZNE projects. Local governments can also tune zoning regulations to encourage ZNE, using well-established tools such as density bonuses, accelerated permitting and greenfield development. It is also important to review local zoning and code structures to ensure that current regulations don't unintentionally constrain the ability to construct ZNE buildings; revisions to existing code language and regulations may be needed to ensure compatibility.
- 7. Leadership in Government and School Building Portfolios.** State and local government buildings and school district facilities are excellent opportunities in which to demonstrate ZNE and interim energy reduction targets based on measured performance. It is particularly important for the school sector to lead by example both for educational purposes and to establish viability, market development and credibility of other policy efforts. Public buildings can also provide examples of design methods, effective on-going management strategies, contract processes, costs and financing models. Portfolio-wide analysis of a municipal building stock can identify the best opportunities for ZNE in their existing structures.
- 8. Community-Scale Renewable and Storage Systems.** Renewable energy systems located beyond the boundaries of a single building site can offer economies of scale for distributed generation, and in many instances may have advantages over individual building systems. "Community solar" will be particularly valuable in serving the existing building stock, especially in urban downtowns where dense development, shading and taller structures limit the ability of onsite photovoltaics to provide sufficient renewable energy. New policies to allow community-scale renewable energy production may be needed at the state and local levels. Electricity storage in scales beyond the building site may also offer greater opportunities to manage increased levels of distributed generation.
- 9. Appliance Standards.** A large portion of building energy use is driven by equipment and plug loads that are outside the scope of current energy construction codes. In very efficiently designed buildings, these 'unregulated' loads usually represent more than half of total building energy use. Managing these loads is critical to successfully achieving ZNE at scale. Appliance standards play a critical role in reducing energy consumption. While federal appliance standards pre-empt local regulations, many appliances are not covered by federal standards and can be regulated at the state and local level.
- 10. Public Acknowledgment and Recognition.** Public and official recognition will be very important to increasing the momentum in ZNE buildings. It earns media coverage and elevates attention to the benefits and possibilities of ZNE across building types, and spotlights best practices and achievement. Recognition also adds value to the investments that building owners and stakeholders have made to get to ZNE.